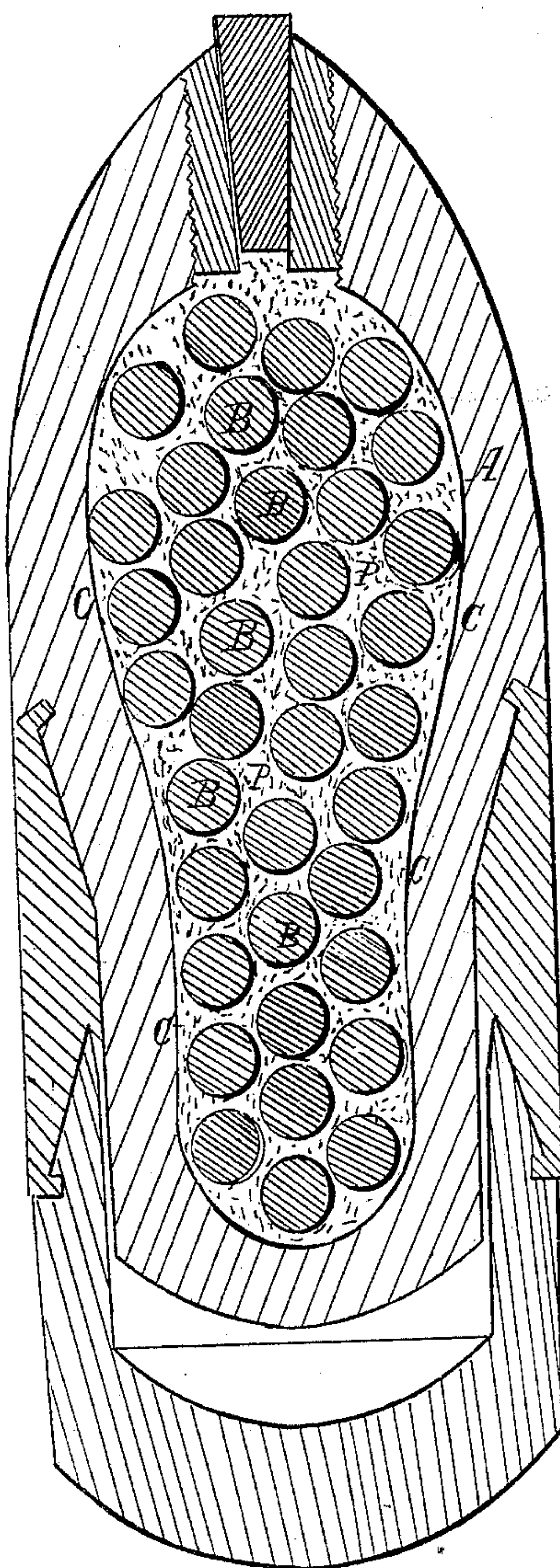


B. B. HOTCHKISS.

Shell.

No. 35,153.

Patented May 6. 1862



Witnesses.

L. H. Babcock

D. W. Hutton

Signature,

B. B. Hotchkiss

UNITED STATES PATENT OFFICE.

B. B. HOTCHKISS, OF SHARON, CONNECTICUT.

IMPROVEMENT IN EXPLOSIVE PROJECTILES.

Specification forming part of Letters Patent No. 35,153, dated May 6, 1862.

To all whom it may concern:

Be it known that I, B. B. HOTCHKISS, of Sharon, in the county of Litchfield and State of Connecticut, have invented certain Improvements in Explosive Projectiles; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, making part of this specification, and which is a longitudinal section of what is known as the "Hotchkiss rifle projectile," with my improvement added.

My improvement relates to the contents or filling of the projectile, and to the adhesion of the same to the inclosing part, and is applicable to all forms and constructions of explosive projectiles.

The first feature of my invention is attained by solidifying the powder in the shell by the use of collodion or an equivalent adhesive material not by its presence destructive to the explosive character of the powder, so as to prevent the friction of the powder upon itself and upon the sides of the shell or balls or other objects mixed therewith from igniting the same, and so as also to prevent a displacement of the powder from interfering with the proper action of the exploding apparatus in percussion-shells.

The nature of my invention also consists in causing the filling of an explosion projectile to adhere firmly to the sides thereof by the employment of a solution of shellac or other proper adhesive substance, in the manner hereinafter described, whereby the said filling is compelled to rotate with the shell, and much friction and danger of premature explosion avoided.

The solidification of the powder in my invention serves the purpose, in addition to the above, of confining bullets or similar objects within the shell, in place of the resin commonly employed in Shrapnel shot.

In explosive projectiles for rifled ordnance premature explosion is very frequent, and is occasionally the cause of much damage. It is well known that friction will ignite powder, and for that reason powder is always ground in a moist condition. The severe percussion caused by the explosion in the gun tends to cause great friction among the grains of the loose powder in the shell, and under some circumstances this is, doubtless, the cause of pre-

mature explosion. The liability to this effect is much increased in shells fired from rifled ordnance by the resistance of their contents to sudden rotation, and in percussion-shells the sudden grinding of a few grains of powder which accidentally lie in the proper position for such action by the sliding percussion-barrel is believed to be the cause of many premature explosions. By my invention these liabilities to accidental ignition are, in a great measure, prevented, and other advantages also secured.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation by the aid of the drawing and the letters of reference marked thereon.

A is the body of the projectile, which may be made in any of the approved forms. P is the powder. B B are bullets interspersed with the powder, as in the Shrapnel or case shot; but I do not wish to confine my invention to that character of projectile.

The manner of filling a shell to produce the advantages of my invention is as follows: I first pour into the shell a solution of shellac in alcohol, and coat the whole interior therewith, as is indicated by a brown line, C. While this is still wet, I place in the balls B, if any are to be used, and then fill all the interstices with the powder P. I then pour into the shell a sufficient quantity of "collodion" (gun-cotton dissolved in ether and alcohol) to fill all the interstices, and place the shell away to dry. The alcohol and ether readily evaporate and leave the charge in a solid mass, the collodion serving as a cement to hold the grains of powder together, but offering no serious obstruction to the proper and rapid action of the fire when it is desired to explode the same. This solidified powder holds the balls B firmly in place, and the rosin usually employed for that purpose may be dispensed with, and the whole is cemented to the sides of the shell by the cement C, so that on firing the shell from a gun there is little or no liability of the powder becoming prematurely ignited, either by friction among the balls or its own particles against themselves or the sides of the shell or by the backward motion of the exploding device.

It is not necessary for the success of my invention that shellac or ordinary collodion be

used, as indicated, though I prefer them and believe them best adapted for the purpose; but any other materials may be substituted therefor which will produce the effect herein described.

I am aware that powder has been solidified by the use of collodion before to form a cartridge, and I do not, therefore, claim such as my invention; but

What I do believe to be new, and desire to secure by Letters Patent, is as follows:

1. An explosive projectile in which the contents are solidified, substantially in the man-

ner and so as to secure the advantages herein set forth.

2. The employment in such projectile of an adhesive lining, C, substantially as herein described, so as to increase the adhesion of the solidified contents to the interior of the shell.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

B. B. HOTCHKISS.

Witnesses:

G. H. BABCOCK,
D. W. STETSON.