

(No Model.)

S. M. TYRRELL.
BREECH LOADING CANNON.

No. 464,089.

Patented Dec. 1, 1891.

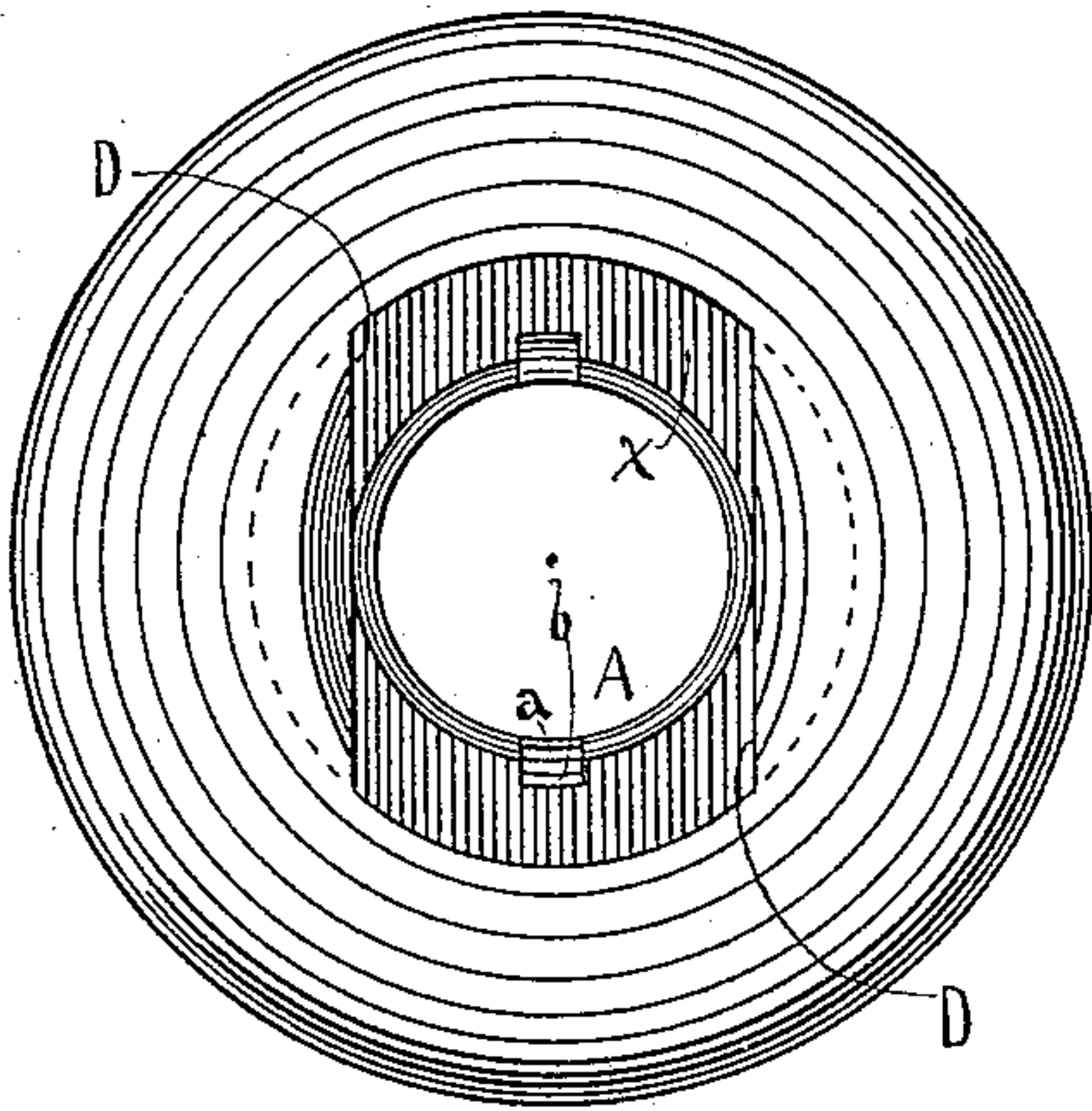


FIG. 1.

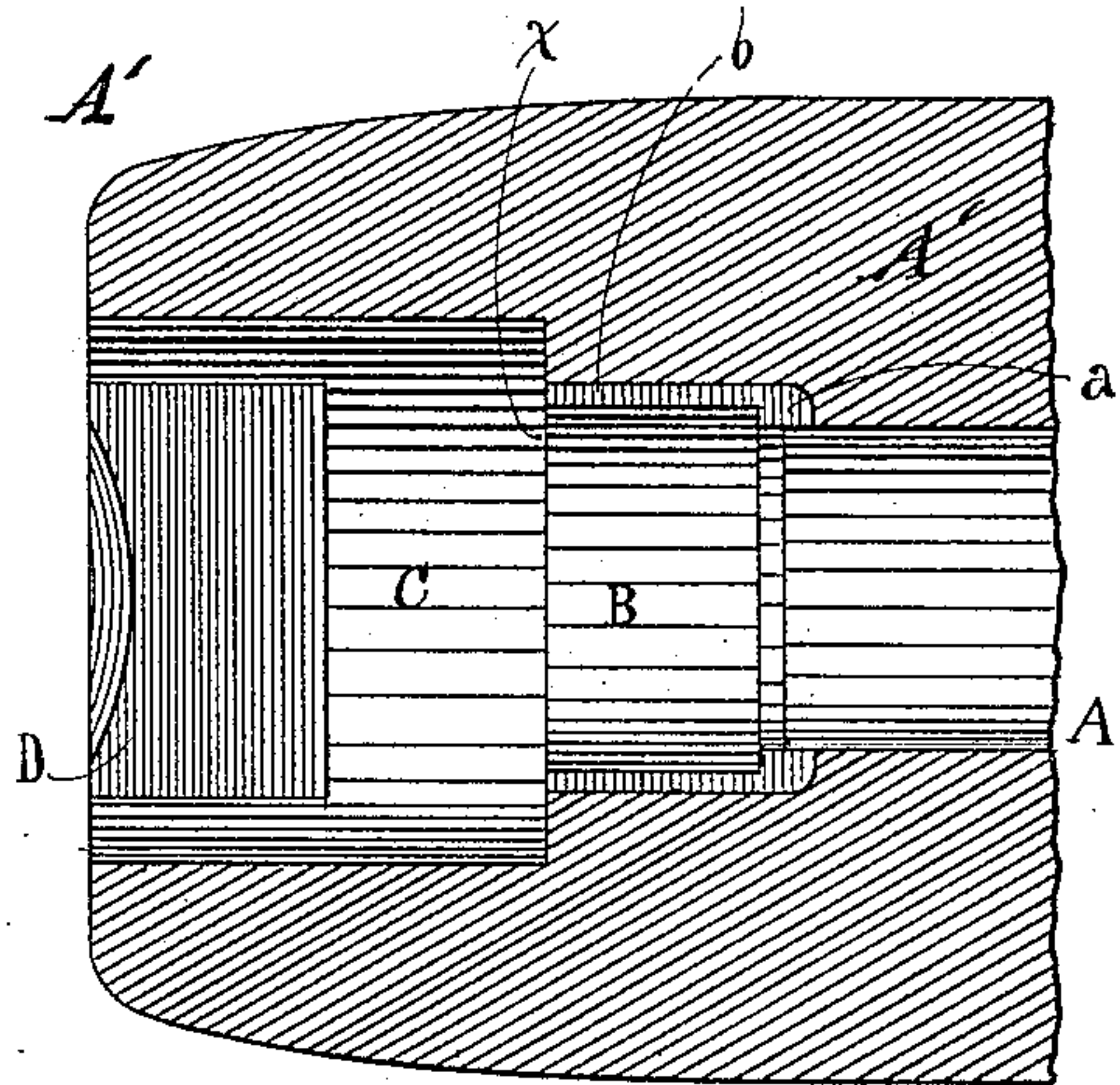


FIG. 2.

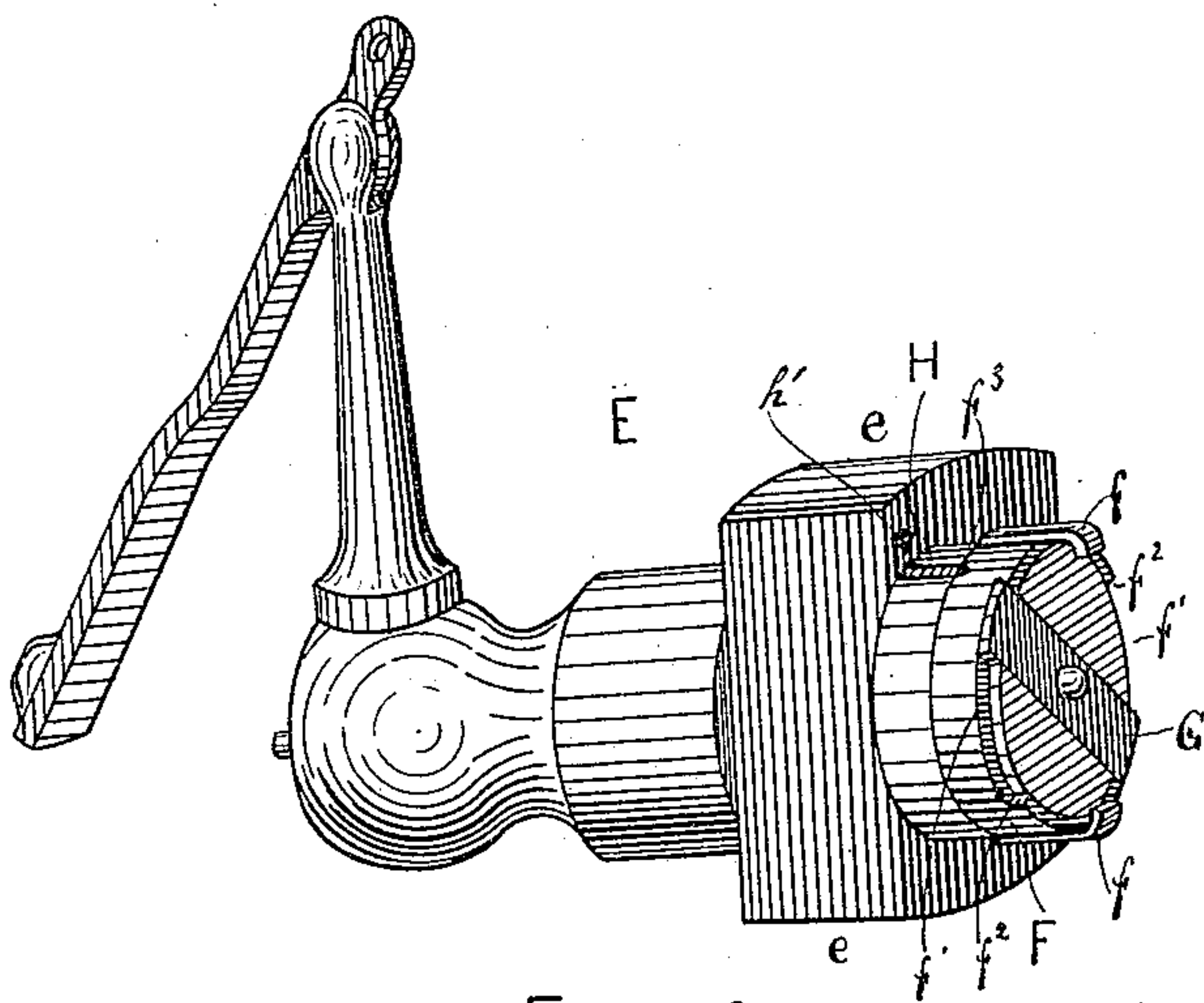


FIG. 3.

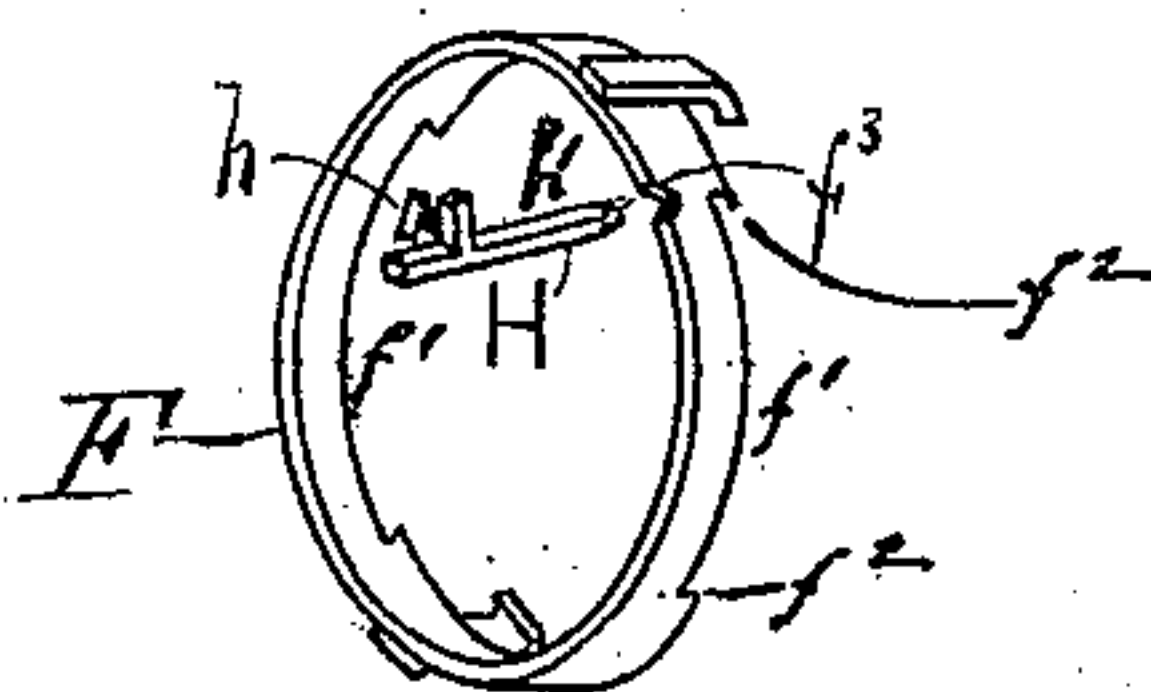


FIG. 4.

Witnesses:-
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by his Att'y
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UNITED STATES PATENT OFFICE.

SYLVANUS M. TYRRELL, OF GRAND CROSSING, ILLINOIS.

BREECH-LOADING CANNON.

SPECIFICATION forming part of Letters Patent No. 464,089, dated December 1, 1891.

Application filed February 11, 1889. Serial No. 299,362. (No model.)

To all whom it may concern:

Be it known that I, SYLVANUS M. TYRRELL, a citizen of the United States, residing at Grand Crossing, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Breech-Loading Cannons, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Figure 1 is a rear view of the open breech of a cannon constructed in accordance with my invention. Fig. 2 is a longitudinal vertical section of the same passing through the center of the bore and the centers of the chambers of the breech, the front portion of the cannon being broken away. Fig. 3 is a perspective view of the breech-block provided with a locking device for holding a loaded shell in the cannon and with shell holding and extracting mechanism. Fig. 4 is a detail view of the shell holding and extracting ring, illustrating the pawl, its actuating-spring, and the notch of the ring within which the pawl engages.

The object of my invention is to provide a substantial breech-block having wings for locking behind solid walls in the breech of a cannon, with a cartridge-carrier and shell-extractor device arranged to be kept (as by a pawl-and-ratchet mechanism) in proper position on the breech-block for entering the longitudinal extractor groove or grooves in the breech of a cannon and to be automatically relieved from turning with the breech-block in its quarter-turn rotary movements in locking and unlocking its wings behind the solid walls or abutments in the cannon-breech.

On the drawings, A represents the cylindrical shell-chamber of a cannon A' for receiving a shell containing a charge.

B is a cylindrical chamber immediately on the rear of chamber A, and is of suitable size to admit the head of a shell.

C is a cylindrical chamber of still larger diameter, cut away in the rear at top and bottom for the insertion therethrough of the wings of the breech-block, the sides of which chamber after said insertion serve as recesses for receiving the wings or projections on the

turning of the breech-block into its locking position.

D are the walls (represented in Figs. 1 and 2 of the drawings as having inner vertical faces) formed by the recessing or boring out of chamber C and the slotting or cutting away of portions of said chamber for the passage of the wings of the breech-block.

In the chamber B are grooves *b b*, terminating at their front ends in recesses *a a*, formed at the rear extremity of chamber A.

E is the breech-block, having wings *e e* for locking in the chamber C behind the solid walls D.

F is an extractor-ring provided with extractors *f f*, the said extractors, when the breech-block is being forced into position in the breech of the cannon, passing into the grooves *b b*, with their front inwardly-hooked ends coming to rest in the recesses *a a*. The extractor-ring F is so placed on the inner end portion of the breech-block E as to allow the breech-block to turn or revolve a quarter part of a revolution, the ring being cut away or notched at its front at two opposite points, affording segmental openings *f' f'*, within which the ends of a retaining plate or bar G extend, the said bar being rigidly affixed to the inner end of the breech-block. The extractors are rigidly secured to the extractor-ring or formed thereupon as integral parts thereof, so as to be definitely retained with relation to the ring and to each other. In case but one extractor is used it is likewise rigidly attached to or formed upon the extractor-ring; but it is preferred to make use of two, as shown.

The bar G is affixed in any suitable manner to the front end of the breech-block E, as by being secured in a closely-fitting dovetailed slot, as shown in Fig. 3, or otherwise, its ends projecting beyond the turned-down inner end of the breech-block, and hence extending within the segmental recesses or notches *f' f'* of the extractor-ring. The ends of the bar G therefore serve to limit the revolving movements of the extractor-ring F or the rotary movement of the breech-block E through the engagement of the shoulders *f² f²* at the ends of the segmental notches *f' f'* coming in con-

tact with the sides of the end portions of the bar G.

When the breech-block E is turned either into its position for locking it in the breech or turned into position for removing it therefrom, these shoulders $f^2 f^2$ serve to stop the ends of the bar G, and through it the breech-block, so that the rotary movements of the breech-block are exactly limited. The ends of the bar G serve also to hold the extractor-ring F on the breech-block E.

Instead of an extractor-ring of the form shown, any other form of the part carrying the extractor f or extractors ff that will serve to limit the rotary movements of the breech-block and the rotary movements of itself upon the breech-block, as stated herein with respect to the ring F, will answer—as, for instance, a slotted plate attached to or upon the end of the breech-block and carrying an extractor or extractors and having a stop to prevent the plate from revolving after the breech-block is withdrawn from the cannon and to allow the breech-block to revolve a quarter-turn after it has been pushed to its extreme forward position in the cannon-breech.

The extractor mechanism comprises the extractor-ring and the extractor or extractors and means for securing the extractor-ring to or upon the rotary breech-block, so that said ring can have a degree of rotary movement—in other words, whereby the extractor or extractors and the extractor-ring are adapted to remain stationary while the breech-block is given rotary movement in the two acts or movements of the breech-block in turning either to become locked or unlocked in the cannon-breech after said block has been forced into the breech to its farthest extent.

The friction between the extractor-ring F and the breech-block E may in itself suffice to maintain said parts in their proper relation to each other upon the withdrawal of the breech-block; but lest by accident the one might be turned with respect to the other out of proper position when the breech-block is being removed from the cannon I provide a spring-pawl h H, having a lug h' , and form a notch f^3 in the rear edge of the ring F, thus providing a ratchet-and-pawl device that serves to prevent any movement of said ring on the breech-block until the latter is forced into the breech, whereupon the pawl H becomes tripped through its outwardly (and at the time upwardly) projecting lug h' coming in contact at x with the opposing wall of the chamber B, the breech-block continuing its forward movement snugly up to the shell-chamber A. This movement, as above indicated, withdraws the front end of the pawl H out from its engagement within the notch f^3 , and hence the breech-block is thereby rendered free to revolve a quarter-turn to become locked in position in the cannon-breech.

A firing-pin and a striker of the ordinary kind are shown in the drawings, but form no part of my invention.

The bar G is provided with an opening at its center to allow the front end of the firing-pin to project and freely reciprocate there-through.

In the operation of using my invention I place a loaded shell with an edge of its projecting rim beneath the hooked end of my single extractor when I use but one extractor or beneath the hooked ends of both the extractors when I use two, as shown, and then I carry the loaded shell thus held on the end of the breech-block directly forward into the breech to its extreme forward position, the said extractor f or extractors ff sliding in the groove b or grooves bb until the hooked end or ends come to rest in the recess a or recesses aa . By this movement the projecting shoulder of lug h' of the pawl H is brought against the inner front wall of the chamber B at the point x and there held while the breech-block moves still farther forward, thus relieving the pawl H from its engagement within the notch f^3 , and hence rendering the breech-block free to be partly turned, whereupon said block is turned a quarter-turn to the right and its wings $e e$ securely locked in position behind the solid abutment-walls D D, thereby fastening the block supporting the loaded shell as a charge ready for firing. After firing, a quarter-turn of the breech-block to the left is made, this bringing the locking-wings $e e$ out from behind the solid abutment-walls D D and into proper position for being withdrawn through the cut-away spaces in the rear of chamber C, whereupon the breech-block is withdrawn, its extracting mechanism bringing out the empty shell therewith, and the pawl-and-ratchet device coming into place to lock the extractor-ring against rotary movement on the end of the breech-block until such time as said block is again pushed forward into the breech and through this procedure automatically unlocked, as hereinbefore stated.

I do not wish to be limited to the precise forms shown and described of the abutment-walls, the breech-block, and its locking-wings or the recesses for receiving the latter, or to the precise mechanism embodied in the extracting device, as all these parts may be modified to a very considerable extent in different-sized guns more especially, without departing from the spirit of my invention.

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

1. A double extractor rigidly secured upon an extractor-ring, in combination with a rotary breech-block, substantially as and for the purpose described.

2. An extractor mechanism wherein an extractor is rigidly secured to a part attached to and supported upon the inner end of a breech-block and having a limited rotary movement thereon, in combination with a rotary breech-block, substantially as and for the purpose described.

3. A breech-block having on the inner end thereof an extractor-ring provided with one or more extractors and means for limiting the rotation of said block with relation to said ring.

4. A breech-block having extractor mechanism comprising one or more extractors rigidly secured to a part attached to the inner end of said breech-block, and pawl or stop mechanism on the breech-block for automatically locking or unlocking the breech-block and the said extractor mechanism.

5. A double extractor rigidly secured to a ring on the end of a rotary breech-block, the latter being adapted to partially rotate, in combination with the breech of a cannon or gun, substantially as and for the purpose described.

6. An extractor and pawl or stop mechanism secured to a breech-block on its inner end portion, in combination with a cannon having

a groove in the breech for the extractor to slide within, and mechanism permitting the breech-block to be rotated into locking position while the extractor remains in said groove, substantially as and for the purpose described.

7. A breech-block provided with locking-wings and having an extractor-ring with extractors rigidly attached thereto, in combination with a cannon recessed at its breech for admission of the block thus provided and having solid abutments against which the rear portions of the wings rest in their locking positions, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

SYLVANUS M. TYRRELL.

Witnesses:

WILLIAM H. CHADSEY,
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