

No. 740,849.

PATENTED OCT. 6, 1903.

S. A. GROFF.
PROJECTILE.

APPLICATION FILED JUNE 18, 1903.

NO MODEL.

Fig. 1.

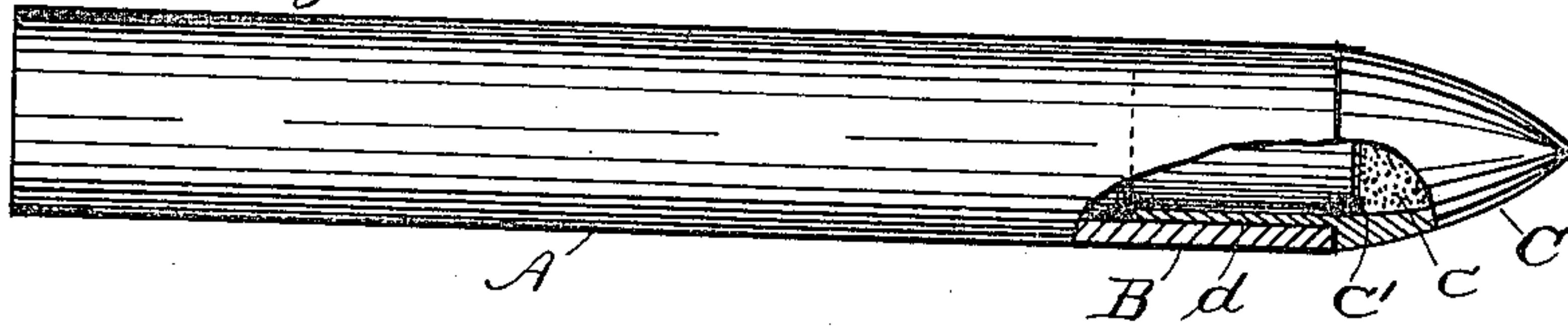


Fig. 2.

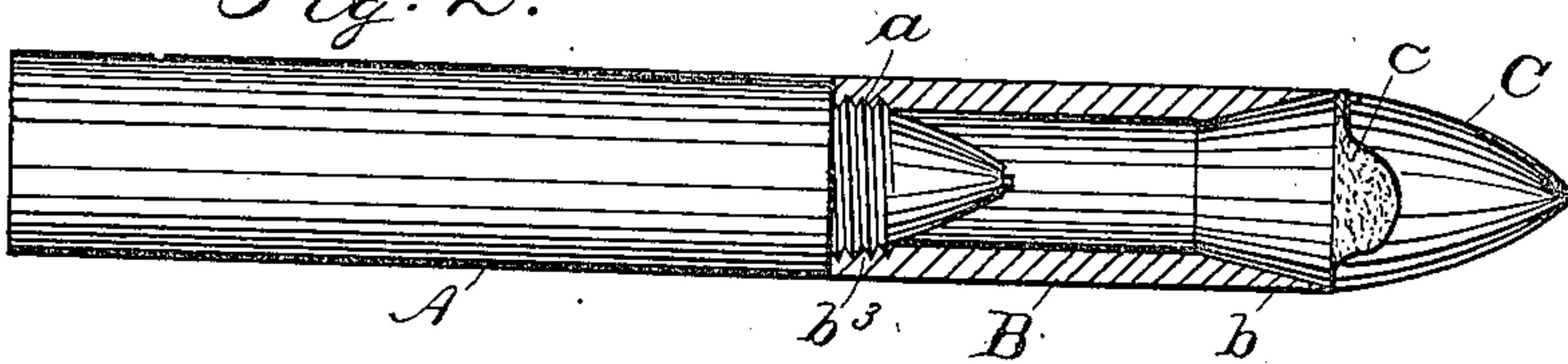


Fig. 3.

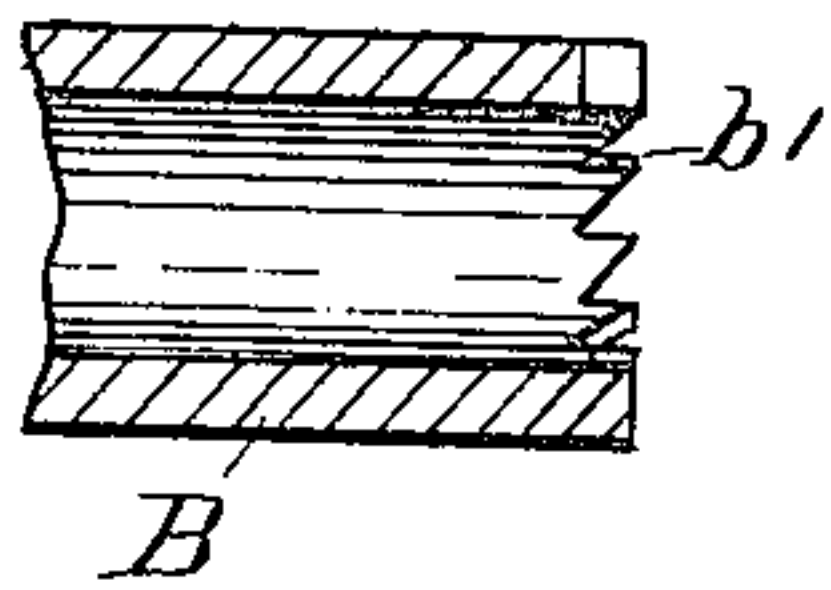


Fig. 4.

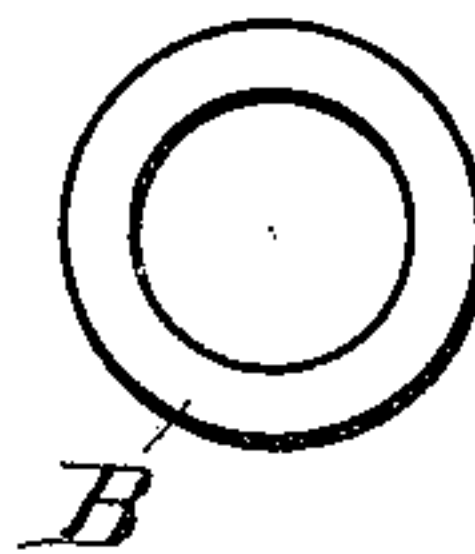


Fig. 5.

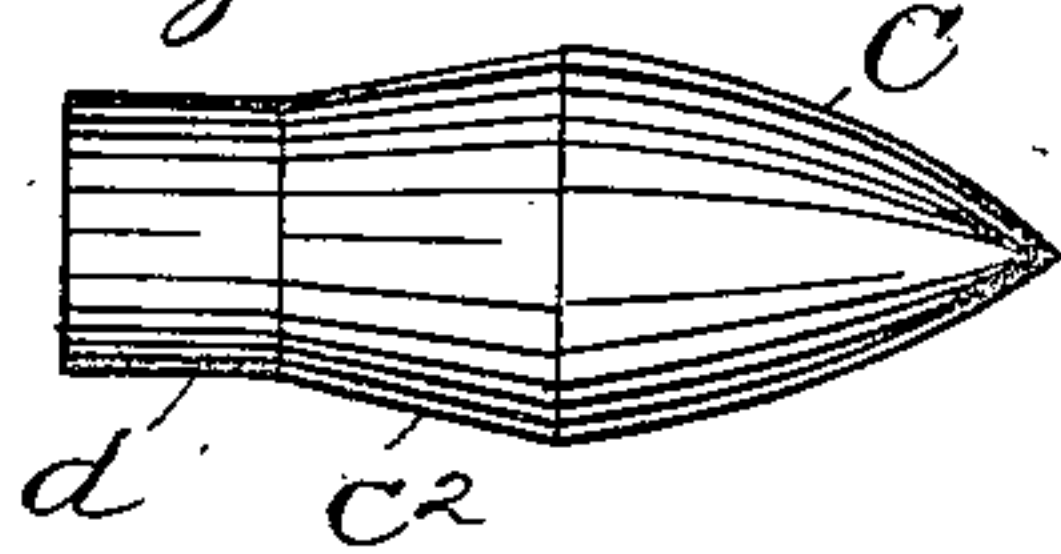


Fig. 6.

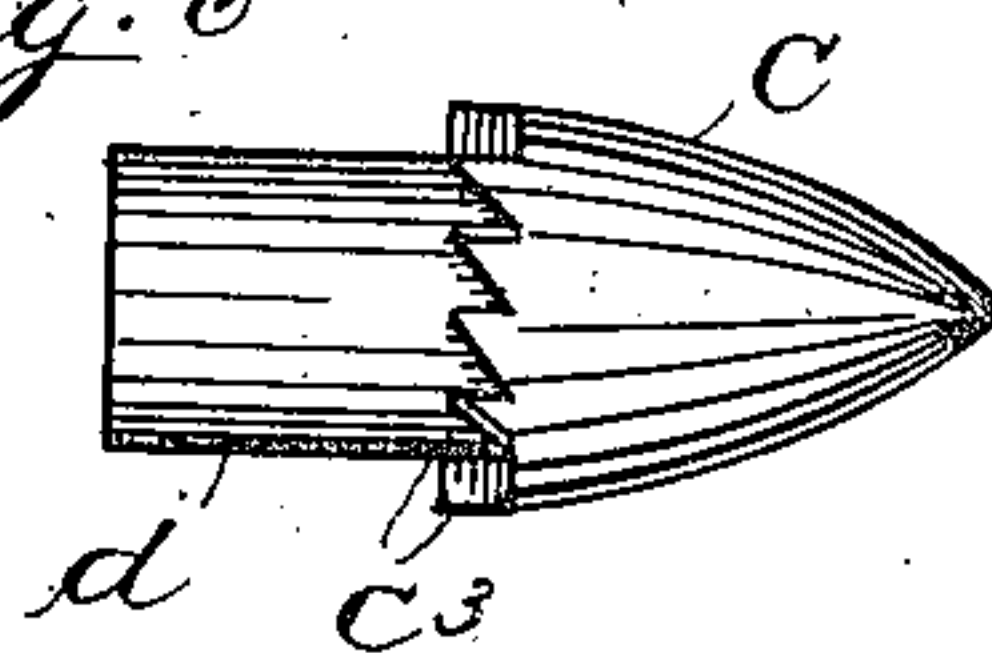
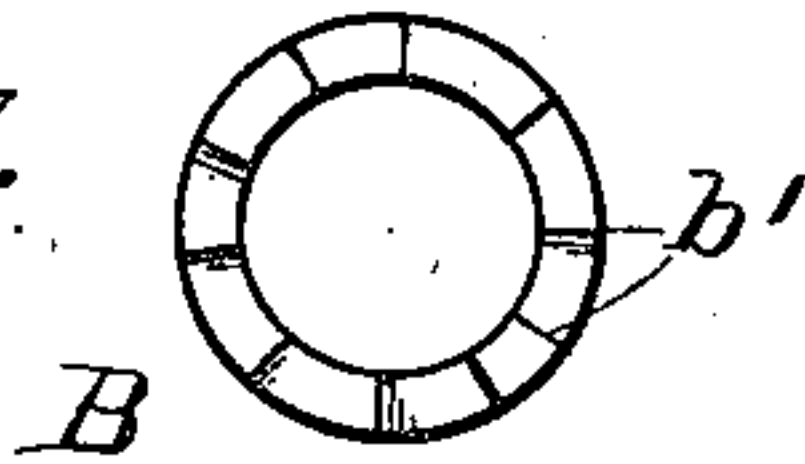


Fig. 7.



Witnesses
Joseph W. Harper
Joseph S. Potts

By

Samuel A. Groff.
Chas. D. Groff.

Inventor

Attorney

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. 740,849, dated October 6, 1903.

Application filed June 18, 1903. Serial No. 162,035. (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 much 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 is a longitudinal view, partly in section. Fig. 2 is a similar view of a modification, partly in section; Fig. 3, a fragmentary section of another modification of the front end of the penetrator. Fig. 4 is a plan of the end of a plain penetrator. Fig. 5 is a side of a cap to be used with the modification shown in Fig. 2. Fig. 6 is a side of a cap to be used with the modification shown in Fig. 3, and Fig. 7 is a plan of the end of the modification shown in Fig. 3.

The various features of this device are referred to by letters, similar letters denoting corresponding parts in the several 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 on the front end of the projectile, made of hardened material and of equal diameter with the projectile. It may be integral with the projectile or be made separately and attached to the projectile in any preferred manner. Its length should exceed the thickness of the armor-plate against which it is projected. This extension or penetrator B when it strikes the plate will

by the force of the impact and its rapid rotation cut into or through the plate, taking out a core of the plate, and be followed in by the projectile, which, if a shell, should be timed to explode accordingly. When desired and according to circumstances, the front end of the penetrator is provided with a cutter, which may be of any desired form, but preferably a continuous annular blade *b*, as shown in Fig. 2, or a series of teeth *b'*, as shown in Figs. 3 and 7. A convenient way to attach the penetrator to a projectile already made is to form a thread *a* on the front end of the projectile and an interior thread *b³* on the rear end of the penetrator and screw the two together.

C is a cap or cone of any soft metal, easily crushed, so as not to interfere with the progress of the penetrator when the impact is made. This cap is pointed and adapted to be secured to the front end of the penetrator. Its primary object is to protect the penetrator from the resistance which the air would offer to its movements, and it is also made to serve as a lubricator to the cutter, either by the material of the cap itself or by a lubricant *c* within the cap. If the lubricant used is fluent, I provide a cover *c'* to hold it in the cap. This cap or cone may be secured to the penetrator in any desired manner; but I prefer to form on it a rear extension *d* to tightly fit into the front end of the penetrator. The cap is also made to conform to the shape of the cutter used on the penetrator and will have, therefore, either a beveled section *c²* to engage the inside of the blade *b* or teeth *c³* to engage the teeth *b'* on the penetrator.

Having now described the invention, what I claim is—

1. In combination with a projectile a tubular penetrator, a cutter thereon and means to secure said penetrator to said projectile.

2. In a projectile a tubular extension on the front end of the projectile and a cutter on the front end of said extension.

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

SAMUEL A. GROFF.

Witnesses:

CHAS. DIETZ, Jr.,
CHARLES FISCHER.