

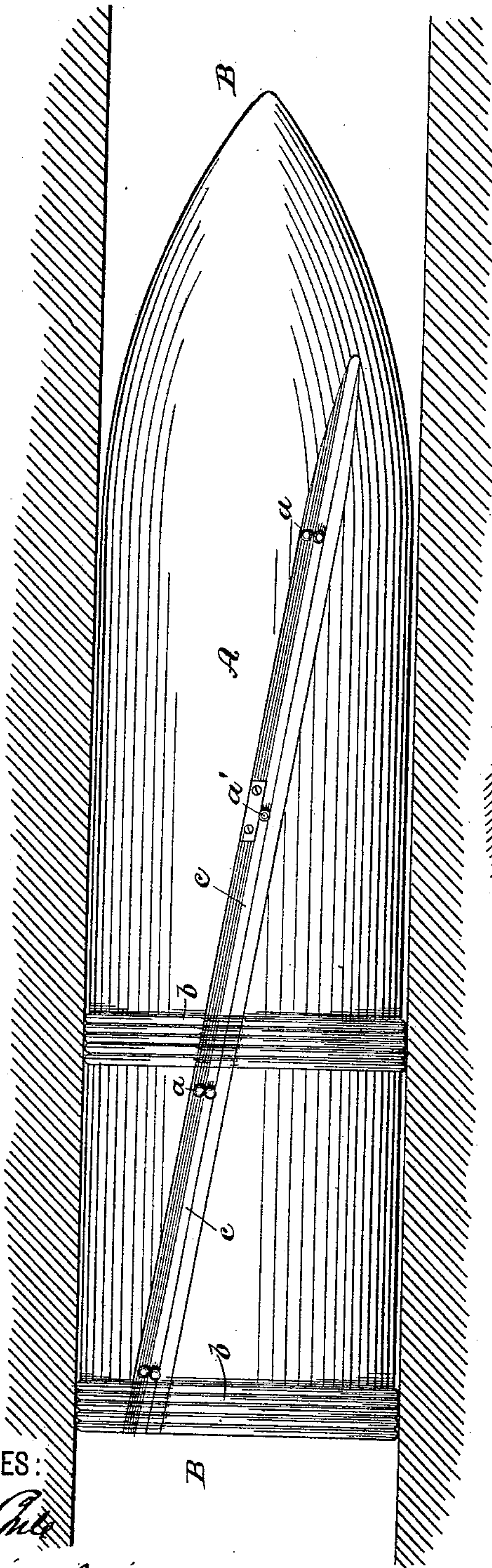
(No Model.)

J. R. HASKELL.
PROJECTILE.

No. 484,008.

Patented Oct. 11, 1892.

Fig. 1.



WITNESSES:
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Fig. 3.

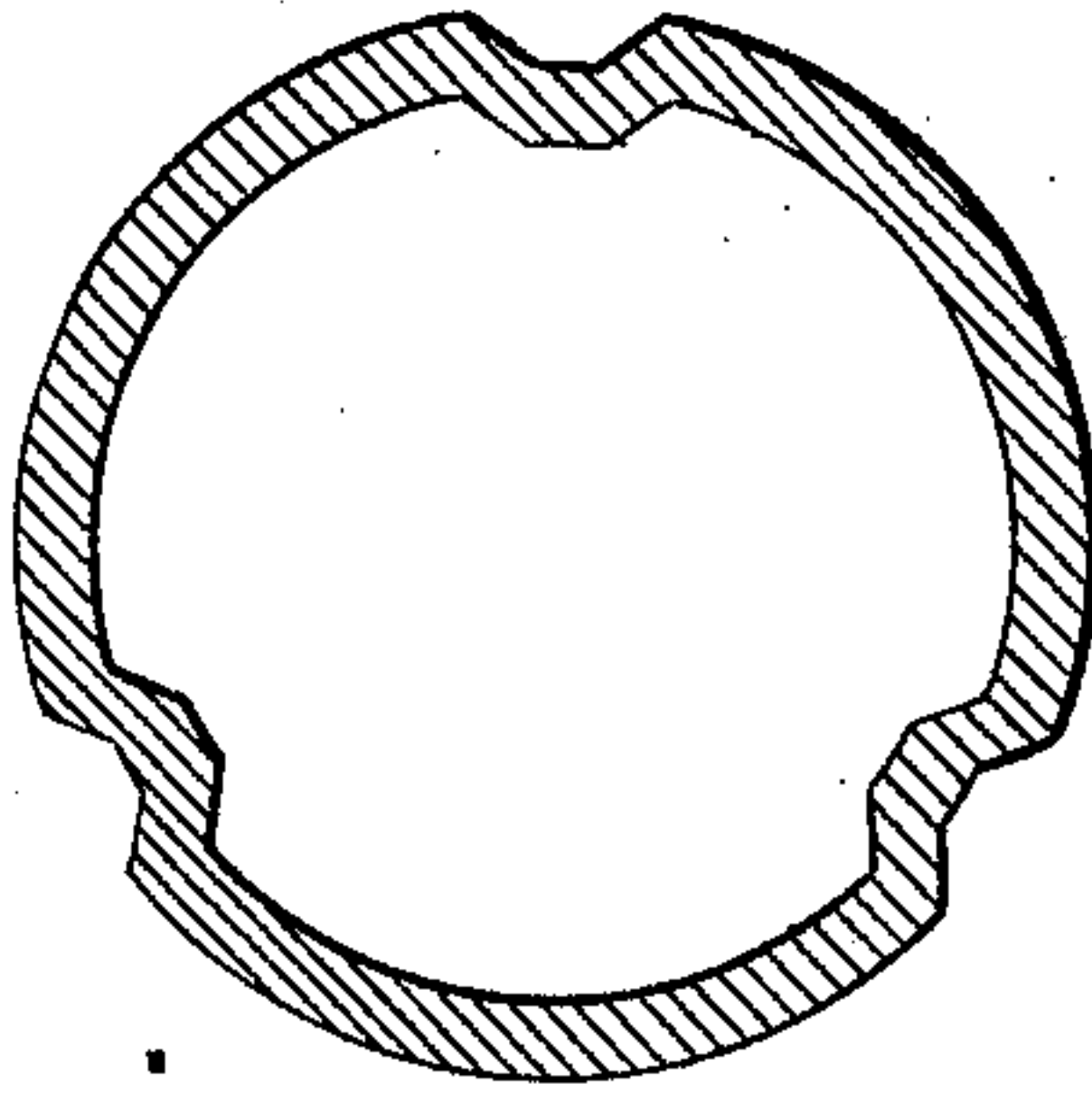
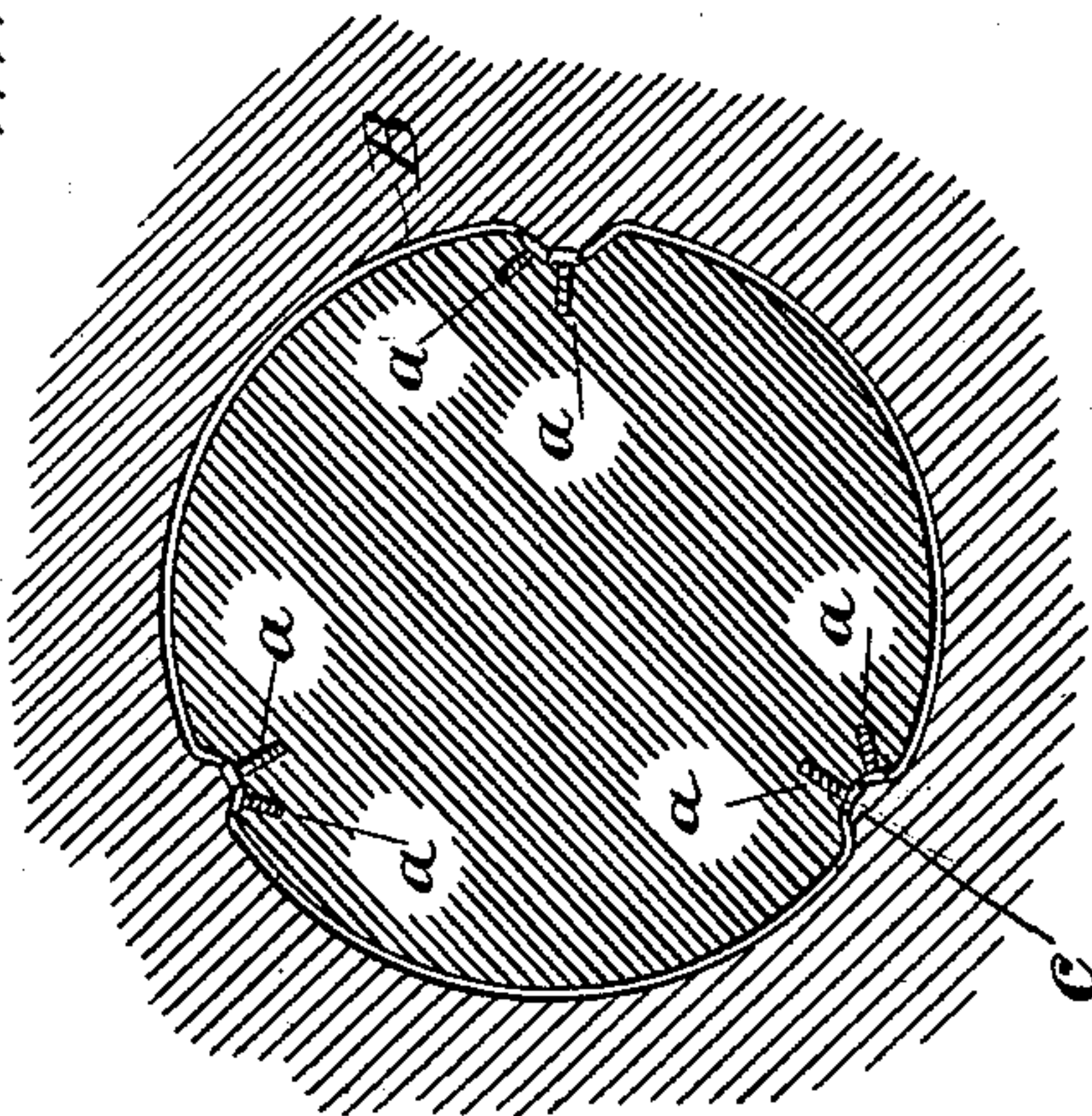


Fig. 2.



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PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 484,008, dated October 11, 1892.

Application filed March 24, 1890. Renewed June 15, 1891. Again renewed March 9, 1892. Serial No. 424,268. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. HASKELL, a citizen of the United States, residing at Passaic, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Projectiles, of which the following is a description in such full, clear, and exact terms as will enable any one skilled in the art to which my invention appertains or with which it is most nearly connected to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In said drawings, Figure 1 is a longitudinal elevation of my improved projectile as it appears in the bore of the gun; and Figs. 2 and 3 are cross-sections through said projectile, the latter figure representing a shell instead of a solid shot.

The object of my invention is to lessen the friction and resistance of the projectile in its passage through the bore of the gun, to more perfectly center and support it, and to prevent wobbling, insure accuracy, and at the same time prevent the undue escape of the propelling-gases.

The projectile is made of the general form shown by the drawings and of any suitable metal best adapted for the purpose.

The projectile is shown by A. It is made a little less in diameter than the bore of the gun. On the periphery of the projectile two corrugated bands are made in diameter exactly equal to the bore of the gun. In the surface of the projectile longitudinally grooves are made to fit the rifling of the gun. In these grooves, which may be diagonal to give the shot a rotary motion, are fitted pieces of suitable antifriction metal—such as copper or Babbitt metal, for example—that ride upon the lands of the rifling during the progress of the projectile through the bore of the gun. These metal pieces are fitted and adjusted in the grooves of the projectile for the purpose of lessening friction, centering, and supporting the shot in the bore of the gun. They may consist of screws (shown in Fig. 2 of the drawings by *a a*) or they may be set or fitted in the grooves of the projectile by any other mechanical means adapted to secure the object for which they are used. Such center-

ing pieces or screws are shown in the drawings by *a*. They should be set directly in the bottom and center of the groove, and antifriction-pieces *a'* should be set against the side of the groove against which the projectile bears in its progress through the bore. By placing these centering and antifriction pieces in the bottoms and sides of the grooves, as stated, the projectile can be exactly centered and the friction reduced to a minimum, while at the same time the soft metal of which they are made by being placed in the groove is saved from injury in handling the projectile. The corrugated bands above referred to are shown in the drawings by *b b* and the longitudinal or diagonal grooves by *c*. The corrugated bands I prefer to make parts of the projectile itself and an integral part of it, the corrugations being turned in the bands, or they may be made of separate pieces of metal fitted into or upon the projectile; but in no case must the corrugations be greater in diameter than the bore of the gun, and in all cases the corrugations should be filled with a suitable lubricant before being put in the gun.

The projectile now in general use in breech-loading guns is made to rotate around its own axis by soft-metal bands, principally made of copper, attached to the projectile and of greater diameter than the projectile itself and of the bore of the gun, the breech of the gun being chambered out to a greater diameter than its bore, so that the bands on the projectile will pass easily into the breech down to the point where the rifling begins. These soft-metal bands are smooth and round, having no longitudinal grooves in them, so that upon the explosion of the charge of the gun the projectile is driven forward into the rifling, the grooves and lands of the rifling being cut into the soft metal of the bands on the projectile, the rifling of the bore of the gun acting as a die through which the projectile is forced, which is thus made to take the rotating motion imparted by the rifling. By this method great friction and heat are created between the projectile and the rifling, which tends to the destruction of the gun and creates, also, an enormous friction, robbing the projectile of much of its initial velocity and

force. By my improvement this friction, resistance, and strain upon the gun are avoided, the full power of the charge being utilized in propelling the shot, no part of it being absorbed
5 in cutting grooves in the projectile. In considering this projectile it must be borne in mind that the corrugated bands on its periphery are not grooved longitudinally by the rifling of the gun, nor have they any influence
10 whatever upon the rotary motion of the projectile. They are merely designed to fill the space between the external surface of the bore of the gun for the purpose of preventing the undue escape of the gases past the projectile,
15 the rotating motion of the projectile being imparted to it by the diagonal grooves *c*, into which the lands of the rifling are made to fit, the grooves being supplied with centering screws or plates of antifriction metal, by which
20 the projectile is exactly centered and by which all wobbling and inaccuracy of the projectile in its flight are avoided.

This projectile is intended to be made in the form of a shell as well as a solid shot and
25 used in the projection of high explosives as well as of powder, and in the event that experience should show it to be necessary it is my purpose to cast the shell of equal thickness on all sides, retaining the same form in-
30 side as that of the outside of the projectile,

so that the projectile in rotating will carry with it in its rotation any explosive with which it may be charged, as shown by Fig. 3.

Having thus described my improved projectile, what I claim as new, and desire to se- 35 cure by Letters Patent, is—

1. A projectile of a diameter less than the bore of the gun, correspondingly rifled before it is introduced into the barrel and having one or more raised gas-check rings made to fit the 40 internal surface of the barrel, substantially as described.

2. A projectile having grooves made in the surface thereof to fit the rifling of the gun, said grooves being provided with suitable 45 antifriction bearing-pieces for the purpose of diminishing friction, substantially as described.

3. A hollow projectile having longitudinal grooves in its exterior surface and correspond- 50 ing projections in its interior, the wall of the shell being of equal thickness throughout its entire circumference, the projections on the inside corresponding to the indentations made on the outside, for the purpose specified.

JAMES R. HASKELL.

Witnesses:

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R. A. CORINALDI.