

(No Model.)

7 Sheets—Sheet 1.

J. H. ALTHOF.
BREECH LOADING ORDNANCE.

No. 519,308.

Patented May 1, 1894.

FIG. 2.

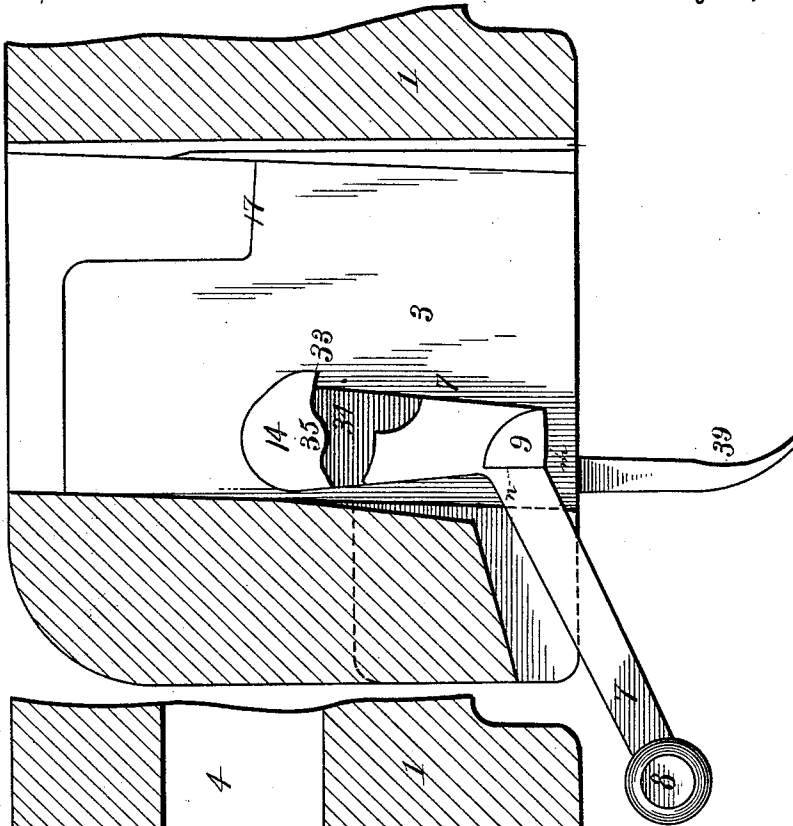
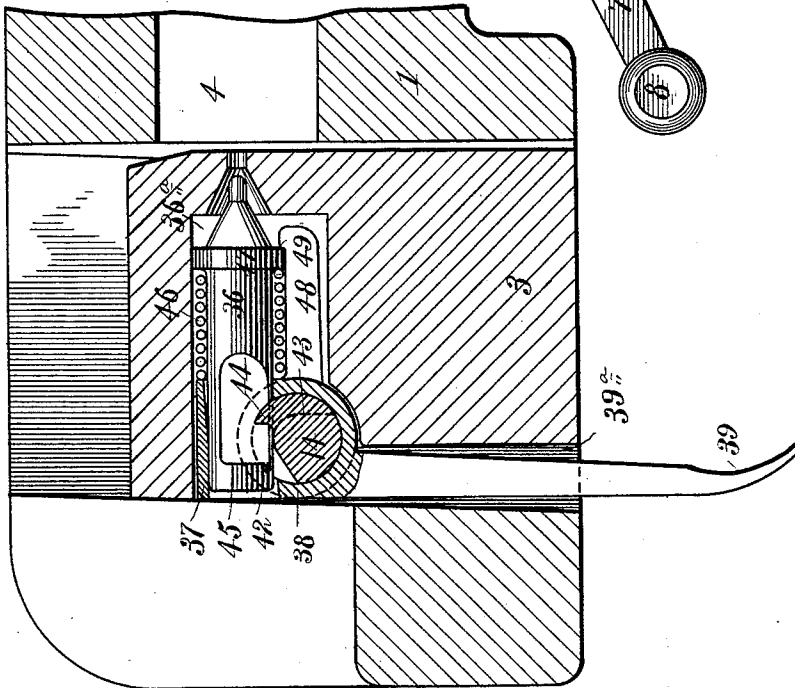


FIG. 1.



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Fig. 3.

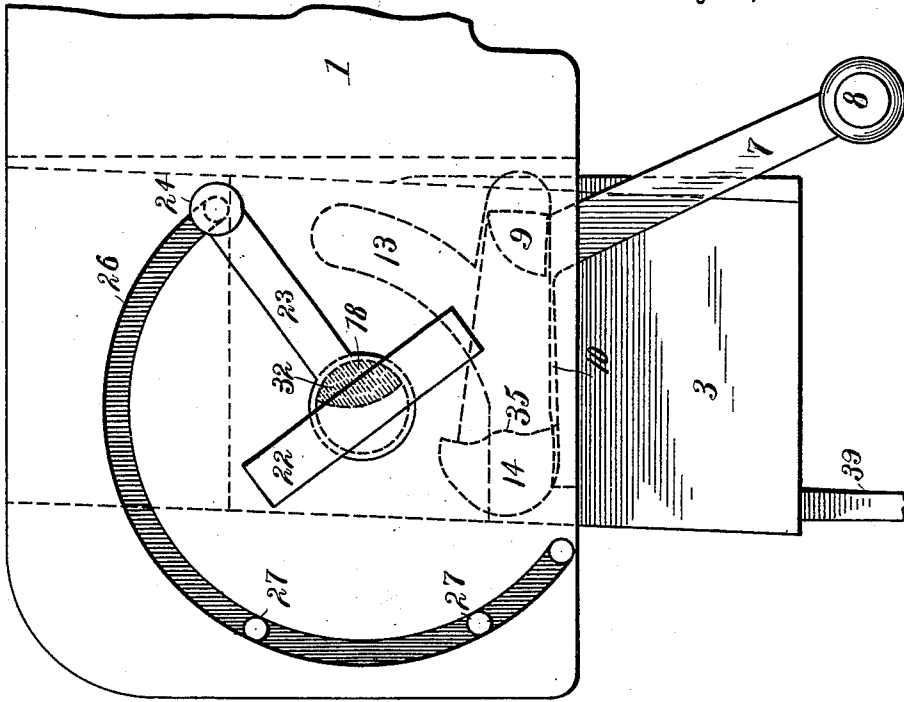
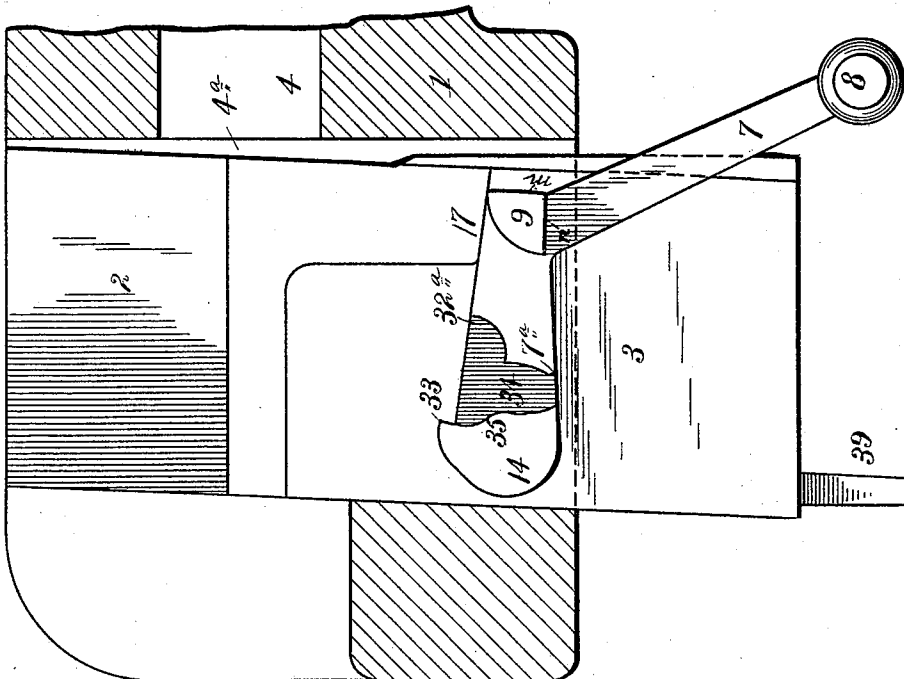


Fig. 4.



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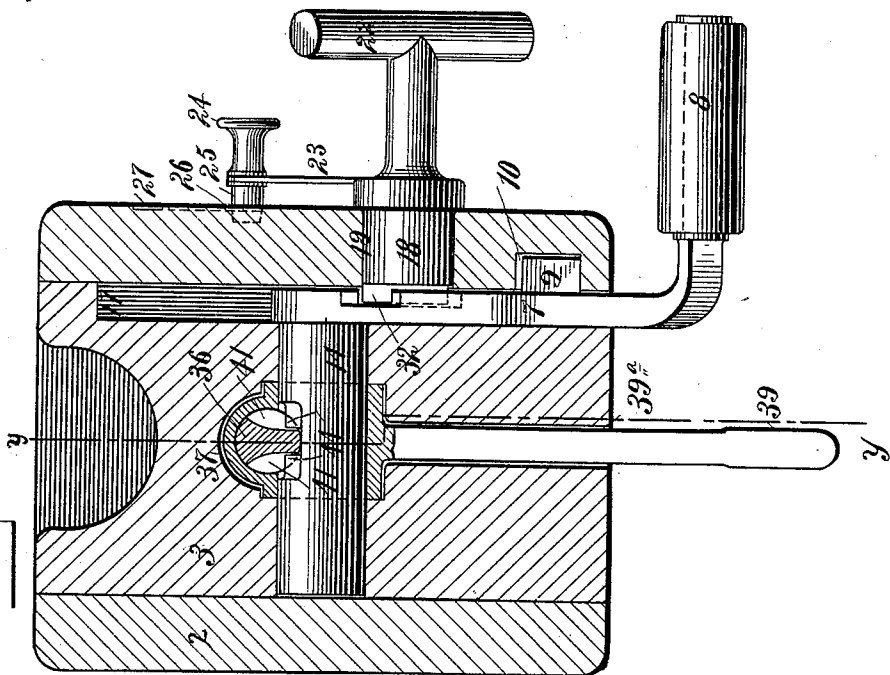
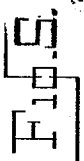
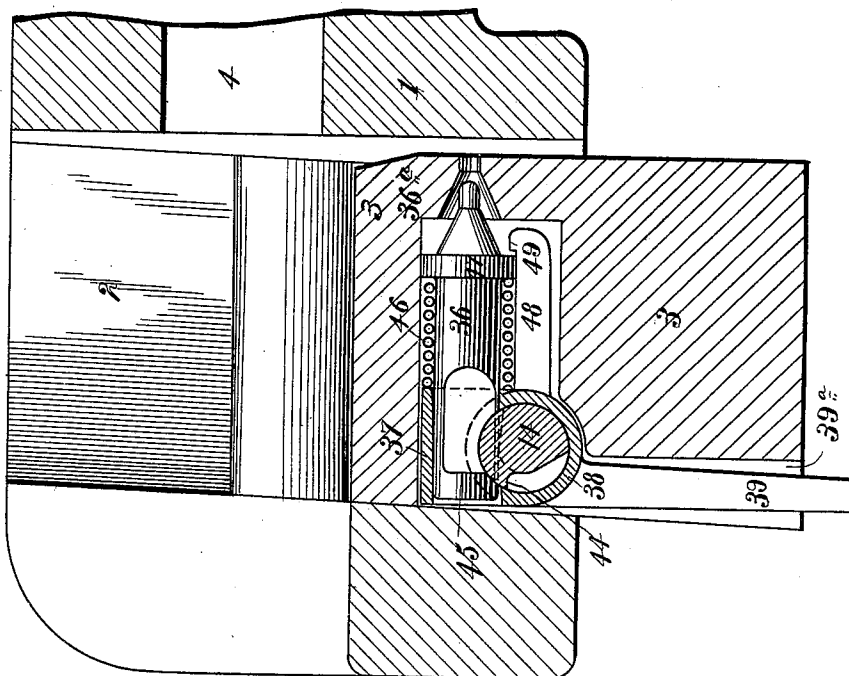
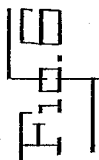
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Fig. 6.

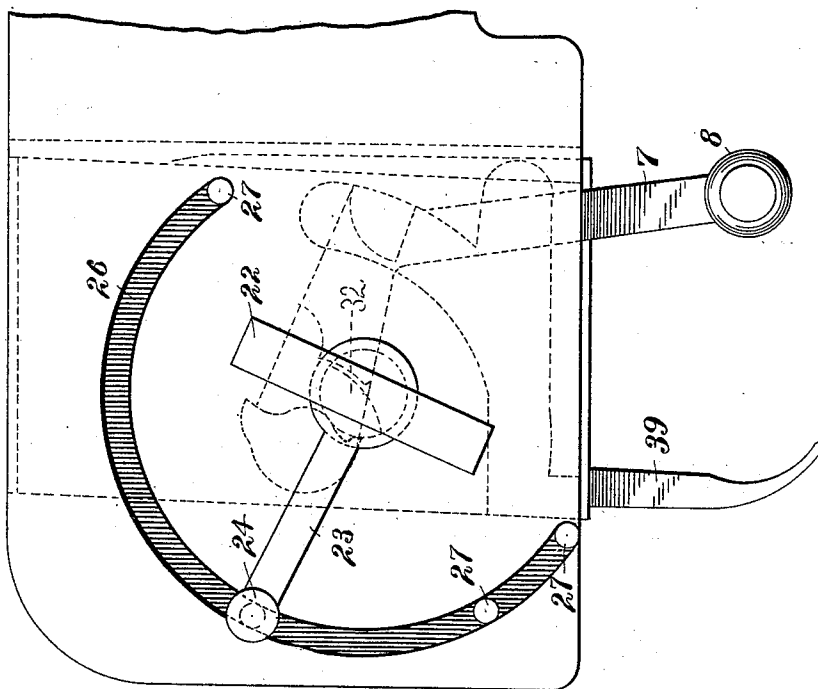
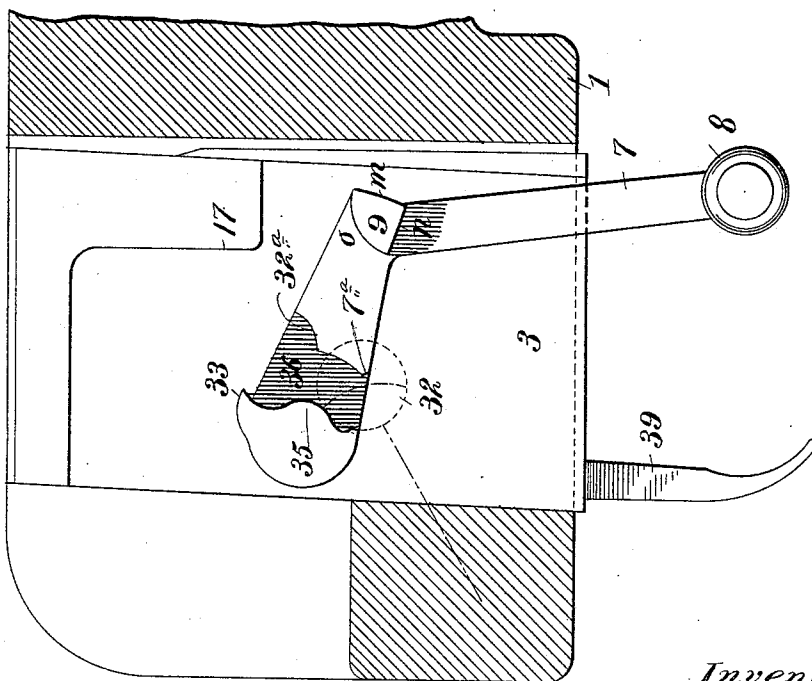


Fig. 7.



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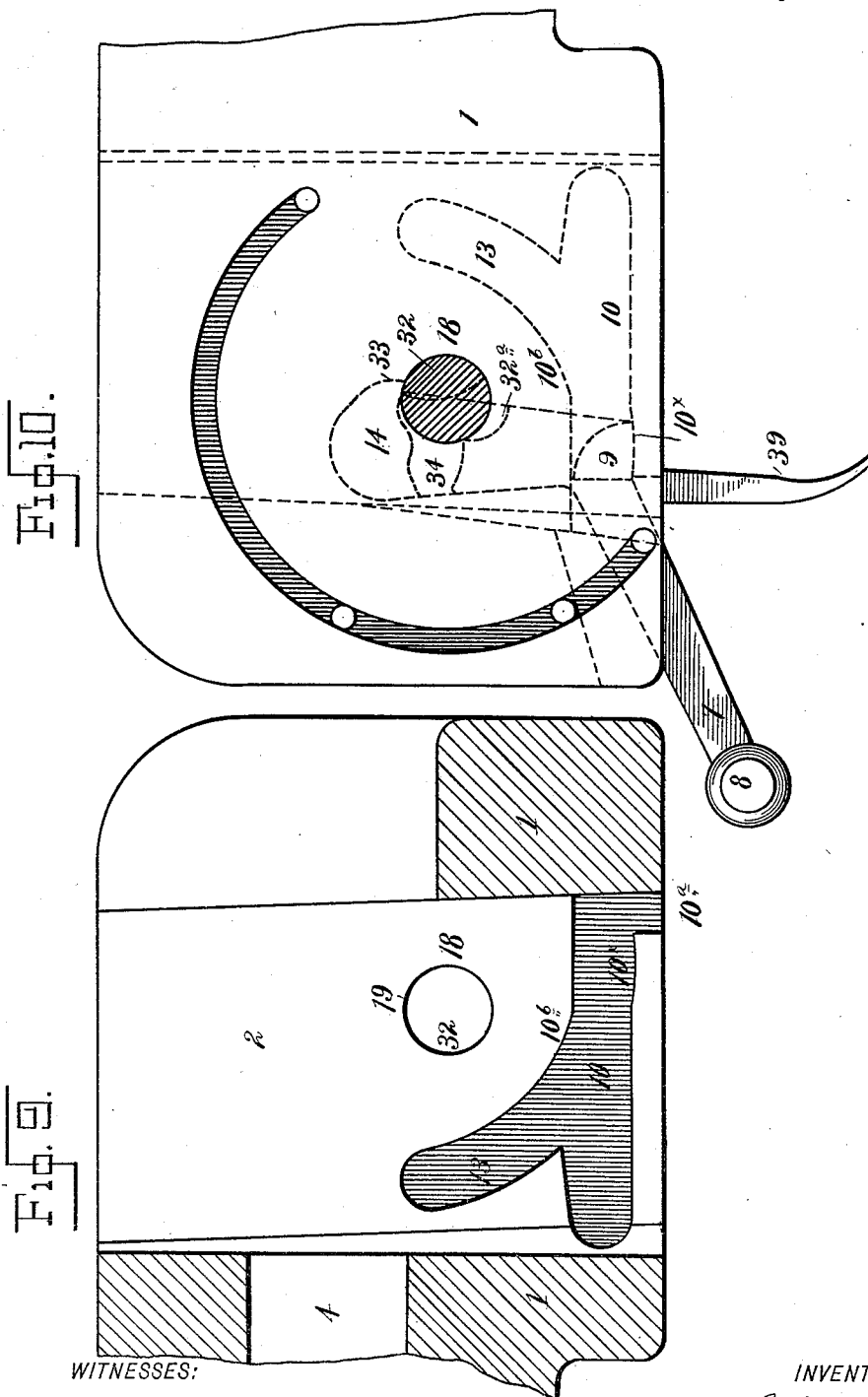
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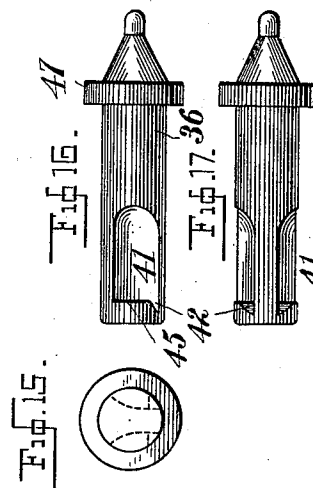
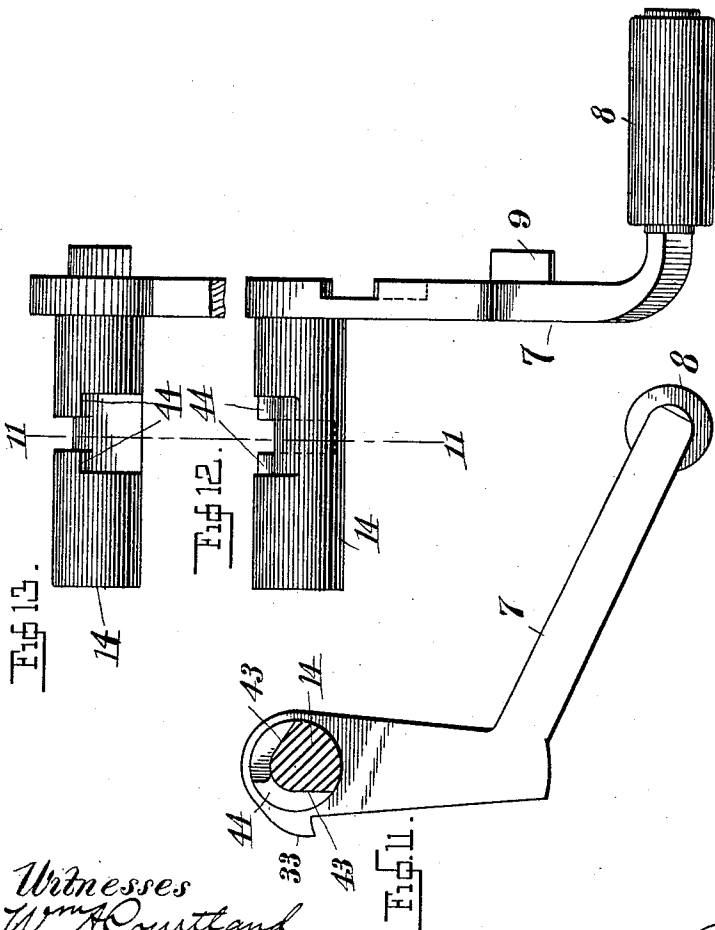
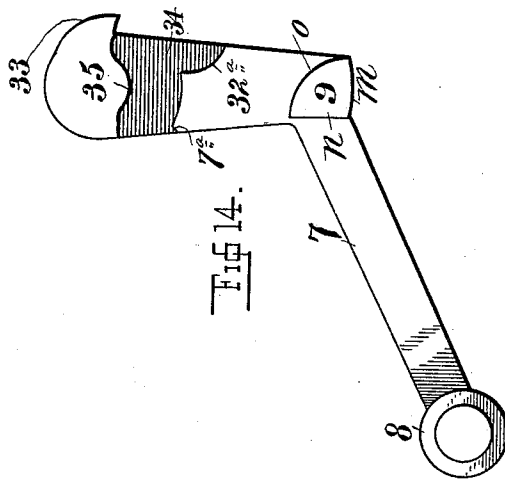
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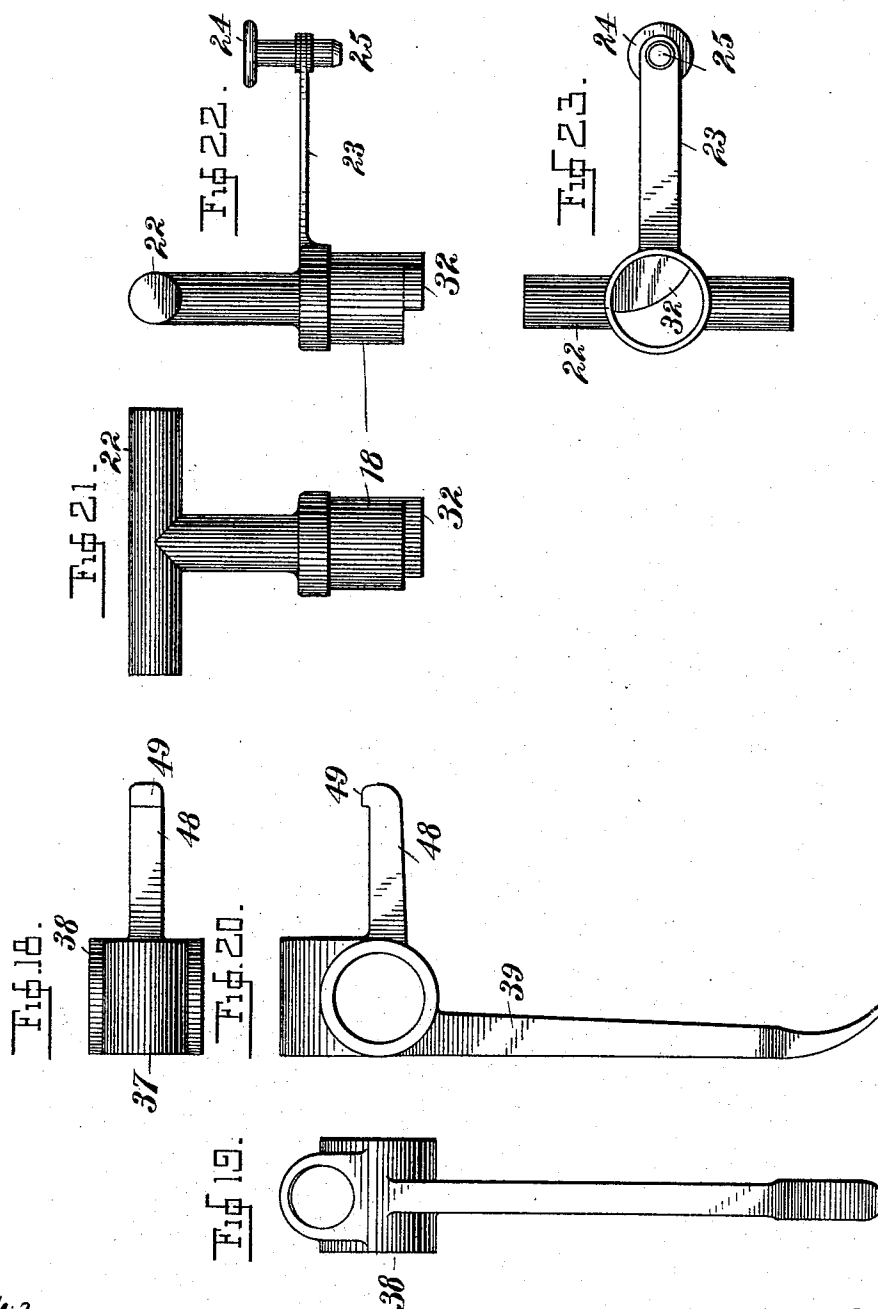
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UNITED STATES PATENT OFFICE.

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BREECH-LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 519,308, dated May 1, 1894.

Application filed February 6, 1893. Serial No. 461,207. (No model.)

To all whom it may concern:

Be it known that I, JULIUS H. ALTHOF, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Breech-Loading Ordnance, of which the following is a specification.

My invention relates to improvements in breech loading ordnance of the kind or class wherein the breech block slides in the reinforce or breech in a direction at right angles, or nearly so, to the axis of the gun.

The principal object of the said invention is to construct a gun in which the movement of the breech block to open and close the breech and the cocking of the firing pin are effected by a novel arrangement of mechanism, that is to say; a crank provided with a projection received in a suitably formed groove in the wall of the reinforce, the crank being secured to a shaft which is arranged to turn in a bearing in the breech block and which in turning effects the cocking of the firing pin.

A further object of the said invention is to provide means which limit the movement of the breech block and also operate to lock the same and control, to a certain extent, the movement of the shaft which carries the crank.

The said invention comprises also the construction of simple means for starting the breech block in case it should become jammed and other mechanism hereinafter particularly explained.

In order that the said invention may be clearly understood it will now be described with reference to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal central section in the plane indicated by the line Y—Y, Fig. 5 of the breech of the gun fitted with improved breech mechanism constructed according to this invention, the breech being shown closed. Fig. 2 is a vertical longitudinal section of the breech of the gun, the plane of section cutting the gun just outside of the breech block so as to show the latter with its attached parts in elevation. Fig. 3 is a side elevation of the gun breech, the block being shown depressed so that the breech is open. Fig. 4 is a view similar to Fig. 2, the parts however being shown in position which they have in Fig. 3, that is to say, with the breech block

down and the breech open. Fig. 5 is a transverse vertical sectional view through the breech and breech block in the plane of the operating shaft, the breech being shown closed. Fig. 6 is a view similar to Fig. 1 with the breech open. Fig. 7 is a sectional view similar to Fig. 2 showing however the position of the lever when re-cocking the firing pin without depressing the breech block. Fig. 8 is a side elevation similar to Fig. 3 but showing the breech block elevated and showing the stop bolt and lever in the re-cocking position. Fig. 9 is a vertical sectional view looking in the opposite direction to Fig. 1, that is, toward the right hand wall of the reinforce, the breech block being removed. Fig. 10 is a side elevation of the breech, the handle of the stop bolt being removed showing the stop bolt itself in section. Fig. 11 is an elevation of the operating lever showing its attached shaft in cross section on the line 11—11 Figs. 12 and 13. Fig. 12 is a detail rear view of said lever and shaft. Fig. 13 is a top view of the shaft. Fig. 14 is a view of the operating lever in side elevation. Fig. 15 is a rear end elevation of the firing pin. Fig. 16 is a side elevation thereof. Fig. 17 is a bottom view thereof. Fig. 18 is a top view of the trigger. Fig. 19 is a rear view thereof. Fig. 20 is a side elevation thereof. Fig. 21 is a detached side view of the stop bolt. Fig. 22 is also a side view, the view being taken at right angles to Fig. 21. Fig. 23 is an elevation of the stop bolt detached looking from its inner end.

I will first describe in detail the several parts of the gun and then briefly describe the conjoint action of said parts.

The breech 1 of the gun is bored at 4 and its reinforce 2 has the usual vertical chamber or way wherein slides the breech-block 3. In Fig. 4 is shown how, when the breech-block is down and the breech consequently open, a space 4^a is exposed to admit the head of the cartridge which is slipped in through the trough in the top of the breech-block. The inner right-hand wall of the reinforce 2 is (see Fig. 9) grooved at 10. The lower edge of the groove is horizontal except for short portion 10^x immediately under the pivot shaft of the operating lever, which portion is curved concentrically with said shaft when the latter is at its uppermost position. The groove is

open at 10^a to the under side of the breech. The upper surface 10^b is of such shape as to act as hereinafter explained, to positively start the descent of the breech-block. The groove also has a curved upward extension 13, concentric with the shaft of the operating lever when the latter is at its highest point.

In Figs. 5 and 9, the segmental stud or stop 32 on the inner end of a bolt 18 will be observed projecting through a cylindrical bearing 19 in the wall of reinforce 2 and the right-hand wall of the breech-block is cut away below a shoulder 17 to receive said stud and other mechanism. The shape of the shoulder 17 is seen in Fig. 2. The shape of the bolt 18 and its attached parts is shown in Figs. 21, 22 and 23. The means of fastening the bolt to the reinforce of the gun is not shown but a bayonet-joint or other means permitting ready removal of the bolt will be preferably employed. The bolt has a handle 22 and a spring arm 23, the latter bearing at its outer end a button 24 and a boss 25.

26 is a groove in the outer right-hand surface of the reinforce concentric with the bolt 18 and adapted for the boss 25 to travel in. It has recesses 27 which arrest the boss 25 and the stop-bolt in any one of four different positions for the purposes hereinafter explained.

The form of the firing pin 36 is shown in Figs. 1, 15, 16 and 17. It is mounted in the chamber 36^a of the breech-block 3 and has an annular shoulder 47 against which the spiral spring 46 bears, and near its rear end the sides of the firing pin are cut away at 41 leaving the firing pin at this point of the shape in cross-section shown in Fig. 5. At rear the cut-away portions 41 terminate in shoulders 45, but at bottom the cut-away portions extend beyond the shoulders as shown at 42.

The operating lever 7 is mounted on the breech-block 3 by a transverse shaft 14 and itself supports said breech-block in the breech by means of a stud 9 entering groove 10 in the reinforce. The form of the lever and shaft is shown in Figs. 11 to 14 inclusive. The lever has a handle 8 at its lower end. The stud 9 on the lever has its surface *m* curved concentrically with shaft 14, its surface *n* flat and its surface *o* curved concentrically with the apex of surfaces *m*, *n* so permitting the stud to roll over in the groove 10. Near its axis the outer surface of lever 7 has a portion 34, of a depth to receive the stop-stud 32, cut away so as to have the several shoulders 32^a, 35 and 7^a whose several functions will all be explained when I describe the operation of the mechanism. The lever also has a nose 33 adapted to impinge on the stop-stud 32 as hereinafter explained. The shaft 13 is recessed at its mid-length so as to have a cam-shaped bearing 43 adapted to slide under and support the rear end of the firing pin and on each side of said bearing is a nose 44 which, as shown in Fig. 1, move in the cut-away portions 41, of the firing pin, are adapted to bear against the shoulders 45 thereof

and pass from engagement with said shoulders through the cut-away portions 42. The cam-shaped portion 43 is rounded at center to allow it to roll freely under the firing pin and is flat at its ends.

Referring to Figs. 18, 19 and 20, 38 is a sleeve embracing the shaft 14 and bearing the trigger 39, the detent arm 48 (which has a lip 49 adapted to engage the flange or shoulder 47 of the firing pin) and the arm 37 which is bored to receive the rear end of the firing pin and which receives the rearward thrust of spring 46, so that said spring not only acts to press the arm 37 back so as to lift the detent 48 up into engagement with the shoulder 47 but serves, when the said detent releases said shoulder to project the firing pin to discharge the gun. The trigger 39 works in a recess 39^a in the breech-block.

By examining Fig. 1, it will be seen that the bore in arm 37 is so flared as to allow the trigger to be moved notwithstanding the location of the pin 36 within said bore.

My improved mechanism will now be seen to be made up of a few simple parts, to wit:—the operating lever and shaft, the trigger connections, the spring and the firing pin all mounted in the breech-block, and the stop-bolt mounted in the reinforce.

The method of operating the mechanism to secure the various results desired is as follows:—With the lever 7 in the position shown in Figs. 2, 5, and 10, the breech-block is elevated and is maintained in that position by shaft 14 and lever 7 whose stud 9 engages the groove 10 in the wall of the reinforce. Suppose the gun has been fired and it is desired to reload it and cock the firing pin. The stop-bolt 18 is placed in the position shown in Fig. 3 so that its stud 32 is arranged as indicated in dotted lines in that figure and in Fig. 10 and in full lines in Fig. 9. The lever 7 is now pushed forward by its handle 8. The stud 9 at first rides in the curved part 10^a of grooves 10 (see Fig. 10) so that at first the breech-block is not allowed to drop, while the noses 44 of shaft 14 embracing the firing pin on both sides come in contact with the shoulders 45 of the firing pin and draw it back slightly. The pin is thus drawn far enough back to clear the cartridge before the breech-block begins to fall. If the breech-block moves freely, it will now fall by its own gravity and force the stud along the flat bottom surface of groove 10. If the block should stick, the stud 9 after leaving part 10^a will ride up against the surface 10^b of the groove 10 and so force the block down positively. As the lever 7 goes forward, the nose 33 clears the stud 32 and passes down behind the same. The shoulder 32^a of the lever 7, coming in contact with the stud 32, continues the positive depressing action, if necessary. Finally, the parts assume the position shown in Figs. 3 and 4, with the stud 9 lying in the front end of groove 10, and as the shoulder 17 of the breech-block comes to rest against the upper

side of the horizontal part of lever 7 while the flat bottom of the stud has rigid support on the bottom of the groove 10, the breech-block is firmly held from further descent.

5 The breech is now open and the gun can be loaded. Meanwhile the turning of the shaft 14 has continued to force back the firing pin, compressing the spring 46 between shoulder 47 and arm 37 until, as shown in Fig. 6, the

10 lip 49 may engage the shoulder 47, when the noses 44 pass from the shoulders 45, through cut-away portions 42 of the firing pin. After the gun is loaded, the lever 7 is drawn backward raising the breech-block until the stud 9

15 reaches the part 10^a of the groove 10, when the nose 33 of lever 7 strikes the stud 32, so preventing the stud 9 from passing into the vertical portion 10^a (see Fig. 9) of said groove. If the gun should miss fire, to re-cock the firing pin

20 without depressing the breech-block, the bolt 18 is turned to the position shown in Fig. 8, where, as seen by the dotted lines, the stud 32 is shifted to such a position that now, when the lever 7 is pushed forward the shoulder 35 thereof will roll on the stud 32 and hold the breech-block up while the firing pin is being re-cocked.

25 The stud 9 being by this action relieved of its function of supporting the breech-block, passes up in the curved part 13 of slot 10 as the lever 7 goes forward. When the gun has thus been re-cocked, the lever 7 is drawn back, and the gun can be fired—this action being repeated as often as is necessary. To open the breech for reloading, the stop-bolt

30 should again be shifted to the first position indicated in Fig. 3. If the bolt be turned a farther step to the left, indicated by dotted lines in Fig. 7, the stud 32 passes behind the shoulder 7^a of the lever 7, preventing it from being drawn back and so preventing the release of the firing pin so that the gun is locked.

35 Another turn of the stop-bolt, bringing the boss 25 to the lowermost recess 27, enables the bolt 18 to be slipped out through its bayonet joint or other fastening. The breech-block and its attached parts may then be removed on putting lever slightly back of the position shown in Fig. 10, so that its supporting stud 9 will pass out through the outlet

40 portion 10^a of groove 10. The taking of the several parts out of the breech-block is then a simple matter.

In the operation of the gun, it will be seen that the impingement of the stud 9 on the

55 part 10^b of the breech starts the descent of the block and that the descent is positively forced to continue by the impingement of the part 32^a of the lever 7 on the stop bolt projection 32. Furthermore, that either of these

60 means for imparting positive motion to the block may be solely relied on or that any other solid abutment on the breech may be provided for the lever. For example, the lever instead of acting first against the groove

65 wall and then against the stop bolt projection, may act in reverse manner first against the

stop bolt and then against some fixed abutment.

Having thus described my invention, the following is what I claim as new therein and

70 desire to secure by Letters Patent:

1. The breech mechanism for guns comprising the movable breech block, a shaft transverse of the breech carried by said block, a lever connected with said shaft, a stud or support

75 carried by said lever, the gun breech having a groove or recess to receive said stud to support said lever and the breech block in different positions and means for regulating the movements of said shaft for the various

80 purposes described.

2. A gun breech having an opening, a breech block adapted to slide therein and having a shoulder 17, combined with a shaft carried by said breech block, a lever connected with

85 said shaft and a stud or support carried by said lever and adapted to travel in a groove in the breech to support said lever and breech block, substantially as described.

3. A gun breech having an opening, a breech

90 block sliding therein, a shaft carried by said breech block and a lever for operating said shaft combined with a stop bolt carried by said breech and having a part adjustable to engage and disengage with said shaft and arranged to hold the latter from descending and

95 to permit it to descend, as and for the purposes specified.

4. In combination with a gun-breech, a breech-block having movement therein, an

100 operating lever therefor and a stop-bolt carried by the breech adjustable to engage and disengage a part carried by said block and arranged in one position to allow the block to move, and in the other to arrest its movement

105 in its closed or nearly closed position, substantially as set forth.

5. In combination with a gun breech, a breech-block an operating shaft therefor journaled in said block and having a part im-

110 ping upon a solid abutment on or part of the breech, whereby the block is positively started, substantially as set forth.

6. In combination with a gun breech, a breech block adapted to move therein, a lever

115 for operating said block, carried by said breech block and a stop bolt carried by the breech and having a part placed in the path of said lever, so as to operate as an abutment to positively move the block substantially as

120 set forth.

7. A gun breech having an opening, a breech block sliding therein, a shaft carried thereby, a lever connected with said shaft, means for supporting said lever and a projection 33 con-

125 nected with said lever combined with a stop bolt having a part which permits said shaft to descend, and which engages the projection 33 to limit the rotation of said shaft, substantially as set forth.

130

8. A gun breech having an opening, a breech block adapted to slide therein, a shaft carried

by said breech block, a lever connected with said shaft, means to support said lever and a projection or shoulder 35 connected therewith combined with an adjustable stop bolt having a stud or part 32 which in one position permits said shaft to descend and which in another position is engaged by the shoulder 35, as and for the purposes set forth.

9. A gun breech having an opening and a breech block adapted to slide therein, a shaft carried thereby, a lever connected with said shaft and means to support said lever combined with an adjustable stop bolt regulating the movement of said shaft and means for holding said stop bolt in its several positions, substantially as set forth.

10. A gun breech having an opening, a breech block carried thereby, a shaft connected with said breech block, a lever connected with said shaft and means to support said lever combined with a stop bolt regulating the movements of said shaft, a spring arm connected with said stop bolt, a projection 25 connected with said spring arm and depressions 27 in the gun breech to hold said spring arm, substantially as described.

11. A gun breech having an opening, a breech block adapted to travel therein, a firing pin carried by said breech block and a projection connected with said firing pin to be engaged by a cocking device combined with a shaft journaled in said breech block, transverse of the breech and of the firing pin a projection connected therewith for directly engaging and cocking the firing pin, a detent and trigger for holding and releasing said firing pin and a lever connected with said shaft for supporting the breech block and cocking said firing pin, as set forth.

12. In a gun breech having a sliding breech block a shaft journaled in said block a lever connected with said shaft and means for supporting said lever and breech block combined with a firing pin carried by the breech block, a spring to move said firing pin, means connected with said shaft for cocking the firing pin, a detent to be pressed upon by said spring, a projection carried by said detent to hold the firing pin cocked, said spring being arranged to hold said projection in engagement with said firing pin and a trigger to release said firing pin, substantially as described.

13. In a gun breech, the combination of a movable breech block, a firing pin carried thereby, a shaft journaled in said breech block, a lever connected with said shaft and means for supporting said lever and the sleeve journaled on said shaft and having an arm 37, detent 48 and trigger 39, a projection 49 on said detent adapted to hold the firing pin, a shoulder or projection 47 on the firing pin, a spring located between the arm 37 and the shoulder 47 and devices intermediate of said shaft and said firing pin for cocking the latter by the former, substantially as described.

14. In a gun breech, a movable breech block,

a firing pin carried thereby, and having shoulder 45, a spring for actuating said firing pin and devices for holding and releasing said firing pin combined with a shaft 14 journaled in said breech block and having a projection 44 to coact with the projection 45 on the firing pin, a lever connected with said shaft and means for supporting said lever and the breech block, substantially as described.

15. The combination of a gun breech, a block adapted to move therein, a lever carried by said block and adapted to move the same, and a stop-bolt arresting the lever when the block has reached its closed position, and removable to allow the separation of the parts.

16. The combination of a gun breech, a breech block, a shaft carried thereby, a lever connected with said shaft, a stud or support carried by said lever, the gun breech having a recess or groove 10 arranged to receive said stud and to support said lever and breech block in different positions, the groove 10 having an extension 10^a to permit removal of the block when the lever is moved past the position at which the breech is closed, substantially as set forth.

17. The combination of a gun breech, a breech block, a shaft carried thereby, a lever connected with said shaft, for actuating it and supporting the block, a stud or support carried by said lever, the gun breech having a recess or groove 10 provided with extended part 10^b to engage the stud as it travels through the groove to draw down the breech block to give it an initial movement, substantially as described.

18. The combination of a gun breech, a breech block a shaft carried thereby, a lever connected with said shaft, a stud on said lever and a solid abutment on the breech to be engaged by said stud to give the breech block initial movement, substantially as described.

19. The combination of a gun breech, a breech block, a shaft 14, a lever for moving the breech block, a stud on said lever, said breech having a groove 10, 13 to receive said stud and a stop bolt to limit the movement of said breech block and permit said stud to enter groove 13 as and for the purposes specified.

20. The combination of a gun breech having its wall grooved, a block carrying a firing pin and adapted to move in said breech, means for supporting the breech block and an operating lever for moving said block and cocking the firing pin and having a stud or part engaging the grooved wall of said breech, the said groove having the extension 13 permitting the lever to move to recock the firing pin without the opening of the breech, substantially as set forth.

21. The combination of a gun breech, a breech block adapted to move therein, a firing pin carried by said breech-block, an adjustable bolt which may be adjusted to sup-

port said breech block or to allow it to descend and an operating lever connected to said firing pin and supported by the block, the breech reinforce having an internal groove 5 to engage said lever provided with an upward extension to permit it to play freely when relieved of the weight of the block by said bolt whereby the lever may be operated to recock the firing pin without opening the breech, 10 substantially as set forth.

22. The combination in a gun of a breech-block adapted to slide therein, a firing pin supported in said breech block, a detent for holding said firing pin in cocked position, and 15 a spiral spring surrounding said firing pin and bearing between a projection on said pin and an arm of said detent, substantially as set forth.

23. The combination of the gun breech, the 20 breech-block adapted to slide therein, the movable stop-bolt 18 having segmental stud 32, and the lever 7 and shaft 14 said lever

having nose 33, cut-away portion 34 and shoulders 32^a, 35 and 7^a, substantially as and for the purposes set forth. 25

24. The combination of the gun-breech having its reinforce provided with groove 10, 10^a, the block adapted to slide in said breech and the lever carried by said block and having stud 9 engaging said groove 10 and adapted 30 to pass through the part 10^a thereof, substantially as set forth.

25. In breech mechanism, the combination of the breech block, an operating shaft and its lever mounted in said block acting against 35 the wall of the reinforce to move the block and having shoulder 35 and a movable stop bolt 18 having an eccentric stud 32 adapted to engage said shoulder and prevent the opening of the breech, substantially as set forth. 40

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