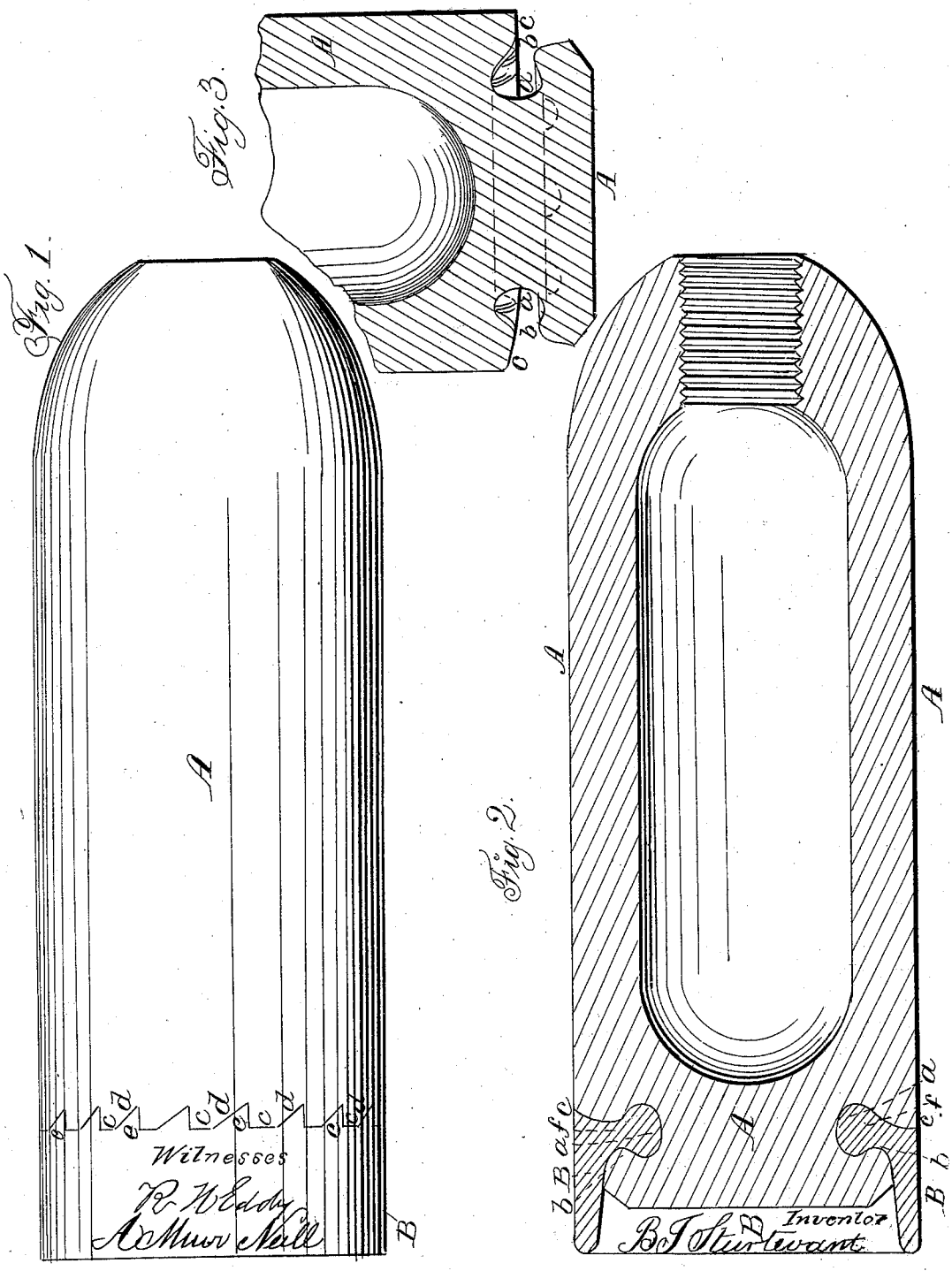
B. F. STURTEVANT.

Projectile.

No. 36,116. Patented Aug. 5, 1862.



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UNITED STATES PATENT OFFICE.

BENJ. F. STURTEVANT, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN PROJECTILES FOR RIFLED ORDNANCE.

Specification forming part of Letters Patent No. **36,116**, dated August 5, 1862.

To all whom it may concern:

Be it known that I, BENJAMIN F. STURTEVANT, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Shells or Projectiles for Cannon or Ordnance; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side view, and Fig. 2 a longitudinal section, of a shell as provided with my invention, the nature of which consists in the application of an annular enlargement or crossing groove and its filling-head with the annular neck and groove of the annular packing and butt of a projectile; also, in a peculiar arrangement of two series of interlocking teeth with respect to the annular packing and its holding-grooves.

The object of my invention is to so firmly secure the annular packing to the body of the projectile as to prevent rupture of such packing and its detachment from the body of the projectile either at the period of discharge of the latter from a piece of ordnance or during its flight therefrom.

It is well known that when a metallic packing of a projectile is ruptured by the explosion of the charge by which the projectile may be expelled from a gun, pieces of the packing are liable to be scattered in various directions with great force, so as frequently to be productive of serious accidents to friendly troops, over whose heads it may be necessary to discharge the projectile at an enemy. My mode of connecting the expansive packing to the body of the projectile tends to effectually prevent such accidents.

In the drawings, A denotes the body of an elongated shell, while B is the annular expansive metallic packing applied to its rear end. This packing I usually make of bronze or some composition of metals, such as by the force of explosion of the powder-charge of a gun may be expanded and driven closely against the bore of the piece, or into the grooves, in case such bore may be rifled or grooved. In affixing the packing B to the body A, the latter is first cast or constructed with an annular groove, *a*, extending within and around its rear portion and opening out of the same by means of a passage, *b*, narrower than the groove, and arranged as shown in Fig. 3, which is a section of the rear part of the shell as it appears without the packing. This groove and its neck are so arranged within the body A that there may be in advance of them an annular shoulder, *c*, for supporting the front edge of the metallic packing, which is subsequently to be cast about or around the rear part of the projectile, and so as to enter and fill the neck *b* and the groove *a*, and extend in a hollow or tubular form a short distance rearward from the rear end of the body, as shown in Fig. 2. The shoulder *c*, I form with a series of cavities or teeth, as shown at *d d d*, extending either partially or entirely around it, and so that in the process of casting the packing portions *e e e* of it may run between these teeth and form interlocking teeth, the whole being to prevent the packing from being turned laterally in the annular groove *a*. That part of the packing which extends into the groove *a* and its neck *b*, and is marked *f* in Fig. 2, may be termed an "annular tenon," having the form of a dovetail or an approximation thereto, it being so arranged as to extend from the inner surface of the packing in such manner as not only to enable the packing to abut against the toothed or serrated shoulder *c*, but to have its outer cylindric surface coincident with or in line with that of the body of the projectile, in manner as indicated by the drawings.

From the above it will be seen that my mode of connecting the expansive packing to the butt of a shell or projectile will operate to great advantage, not only to prevent the packing from being ruptured and driven forward on the projectile, both while it may be in a gun and under the action of the force of an explosion of a charge thereof, but also to secure the packing so strongly to the projectile as to prevent such packing (in case of being ruptured) after it may have left the piece, from flying in pieces and becoming detached from the projectile until the proper period for the shell to meet or strike the object at which it may be impelled.

I do not claim the invention either as claimed or represented in United States Patent numbered 15,999, for with such the annular cupped cylinder, when broken, is easily detached from the butt of the projectile, the entering tenon of it being made of an even thickness, or so as to slightly taper or decrease in thickness from

its outer to its inner edge; but with my invention the annular tenon and its groove have combined with them a second or transverse annular groove, *a*, and a head or filling thereof, they (the said transverse groove and head) fitting closely together and being made of greater width than the annular neck or groove *a*, and the whole serving not only to give additional strength to the annular packing, but also to the rear part of the shell. My improvement not only operates to prevent the packing from being separated laterally from the body of the projectile while in flight through and beyond a gun, but enables the neck of that part of the projectile which is within the annular packing to be made so strong as not to be liable to be broken off by the force of the explosion of an expelling-charge while the projectile may be in the act of being driven through the bore of a gun. The arrangement of the two ranges of teeth of the packing and projectile is very favorable for maintaining the packing in place, as with such an arrangement the packing, while being expanded, does not tend to separate the ranges of teeth, but rather to force them into closer contact.

I claim—

1. In combination with the annular neck-groove *b* and the part of the expansive packing to enter the same, the annular enlargement or crossing groove *a* and the metallic head or filling thereof.

2. The arrangement of the two series of interlocking teeth with respect to the annular packing and its holding-grooves.

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Witnesses:
R. H. EDDY,
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