

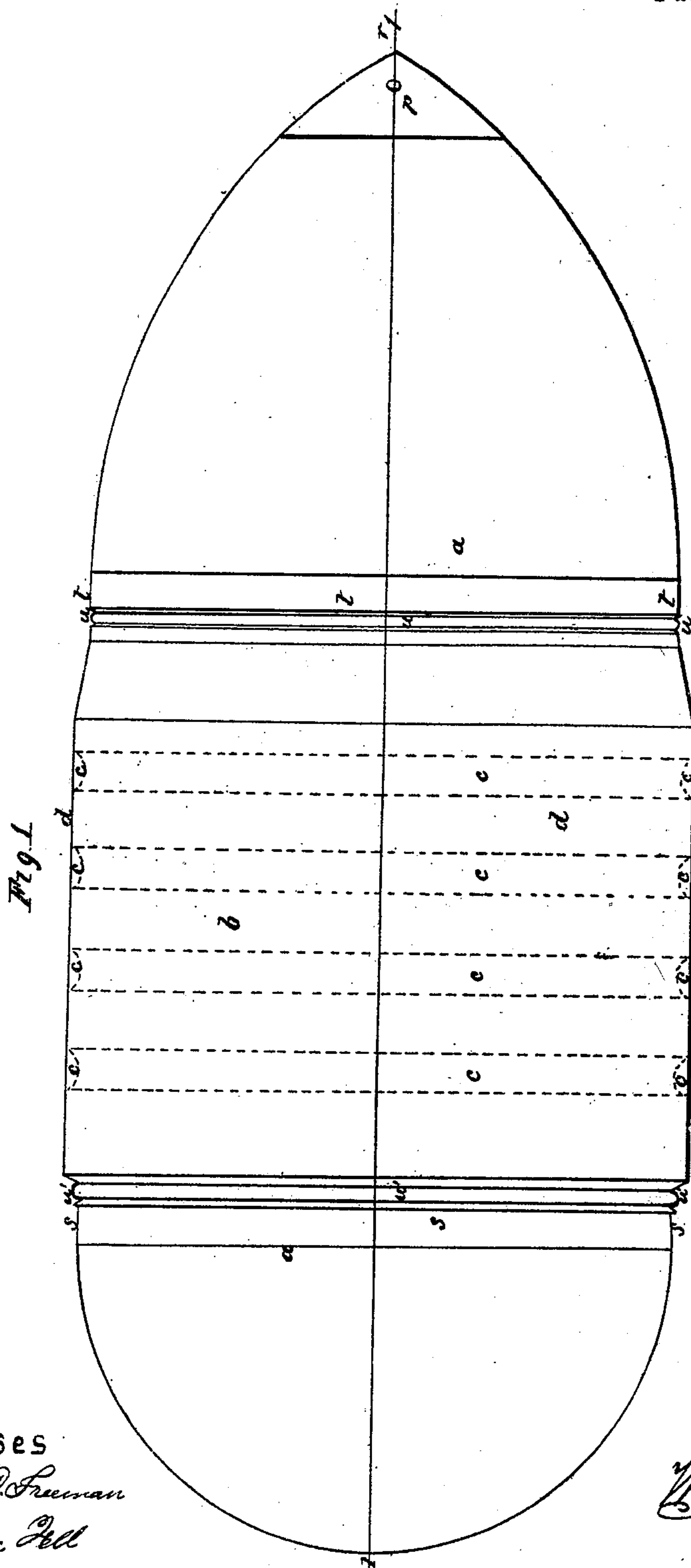
W. W. HUBBELL.

2 Sheets—Sheet 1.

Projectile.

No. 28,084.

Patented May 1, 1860.



Witnesses

Charles D. Freeman

Henry Bell

Inventor

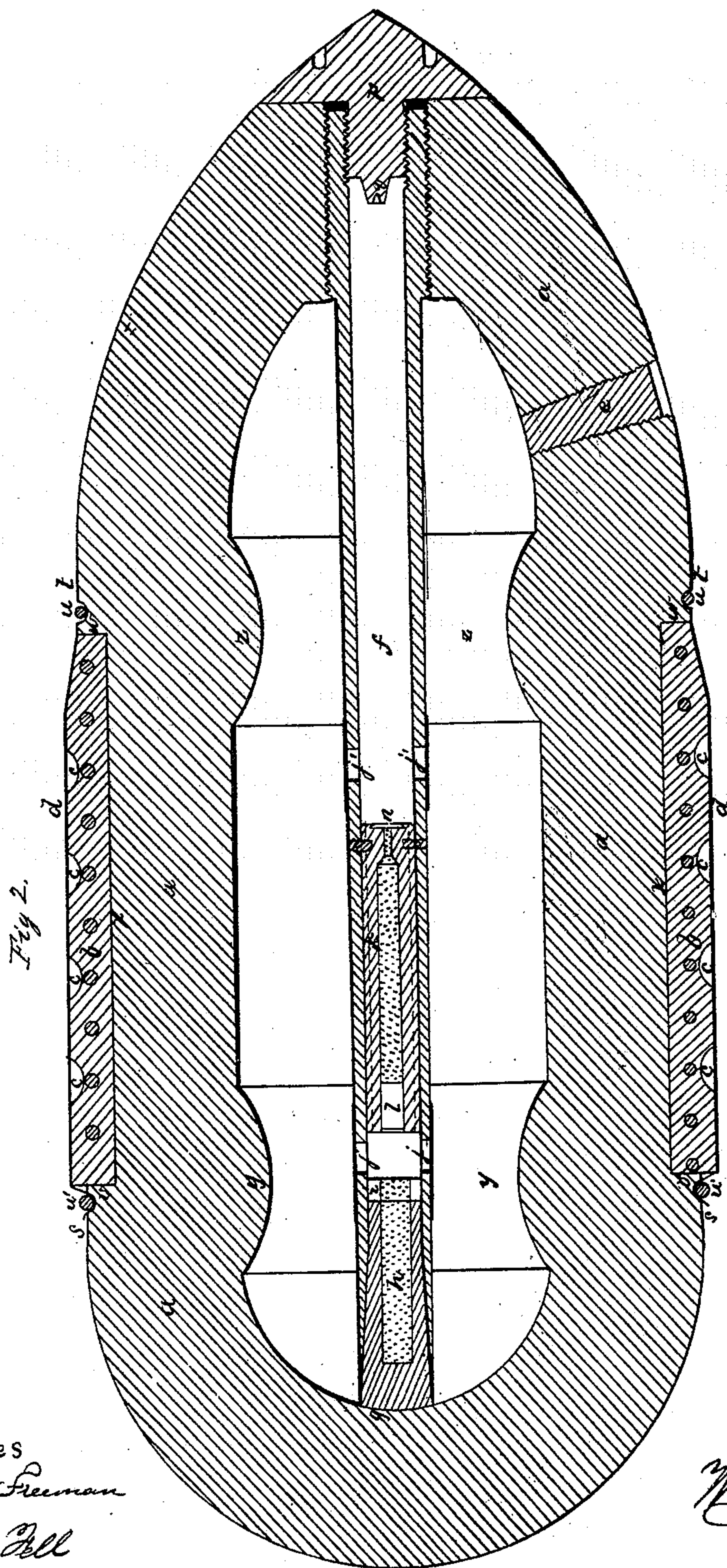
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Lawrence Bell

Inventor

Wm. W. Hubbard

UNITED STATES PATENT OFFICE.

WILLIAM WHEELER HUBBELL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PROJECTILES FOR BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. 28,084, dated May 1, 1860.

To all whom it may concern:

Be it known that I, WILLIAM WHEELER HUBBELL, of the city of Philadelphia, counsellor and scientific engineer, have invented a new and useful Improvement in Projectiles for Breech-Loading Rifled Cannon; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawings, making part hereof, in which—

Figure 1 is a perspective side view of the projectile; and Fig. 2 is a longitudinal sectional view of the same on the line 1 1, Fig. 1.

The nature of my invention consists in a certain combined construction, hereinafter more particularly described, by which an improved projectile is made, adapted to breech-loading rifled cannon, and capable of exploding on concussion in penetrating an enemy's vessel or works. The percussion-exploder in the projectile is the same contained in my Letters Patent for improvement in projectiles for fire-arms, dated January 24, 1860, with an improvement, and in this projectile it has other elements in the construction of the shell combined with it, so as to give the necessary initial course, accuracy, and rotation to preserve a true position of the exploder to cause it to explode the shell from a rifled cannon. The body of the shell-casting *a a a* is elongated to about two and a half times the diameter of the bore of the gun. The front of the projectile curves gradually to a point, *r*, the same as ordinary projectiles for rifled guns. The rear part of the projectile is rounded, and between the rear part and front it is cylindrical, and recessed for the reception of a compound band of lead, iron wire, and canvas. Behind the recess is a small cylindrical surface, *s s*, and before it a similar surface of equal diameter, which are turned to fit, to be about three or four hundredths of an inch less than the diameter across the inner faces of the lands of the rifled bore, and serve as permanent guide-surfaces of the shell. In the recessed portion *x x* of the projectile, between the rear shoulder, *v v*, and the front shoulder, *w w*, is cast a lead band, *b*, which is cast onto and around, and so as to inclose a coil of iron wire, (shown by the dots *o*,) the outer curve of which coil is within the diameter of the lands of the rifled bore, and which coil of wire, with its strands about half an inch apart, as shown, serves the purpose of

giving strength to the lead band to prevent it from splitting and flying off of the projectile, and yet does not obstruct the indentation of the lands of the rifled bore into the lead and canvas which covers it. In the lead band or around it is turned or cast a series of grooves, *c c c*, which allow the lead to adjust itself while being compressed into the rifled bore. Around the outside of the lead band is sewed a cylindrical covering of canvas, *d*, with a wire, *u*, wrapped around its front end in a small groove, and a similar groove and string is behind to secure it there. Strings may also be tied around the canvas into the grooves *c*. This canvas is greased outside and protects the lead band from being scored before use, and protects the rifled bore of the gun from being leaded, while it also relieves the friction as the projectile is being discharged in the gun. The body of the shell, both behind and before the band, is left thicker than it is under the band, and has two ribs, *y* and *z*, inside, as shown, and circular so as to enable it to resist the great strain in starting in the gun and the shock in penetrating the object struck. The exploder has the cylinder *f* extending to the back part of the shell, with the capping *p* screwed in it and forming the point of the projectile, with *q*, the inverted tube, on its inner end. The striker *k* has the flat or open sides, the fulminate *n* in front, the magazine of powder, *m*, secured by the cork *l*, and the striker secured by the lead screws *o o*. In the rear part of the cylinder are the firing-vents *j j*, covered with paper.

g is the seat of wood with its magazine *h* and its lead seat *i*, all as described in my said patent of January 24, 1860, and now combined with the compound band to co-operate with it for rifled cannon.

The improvement in the exploder consists in making the vents *j' j'* through the cylinder in front of the striker, they being also covered with paper, and in such position that when the striker explodes they are behind it, so that the air, fire, and powder may commingle more freely when the cylinder is so very long, as in this projectile, to facilitate the explosion. *e* is the filling-screw.

The compound band when finished, as described, projects beyond the diameter of the body at *s s* and *t t* about fifteen-hundredths of an inch, so as to be relieved into a chamber in the breech of the gun, and it is beveled in front

so as to be easily started and compressed into the rifled bore of the gun by the explosive power of the cartridge.

The grooves and lands of the gun should be about an eighth of an inch deep, and from a half to three-fourths of an inch wide, and the number and size should increase with the increase of the size of the gun. The smallest size mentioned will suit for a six-pounder bore. This compound band will compress into the rifled bore, keep tight, not lead the gun, cause but little friction, and give the projectile the rifled motion which keeps it accurate and in position, causing the point to remain foremost and take a great range in the flight, and the exploder to operate so as to explode the shell when it penetrates a vessel or military work. It is well adapted to the breech-loading rifled cannon of my invention, for which I have applied for a patent.

What I claim is—

1. The combination, of the recess x , shoulders v and w , with the band b and the wire coil o secured in the band, as described.

2. The beveled cylindrical lead band b , in combination with the flutes $c c c$, and the wire coil o in the recess x , so as to easily enter, compensate, and indent the band into the rifled bore and give it great comparative strength to retain its proper form and position under this action, and with certainty rotate the shell or shot in the breech-loading rifled gun.

3. The beveled cylindrical canvas covering extending around and in front of the lead band, and secured by the groove and wire u to the body of the projectile, in combination with the flutes $c c c$ and the wire coil o , so that its beveled front may easily enter and indent in the rifled bore without stripping, and the flutes allow the lead to compensate under it to the lands and grooves, and the wire strengthen and hold the lead firm that the canvas may be enabled to assume a form and firmness of bearing to co-operate with the lead band in rotating the projectile in the breech-loading rifled cannon.

4. The firing-holes $j' j'$ in front of the striker, in combination with the striker and the magazine m , to facilitate the explosion in shells adapted to long-ranged rifled cannon.

5. The circular ribs y and z inside of and uniform around the axis of the shell, in combination with and at each end of the circular recess x and band b , so as to strengthen and support both the front and rear ends of the projectile, and the base of the circular recess resist the shock of discharge, the compression into the grooves, and the shock of penetration by restoring the strength lost in the application of the lead band.

WM. W. HUBBELL.

Witnesses:

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PENROSE FELL.