J. FRICK.

EXPANSIBLE PROJECTILE.

APPLICATION FILED MAY 29, 1918.

1,318,858. Patented Oct. 14, 1919.

Fig. 1.

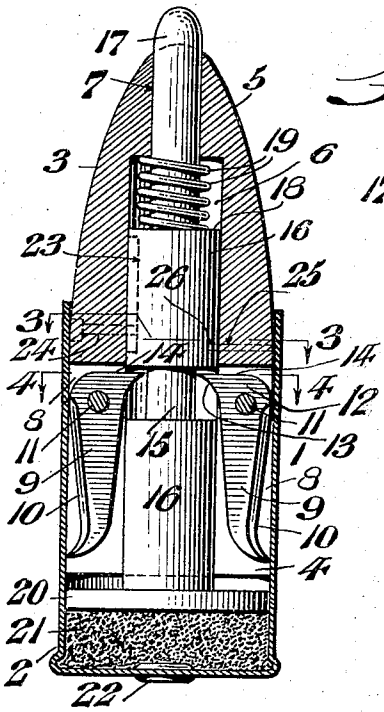


Fig. 6.

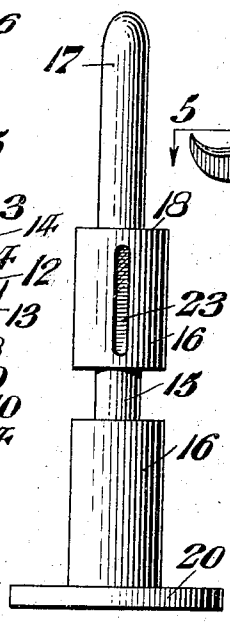


Fig. 2.

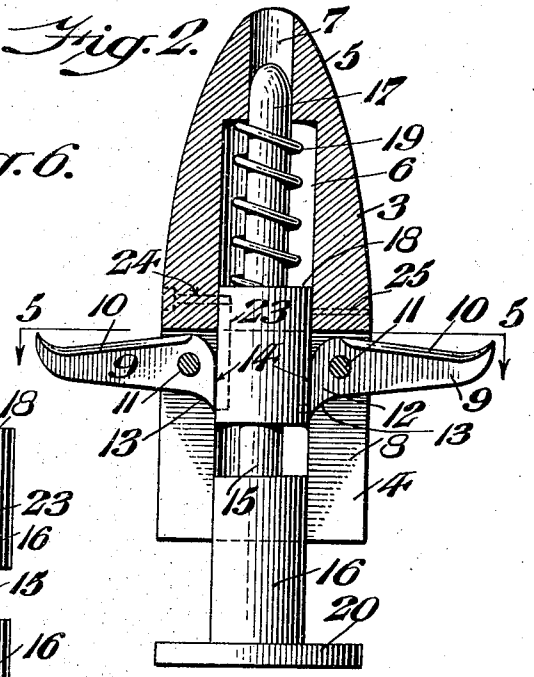


Fig. 3.

ON LINE 3-3. FIG. 1.

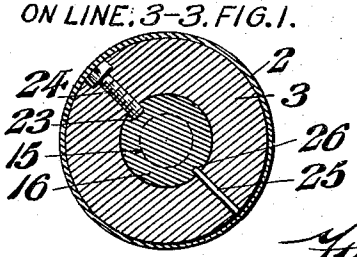


Fig. 4.

ON LINE 4-4. FIG. 1.

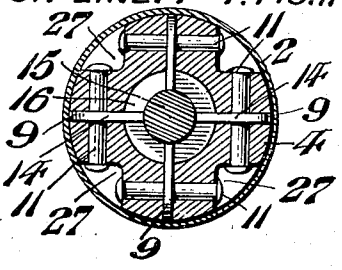


Fig. 5.

ON LINE 5-5. FIG. 2.

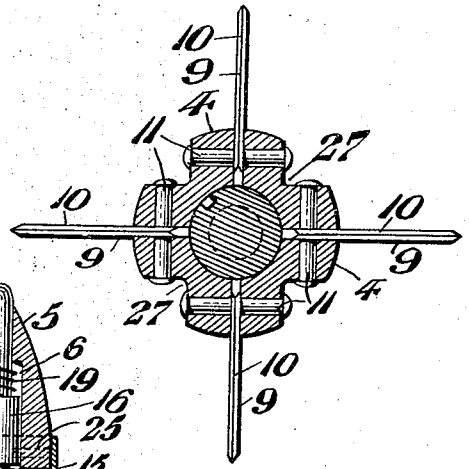
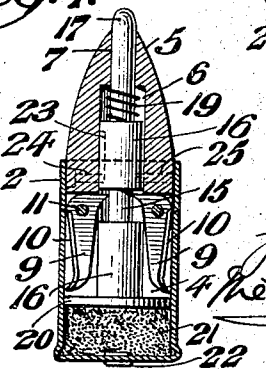


Fig. 7.



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EXPANSIBLE PROJECTILE.

1,318,858. Specification of Letters Patent. Patented Oct. 14, 1919.

Application filed May 29, 1918. Serial No. 237,222.

To all whom it may concern:

Be it known that I, JOHN FRICK, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Expansible Projectile, of which the following is a specification.

My present invention comprehends a novel construction and arrangement of expansible projectile, the size of which depends upon the bore of the ordnance with which it is used and it may be employed with the shells of small arms such as revolvers or rifles and also in conjunction with both light and heavy artillery and with guns of the largest size.

In accordance with my present invention, the projectile is constructed in such a manner that its width is materially increased so that when the projectile penetrates an object an opening will be made much larger than the normal diameter of the projectile.

It further consists of a novel projectile in conjunction with which is employed a desired number of outwardly projecting arms or cutting blades which are automatically positioned either due to the force of explosion or by the impact of the projectile against an object.

It further consists of a novel construction of a projectile having arms movably connected therewith and provided with a plunger which effects the opening of said arms.

Other novel features of construction and advantage will hereinafter more clearly appear in the detailed description of my invention.

For the purpose of illustrating my invention I have shown in the accompanying drawing a typical embodiment of it which in practice will give satisfactory and reliable results. It is, however, to be understood that this embodiment is typical only and that the various instrumentalities of which my invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of these instrumentalities as herein set forth.

Figure 1 represents in sectional elevation a projectile embodying my invention.

Fig. 2 represents in sectional elevation the projectile seen in Fig. 1 after it has left the shell and the blades have been opened.

Fig. 3 represents a section on line 3—3 of Fig. 1.

Fig. 4 represents a section on line 4—4 of Fig. 1.

Fig. 5 represents a section on line 5—5 of Fig. 2.

Fig. 6 represents in side elevation and in detached position one of the elements of the projectile.

Fig. 7 represents in sectional elevation another embodiment of my invention.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings,

Referring first to Figs. 1 to 6 inclusive, 1 designates an expansible projectile embodying my invention which comprises a shell 2 and a projectile proper 3. The projectile proper 3 has a body portion 4 and the forward end 5 preferably has its walls converging in order to facilitate the flight of the projectile.

6 designates a chamber or aperture in the body 4 which extends through the rear end of the body portion and at its forward end communicates with an aperture 7 of reduced diameter opening through the forward end of the projectile. The body portion 4 is provided with a desired number of slots 8 and for purpose of illustration I have shown four of such slots it being understood that one or more may be employed in practice.

9 designates arms preferably in the form of blades which are provided at their forward ends with a cutting edge 10. Each blade 9 is pivoted as at 11 in its respective slot and is provided with a flange or foot piece 12 one face of which is curved as at 13 while its juxtaposed face 14 is substantially straight. The foot piece 12 forms a trigger which when the parts are in assembled position as seen in Fig. 1 is received in the space formed by the groove 15 of a plunger 16 which is slidably mounted in the chamber 6, of the projectile. The plunger 16 terminates at its forward end in a striker or impact member 17 which is of reduced diameter and which is slidable in the aperture 7. The plunger 16 and impact mem-

ber 17 form a shoulder 18 between which and the forward end of the chamber 6 is interposed a spring 19. The rear end of the plunger 16 is provided with a head 20 of enlarged diameter and this head is preferably of the same diameter as the diameter of the body portion 4 and when the parts are assembled, as in Fig. 1, it contributes with the shell 2 to form a chamber to receive the explosive charge 21. The shell 2 is provided with a percussion cap or time fuse 22 the purpose of which is to ignite the explosive charge 21.

The forward head of the plunger 16 is provided with a longitudinally extending groove 23 into which extends a set screw 24 which is in threaded engagement with the body portion 4 of the projectile.

In the embodiment seen in Figs. 1 to 5 inclusive, the plunger 16 is maintained in the position seen in Fig. 1 by means of a pin 25 which extends through the projectile proper 3 and into a recess 26 in the forward head of the plunger 16. This pin 25 may vary in size so that it will be broken by the force of the explosion or it may be of such size that it does not break until the impact member 17 strikes an object. In the construction seen in Figs. 1 to 5 inclusive, the pin 25 will preferably be of such size and strength that the force of the explosion will cause it to break whereupon the spring 19 will cause the plunger 16 to move rearwardly as soon as the projectile proper leaves the shell 2. During such movement the shoulder formed by the groove 16 will cause the arms 9 to move into the position seen in Fig. 2 and due to the set screw 24 and the groove 23 the position of the plunger and the projectile proper will be that seen in Fig. 2. The flat faces 14 engaging the periphery of the forward head of the plunger 16 retain the cutting blades in the position seen in Fig. 2.

In the embodiment seen in Fig. 7, the construction is substantially the same except that the head 20 of the plunger 16 is positioned nearer to the groove 15. The pin 25 is made relatively stronger so that the cutting blades 9 will not be opened until the impact member 17 strikes the object.

My present invention is especially adapted to be employed in guns which are used against aeroplanes since a much larger hole can be made in the wings or engine of the aeroplane. If desired to lighten the rear end of the body portion such body portion may be cut away as indicated at 27.

These cut away portions 27 also facilitate the insertion of the means employed to pivotally connect the cutting blades of the projectile.

It will be apparent from the foregoing that in accordance with my present invention, I provide a projectile with one or more outwardly projecting elements which are automatically thrown or moved outwardly as soon as the projectile leaves the gun or as soon as the projectile impacts against an object. These cutting blades are securely held in their open position by means of the plunger which coöperates with them.

It will be apparent that in the broad aspect of my present invention it is not necessary that the projectile be fired from the bore of a gun since it can be projected by any desired means, and in any desired manner in which case the time fuse can be set so that the blades will be automatically opened at any desired point in the flight of the projectile.

It will now be apparent that I have devised a novel and useful construction of an expansible projectile which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described a preferred embodiment thereof which will give in practice satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. A projectile comprising a shell, a body portion therein having a chamber having its forward end extending beyond the impact end of said projectile, a plunger in said chamber having a head contributing with said shell to form a chamber for said explosive charge, an explosive charge in said chamber, a spring to effect the relative movement of said plunger and body portion, blades pivotally carried by said body portion and normally concealed within said shell and provided with means actuated by said plunger to effect the opening of the blades, and a pin to prevent relative movement of said plunger and body portion until the projectile has been fired.

2. A projectile comprising a shell, a body portion in said shell, said body portion having an aperture extending therethrough, a plunger in said aperture having an impact member extending beyond the forward end of said body portion, said plunger having a groove intermediate its ends and having a head contributing with said shell to form a chamber for the explosive, blades pivotally mounted at their inner ends in said body portion and having their inner ends extending into the groove of said plunger, whereby relative movement of said plunger and body portion effects the opening of said blades, and a pin to normally prevent relative movement of said plunger and body portion.

3. A projectile having a chamber, a plun-

ger slidable in said chamber and extending through the forward end of the projectile to form an impact member, blades pivotally carried near one end by said projectile and having flat faces engaging the periphery of the plunger to retain the blades in open position, said plunger having means to effect the opening of said blades, a spring acting directly against said plunger to effect relative movement of said plunger and blades, means to limit the travel of the plunger, and means to prevent movement of the plunger to effect opening of the blades until after the projectile has been fired.

4. In a projectile, a body portion, a plunger slidable in said body portion and having its forward end extending beyond the impact end of said body portion, said plunger being provided with a groove, a spring acting against said plunger and tending to move it longitudinally after the projectile has been fired, and blades pivotally carried by said body portion and having foot pieces extending into said groove, whereby said blades are moved into expanded position when the plunger is moved rearwardly with respect to said body portion.

5. In a projectile, the combination with a shell, of a body portion fixed to the shell, a plunger longitudinally movable in said body portion and having a head contributing with said shell to form a chamber to receive an explosive charge, said plunger having its forward end extending beyond the body portion to form an impact member, said plunger being also provided with a groove, a spring interposed between said body portion and plunger and tending to move the latter rearwardly, and cutting blades pivotally mounted in said body portion and having foot flanges extending into said groove, one face of a foot flange being straight and the other face being curved, whereby said straight face engages said plunger when the blades are expanded to retain them in expanded condition.

JOHN FRICK.

Witnesses:
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C. D. MCVAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."