

C. DAVIS.

ATTACHMENT FOR PROJECTILES.

APPLICATION FILED NOV. 4, 1907. RENEWED MAY 10, 1909.

942,617.

Patented Dec. 7, 1909.

Fig. 1.

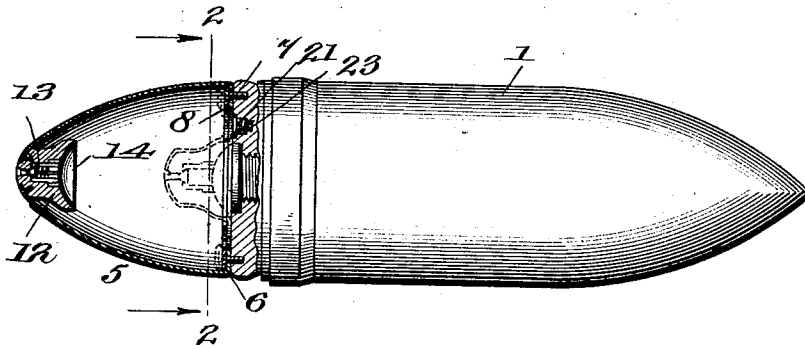


Fig. 2.

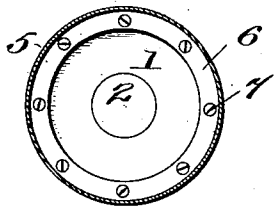


Fig. 3.

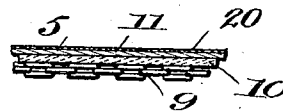
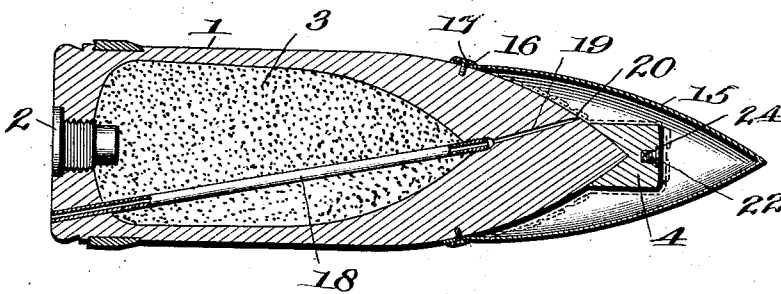


Fig. 4.



Witnesses

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ATTACHMENT FOR PROJECTILES.

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To all whom it may concern:

Be it known that I, CLELAND DAVIS, lieutenant-commander U. S. N., a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Attachments for 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 invention relates to attachments for projectiles, and the object of my invention is to produce an attachment which will lessen the resistance of the air to the projectile during flight, and which shall be capable of being secured to the standard projectiles now in use.

It is now well known, from practical demonstrations, that the flight of projectiles can be considerably increased by simply so shaping and proportioning that portion of the projectile which lies forward of the bourrelet, so that the same will offer a minimum resistance to the air during flight. That is to say, it is well known that the air is greatly compressed in front of the projectile during flight, and is correspondingly expanded immediately in the rear, thereof; and that if the curved front portion of the projectile is given the proper contour, a minimum of resistance through the compressed layers of air is encountered, and the flight and accuracy of these new projectiles is increased. It is evident from these facts that if the so called vacuum, or expanded layers of air, at the rear of the standard projectiles, could be done away with, the flight and accuracy of these projectiles could be likewise increased. It, also, follows that if the resistances encountered by the standard projectile at its forward, as well as at its rear end, could be diminished, its flight and accuracy would be still further enhanced.

It is the object of my invention, as above stated, to produce an attachment which will lessen the resistance of the air to a standard projectile during its flight, either at the rear portion thereof, or at the front portion thereof. And with this object in view my invention consists in an envelop or an equivalent attachment to the projectile which is capable of being collapsed when the shell is not in use. and of being automatically in-

flated, and thereby giving the projectile the desired contour at the front or rear, when the same is fired.

Referring to the accompanying drawings forming a part of this specification:—Figure 1, is a side elevational view partly in section of the projectile provided with my attachment in its inflated condition; Fig. 2, is a cross sectional view taken on the line 2—2 of Fig. 1; Fig. 3, an enlarged detailed view of the materials out of which the walls of my attachment are made; and Fig. 4, a longitudinal sectional view of a shell provided with my attachment at its front portion.

Like numerals refer to like parts in all the views.

1, represents the body of a standard shell; 2, the standard fuse therein; 3, the cavity thereof; and 4, the soft steel cap usually employed in such projectiles.

5, represents an envelop or bag, which may be attached to the base of the standard projectile by means of a metal ring 6, or by any other suitable means. The metal ring 6, is provided with holes through which pass suitable screws 7, and serves to clamp the edges 8, of the bag firmly between itself and the base of the projectile. The walls of this bag, as best shown in Fig. 3, are composed of a chain fabric 9, on the outside, an inner lining of asbestos 10, next to the chain, and a further inner lining 11, of silk coated with asbestos 20. At the apex of this bag is secured gas tight a suitable plug 12, provided with a check valve 13, and having a cavity 14, in its bottom, as shown. The said bag or envelop 5, being made of the layers 9, 10 and 11, of flexible material, as above stated, is capable of being collapsed against the base of the projectile, as shown in dotted lines in Fig. 1, and in this condition the shell is loaded into the gun.

The shape of the bag, or envelop 5, when extended, is so designed that it will have a curvature substantially filling the greater portion of the so-called vacuum, which exists at the base of a standard projectile during flight; and when the said projectile is fired from the gun the gases of explosion, under a very high pressure, will unseat the check valve 13, fill the cavity 14, and cause the said envelop 5, to expand and occupy the position shown in full lines in Fig. 1. The cavity 14, is chosen of such a dimension as

will accommodate the proper quantity of gas when the said bag 5, is in its collapsed condition.

In the form shown in Fig. 4, the bag 15, is given a different shape when extended from that shown in Fig. 1, in order that the minimum resistance to the forward portion of the shell may be secured. The said bag is normally collapsed around the soft metal cap 4, and the end of the shell, as shown in dotted lines, and is secured gas tight to the curved forward portion of the shell by any suitable means, as by the ring 16, and screws 17, illustrated. A tube 18, is secured diagonally across the cavity 3, of the shell before filling the said cavity, as shown, and a passage 19, is preferably bored through said cavity to the outside of the shell in order to complete a passage for the gas of explosion, from the base of the shell to the envelop 15. The said passage 19, is made much smaller at its extreme end 20, than at any other point, in order that the gas may not too violently, rush into the envelop 15. In this form of my invention the shell is loaded into the gun with the envelop 15, in its collapsed condition, shown in dotted lines in Fig. 4, and when the gases of explosion are generated, the same pass through the tube 18, and escape through the restricted portion 20, of the passage 19, into the said envelop 15, and expand the same to its full line position, shown in Fig. 4. When the envelop 15, is in this position, its shape having been properly designed, the projectile will encounter a minimum resistance from the air. The walls of the envelop 15, are likewise made of chain, asbestos and silk, as described in connection with envelop 5.

In all cases I may provide, if desired, any suitable small fuses 21 and 22, located in the base and nose portions, respectively, of the projectile, and capable of igniting the respective quick burning compositions 23 and 24, and thereby generating sufficient gas to keep the walls 5 and 15, of the envelops inflated. In fact, in some cases, I may depend entirely upon these fuses to inflate the envelops, and hold them inflated. Of course, proper escapes for the gas, not shown, around or through the fuses, are provided.

The operation of my device will be readily understood from the foregoing description, and will therefore not be repeated here.

I do not wish to be understood as limiting myself to the exact details of construction and arrangement of parts above described, nor to any gas generating compositions, since it is obvious that the same may be very widely varied without departing from the spirit of my invention.

What I claim and desire to secure by Letters Patent is:—

1. The combination of a projectile, and a hollow collapsible cone shaped means attached to the base thereof for lessening the resistance of the air during flight, substantially as described.
2. The combination of a projectile, and a cone shaped hollow, flexible, means attached thereto for lessening the resistance of the air during flight, substantially as described.
3. The combination of a projectile, a hollow, collapsible, means attached thereto for lessening the resistance of the air during flight, and means for inflating the same while the shell is acquiring its velocity, substantially as described.
4. The combination of a projectile, of a hollow, collapsible, means attached thereto for lessening the resistance of the air during flight; and means for inflating said collapsible means while the shell is acquiring its velocity comprising a channel for conducting the gases of explosion into said collapsible means, substantially as described.
5. The combination of a projectile, a bag attached thereto conforming to the contour of the projectile, of such a shape as to lessen the resistance of the air during flight, and means for causing said bag to be inflated after the gun is fired, substantially as described.
6. The combination of a projectile, a collapsible bag attached thereto conforming to the contour of the projectile when extended; and of such a shape as to lessen the resistance of the air during flight, and means for causing said bag to be inflated by the gases of explosion after the gun is fired, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

CLELAND DAVIS.

Witnesses:

KATHARINE BYRNE,
H. T. McKEEVER.