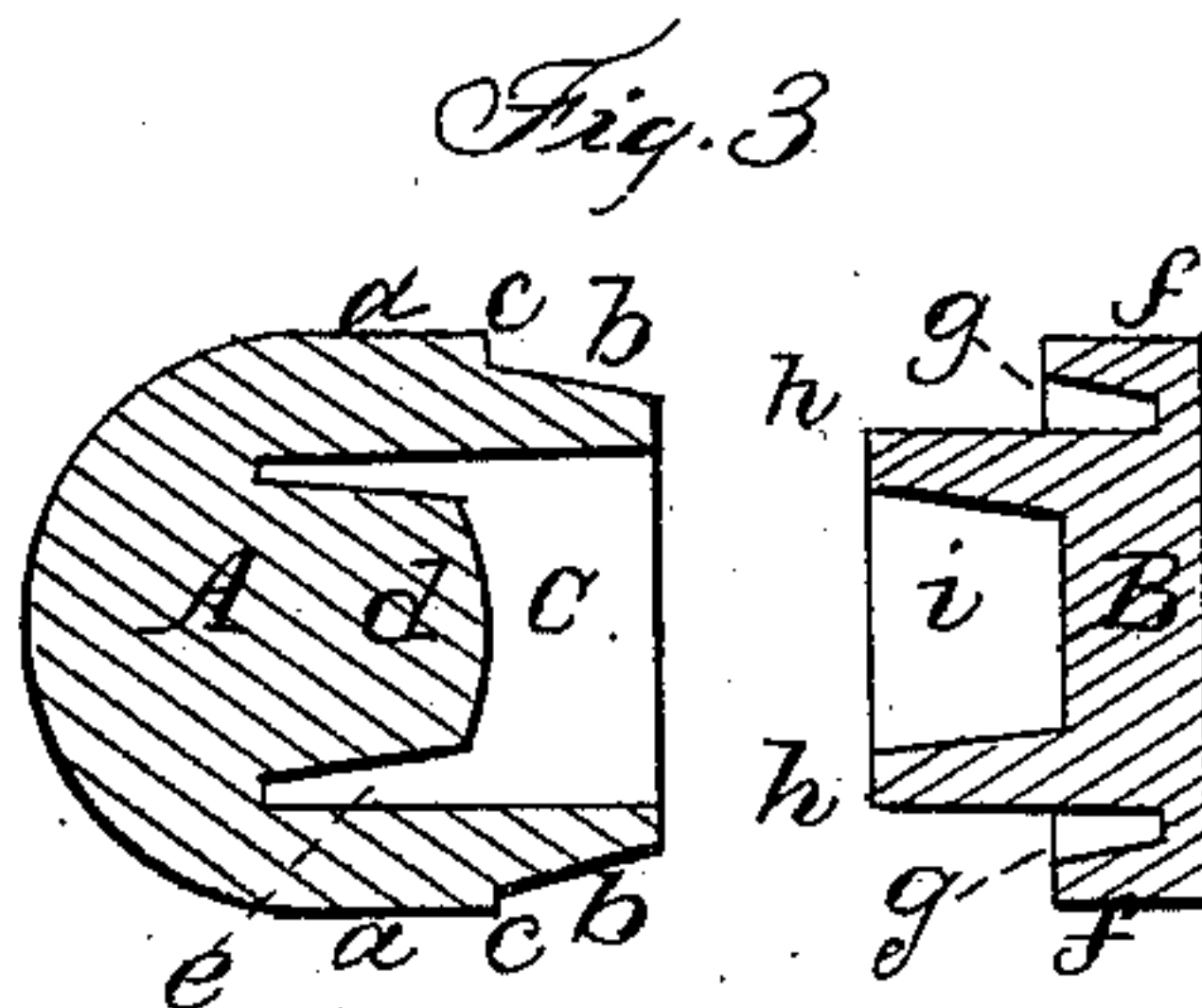
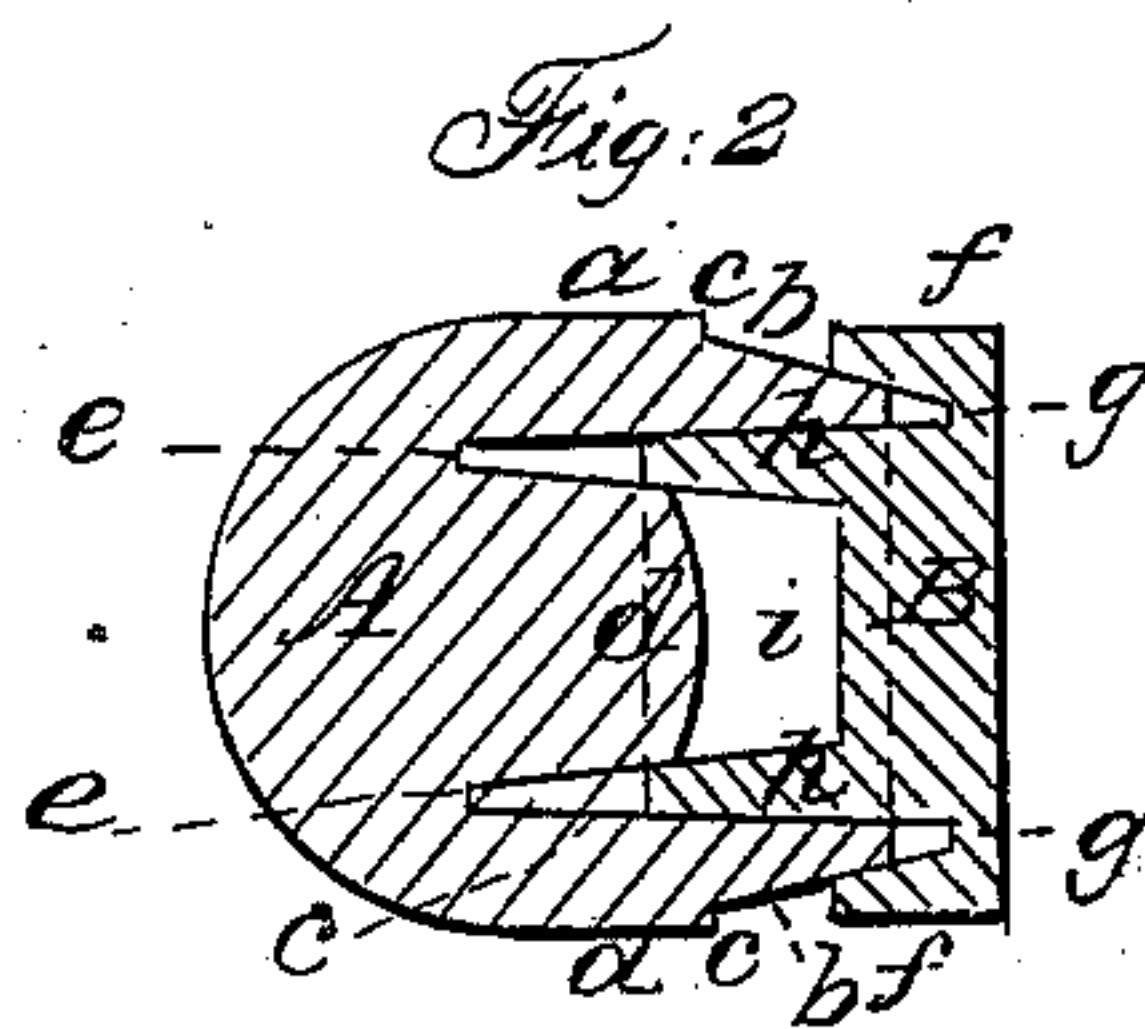
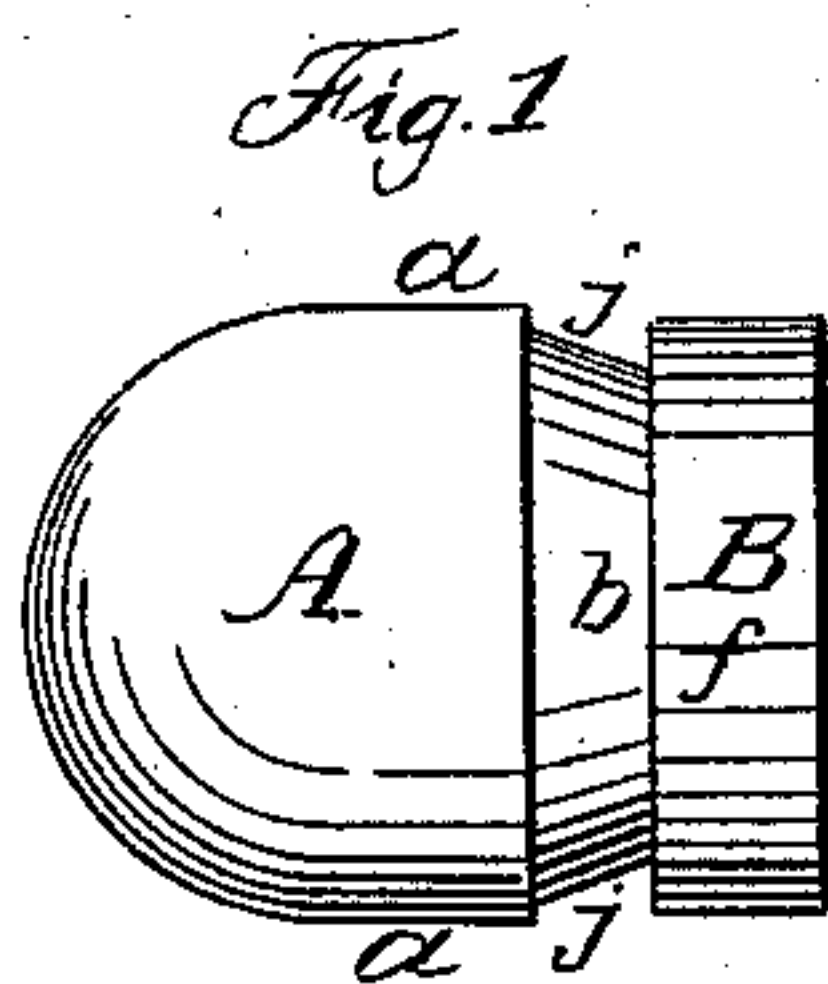


E. D. WILLIAMS.

Projectile.

No. 43,615.

Patented July 19, 1864.



Witnesses:
Geo. Fusch
Geo. H. Reed

Elijah D. Williams Inventor:

UNITED STATES PATENT OFFICE.

ELIJAH D. WILLIAMS, OF NEW YORK, N. Y.

IMPROVEMENT IN EXPANDING BULLETS.

Specification forming part of Letters Patent No. 43,615, dated July 19, 1864.

To all whom it may concern:

Be it known that I, ELIJAH D. WILLIAMS, of the city, county, and State of New York, have invented a new and useful Improvement in Expanding Bullets; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of a bullet, and Fig. 2 an axial section of the same. Fig. 3 represents axial sections of the two pieces of which the bullet is composed, detached from each other.

Similar letters of reference indicate corresponding parts in the several figures.

The objects of my invention are, first, to obtain a long cylindrical bearing for the bullet in the bore of the fire-arm; secondly, to provide for the better lubrication of the bore and rifle-grooves of the arm; thirdly, to provide for the cleaning of the rifle-grooves of the arm by means of the bullet itself; and, fourthly, to diminish the weight of the bullet without impairing its effect; and to these ends my improvement consists in a certain novel construction of the bullet in two pieces, one of which is caused by the action of the gunpowder in discharging the arm to move forward within the interior of, and upon the exterior of the other, in such manner that each piece is caused to produce or aid in producing the expansion of the other.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A and B are the two pieces of which the bullet is composed, and of which A may be termed the "body," and B the "follower." The body A has the middle portion, *a*, of its exterior of cylindrical form, and of a caliber to pass easily into the bore of the arm, the front portion of conoidal, spherical, or spheroidal form, and the rear portion, *b*, conical commencing from a shoulder, *c*, and tapering to the rear end. It has formed within it a concentric cavity, C, opening at its rear and extending forward as far as or slightly beyond the front of the cylindrical portion *a*, of its exterior, the said cavity being slightly conical, diminishing in size in a forward direction; and from the back of this cavity there extends in a forward direction, about half-way to the rear end of B, a

concentric and slightly-conical projection, *d*, tapering in the opposite direction to the said cavity, between which and the said projection there is left a narrow annular space, *e*, which tapers from both sides toward the point of the bullet. The follower B resembles a hollow pin, the head *f* of which, constituting the rear end of the bullet, has a cylindrical periphery of a caliber slightly smaller than the cylindrical portion *a* of the body A, and in the front face of the head *f* there is an annular groove, *g*, of a size and form to receive partly within it the annular rear end, *b*, of the body A. The exterior of the portion *h* of the follower in front of its head is made of a conical form to fit the interior of the cavity C in the body, and the said portion *h* has its front part cavity, *i*, of a form and size to receive within it the end of the projection *d*, of the body, the interior of the said cavity being tapered to correspond with the said projection *d*. The outer side of the groove *g* is tapered to correspond with the portion *b* of the body, and the inner side of the said groove forms an unbroken continuation of the exterior surface of the part *h* of the follower. Both pieces A and B of the bullet may be made of lead, but I prefer to make B of an alloy of lead, with antimony or some other harder metal; in order to prevent it from sticking to the bore and in the grooves of the arm and enable it to clean their surfaces. I generally use five (5) parts of antimony to ninety-five (95) of lead. The two pieces are placed together, as shown in Figs. 1 and 2, and a slight blow upon either serves to attach them so securely together that they cannot be separated by transportation or by any accidental agency. When once put together they never require to be separated. It will be seen by reference to Fig. 2, that the portion *b* of the body enters the groove *g*, and the projection *d* enters the cavity *i* of the follower, and the portion *h* of the follower enters the cavity *c* of the body, and into the annular space, *e*. The groove *j*, that is left between the shoulder C and the follower when the two pieces are put together, forms a receptacle for grease or lubricating matter. The bullet, in this condition, may be inserted into the fire-arm either at the muzzle or breech. When the charge is fired, the follower is driven forward within and upon the exterior of the body, and the portion *h* of the follower, being driven into the annular

space *e*, is itself expanded, and also caused to expand the cylindrical portion *a*, by a double-wedging action, while at the same time the portion of the head *f* of the follower outside the groove *g* is expanded by a similar action in being driven forward on the conical surface *b* of the body, and so caused to produce a continuation of the cylindrical bearing-surface of the bullet, which is thus made longer than in most elongated bullets, as such bullets, though commonly made longer than mine, have no great portion of their length expanded, or are not uniformly expanded along any very considerable portion of their length.

As the exterior of the head of the follower is made a trifle smaller than the portion *a* of the exterior of the body, the forward portion of the bullet comes to a bearing before the hinder portion, and this is of great advantage to the accuracy of the shooting.

In the driving forward of the follower, the grease or lubricating matter is forced out from the groove *j* against the bore and into the rifle-grooves of the gun.

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

The construction of a bullet of two pieces, A and B, fitted together with a series of conical surfaces arranged substantially as herein specified, whereby in the discharge of the bullet from the fire-arm the piece B is caused to move forward both within the interior of and upon the exterior of the piece A, and each is caused to produce the expansion of the other by a double-wedging action, substantially as herein set forth.

ELIJAH D. WILLIAMS.

Witnesses:

JAMES P. HALL,
GEO. W. REED.