No. 741,328. PATENTED OCT. 13, 1903.

S. A. GROFF.

PROJECTILE.

APPLICATION FILED JULY 9, 1903.

NO MODEL.

Fig. 1.

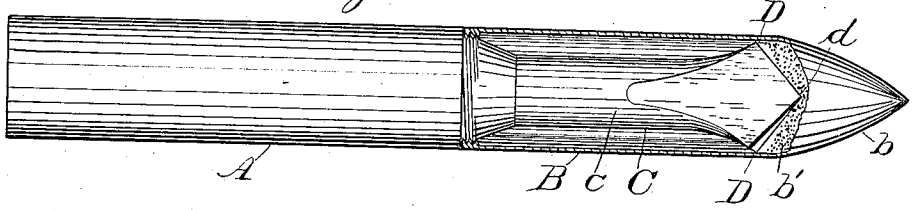
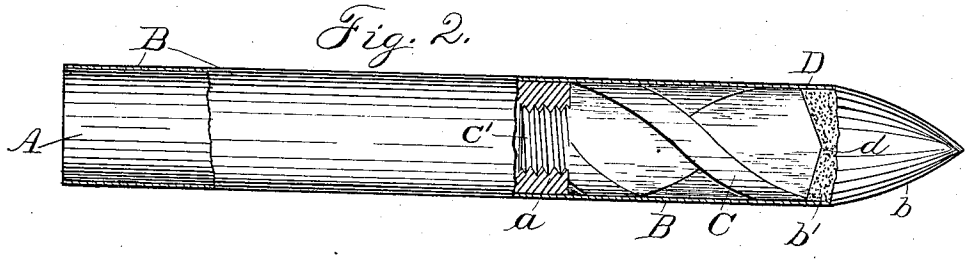


Fig. 2.



Witnesses

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No. 741,328. Patented October 13, 1903.

UNITED STATES PATENT OFFICE.

SAMUEL A. GROFF, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO DILLER B. GROFF, OF WASHINGTON, DISTRICT OF COLUMBIA.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 741,328, dated October 13, 1903.

Application filed July 9, 1903. Serial No. 164,824. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL A. GROFF, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Projectiles, of which the following is a specification.

My invention relates to projectiles, either solid or containing explosives. Its object is to increase the penetrating quality of the projectile and in the case of shells to open a way through an obstruction for the entrance of the shell and its explosion therein.

It is well known that when a shell does not penetrate the object against which it is fired, as the armored side of a vessel, it falls away and the explosion of the shell does very little damage; but if the shell can be held against the armor-plate the explosion becomes more destructive, and since a very slight entrance of the penetrator of my device will hold the shell against the plate a valuable result is attained in this respect also.

The accompanying drawings illustrate the invention, Figure 1 being a longitudinal view, partly in section. Fig. 2 is a similar view showing modifications of the invention.

The various features of this device are referred to by letters, similar letters denoting corresponding parts in both views.

The letter A indicates a cylindrical projectile made either solid or as a shell. It is adapted to acquire a rotary motion by rifling the cannon or in any preferred way.

B is a tubular extension or air-fender, preferably of soft material, on the front part of the projectile A. It has a conical point *b*, which may be supplied with a lubricant *b'*. This fender B should entirely cover the penetrator C, and may be screwed to the projectile, as shown in Fig. 1, or attached to it in any other way.

C is the penetrator, which may be made integral with the projectile or attached to it in any desired manner. In Fig. 2 it is provided with a threaded stem *c'*, which is screwed into a threaded socket *a* on the front end of the projectile. This penetrator is preferably made of tool-steel and in the form of a drill, as seen in Fig. 1, or in the form of an auger, as shown in Fig. 2. If desired, also, its points D *d* may be tipped with any very hard material to increase their cutting power.

The object of the fender B is to prevent atmospheric resistance to the penetrator and to lubricate the penetrator when entering an object.

It is found that the body of the projectile will pass through an opening slightly smaller in diameter than itself, and in order to cover the extreme tips of the penetrator with the fender, which is limited to the diameter of the projectile, the fender must be made very thin adjacent to the tips. If found, however, to be desirable, the penetrator and its cutting edges may be made the full size of the projectile or even larger, in which case the fender of soft material should extend rearwardly and cover the body of the projectile, as seen in Fig. 2. This provides a uniform surface from the base of the conical point to the rear end of the projectile and avoids unnecessary atmospheric friction.

Having now described the invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a projectile of a drill on said projectile and a cylindrical extension having a conical point on said projectile to cover said drill for the purpose herein set forth.

2. In a projectile a covering of soft material for the projectile extended to form an air-fender, and an auger on the front end of the projectile within said fender as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL A. GROFF.

Witnesses:
F. A. FETRING,
J. Y. POTTS.