

(No Model.)

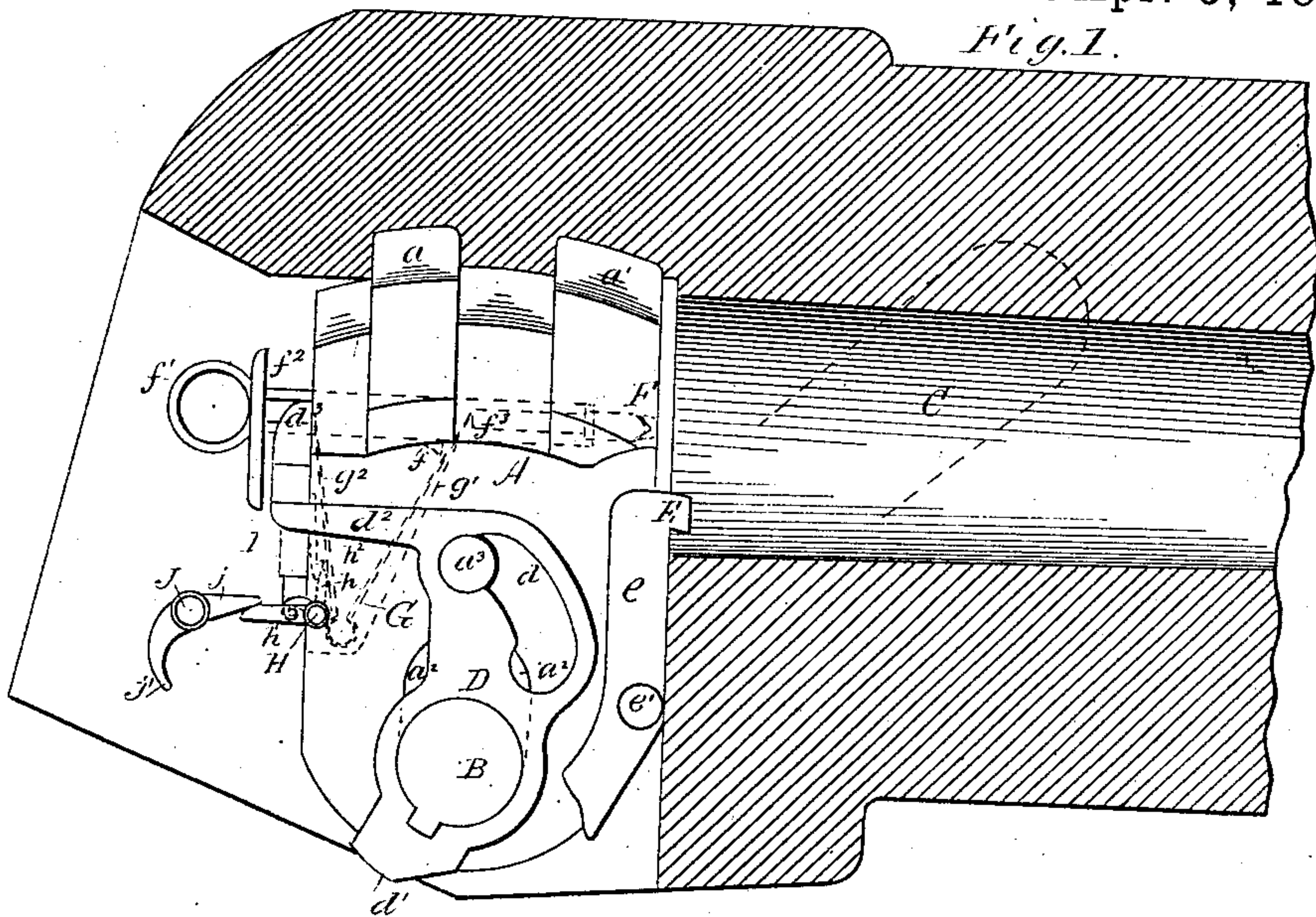
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W. H. DRIGGS.

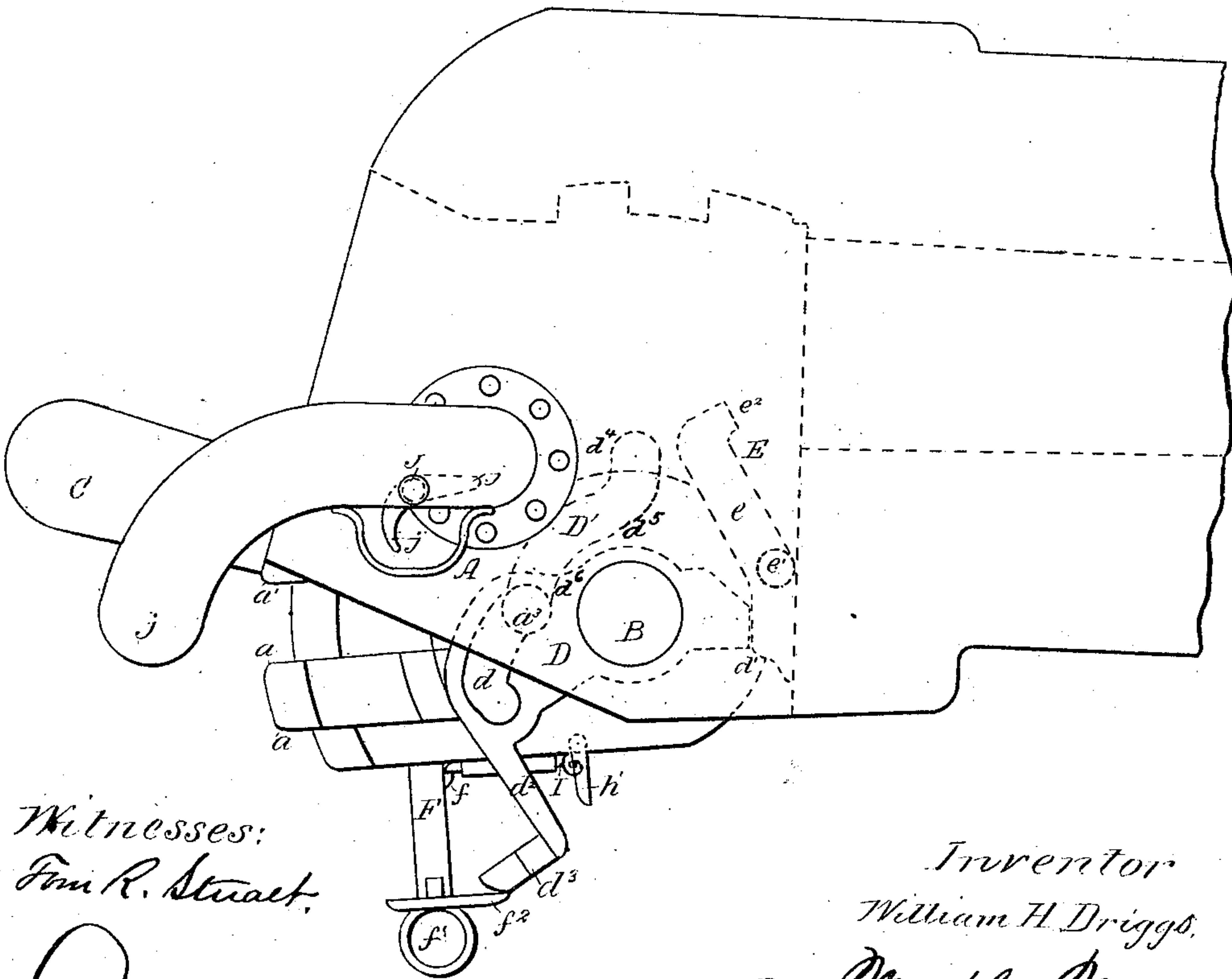
BREECH LOADING ORDNANCE.

No. 360,798.

Patented Apr. 5, 1887.



*Fig. 2.*



Witnesses:

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L. W. Harris

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William H. Driggs,

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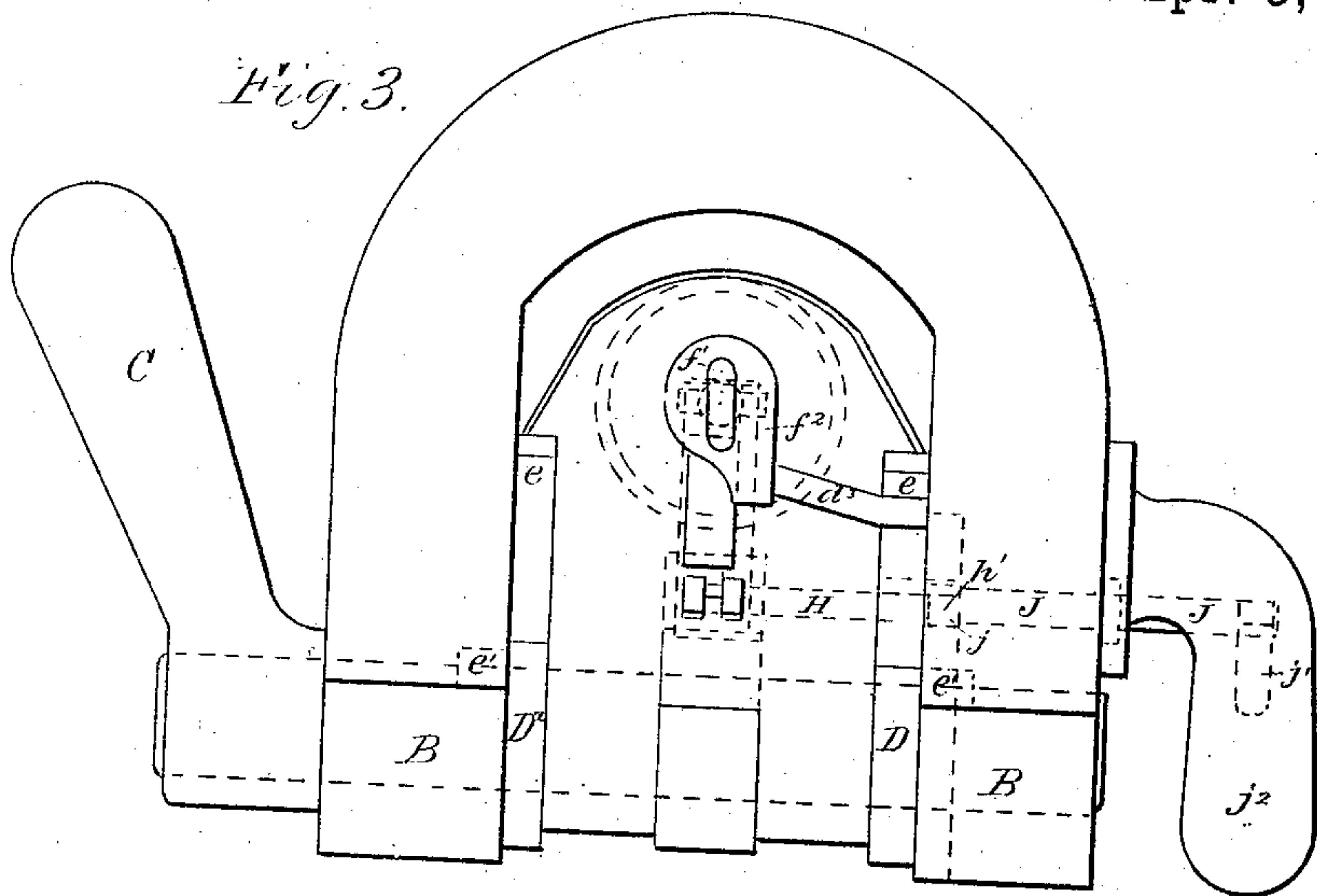
W. H. DRIGGS.

BREECH LOADING ORDNANCE.

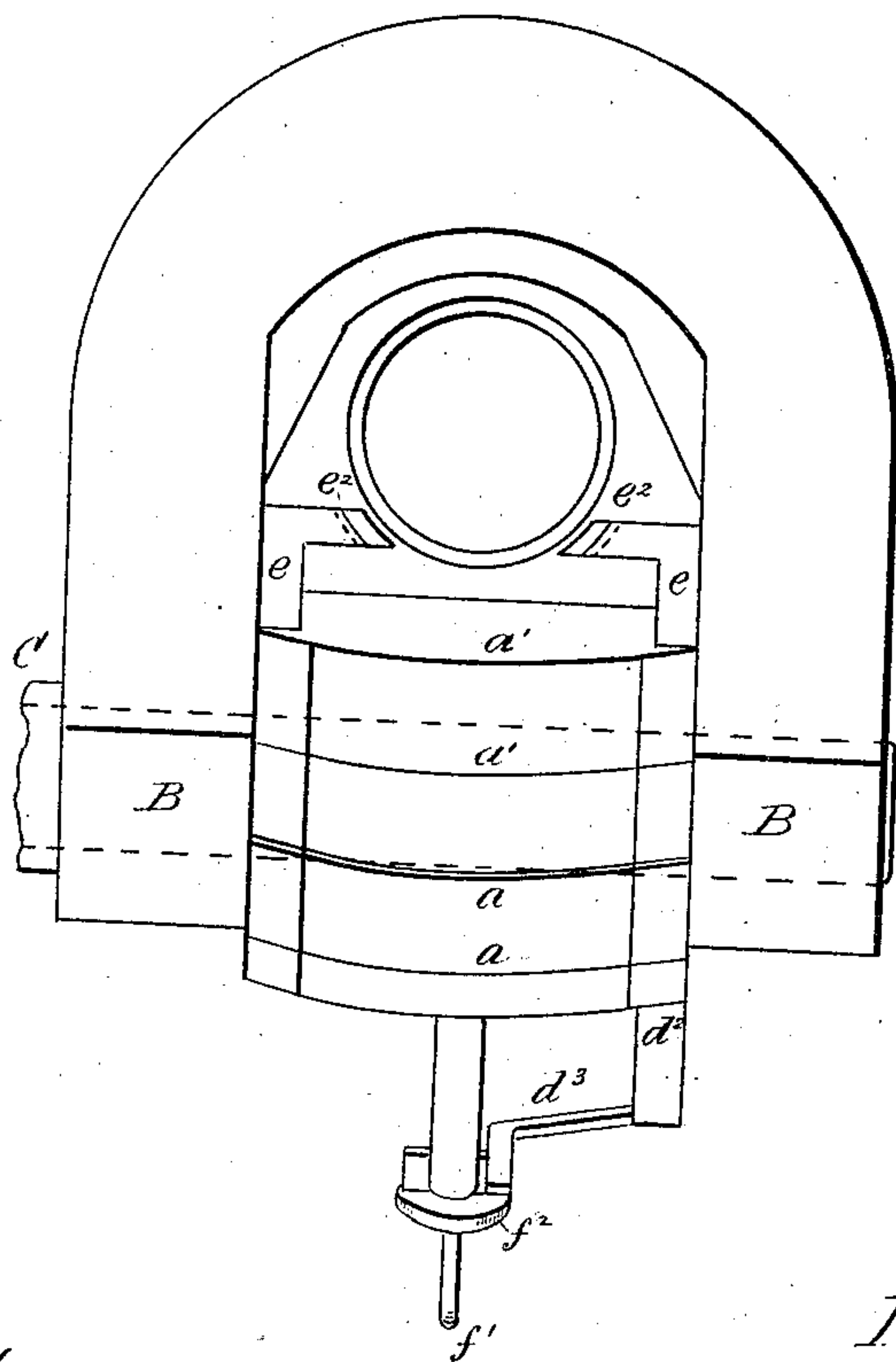
No. 360,798.

Patented Apr. 5, 1887.

*Fig. 3.*



*Fig. 4.*



Witnesses:

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(No Model.)

4 Sheets—Sheet 3.

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Fig. 6.

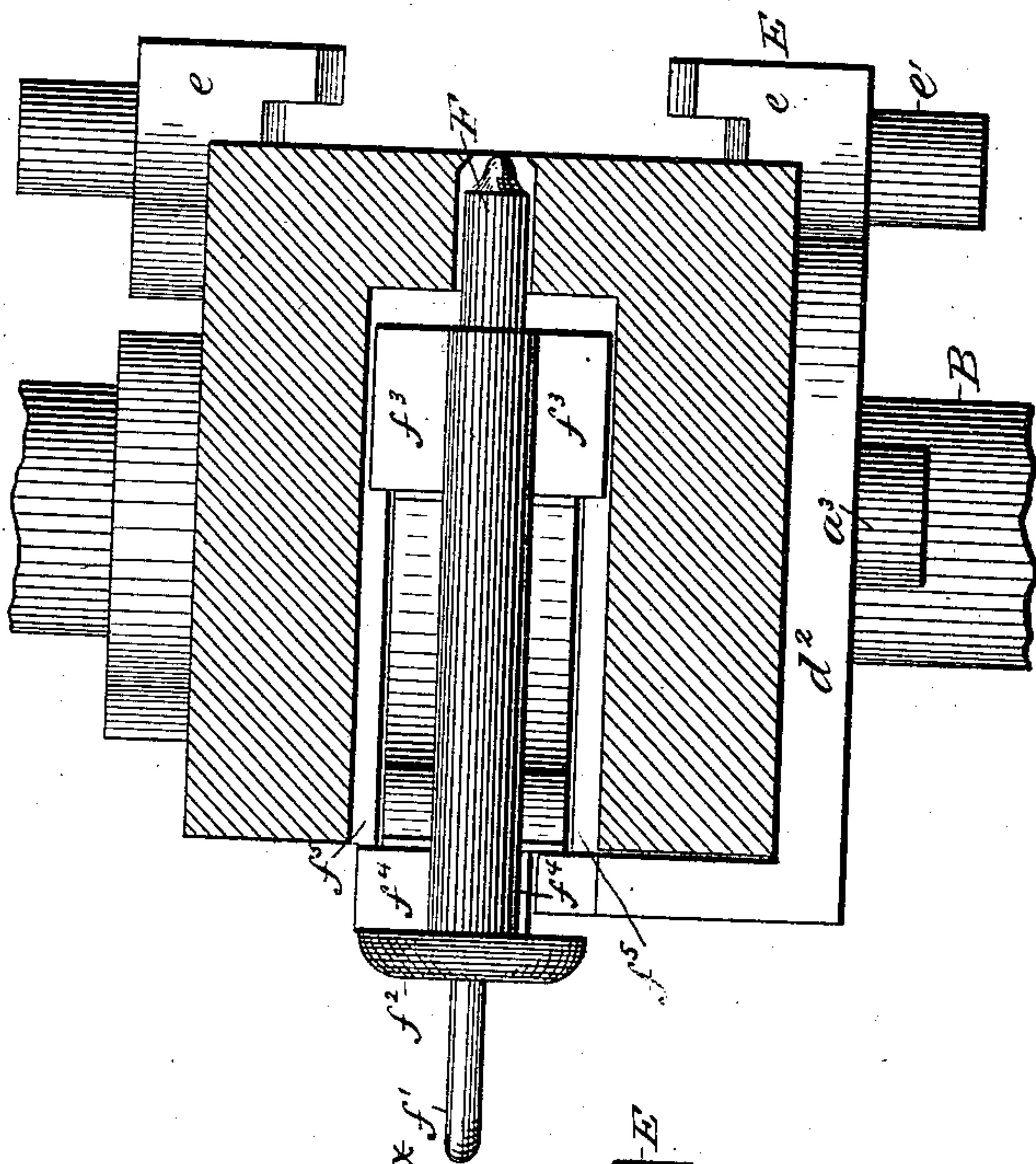


Fig. 7.

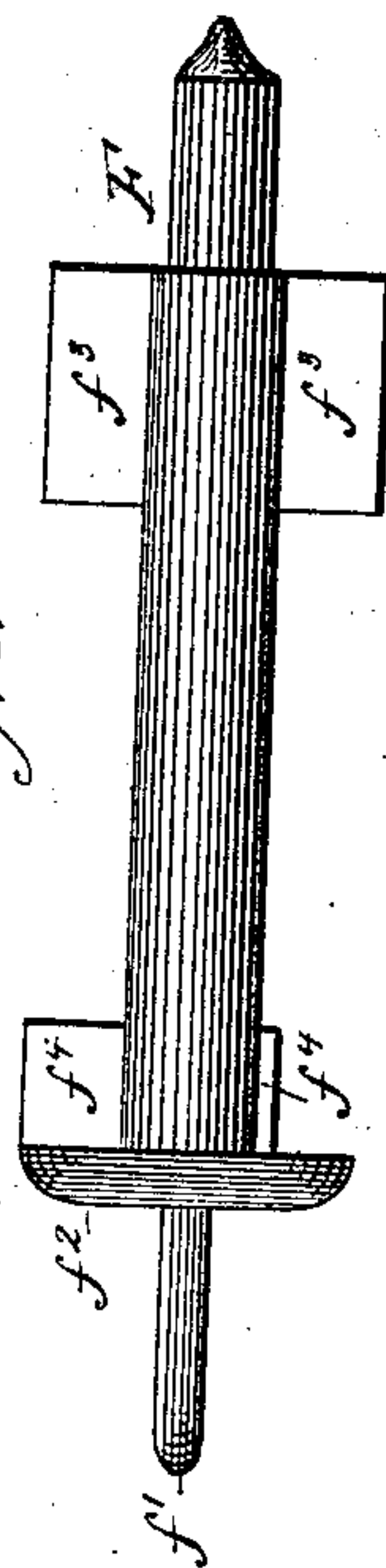
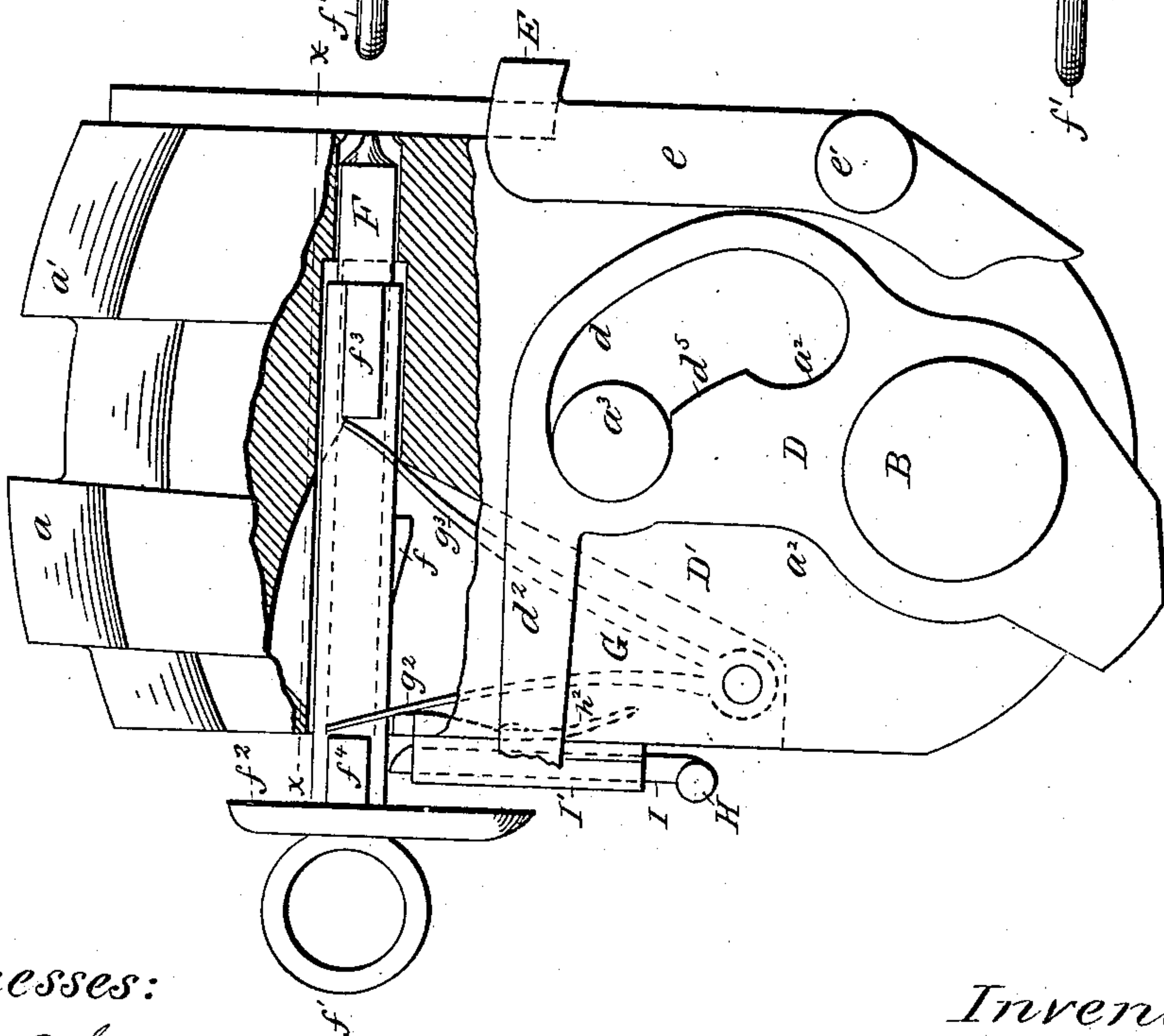


Fig. 5.



Witnesses:  
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(No Model.)

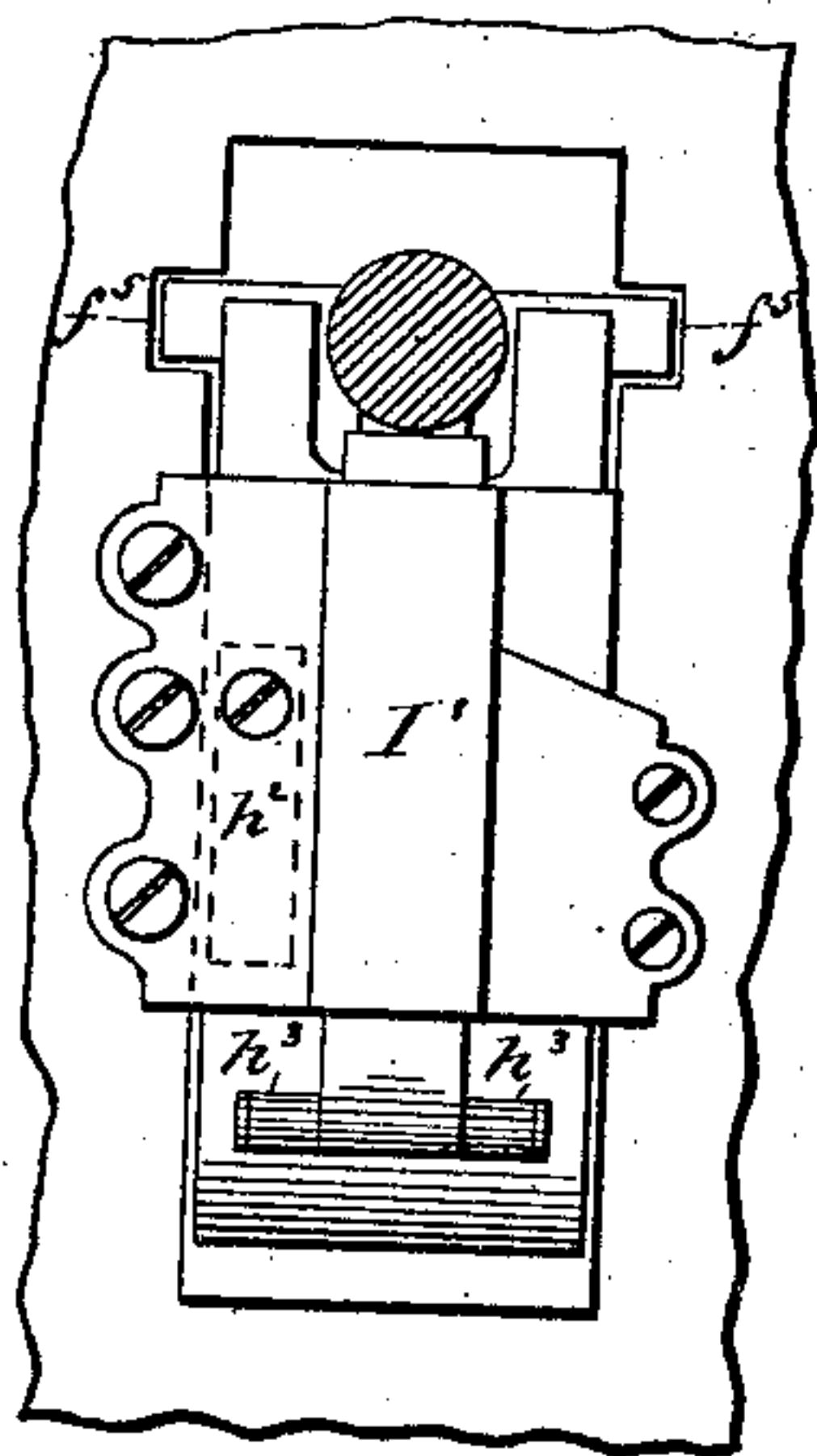
W. H. DRIGGS.  
BREECH LOADING ORDNANCE.

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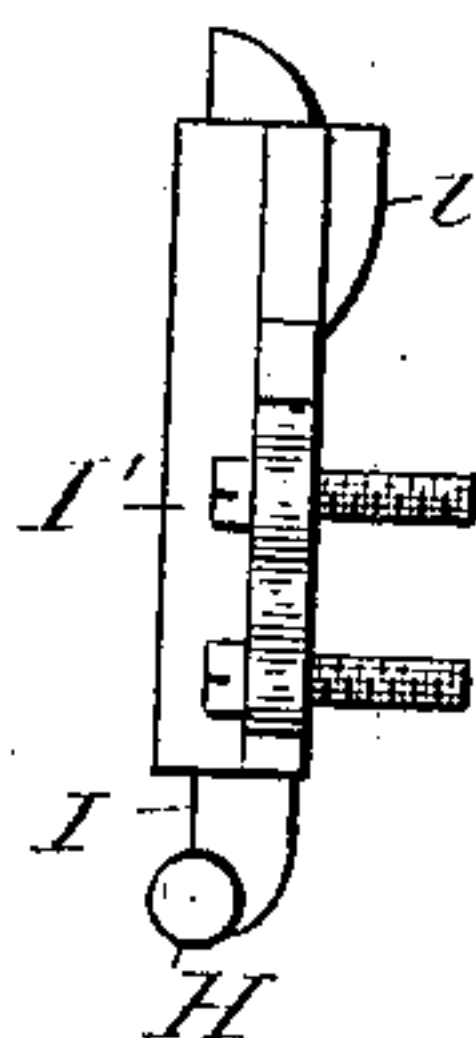
No. 360,798.

Patented Apr. 5, 1887.

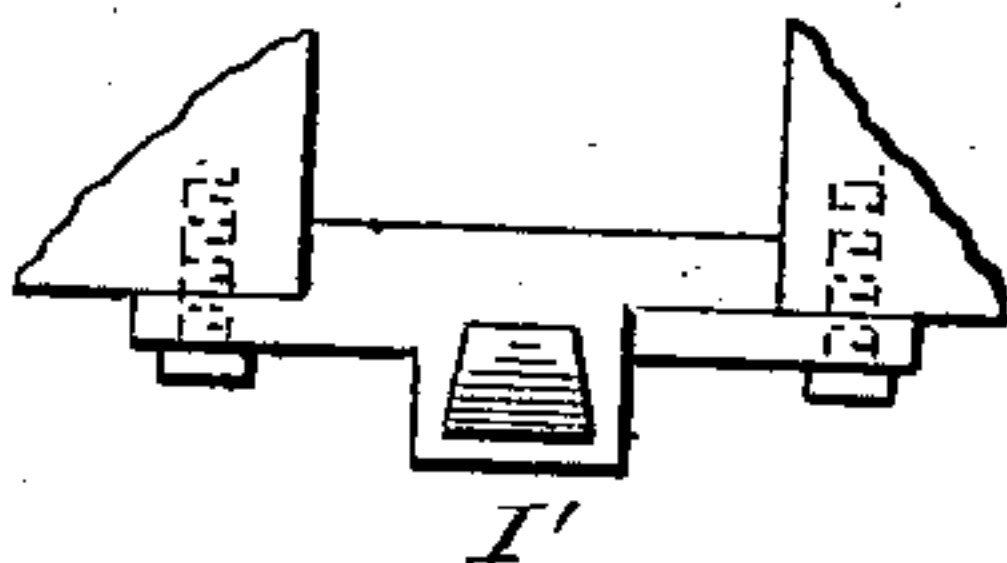
*Fig. 8.*



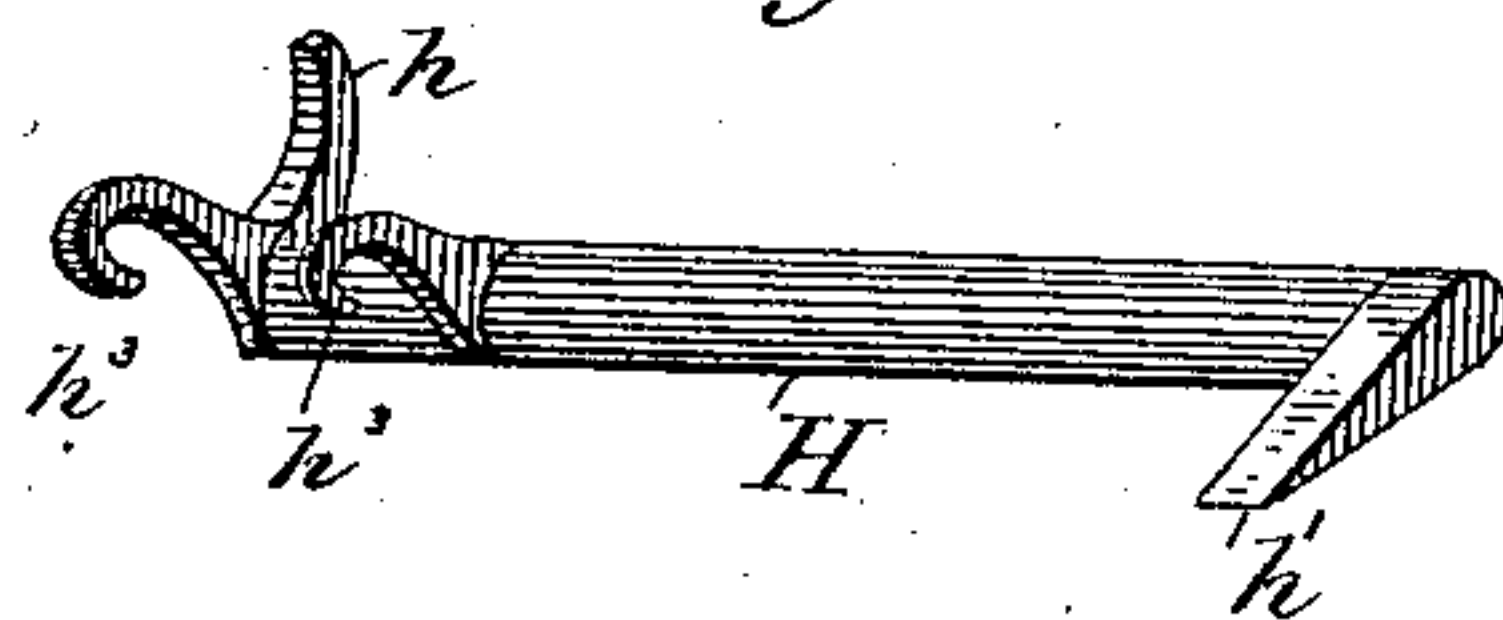
*Fig. 9.*



*Fig. 10.*



*Fig. 11.*



Witnesses:  
Tom R. Stuart.  
L. Seward Bacon

Inventor.  
William Hale Driggs.  
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# UNITED STATES PATENT OFFICE.

WILLIAM HALE DRIGGS, OF WASHINGTON, DISTRICT OF COLUMBIA, AS-  
SIGNOR OF ONE-HALF TO SEATON SCHROEDER, OF SAME PLACE.

## BREECH-LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 360,798, dated April 5, 1887.

Application filed February 25, 1887. Serial No. 222,816. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HALE DRIGGS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Breech-Loading Ordnance; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-  
10 pertains to make and use the same.

My invention has for its object certain improvements in breech-loading ordnance, and more particularly in the class of rapid-firing single-shot guns; and it consists in the construction and combination of parts, hereinafter described, and pointed out in the claims. This object I accomplish by the mechanism illustrated in the accompanying drawings, forming part of this specification, wherein the same  
15 letters of reference denote the same or corresponding parts in the several views, and in which—

Figure 1 represents a longitudinal section of the breech end of the gun, with the breech-  
25 block and the adjoining parts in side elevation, the chamber being closed, as it would appear at the moment of firing. Fig. 2 shows the same parts in full and dotted lines, with the breech-block moved into position for opening the chamber for the reception of the car-  
30 tridge. Fig. 3 is a rear elevation of the breech end of the gun, the breech-block being in position for closing the chamber. Fig. 4 is a similar view representing the same parts, but with the breech-block in position for exposing  
35 the chamber. Fig. 5 is a side elevation of the breech-block and the adjoining parts, a portion of said block being broken away to show the firing-pin in its opening and the upper ends of the wings of the mainspring resting  
40 against the front and rear shoulders on said pin. Fig. 6 is a horizontal section on the line  $xx$ , Fig. 1. Fig. 7 is a detail plan view of the firing-pin. Fig. 8 is a rear view of a portion of the breech-block, the vertically-mov-  
45 able slide, and the casing fitted over the same and over a portion of the central recess in the rear face of said breech-block, the firing-pin being shown in section. Fig. 9 shows a side  
50 elevation of said casing and screws for securing the same to the breech-block. Fig. 10 is a top plan view of the same, and Fig. 11 is a

detail perspective view of the short rock-shaft provided with the horizontal and vertical arms and the hook-shaped catches.

A represents the breech-block, which is provided on its upper convex surface with bands or projections  $a$   $a'$ , fitting into correspond-  
55 ingly-shaped recesses in the upper interior surface of the gun-breech and extending downward below the center line of the chamber. These bands and their grooves firmly hold the breech-block in position and prevent back-  
60 ward movement of the same during firing.

B is a stout steel shaft or axis fitted in open-  
65 ings in the breech and extending out beyond the same on its left side, where it is provided with an operating-handle, C, for a purpose which will be hereinafter stated. This axis passes loosely through an elongated opening,  $a^2$ , in the lower portion of the breech-block,  
70 as shown in Fig. 1, so as to allow of a down and up movement of said block on a line inclined about two degrees from the vertical. A pin or stud,  $a^3$ , projects from the side of the  
75 breech-block at or near its center, and passes into an irregularly-curved or cam-shaped groove,  $D$ , formed in the inner wall or cheek of the breech. The peculiar shape of this groove is shown in dotted lines in Fig. 2, in  
80 which its walls are nearly vertical for a short distance from its upper end, as shown at  $d^4$ . From this point said walls incline slightly to the rear from the vertical walls, as shown at  $d^5$ , and then continue on in curved lines  $d^6$  to  
85 the bottom of said groove.

D is the cam. It is rigidly fixed to the axis B and adapted to be moved therewith by the handle C. This cam is formed in its upper  
90 portion with an opening,  $d$ , having curved ends, of the form shown in Fig. 1, and is provided at its lower portion with a curved or  
convexed end,  $d'$ , and at its upper portion with a rearwardly-extending arm,  $d^2$ , having a right-  
95 angled extension,  $d^3$ , terminating in front of the head of the firing-pin, for retracting or  
cocking the same.

E represents the cartridge-extractor, which consists of two vertically-extending limbs,  $ee$ , loosely pivoted upon bolts  $e'$   $e'$ , fixed in the  
100 inner walls of the breech-chamber, at the sides of the front part of the breech-block and forward of the axis of the operating-lever, one of said limbs being arranged in front of the



cam D and the other in front of the cam D<sup>2</sup> on the rod or axis B at the opposite side of the breech-block. The lower ends of the limbs in front of cams D and D<sup>2</sup> are slightly concaved on their rear faces, and extend slightly rearward, so as to leave space for their movement by the curved ends d' of the cams. The upper ends of the limbs e have right-angled extensions e<sup>2</sup>, for projecting in front of and against the flange of the cartridge.

Through the breech-block A, from front to rear, is formed an opening for the firing-pin, and at the horizontally-opposite sides of said opening, and communicating therewith, are also formed the grooves f<sup>5</sup> f<sup>6</sup>. The firing-pin F passes through said opening, and is provided with the bottom projection, f, the ring f', and the head f<sup>2</sup>, projecting over the extension d<sup>3</sup> on the arm d<sup>2</sup> of the cam. Said firing-pin is also provided with front and rear shoulders, f<sup>3</sup> and f<sup>4</sup>, on each side, as shown in Figs. 5, 6, and 7, which fit and are adapted to slide in the grooves f<sup>5</sup> f<sup>6</sup>, and thus secure positive or direct guidance of said pin. Against the front shoulders the front wing, g', of the mainspring G presses when the firing-pin is retracted, the other wing, g<sup>2</sup>, of said spring resting freely against the rear shoulders, f<sup>4</sup>, on said firing-pin, or in elongated slots or against stops in the central recessed part of the rear face of the breech-block. The mainspring is formed of broad steel plate, broader than the diameter of the firing-pin, and is bifurcated at the upper ends of its wings for permitting them to extend up on each side of the firing-pin, the front one to operate against the front shoulders thereon and the rear one to rest against its rear shoulders and against a forwardly-extending projection, i, (prominently shown in Figs. 5 and 9,) of the casing I', hereinafter described.

H is a short rock-shaft fitted in the rear part of the breech-block, and having one end projecting beyond the side thereof and the inner end extending to its center. At its projecting end it is provided with a horizontal arm, h', and at its inner end with the vertical arm h, which is normally held from downward movement by a leaf-spring, h<sup>2</sup>, suitably secured to the casing I', as shown in dotted lines in Fig. 8. This short rock-shaft, at the inner end, which projects to the center of the breech-block and in rear of the vertical arm h, is provided with hook-shaped catches h<sup>2</sup> h<sup>3</sup>, which embrace the lateral extensions h<sup>3</sup> h<sup>3</sup> at the lower end of a vertically-movable slide, I, which is inclosed by the casing I', which is open at its ends and secured to the rear of the breech-block. The upper end of this slide projects in front of the projection f on the firing-pin when the latter is drawn back.

J is a rock-shaft passing transversely through the right wall of the gun-breech, and having its inner end terminating in a recess in said wall and in rear of the breech-block. At its inner end it is provided with a rigidly-attached trip or finger, j, which projects slightly

over the arm h' of the short rock-shaft H, and at its outer end it has a rigidly-secured finger-piece or trigger, j', projecting downward in front of the hand-rest j<sup>2</sup>.

The operation of the parts thus described is as follows: Fig. 1 represents the breech as closed, or as it would appear after the discharge of the gun. To open the chamber and extract the cartridge-shell, the handle C is turned, and by it the axis B and the attached cam D are also turned, the latter being moved downwardly and rearwardly. This movement is accomplished by the pin or stud a<sup>3</sup> on the breech-block projecting through the opening d of the cam and into the cam-groove D' in the inner wall of the breech, said cam-groove, owing to the described contour of its walls d<sup>4</sup>, d<sup>5</sup>, and d<sup>6</sup>, first moving the stud and block vertically downward the extent of its vertical walls d<sup>4</sup>, the bands a a' on the upper surface of said block being thus forced from the grooves in the breech. With further movement of the handle C and cam D the pin or stud a<sup>3</sup> is moved down the inclined walls d<sup>5</sup> of the cam-groove, and thence along the curved walls d<sup>6</sup>, forming its lower portion, the latter portion of the movement of said pin or stud being in the arc of a circle whose center is the center of the rod or axis B. When the parts are in this position, with the pin or stud a<sup>3</sup> in the lower end of the cam-groove D' and in the then upper end of the opening d in the cam D, the breech-block is then in its lowest position, which is about horizontal, and the chamber is open and ready for a new cartridge. During this rearward movement of the breech-block for opening the chamber, the lower convexed end, d', of the cam D and also the cam on the other side of the block come in contact with the concaved rear faces of the lower ends of the limbs e e of the cartridge-extractor E, thus forcing the upper ends of the limbs and their right-angled extensions e<sup>2</sup> rearwardly, and thereby ejecting the empty cartridge case or shell. The first part of the movement of the upper parts of the limbs e e of the extractor is slow and powerful, and afterward rapid, so that the cartridge case or shell shall be thrown quickly out of the chamber. In the movement of the breech-block and cam to the rear, or into the position shown in Fig. 2, the arm d<sup>2</sup> of the cam comes in contact with the head f<sup>2</sup> of the firing-pin F and pushes the same to the rear until the projection f thereon comes beyond the upper end of the vertically-movable slide I, by which it is held until released by the trigger j' and the intermediate devices. With the parts named in the positions just stated, the cartridge is placed in the chamber, and, by turning the handle back to its original position, the breech-block is also moved back and closes said chamber. During this movement the pin or stud a<sup>3</sup> remains in the then upper curved portion of the opening d of the cam D until the inclined walls d<sup>5</sup> of the cam-groove D' in the breech are reached, when it is raised out of that position by



said inclined walls and forced up into the then elevated curved portion of the opening  $d$ . In this position the breech-block is raised bodily up until its bands fit into the  
 5 grooves or recesses in the breech of the gun, and the cam, being drawn forward, brings the extension  $d^3$  of its arm  $d^2$  close up to the rear surface of the breech-block. The horizontal arm  $h'$  of the rock-shaft H is then under and  
 10 against the trip or finger  $j'$ , which projects from the inner end of the rock-shaft J, which is operated by the trigger  $j'$  on its outer end and beneath the hand-rest  $j^2$ . The parts being in this position, the gun is ready for firing.  
 15 The trigger  $j'$  is then moved to the rear and turns the rock-shaft J and its finger  $j$  downward. The latter also forces downward the horizontal arm  $h'$  of the rock-shaft H, lowers the slide I, and releases the firing-pin, which  
 20 is then thrown forward against the primer by the action of the V-shaped mainspring G, the front wing,  $g'$ , of said mainspring pressing against the front shoulders,  $f^3$ , on the side of the firing-pin, and the rear wing,  $g^2$ , resting  
 25 against the rear shoulders,  $f^4$ , thereof. The firing-pin, after its release from the tension of the spring, continues forward by virtue of its weight and momentum, and, after striking the primer, is drawn back a short distance by the  
 30 reactive force of the rear wing of the spring, which has been slightly compressed by the rear shoulders of the firing-pin in the forward movement of the latter, thus bringing the point of the firing-pin inside of the face of the  
 35 breech-block and away from the primer, so that no obstacle remains to the downward movement of said breech-block when opening the breech for a new charge.

Prominent among the advantages of my invention is the arrangement of the center of the pin or stud  $a^3$  slightly forward of a vertical plane passing through the center of the axis B when the breech-block is in its up or closed position, whereby the breech-block is enabled  
 40 to resist backward and downward pressure upon its face from the exploded charge. Also, back-pressure is further resisted by the bands  $a a'$  of the breech-block fitting in the grooves in the upper wall of the gun-breech, since to  
 45 open the block at all it must first be lowered out of the grooves. Also, any downward pressure is resisted by the pin or stud  $a^3$ , as any pressure thereon only acts to push the block forward and lock it tighter than before. Also,  
 50 as the right-angled extension  $d^3$  on the cam-arm  $d^2$  is not close against the back of the block until the latter is securely locked in position, should the firing-pin be accidentally released before said block is closed, the head  
 55  $f^2$  on the firing-pin will come in contact with said extension  $d^3$  on the cam-arm  $d^2$  and prevent the point of the firing-pin from striking the primer, thus avoiding premature discharge of the gun.

55 My breech-loading gun, with the parts constructed, arranged, and operating as described,

is not only capable of being rapidly operated or fired, but is simple, strong, and not liable to get out of order.

It is obvious that minor changes can be  
 70 made in the construction and arrangement of the parts without departing from the nature or principle of my invention—as, for instance, the cam and its adjuncts, as shown in Fig. 1 of the drawings, may be duplicated on the op-  
 75 posite side of the breech-block, if necessary or desired. Also, I may find it desirable to use a spring-catch on the handle of the breech-block to prevent the breech from being accidentally opened, and also for the purpose of  
 80 indicating by its clicking sound (at night or in the hurry of battle) that the closure of the chamber is complete.

Having thus fully described my invention, I claim as new the following:

85 1. In a gun in which the breech-block first moves downward in opening and then swings backward and downward, the combination, with the gun-breech provided with grooves in its upper wall, of the pivoted breech-block A,  
 90 provided on its upper surface with bands or projections  $a a'$ , adapted to fit in said grooves and hold said breech-block firmly in place, and means for moving the breech-block into and out of said grooves, substantially as de-  
 95 scribed.

2. The combination of the gun-breech, the breech-block A, having the stud or pin  $a^3$ , the cam D, having the opening  $d$ , with curved ends, in which said stud or pin is supported, and  
 100 the axis B, which carries said cam, passing through said breech-block and having its center to the rear of the vertical plane passing through the center of said stud or pin  $a^3$  when the breech-block is closed, whereby back-pressure  
 105 upon the face of the block is resisted, substantially as described.

3. In a gun in which the breech-block first moves downward in opening and then swings  
 110 backward and downward, the combination, with the gun-breech having the cam-groove D' in its inner wall, of the breech-block A, having the stud or pin  $a^3$  and the elongated opening  $a^2$ , and mechanism for moving said breech-block out of and into operative position, con-  
 115 sisting of the shaft or axis B, passing through said elongated opening, the cam D, rigidly attached to the axis and having the opening  $d$ , with curved ends, to receive the stud or pin  $a^3$ , and the handle C, attached to said axis, for op-  
 120 erating the same, the cam, and the breech-block, substantially as described.

4. The combination of the breech having the interior cam-groove, D', provided with nearly vertical walls  $d^1$  at its upper end, slightly-inclined and rearwardly-extending  
 125 walls  $d^2$  below said vertical walls, and curved walls  $d^3$  for the rest of its length, the breech-block A, having the stud or pin  $a^3$  and the elongated opening  $a^2$ , the shaft or axis B, passing through said opening, the cam D, having  
 130 the opening  $d$ , with curved ends, to receive



the pin  $a^3$ , and the handle C, attached to said axis, for operating the same and the cam and breech-block, substantially as described.

5. In a gun in which the breech-block in opening first moves downward and then swings backward and downward, the combination of the gun-breech, the breech-block, the cartridge-extractor E, consisting of the vertical limbs  $ee$ , having the right angled extensions  $d^3$  at their upper ends, the lower ends of said limbs  $e$  projecting slightly rearward and being concaved, the pivotal bolts  $e' e'$ , fixed in the inner walls of the breech-chamber forward of the pivot of the operating-lever, the axis B, having a cam on each side of the breech-block for operating the extractor, said cams having curved ends, and means for operating said axis and cams, substantially as described.

6. In a gun in which the breech-block in opening first moves downward and then swings backward and downward, the combination of the breech, the breech-block having the pin or stud, the shaft or axis having the handle, the cam attached thereto, and having the opening with curved ends to engage the pin on the breech-block, and the rearwardly-extending arm provided with the right-angled extension, and the firing-pin having a head against which said extension of the cam-arm abuts for retracting the firing-pin, substantially as described.

7. The combination of the breech-block A, the mainspring G, the firing-pin F, having shoulders for the front and rear wings of said spring and a projection on its under side, and mechanism for retracting said firing-pin, with the short rock-shaft H, the vertically-movable slide I, secured to said rock-shaft, and devices for moving said shaft, lowering the slide, and releasing the firing pin, substantially as described.

8. The combination of the breech-block, the firing-pin movable therein, devices for retracting the latter, and the vertical slide for holding the same when retracted, with the spring-controlled short rock-shaft provided with the horizontal and vertical arms and a trip or finger for depressing the horizontal arm on said rock-shaft, and means for releasing the slide from the firing-pin, substantially as described.

9. The combination of the breech-block, the firing-pin, devices for retracting the latter, and the vertical slide for holding the same when retracted, with the spring-controlled short rock-shaft, to which said slide is secured, provided with horizontal and vertical arms, the rock-shaft arranged in a line to the rear of said

short rock-shaft, and provided with a horizontal finger at its inner end and with a trigger at its outer end, and the hand-rest, substantially as described.

10. The combination of the breech, the breech-block, the firing-pin, the cam provided with the rearwardly-extending arm having an extension for retracting said pin, and means for operating the cam, with the vertical slide for holding said pin when retracted, the spring-controlled short rock-shaft, to which said slide is secured, provided with horizontal and vertical arms, and means for depressing the horizontal arm of said rock-shaft, and thus releasing the slide from the firing-pin, substantially as described.

11. The combination of the breech, the breech-block, the firing-pin, the cam provided with a rearwardly-extending arm having an extension for retracting said pin, and means for operating the cam, with the vertical slide for holding said pin when retracted, the spring-controlled short rock-shaft, to which said slide is secured, provided with the horizontal and vertical arms, the rock-shaft arranged in a line to the rear of the short one, and provided with a horizontal finger at its inner end and with a trigger at its outer end, and the hand-rest, substantially as described.

12. The combination of the breech-block, formed with the firing-pin opening and the grooves communicating therewith, the firing-pin having front and rear shoulders projecting into said grooves, a suitably-supported V-shaped mainspring having its forward wing resting against said front shoulders and its rear wing against said rear shoulders, and also having bearing against a fixed part of the breech-block, and devices for retracting and releasing said firing-pin, substantially as described.

13. The combination, with the breech-block having a firing-pin opening and the grooves communicating therewith, of the firing-pin having suitable shoulders, a V-shaped mainspring having its wings bifurcated at their upper ends and extending on both sides of said firing-pin, and resting against the rear sides of said shoulders, a suitable stop or projection at the rear of said spring, fixed with respect to the breech-block, and mechanism for retracting and releasing said firing-pin, substantially as described.

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

WM. HALE DRIGGS.

Witnesses:

L. W. HARRIS,  
E. L. WHITE.