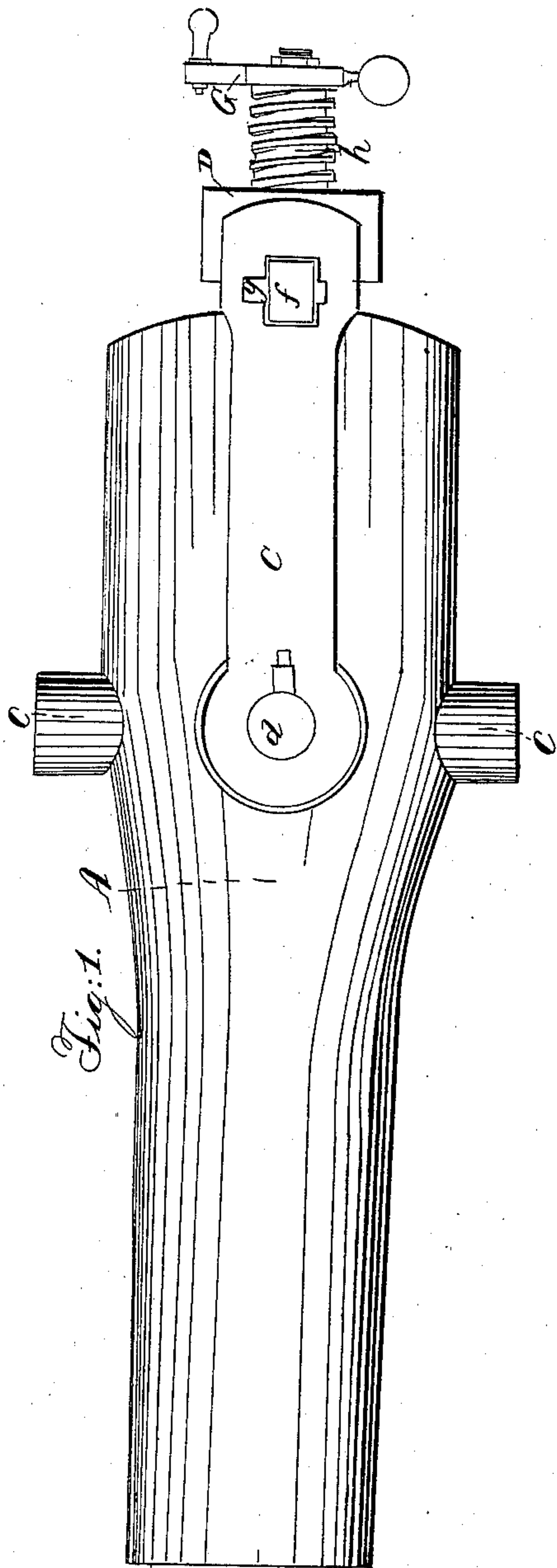


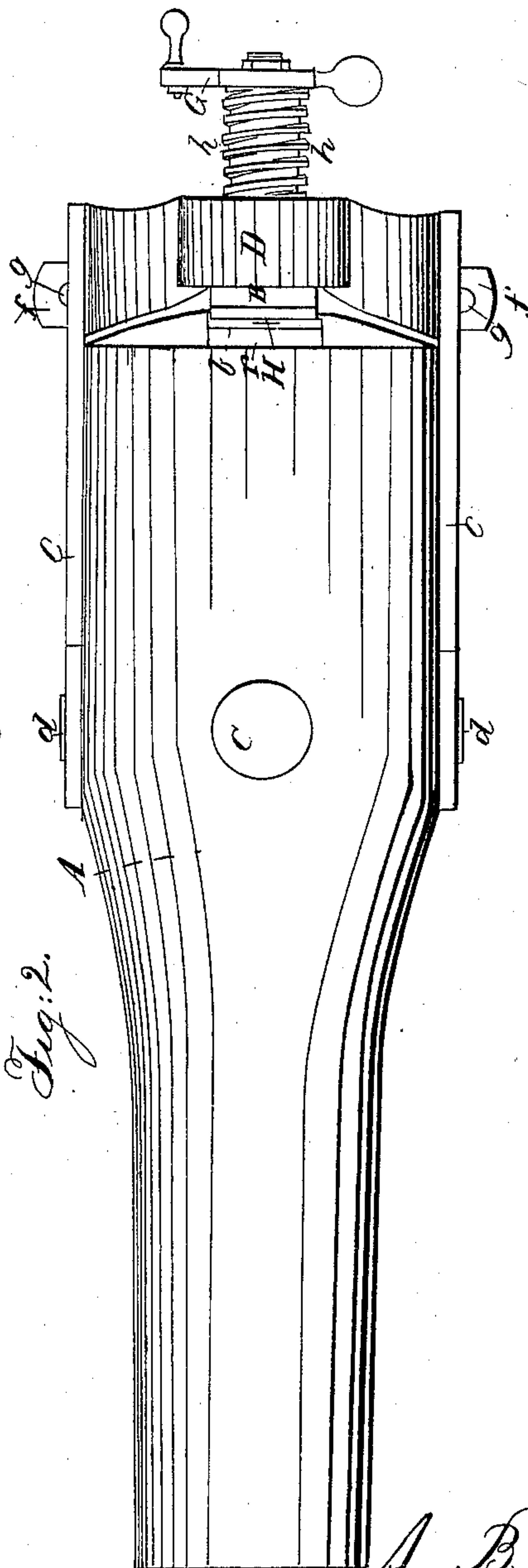
A. B. SMITH
Breech-Loading Ordnance.

No. 39,359.

Patented July 28, 1863.



C. Evans, Jr.
A. Moore



A. B. Smith
By his atty
J. S. Brown

A. B. SMITH

Breech-Loading Ordnance.

No. 39,359.

Patented July 28, 1863.

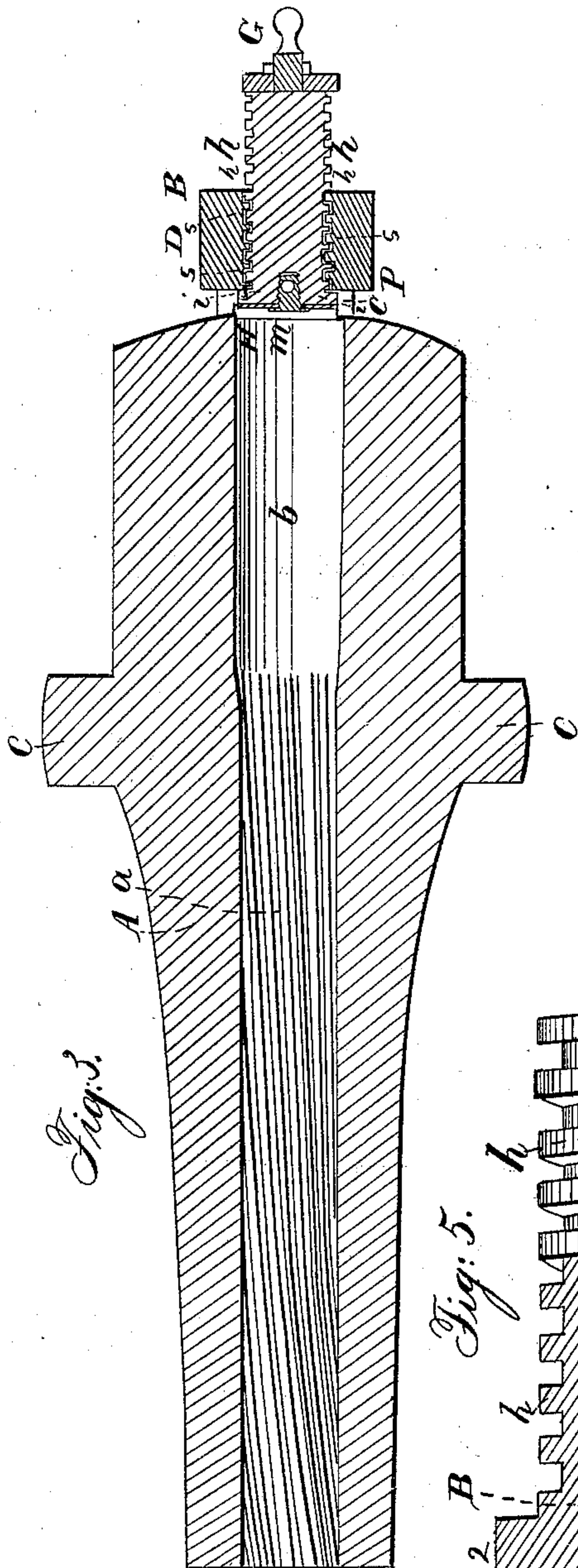


Fig. 3.

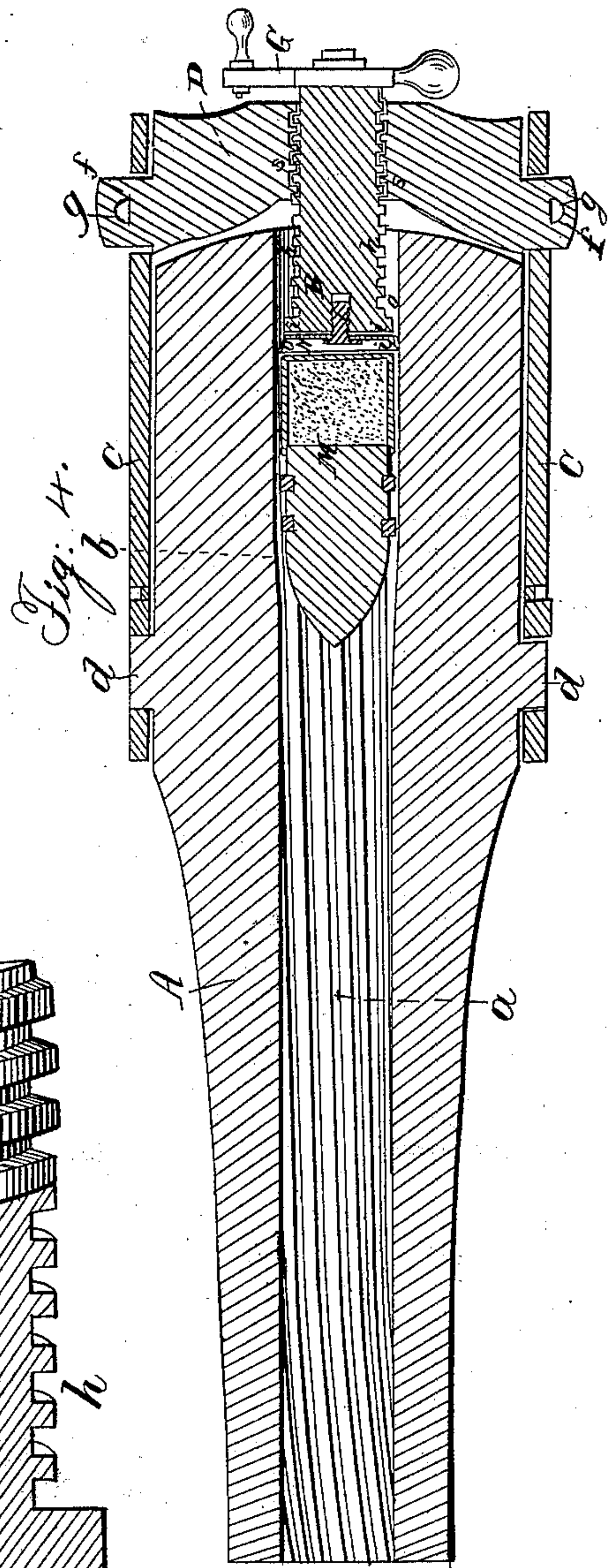


Fig. 4.

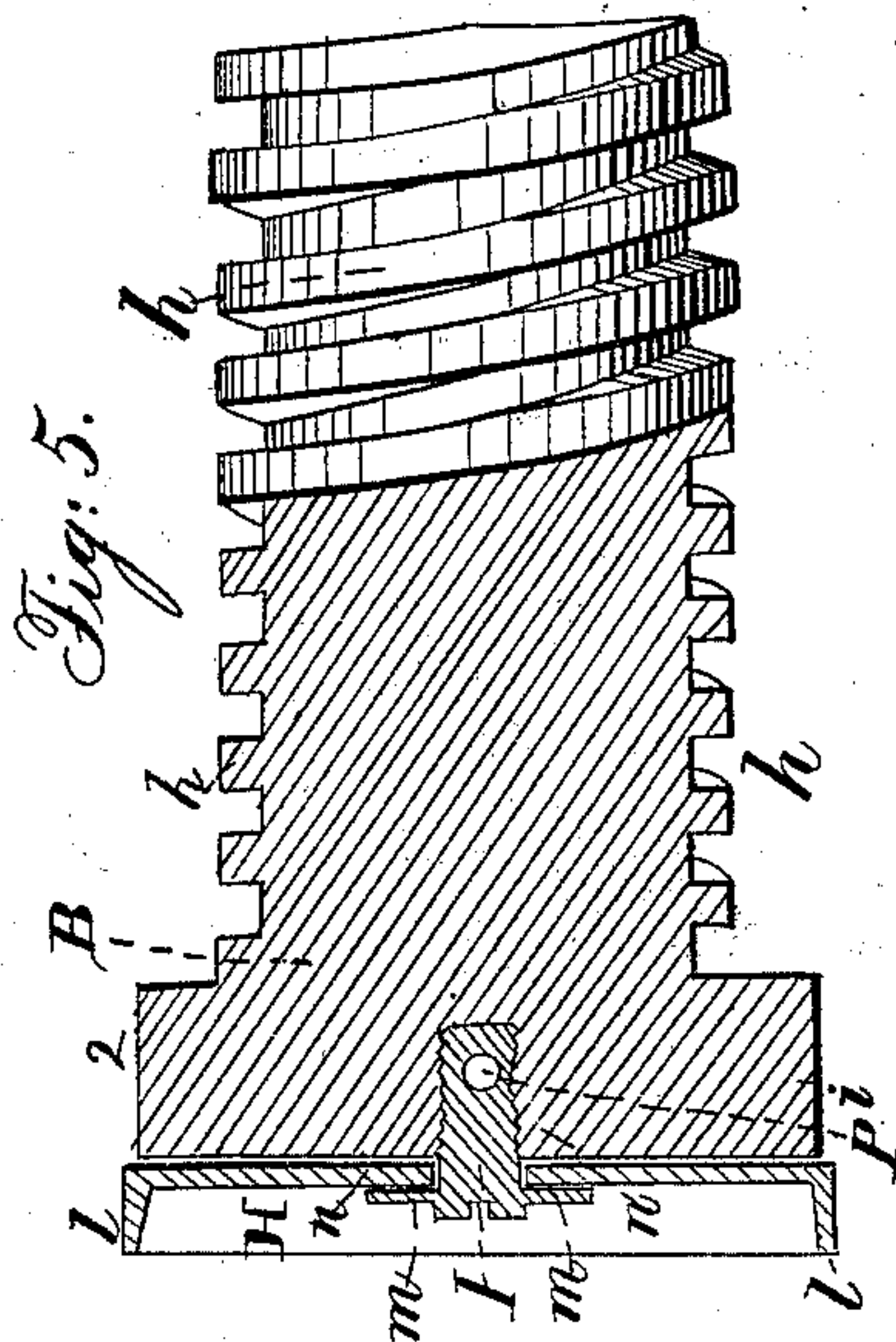


Fig. 5.

E. Cross Jr.
A. Moore

A. B. Smith
By his attys
J. S. Brown

UNITED STATES PATENT OFFICE.

A. B. SMITH, OF CLINTON, PENNSYLVANIA.

IMPROVEMENT IN BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. **39,359**, dated July 28, 1863; antedated January 10, 1863.

To all whom it may concern:

Be it known that I, A. B. SMITH, of Clinton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Breech-Loading Ordnance; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a plan of a piece of ordnance provided with my improvements; Fig. 2, a side elevation thereof; Fig. 3, a central longitudinal horizontal section of the same; Fig. 4, a central longitudinal vertical section thereof; Fig. 5, a detached view of the removable breech-pin or "mandrel" on a larger scale, representing it partly in section and partly in elevation. In Figs. 1, 2, and 3 the mandrel is represented as withdrawn from the breech-chamber of the gun; but in Fig. 4 it is represented as inserted in against the cartridge.

Like letters designate corresponding parts in all of the figures.

The object of my invention is to reduce breech-loading ordnance to the utmost simplicity, lightness, and facility of manipulation, together with all necessary strength and security, and wholly without leakage of gases at the discharge.

Let A in the drawings represent an ordinary piece of rifled ordnance, with an open breech-chamber, *b*. In suitable positions on the surface of the breech, at right angles or quarter-circles from the supporting-trunnions *c c*, and in circle therewith, as shown in the drawings, or in the same plane with the said trunnions, and to the rear thereof, project two other trunnions or pivots, *d d*, on which are hinged two straps, C C, extending backward beyond the gun far enough to admit a cross-head, D, so that the latter may swing with the straps immediately behind the breech of the gun. The straps C C are suitably provided with mortises to receive tenons *f f* on the ends of the cross-head; and through these tenons keys *g g* extend to hold the straps and cross-head together in such a manner that they can readily be removed from the gun for the purpose of disabling the same, or for any other purpose, as occasion may require. These straps and cross-head together compose a kind of swinging "stirrup," in which the breech-pin or mandrel B works, is sustained, and is

managed. For this purpose the cross-head D is sufficiently enlarged in the middle to form a strong nut with large screw-threads *s*, and the mandrel B is provided with a corresponding screw-thread, *h*, to fit and work therein. Thus by giving the mandrel B a few turns by means of a winch, G, or other equivalent means, one way or the other, it is inserted to the proper extent into the breech-chamber *b* of the gun, as seen in Fig. 4, or withdrawn therefrom, as shown in Fig. 3. When the breech-pin or mandrel is withdrawn sufficiently to clear the breech of the gun, the stirrup is readily swung aside far enough to leave the breech-chamber *b* entirely unobstructed; for the purpose of inserting the cartridge. The stirrup is then swung back into place and the mandrel is turned till it drives the cartridge M, Fig. 4, into the front end of the breech-chamber *b*. The piece is then loaded, ready to be capped (if required) and fired. For the purpose of convenience and readiness of determining without care when the mandrel is brought back exactly into the right position for again entering the gun, I usually provide a notch, *r*, Fig. 2, in one side of the breech of gun concentric with the pivots *d d* of the stirrup-straps and just wide enough to allow the end of the mandrel to swing in, so that it cannot swing except in that direction and to the extent allowed by the said notch.

The mandrel B has its inner end somewhat enlarged in diameter in the form of a head, *i*, to prevent its being driven out farther than required; but this head is somewhat smaller than the breech-chamber *b*, so that it always is readily inserted and withdrawn, however much it may be expanded by the heat occasioned by the discharge of the piece. Thus there can be no possible obstruction to the free movement inward and outward of the mandrel, and for the additional reason that the screw-threads *h s* are entirely out of the gun, so that they can never become fouled by the discharge. In order to pack the breech-pin or mandrel perfectly tight, so that there shall not be any leakage of gas by it, I combine with it a tightening-cap, H, in the following manner:

The cap H is made of copper or other sufficiently soft and elastic metal, and it has a lip, *l*, turned up around its entire periphery, substantially as represented. The cap is just large enough to fit somewhat loosely in the breech-

chamber *b*, in order that it may be readily moved therein. It is attached concentrically to the inner end of the head *i* of the mandrel B by a single central screw or bolt, I, which is better to have a broad head, *m*, to hold the cap securely in its place, and to enable it to have a little side play in all directions, the eye or central aperture, *n*, Fig. 5, in the cap being a little larger than the screw I, which extends through it, substantially as shown. The lip *l* of the cap projects inward, so that when the charge is fired the pressure of the gas shall expand the lip outward, and thereby perfectly pack and tighten the joint around it, and thus wholly prevent the escape of gas. The great advantage of the cap H being attached loosely and so as to play sidewise in all directions on the end of the mandrel arises from allowing the mandrel to be made to fit quite loosely in the breech-chamber, so that it may be freely inserted and drawn out, while the cap always adapts itself concentrically in the breech-chamber. Thus the breech-pin or mandrel is free to move under all circumstances. Another important advantage of the free cap on the free mandrel is that, adapting itself freely to the breech-chamber, the pressure of the gas acts equally on all sides, thus perfectly and uniformly tightening the whole periphery. The cap also has a slight play on the mandrel forward and backward, so that, since it can turn freely on the mandrel, when the latter is to be withdrawn after firing, it may be turned and moved a little distance before drawing upon the cap, and by the motion and momentum thereby gained it becomes easier to start the cap from its place.

To render the screw I perfectly sure to retain its place and not work loose, a pin, *p*, or its equivalent may be inserted through it, and thereby prevent its turning back.

The peculiar advantage of the mandrel breech-pin B, arranged as described, in a nut, D, which forms the cross-head of the swinging stirrup, is that it is readily manipulated, and is made to follow the cartridge M as far as ever required, so that it is sure to drive the cartridge, whether longer or shorter, fully to the front end of the breech-chamber; and it can always enter far enough into the breech-chamber to secure any required length of breech behind the charge, and consequently all the strength of breech desired, thus completely obviating the objection to open-breech guns sometimes made on account of alleged lack of metal around the exploding-charge.

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

The combination of the packing-cap H with the loosely-fitting mandrel B, being attached thereto so as to have a side play in all directions, and thus adapt itself concentrically in the breech-chamber, substantially as and for the purposes herein specified.

In witness that the above is a true specification of my improvements in breech-loading ordnance I hereunto set my hand this 14th day of February, 1862.

A. B. SMITH.

Witnesses:

J. S. BROWN,
EDM. F. BROWN.