2 Sheets—Sheet 1.

C. T. JAMES.

Projectile.

No. 34,950. Patented Apr. 15, 1862.

Fig. 2

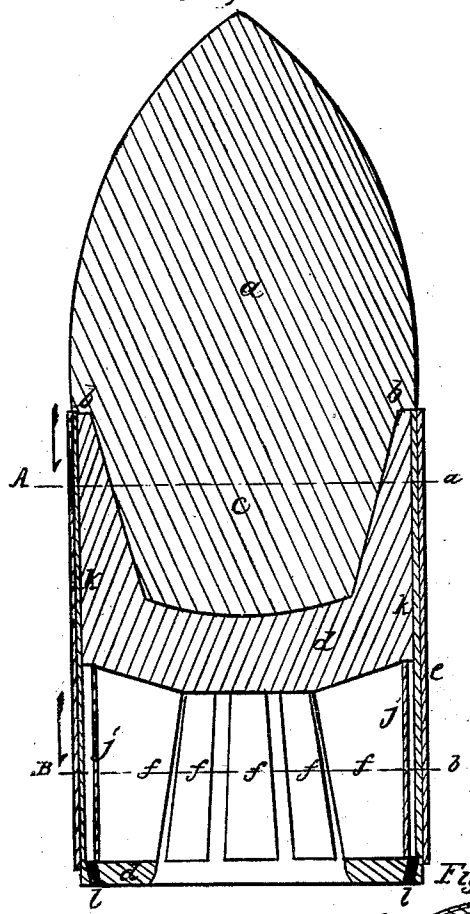

Fig. 1

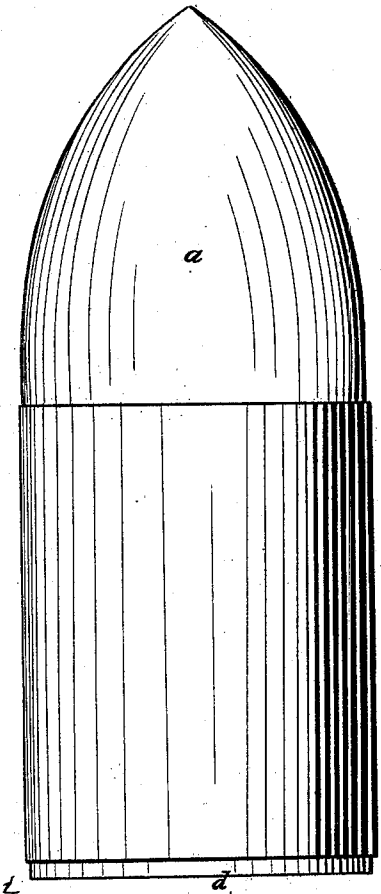

Fig. 4.

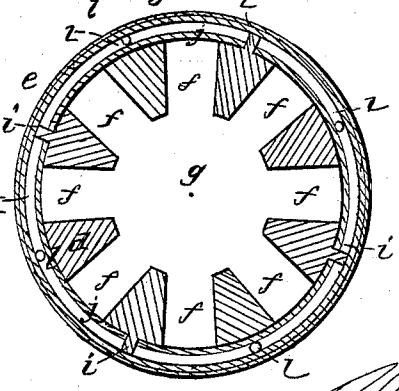

Fig 4

Witnesses:

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A. DeLacy

Inventor:

Chas. T. James

C. T. James.

Sheet 2 2 Sheets

Projectile.

No. 34950.

Patented Apr. 15. 1862.

Fig. 6

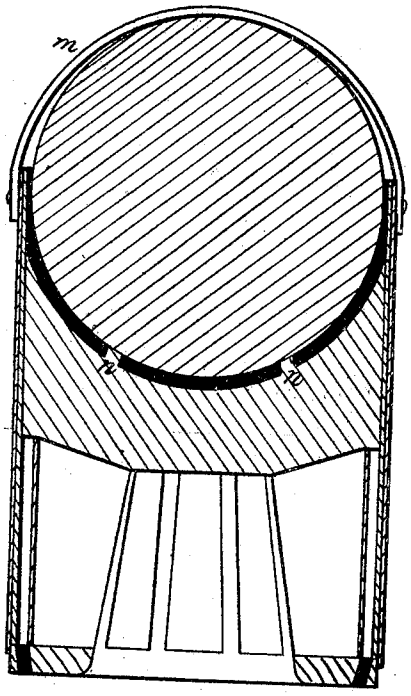
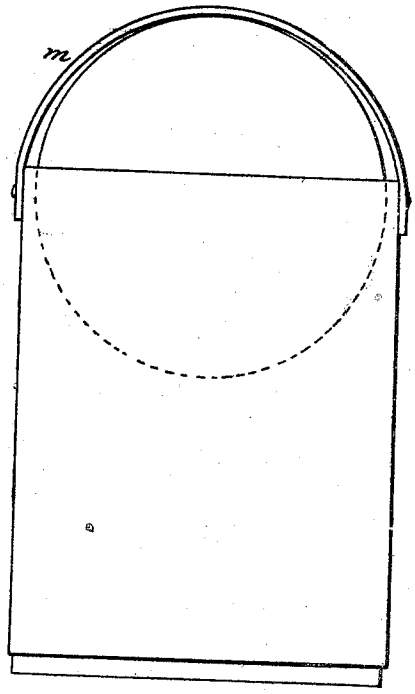
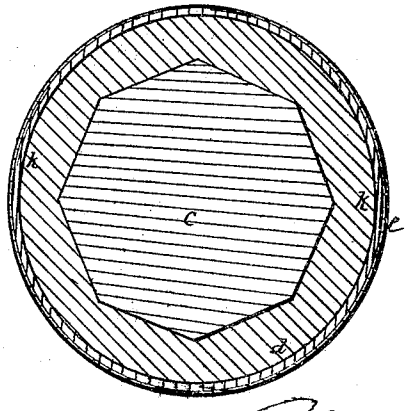


Fig. 5.





Witnesses:

W. H. Bishop

A. Dr Lacy

Inventor:

Chas. T. James

UNITED STATES PATENT OFFICE.

CHARLES T. JAMES, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN EXPANDING SABOTS FOR HOT SHOT.

Specification forming part of Letters Patent No. **34,950**, dated April 15, 1862.

To all whom it may concern:

Be it known that I, CHARLES T. JAMES, of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Projectiles for Firing Hot Shot; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of a projectile on my improved plan; Fig. 2, a longitudinal section; and Figs. 3 and 4, cross-sections thereof, taken at the lines A *a* and B *b* of Fig. 2. Fig. 5 is an elevation of a modification, and Fig. 6 a longitudinal section thereof.

The same letters indicate like parts in all the figures.

My invention relates to a method of constructing projectiles for firing hot shot from rifled cannon, although they may be discharged from smooth-bored cannon; and my said invention consists in making a case of a cylindrical form suited to the bore of the cannon, with the forward end adapted to receive the shot after it has been heated, and provided with an expansible packing, which, by the force of the explosion of the powder, will be expanded outward against the bore of the cannon and into the grooves thereof, if rifled, to stop windage and to give the required rotary motion to the shot when fired from a rifled cannon, the said case at the same time preventing the heat of the shot from firing the charge.

The mode of construction which I prefer is represented in Figs. 1, 2, 3, and 4 of the accompanying drawings.

The shot is represented at *a* and is cast or otherwise formed with the forward part pointed, like the Minié shot, and the rear portion with a shoulder, as at *b*, and back of this it has a projection *c* in the form of a polygonal pyramid. The case *d* is made with a cavity in the forward end of a form the reverse of and adapted to receive the projection *c* of the shot when heated, and its periphery is formed with a broad groove for the reception of a cylindrical and expansible packing-ring *e*, the outer periphery of which I prefer to make of a slightly greater diameter than the ends of the case. There are radial mortises *f* extending from the bottom of the groove to the inside, which is made hollow, as at *g*, from the rear end to within a short distance of the cavity at the forward end, which receives the projection on the rear end of the shot, so that the expanding gases evolved shall enter the cavity *g* of the case and pass outward through the several mortises to act on the inner periphery of the packing-ring to expand it against the bore of the cannon and into the grooves thereof, if rifled, and thereby shut out all windage and cause the projectile in a rifled cannon to follow the rifle-grooves, and thus impart to the shot the required rotary motion on its axis.

The mode of making the expansible packing-ring which I have practiced, and which I prefer, is to form the segments between the mortises *f* each or every alternate one with a projecting longitudinal rib *i* of about half the height of the depth of the groove. Over each of the mortises I lay a piece of pasteboard *j*, and over the ribs I slip a hoop *k*, made of tinned iron, the said hoop being cut to admit of springing it into the groove, the whole length of which it should occupy. After being thus prepared molten lead is run into the spaces between the ribs *i* and within the hoop *k*, the pieces of pasteboard preventing the molten lead from running into the mortises *f*, care being taken to prevent the molten lead from running out around the edges of the hoop by properly surrounding the whole structure for the time being. The molten lead will unite with the tinned inner surface of the hoop, so that when it solidifies in the spaces between the ribs the hoop will be held in place by a series of leaden staves extending between the ribs *i*, so that when the packing-ring is expanded into the grooves of the cannon by the force of the explosion acting on the inside thereof the case and the shot which it carries will be forced to turn with it. To admit of running in the molten lead, holes *l* are made in the rear end of the case leading into each of the spaces between the ribs *i*.

When such projectiles are intended to be fired from smooth-bored cannon, it is unnecessary to form ribs *i* or to run in the molten lead, or to adopt any other mode of so connecting the packing with the ribs as to make the case turn with the packing-ring.

After the hoop has been put on I cover it with canvas, which I prefer should be saturated with tallow and then rolled down with

considerable force after it is put on, a sufficient thickness being put on so as to make the packing-ring of a slightly greater diameter than the ends of the case.

After the shot has been heated its rear plug is inserted into the cavity at the forward end of the case, and the whole put into the cannon over the charge, the case being thus interposed between the hot shot and the charge of powder.

When the packing-ring is expanded by the force of the explosion, if the bore of the gun is rifled it will be forced into the grooves, which will impart a rotary motion to the case and by the case to the shot.

I have contemplated applying my said invention to the discharging of heated spherical balls, and with this view I contemplate making the forward end of the case as represented in Figs. 5 and 6 of the accompanying drawings, which represent the case with a packing-ring, as in Figs. 1, 2, 3, and 4; but the cavity in the forward end is semi-spherical to receive about one half of the ball when heated, and in which it is held by a thin bail *m*, hinged to the forward end of the case, so that it can be turned over the shot when inserted. The cavity in the forward end of the case is formed or provided with projecting pins *n*, which by the concussion at the commencement of the discharge are driven into the red-hot shot, so as to cause it to turn with the case when rotated by the grooves of the rifled bore, and, although I have above particularly described and represented that mode of making the expansible packing-ring which I have tried with success and deem to be the best, I do not wish to limit my claim of invention to such mode of construction, as other and equivalent modes may be substituted—as, for instance, the case may be made of ductile metal with the rear end concave, so as to form a thin hoop at the rear end, which will be expanded by the force of the explosion of the charge; or the case may be made of cast-iron with a hoop of ductile metal secured to the rear end, so that it shall be expanded by the force of the explosion acting inside; or the forward end of the case may be made expansible and the rear end of the shot tapering, so that when the charge is exploded the case shall be forced onto the tapering rear portion of the shot, and thereby expanded as motion is imparted to the shot, the tapered portion of the shot being feathered or otherwise formed with projections, so that the case when rotated by the rifled grooves shall impart the required rotary motion to it.

The foregoing modifications will be sufficient to indicate the many modifications which may be made in the mode of application of my said invention without changing the principle thereof.

What I claim as my invention, and desire to secure by Letters Patent, is—

The making of a case for firing hot shot with an expansible packing-ring or the equivalent thereof, in combination with a cavity or the equivalent thereof at the forward end, so that it can be connected with a hot shot, substantially as and for the purpose specified.

CHAS. T. JAMES.

Witnesses:
WM. H. BISHOP,
A. DE LACY.