

(No Model.)

2 Sheets—Sheet 1.

S. SEABURY.
BREECH LOADING CANNON.

No. 431,214.

Patented July 1, 1890.

Fig. 1.

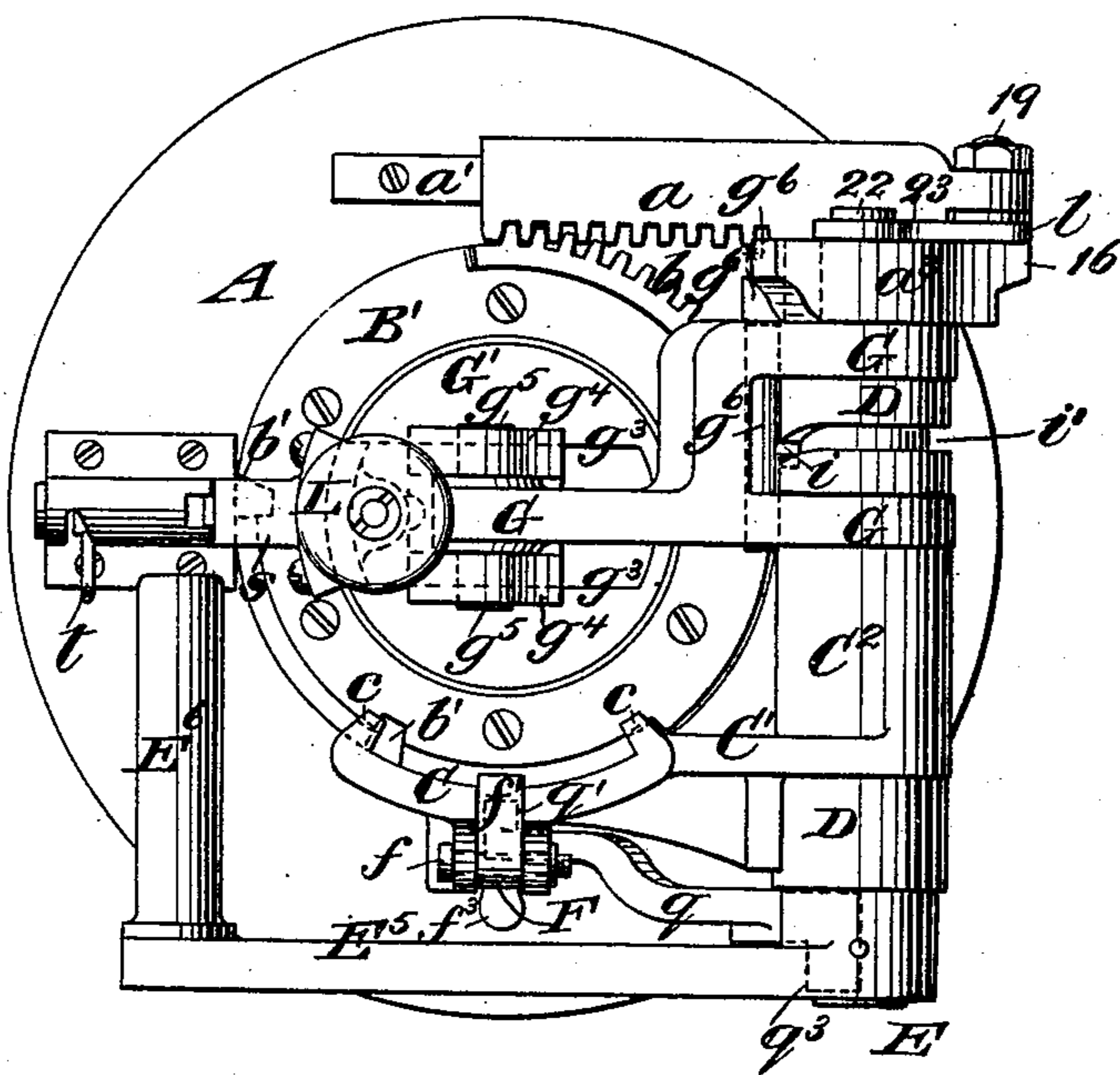
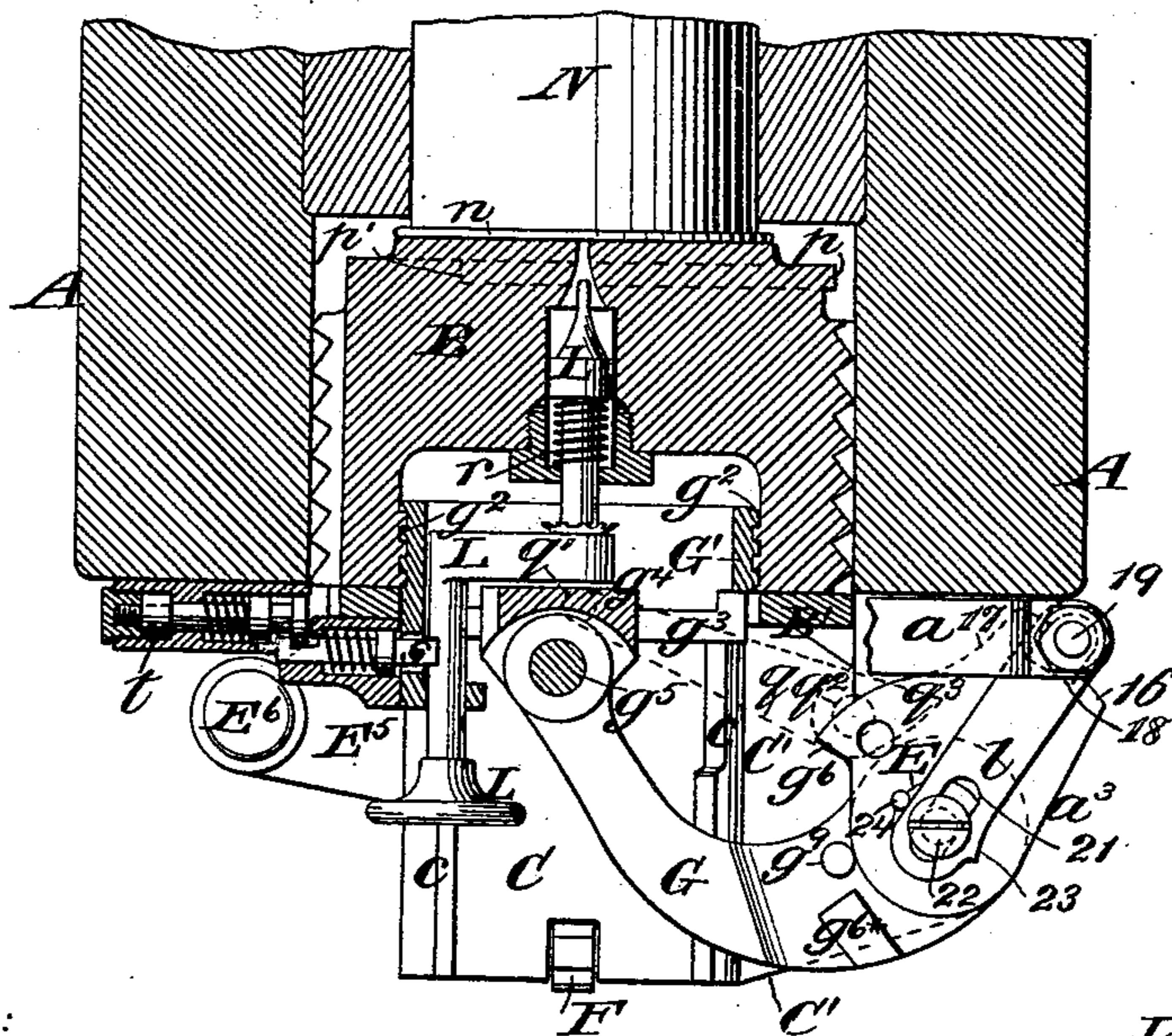


Fig. 2.



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2 Sheets—Sheet 2.

No. 431,214.

Fig. 3.

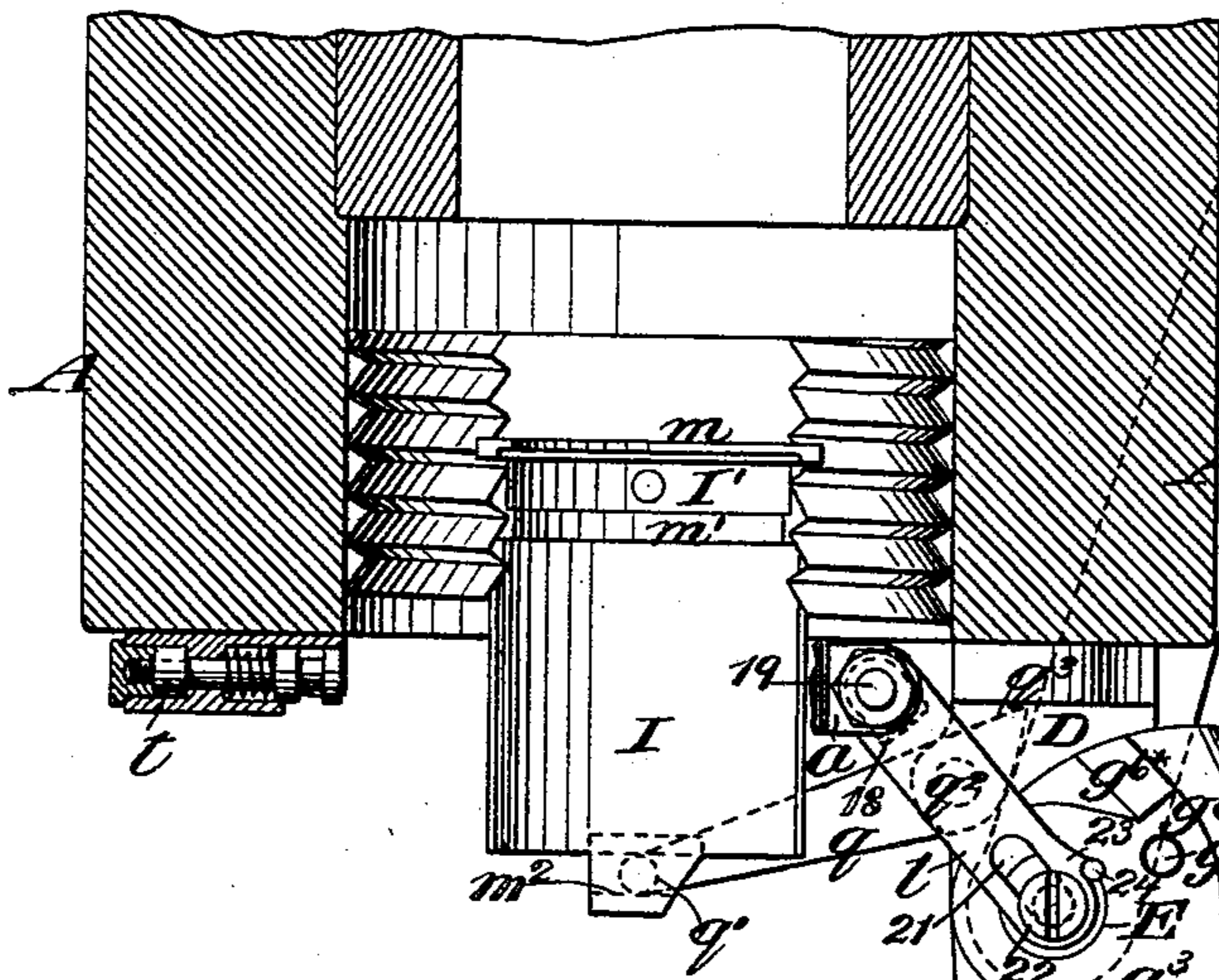


Fig. 6.

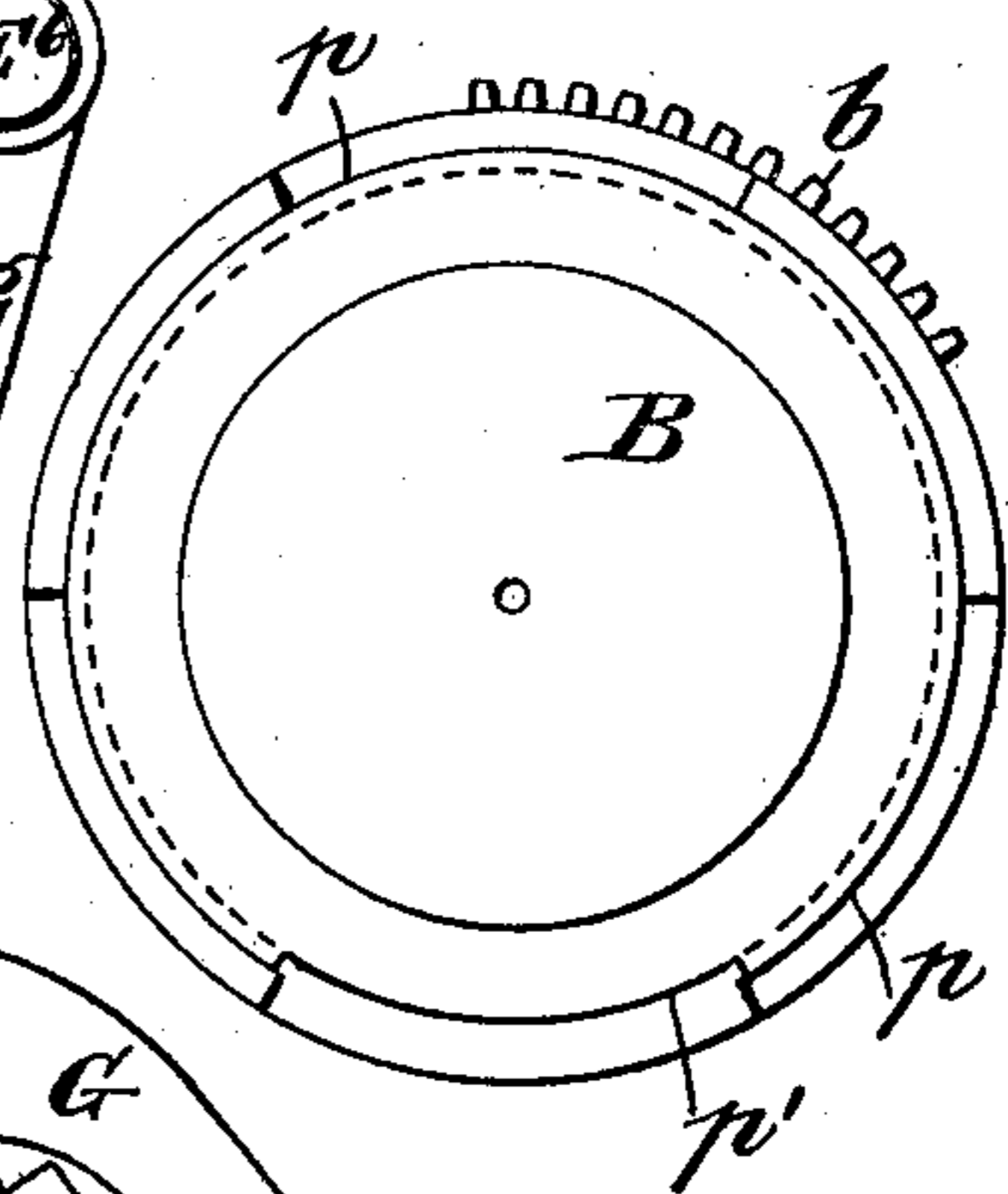
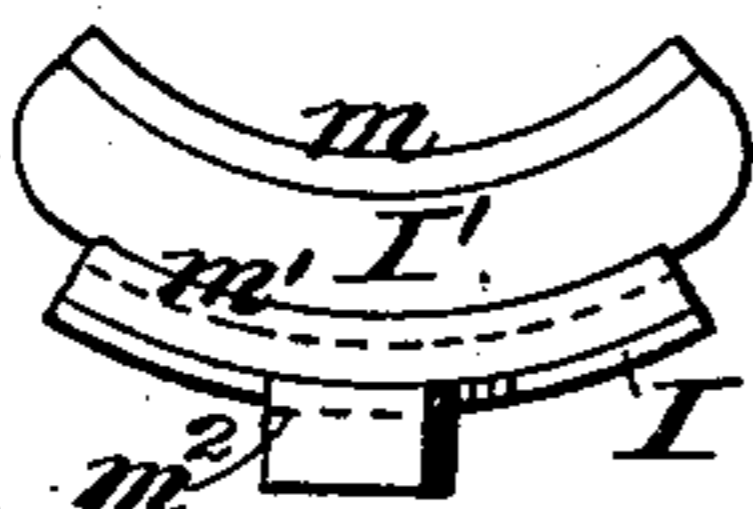


Fig. 5.



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UNITED STATES PATENT OFFICE.

SAMUEL SEABURY, OF UNITED STATES NAVY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO LAVINIA WILSON AND J. B. M. GROSVENOR, BOTH OF NEW YORK, N. Y.

BREECH-LOADING CANNON.

SPECIFICATION forming part of Letters Patent No. 431,214, dated July 1, 1890.

Application filed March 31, 1890. Serial No. 346,026. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL SEABURY, lieutenant United States Navy, at present residing at Bergen Point, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Breech-Loading Cannon, of which the following is a specification, reference being had to the accompanying drawings.

10 This improvement relates in part to the means of operating the removable breech-block of a breech-loading cannon, and in part to the extractor for extracting the discharged shells of fixed ammunition.

15 The invention is herein illustrated and will be particularly described as applied to a breech-loading gun in which are employed a screw-threaded breech-block and a swinging carrier which is hinged to the breech of the gun, and into which the breech-block is withdrawn and by which the said block is swung aside to permit the loading of the gun and the withdrawal of the discharged cartridge-shells.

25 Figure 1 is a rear view of the breech of the cannon having my improvement applied. Fig. 2 is a central horizontal sectional view corresponding with Fig. 1, showing the breech closed. Fig. 3 represents a central horizontal section of the breech of the gun and the top of the breech and breech-block and the cartridge-shell extractor, the breech being shown open and the extractor drawn back. Fig. 4 represents a central vertical section of the breech of the gun and of the breech-block carrier, and a side view of the breech-block, the latter being withdrawn from the breech, but not swung aside. Fig. 5 represents a back view of the cartridge-shell extractor detached. Fig. 6 represents a front view of the breech-block.

Similar letters and numerals of reference designate corresponding parts in all the figures.

45 A designates the breech of the gun, and B the breech-block. The breech-block is represented as having on its exterior a mutilated screw-thread corresponding with a mutilated screw-thread in the breech to permit the

block to be moved in and out of the breech, 50 and to be locked therein by turning it.

C C' C² designate the breech-block carrier, consisting of a tray C and arm C', to which said tray is solidly attached, and a socket C², provided on the said arm and forming a portion of the hinge by which the carrier is 55 hinged to the breech of the gun at one side thereof, other portions of the hinge consisting of fixed sockets D D, secured to the breech of the gun at one side thereof, and a spindle 60 E, which passes through and fits easily within the said sockets C² and D, and for which the said sockets constitute bearings. The tray C, which constitutes the receiver for the breech-block when the latter is withdrawn, 65 is provided with longitudinal tongues c, (see Fig. 1,) which correspond with grooves b' in the breech-block to guide the breech-block as the latter is withdrawn from the breech into the carrier.

70 F is a lever-like catch, which is pivoted by a pin f to the bottom of the tray or receiver C, for the purpose of locking the said tray or receiver to the breech of the gun, having at its rear an upward projection f', which passes 75 through a hole in the tray, and having at its front end a downward projection f², which engages with a hooked bolt f³, fast in the lower part of the breech of the gun.

B' is a circular plate, secured to the rear 80 of the breech-block and having upon it a toothed flange b, which is concentric with the breech-block and which gears with a straight-toothed rack a, which is fitted to run on a slideway a', firmly secured to the back of the 85 breech for the purpose of giving the breech-block the movement on its axis necessary to lock it in and unlock it from its seat in the gun. The means for producing the operation of this rack will be presently described. 90

G designates a horizontal arm, which is fitted loosely to the spindle E. This arm is connected with the breech-block in such manner that by the turning of the arm G on the spindle E the breech-block may be drawn 95 back into the tray by the said arm. The connection shown between the said arms and the breech-block consists of a flanged plate

G' , which is screwed, as shown at g^2 , (see Fig. 2,) into a concentric cavity in the rear of the breech-block, and the slide g^4 , which is fitted to slide in a slideway g^3 in the said plate and is pivoted by a pin g^5 to the end of the said arm G . This connection between the arm G and the breech-block permits the latter to move back in lines parallel with the bore and permits the turning of the breech-block in its seat to lock and unlock it. The arm G and the above-described connection between them constitute what may be termed the "breech-block retractor."

The upward projection on the double catch F also serves the purpose of locking the withdrawn breech-block into the tray C of the carrier by its engagement with a notch in the said breech-block or in the screw-thread thereof, so that the breech-block, the retractor, and the carrier may be all locked together, the breech-block always remaining permanently attached to the retractor. I may here mention that, as thus far described, the breech-block, breech-block retractor, and breech-block carrier are in all essential features like those described in my United States Letters Patent No. 425,584, dated April 15, 1890, and have only been herein described for the purpose of making my present improvement intelligible.

According to my present improvement, instead of the sliding rack a , which operates on the toothed flange or sector b of the breech-block for turning the said block, being operated by a permanent connection with an arm on the hinge-spindle E , it is operated by an engaging device, which I will now proceed to describe, which trips the said rack and leaves it disengaged from the said arm during the operation of the breech-block retractor.

a^3 designates the crank-arm fast on the upper end of the spindle, and constructed with a fork 16 17 to receive a square projection 18 on the under side of a slotted sliding piece l , which is arranged on the top of the crank-arm, and is pivotally connected with the outer end of the toothed rack by a pin 19, which passes through the said sliding piece and through its said projection. The slot 21 in this sliding piece l has passing through it a pin 22, which is screwed centrally into the end of the hinge-spindle. This pin 22 serves as a pivot upon which the said sliding piece l is capable of turning, as well as of the sliding movement just mentioned. When the breech-block is closed and locked, as shown in Fig. 2, the position of the sliding piece l is such that its projection 18 is in the fork of the crank-arm. As the spindle E is turned to commence the movement of turning the breech-block for opening the breech, the prong 16 of the fork of the crank-arm a^3 acts against the projection 18 of the sliding piece to move the toothed rack a to the left to unlock the breech-block. When the breech-block is unlocked, the prong 16 passes by the projection 18 and the crank-arm escapes from

or trips the said block and the rack continues its movement to produce the operations of the retractor and carrier for opening the breech. During the latter operations a projection 24, provided on the said crank-arm, (and represented as a prolongation of the key which secures the crank-arm a^3 to the hinge-spindle E ,) works against the rounded rear end of the sliding piece l and holds the rear end of the slot 21 of the said sliding piece against the pin 22, and so prevents the longitudinal movement of the said sliding piece, which is thus made to constitute a brace to hold the rack a stationary during the said operations. At the end of the said operations the projection 24 comes against a shoulder 23 on the sliding piece l , and so braces it very firmly. As the return movements are made to close the breech, the said projection 24, passing back round the rounded rear end of the sliding piece l continues to hold the said piece, which thus continues to brace the rack during the reinsertion of the breech-block into the breech and until the teeth b on the breech-block enter the rack a , the rack being thus always retained in the proper position for the teeth b to thus re-enter it. During the latter part of the return movement of the retractor and carrier the prong 16 of the fork of the crank-arm a^3 , which is shorter than the prong 17, passes by the projection 18; but just as the retractor completes its movement by which the breech-block is replaced in the breech the longer prong 17 comes against the projection 18 and moves the toothed rack a to the right, and as the crank-arm completes its movement the said rack turns and locks the breech-block. The sliding piece l always points in the proper direction for the square projection 18 to present a square shoulder or bearing to the prong 17 of the fork of the crank-arm when the latter comes into operation on it to move the rack a .

The means by which the turning of the breech-spindle is made to effect the operation of the retractor are substantially like those shown in Figs. 7, 8, and 9 of my hereinbefore-mentioned Letters Patent, the only difference being that the movement given to the said retractor for withdrawing the breech-block, instead of being effected by a prolongation or downward extension of the pin which forms a part of the connection of the crank-arm on the spindle with the sliding rack, is effected by a projection g^6 on one side of the crank-arm a^3 operating on a projection g^{6*} , formed upon the top of the arm G of the retractor, the said projection being so arranged, as may be understood by reference to Figs. 2 and 3, that there will be a lost motion between the said projections while the crank-arm is effecting the operation of turning the breech-block to unlock it, the return movement of the rack being produced, as described in that patent, by means of a trip-pin g^6 , which is engaged with and disengaged from the

crank-arm a^3 at the proper time by means of a projection i on one side of the said pin running in a cam-groove i' in one of the fixed hinge-sockets D.

5 In the example of my invention herein illustrated I have shown the hinge-spindle E as having firmly secured to its lower end, for the purpose of turning it to produce the operation of the breech-block mechanism, a hand-lever E^5 , provided with a handle E^6 . It is immaterial, however, how the turning movement of this spindle is produced, as it may be produced by any mechanism suitable for the purpose.

15 I I' designate the cartridge-shell extractor, consisting of a thin trough-like plate I of metal conforming to the lower part of the opening of the breech of the gun, and provided with a grooved lip-piece I' at its front end. This extractor is shown in section in Fig. 4, and a separate rear view is given in Fig. 5. The plate I is fitted to slide back and forth in a groove in the breech. The lip-piece I' is formed with two lips m m' , one in front to engage with the flange n of the cartridge-shell N, as shown in Fig. 4, and the other m' to engage with a flange p , provided nearly all the way round the front part of the breech-block B, of which a front view is given in Fig. 6. In the rear part of the bottom of the plate I is a transversely-grooved projection m^2 , which receives within it an upwardly-projecting pin q' , which is provided on the end of a lever q , which is fulcrumed by a pin q^2 to the lower fixed socket D of the hinge of the breech-block carrier and retractor. The other end q^3 of this lever q is so formed, as shown in Figs. 2 and 3, that it will be free during the greater part of the movement of the breech-block carrier and retractor, but that when the carrier has almost completed the movement of opening the breech a suitable projection on or from the hinge-spindle—as, for instance, the lever E^5 in the example shown—will come into operation on the said end q^3 and cause the latter lever to draw out the extractor, as shown in Fig. 3, and thereby pull out the cartridge-shell with a very quick movement. As this lever q might not be depended upon to start the shell, it being very tight in the breech, it is to effect the starting that I provide the flange p on the breech-block, so that the breech-block, as it begins to be unscrewed, may pull out the cartridge a little way. The turning of the breech-block far enough to unlock it brings the gap p' in the flange p opposite the extractor and allows the breech-block to be withdrawn without further disturbing the extractor.

60 L designates the firing-pin in the breech-block, and r the mainspring. s is the sear on

the breech-block for holding the firing-pin cocked, and t is the trigger on the breech of the gun engaging with the sear s when the breech-block is locked in the breech. As these parts are not claimed as part of my invention, I have only described them sufficiently to prevent their confusion with other parts.

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

1. The combination, with the swinging breech-block carrier, the mutilated screw-threaded breech-block furnished with a toothed sector, and the sliding rack on the breech of the gun for operating on said sector, of a turning spindle which forms part of a hinge by which the swinging carrier is hinged to the breech, an arm on said spindle, and a tripping engaging device, substantially as described, for engaging said arm with said rack for turning the breech-block and tripping the rack from said arm preparatory to the movement of said carrier, substantially as and for the purpose herein set forth.

2. The combination, with the breech-block having the toothed flange b , the rack a , gearing with said flange for turning the said block, the breech-block retractor, the breech-block carrier, and the hinge-spindle E, by which the said retractor and carrier are attached to the breech of the gun and are operated to open the breech, of the forked arm a^3 , carried by said spindle, and the slotted sliding piece l , pivotally connected with the said rack and with the said spindle and having the square projection 18 to engage with the fork of said crank-arm, all substantially as herein described.

3. The combination, with the breech-block retractor, the breech-block carrier, and hinge-spindle by which said retractor and carrier are hinged to the breech of the gun and through which their movements are produced, of the cartridge-shell extractor and the lever q , carried by said spindle and engaging with said extractor, substantially as herein set forth.

4. The combination, with the breech-block having a mutilated screw-thread on its exterior and having near its front end a flange p , in which there is a gap p' , of the cartridge-shell extractor having a lip m' to engage with said flange when the breech is screwed up and during its unscrewing movement, substantially as and for the purpose herein set forth.

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Witnesses:

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