G. H. FERRISS.

Breech-Loading Ordnance.

No. 41,984. Patented Mar. 22, 1864.

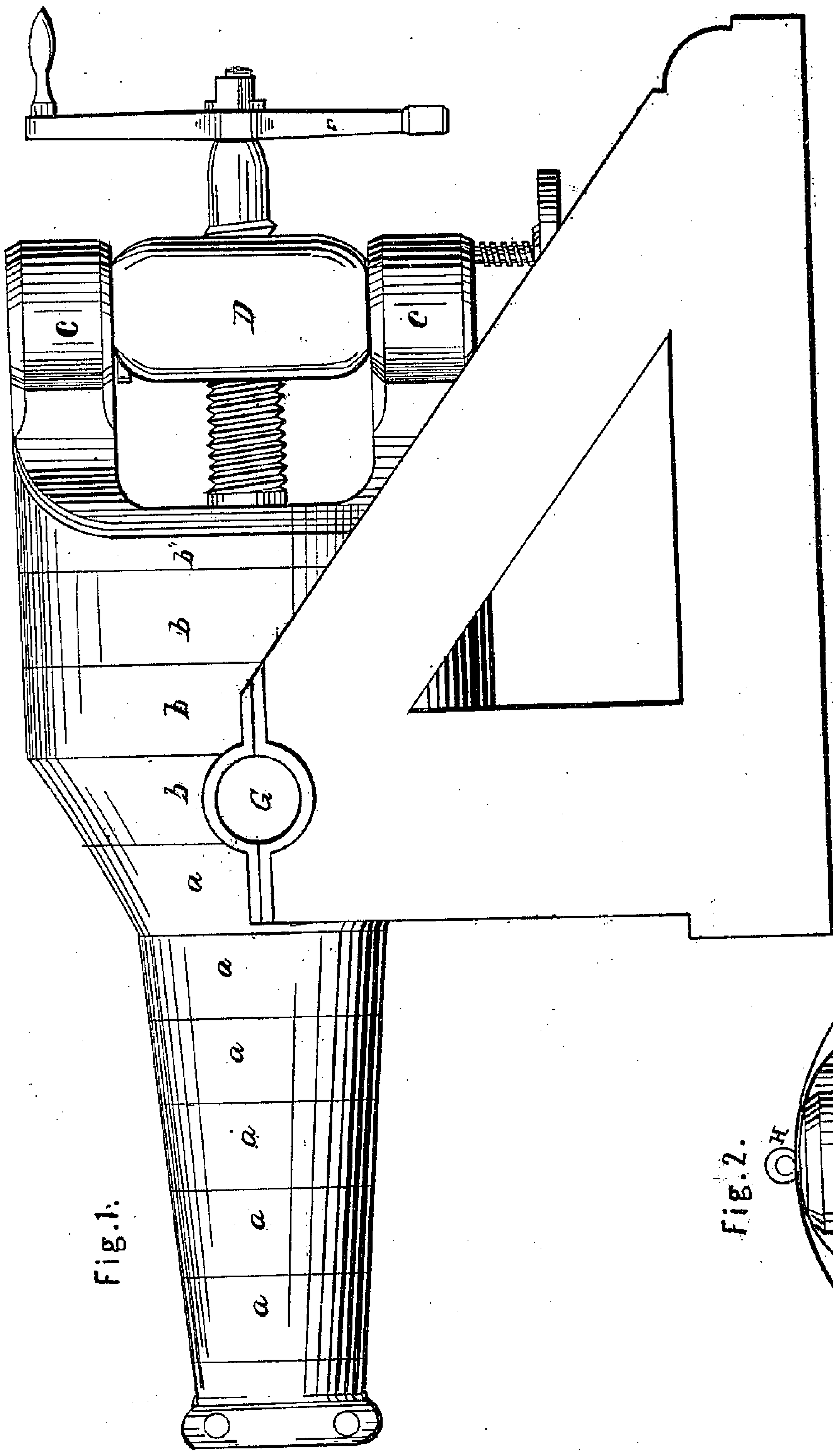

Fig. 1.

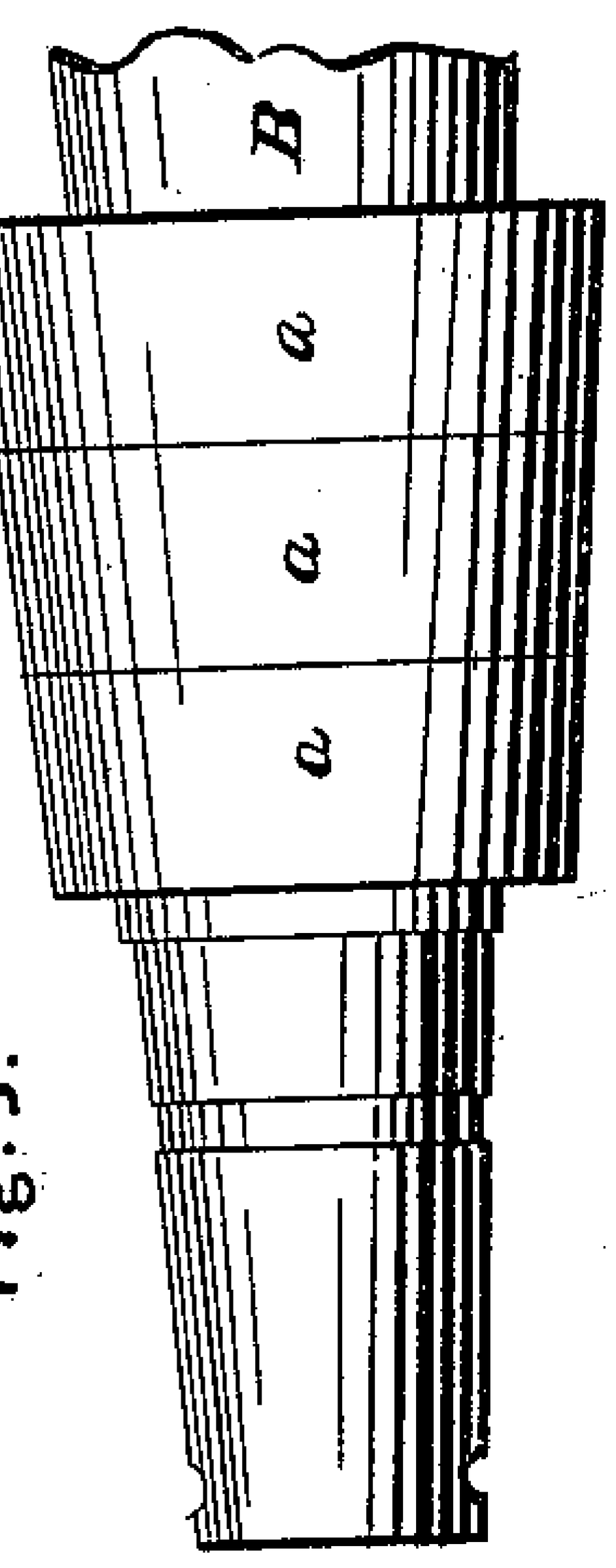

Fig. 5.

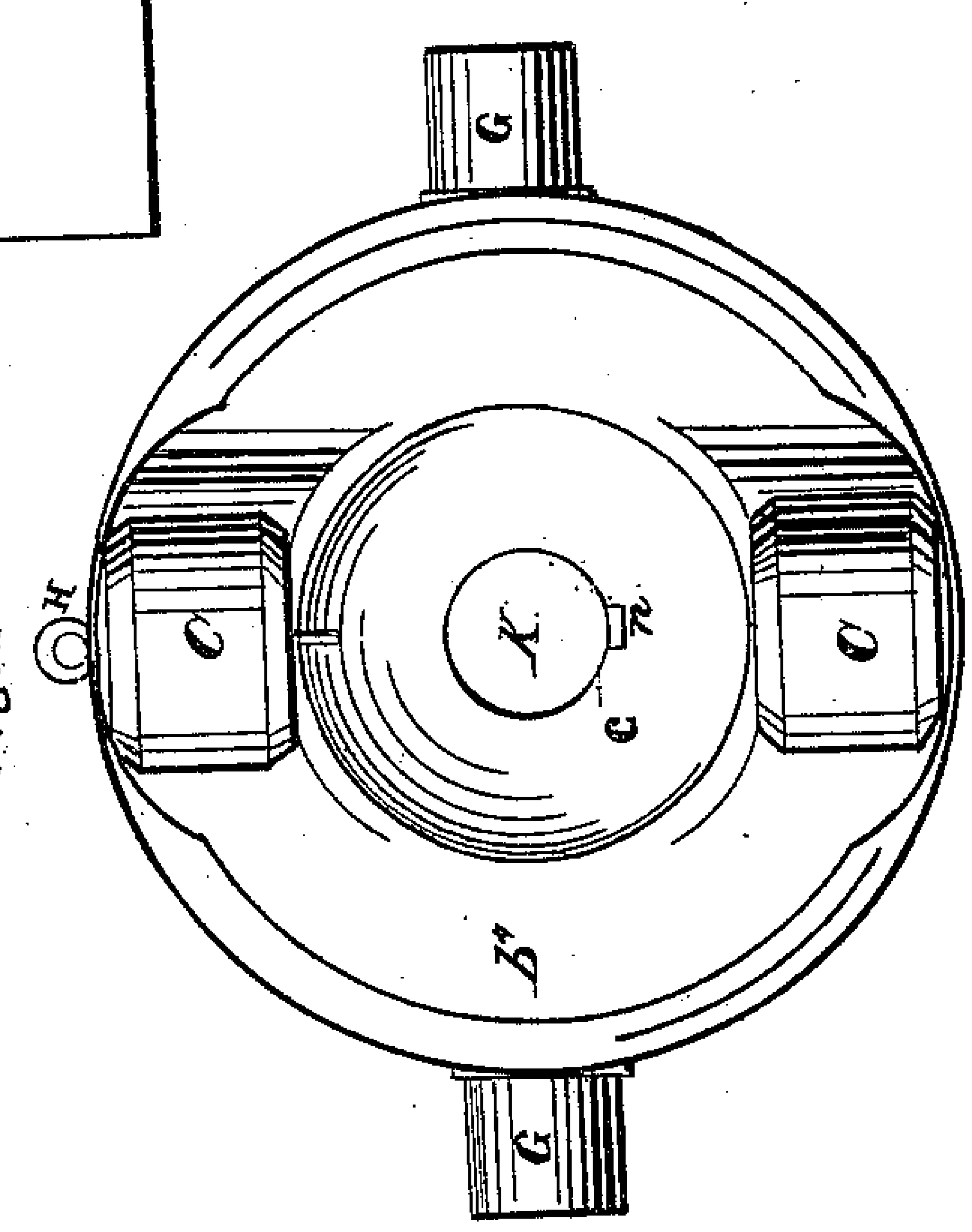

Fig. 2.

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Fig. 3.

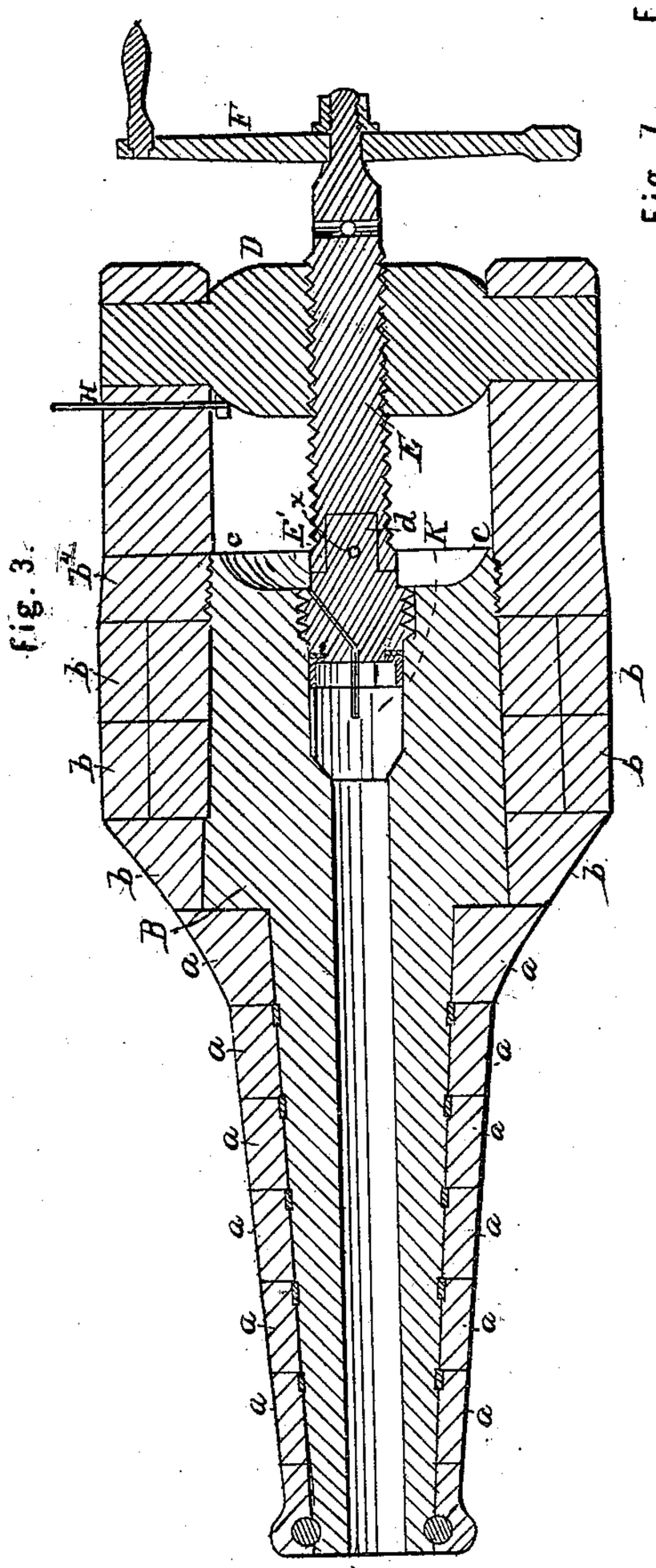

Fig. 6.

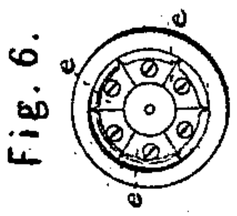

Fig. 8.

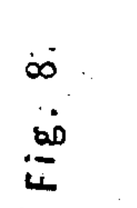

Fig. 7.

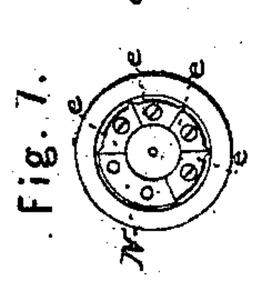

Fig. 4.

WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE H. FERRISS, OF UTICA, NEW YORK.

IMPROVEMENT IN BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. **41,984**, dated March 22, 1864; ante dated March 9, 1861.

To all whom it may concern:

Be it known that I, GEORGE H. FERRISS, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Breech-Loading Ordnance; 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 a part of this specification, and of which—

Figure 1 is a side elevation of my improved breech-loading cannon; Fig. 2, an end view of the same with the breech-screw E and its supporting-nut D removed; Fig. 3, a vertical longitudinal central section of my cannon with the loading-aperture in its breech closed by the screw-encircled recoil-seat E′; Fig. 4, a top view thereof, as it appears with the breech-screw E and recoil-seat E′ withdrawn from the breech and turned aside, to allow the gun to be loaded. Fig. 5 represents a portion of the chase of the gun. Figs. 6 and 7 are end views of the recoil-seat E′, showing the arrangement of the expanding double flange N fitted thereon. Fig. 8 is a detached view in detail of portions of said expanding flange N.

Similar letters indicate like parts in each of the drawings.

The nature of my invention consists in a novel mode of closing the chamber of a breech-loading gun, whereby I obtain greater security and accuracy in the joint and a more perfect gas-check than in the usual mode of securing the breech-piece.

My improved cannon is built of a central core, B, of wrought-iron or other suitable metal, so formed as that it shall gradually increase in hardness from center to circumference, and which is incased within rings or bands of steel *a a a*, driven and firmly secured thereon. Its chamber K is closed by a screw-encircled recoil-seat, E′, Fig. 3, secured to a proper operating-screw, E, by means of a tenon-and-mortise joint, *d*, and dowel-pin *x*, passing through the same, as illustrated in Fig. 3. This recoil-seat E′ is encircled by a screw, which works into a perforation properly formed and grooved to receive it in the rear end of the chamber K of the gun, and is necessarily made somewhat larger in diameter than the bore of said chamber. The ends of the screw-threads encircling the recoil-seat E′ are cut square, and a slot, *n*, Fig. 2, is channeled out in the lower portion of the screw-aperture, extending longitudinally across its threads, Fig. 3; hence any dirt which may collect in the screw is carried forward by the ends of the threads until it drops into this receiving-slot *n*, Figs. 2 and 3.

An expansive double packing-flange composed of a slitted outer casing, N, and a segmental inner casing, *e e e*, is combined with the inner end of the recoil-seat E′ by means of set-screws in such a manner as that the joints or slits in the two casings shall alternate. The form of said casings and the manner of combining them with each other and with the recoil-seat E′ is clearly represented in Figs. 3, 6, 7, and 8 of the accompanying drawings.

It will be observed that the peculiar arrangement of the segmental portions *e e e e* of the inner casing is such that any one of them may be readily withdrawn and replaced without disturbing the remainder.

The expansive packing-flange N thus arranged forms, in combination with the end or face of the screw-encircled recoil-seat E′, a closing-piece for the rear open end of the chamber K, which is so turned as to contract inwardly very gradually to the depth of the flange N, so that as the flange is forced into place to close the chamber it is compressed and made to fit with perfect tightness and accuracy therein. The edges of the segmental portions or staves *e e e*, forming the inner casing of the packing-flange, are so beveled outwardly as that when forced into the chamber they will cut away all accretions or fouling upon the sides of the chamber so far as they enter the same.

It is evident that the expansion of the double packing-flange N, (made as described,) under the influence of the discharge of the gun, will, in connection with the device by which it is securely held in place, form a complete gas-check. By withdrawing the dowel-pin *x*, by which the recoil-seat E′ is secured to the breech-screw E, the former may be quickly removed for repair or carried away to render the gun useless.

The operating breech-screw E (which I prefer to make smaller in diameter than the screw-encircled recoil-seat E′,) is supported in a screw-aperture formed within a pivoted nut, D. The nut is pivoted and supported between two projecting arms, *c* and *c′*, in a ver-

tical plane, coincident with the axis of the gun, (see Fig. 2,) and its rotary movement may be arrested at pleasure by means of a pin, H, inserted through an aperture in the upper arm, C.

The lower supporting-arm, C′, may be formed in one piece with the gun, (or its outer incasing-ring, b^4, which is secured thereon;) but the upper arm, C, must be made separately and secured to the gun opposite to the arm C′ after the nut D has been put into its proper position. I therefore secure this arm C′ to the gun, or to its outer incasing-ring, by means of a serrated, beveled, or dovetailed joint, as seen in Fig. 4.

The breech-screw E is operated or turned backward and forward by means of a crank, F, Figs. 1, 3, and 4, and the pitch of its screw-threads is coincident and uniform with that of the screw-threads encircling the recoil-seat E′.

I contemplate the application of my screw-operated and screw-encircled recoil-seat E′ to all forms and descriptions of breech-loading guns, however its exterior nut, D, may be pivoted or supported, for I consider the use of a recoil-seat or breech-screw which screws both through a supporting-nut and into the breech of the gun as an important and novel improvement in the mode of closing the chamber of the gun.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. Closing and opening the chamber of a gun from the rear by means of a screw-actuated and screw-encircled recoil-seat or breech-piece, E′, when said recoil-seat or breech-piece is received into a screw-perforation in the breech of the gun and combined exteriorly with a supporting-nut, D, or its equivalent, substantially in the manner and for the purpose herein set forth.

2. When the chamber of a gun is rearwardly opened and closed by means of a screw-actuated recoil-seat, E′, combining a tubular-shaped expansible double flange, N, constructed as described, with the inner face of said recoil-seat, substantially in the manner and for the purpose herein set forth.

3. When the chamber of a gun is closed and opened by a screw-encircled recoil-seat or breech-piece, E′, forming a longitudinal groove or slot in the lower portion of the screw-cut portion of the opening to said chamber, to serve as a receptacle for the dirt that may accumulate in the screw-threads of the same, substantially in the manner herein set forth.

The foregoing specification of my improvements in breech-loading ordnance signed by me this 22d day of July, A. D. 1863.

GEO. H. FERRISS.

In presence of—
JAMES T. B. COLLINS,
D. O. MACOMBER.