

(No Model.)

3 Sheets—Sheet 1.

G. GERDOM.
BREECH LOADING ORDNANCE.

No. 466,848.

Patented Jan. 12, 1892.

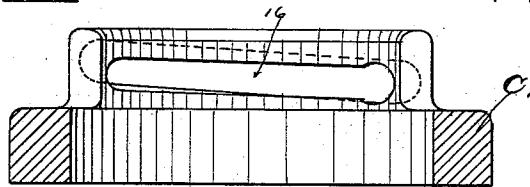
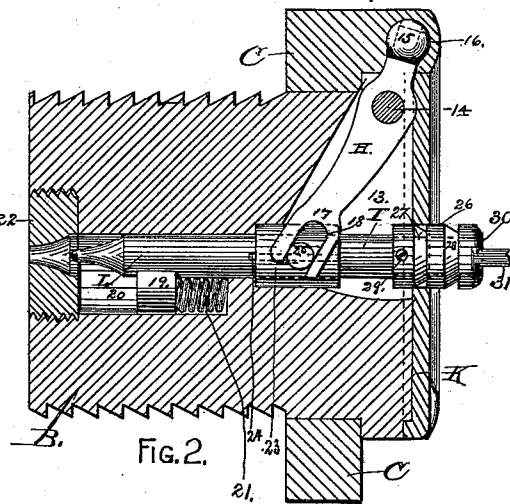
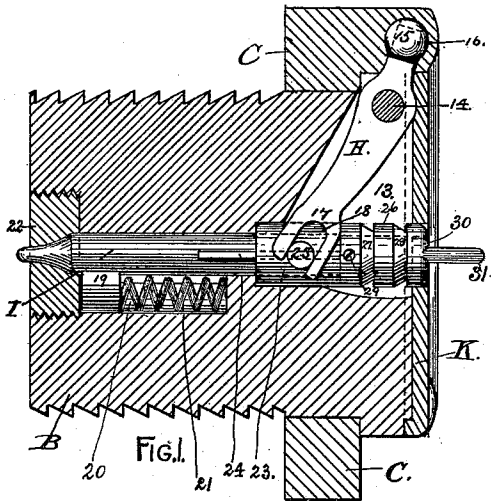


FIG. 6.

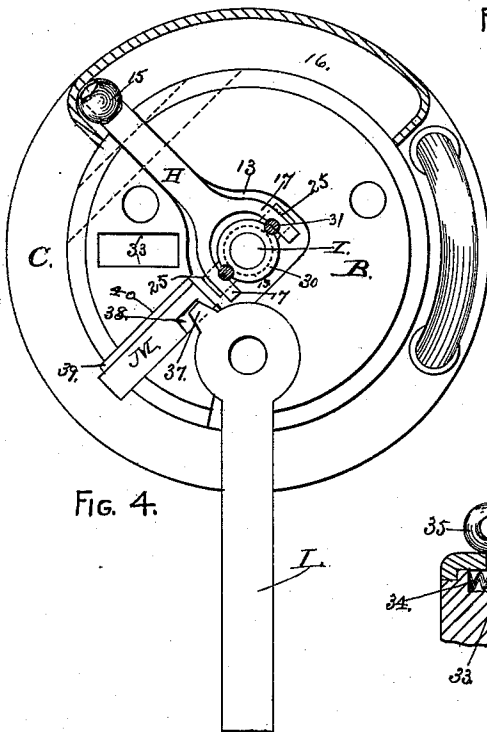


FIG. 4.

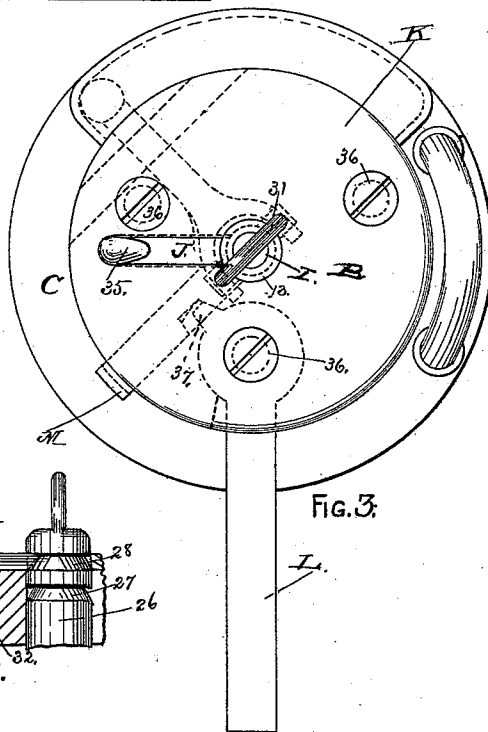


FIG. 3.

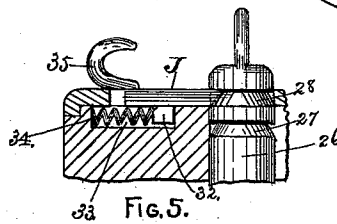


FIG. 5.

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(No Model.)

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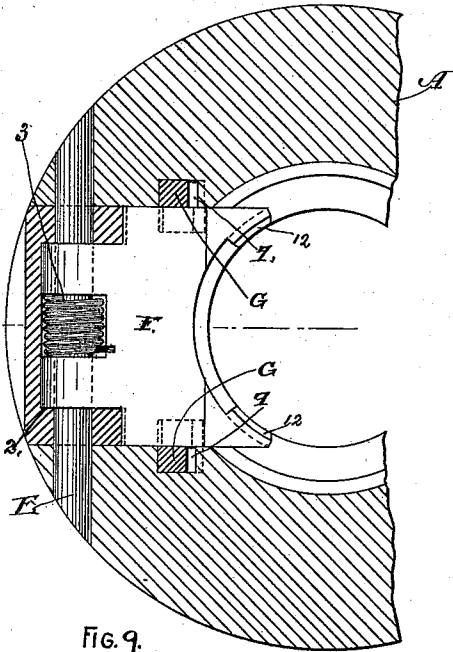


FIG. 9.

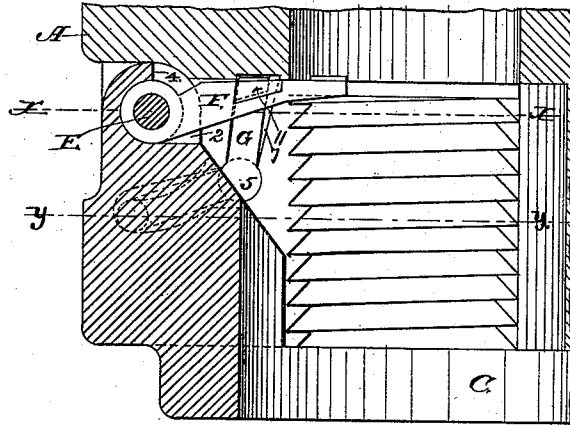


FIG. 7.

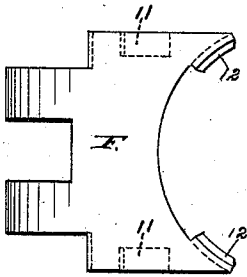


FIG. 11.

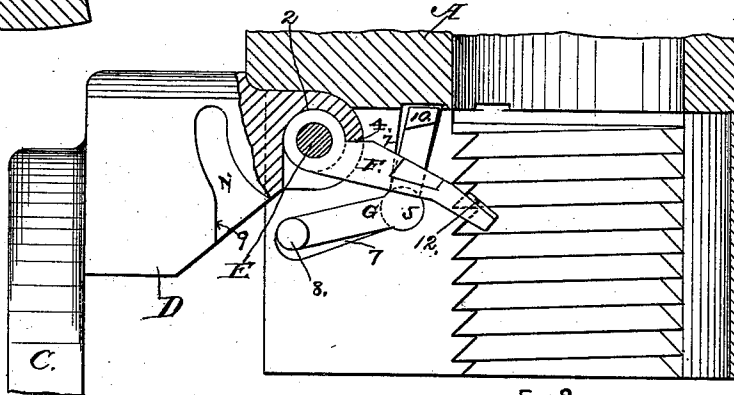


FIG. 8.

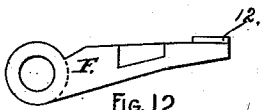


FIG. 12.

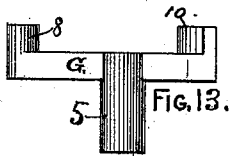


FIG. 13.

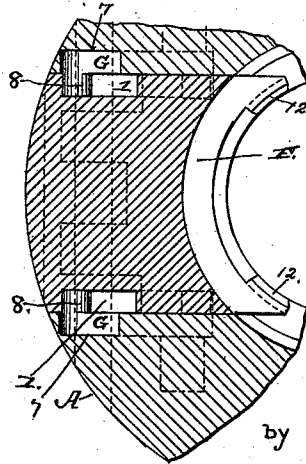


FIG. 10.

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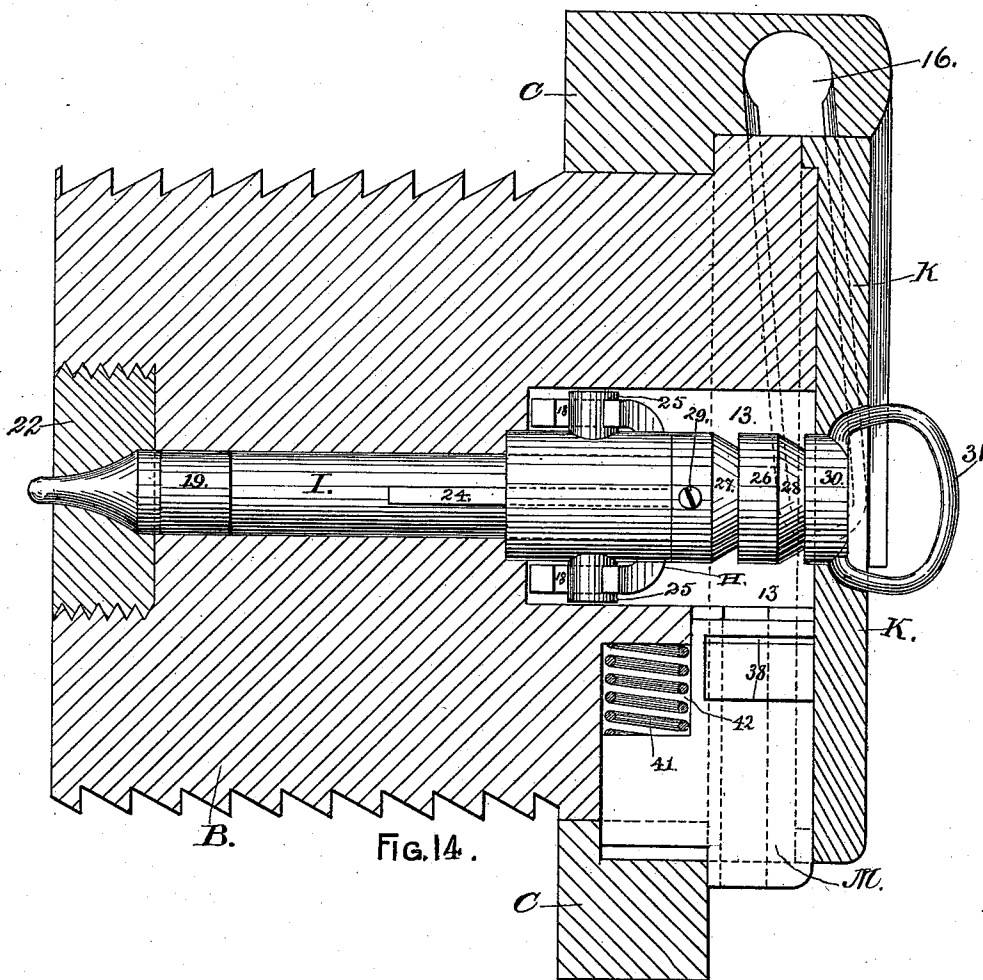
(No Model.)

3 Sheets—Sheet 3.

G. GERDOM.
BREECH LOADING ORDNANCE.

No. 466,848.

Patented Jan. 12, 1892.



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BREECH-LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 466,848, dated January 12, 1892.

Application filed December 22, 1890. Serial No. 375,441. (No model.)

To all whom it may concern:

Be it known that I, GREGORY GERDOM, of West Troy, in the county of Albany and State of New York, have invented new and useful
5 Improvements in Breech-Loading Ordnance, of which the following is a specification.

This invention relates to improvements on my invention for which Letters Patent of the United States No. 451,241 were granted to me
10 April 28, 1891.

The object of this invention is to provide the breech-piece with an automatically-set-lock mechanism for firing metallic cartridges, an automatic ejector for throwing out the
15 shells of the cartridges whose charges have been fired, and a locking mechanism for securing the breech-piece in its closed position. This object I attain by the mechanisms illustrated in the accompanying drawings, which
20 are herein referred to and form part of this specification, and in which—

Figure 1 is a longitudinal section of a breech-piece provided with my automatically-set-lock mechanism, shown in elevation with
25 the point of the firing pin or hammer protruded from the end of the breech-piece. Fig. 2 is a like section showing the hammer intruded and retained by the trigger. Fig. 3 is an end elevation of the breech-piece and
30 part of the carrier-ring, showing the trigger engaged with the hammer. Fig. 4 is a like view of the breech-piece, with its cap-plate removed therefrom. Fig. 5 is a detached side elevation of the trigger and trigger-spring.
35 Fig. 6 is a transverse section of the carrier-ring, showing the spiral groove for imparting motion to the hammer-setting lever. Fig. 7 is a longitudinal section of part of the breech of a cannon and of the carrier-ring, the
40 ejector being shown in plan view and the carrier-ring turned against the end of the breech, as when the breech-piece is shut into the breech. Fig. 8 is a like section of the breech, with part of the carrier-ring in plan view, the
45 latter being turned to carry the breech-piece out of the breech-chamber. Fig. 9 is a transverse section of part of the breech of a cannon at the line X X on Fig. 7, with the ejector, coil-spring, and hinge-pin for the carrier-ring
50 shown in elevation. Fig. 10 is a partial transverse section of Fig. 7 at the line Y Y. Fig.

11 is a rear elevation of the ejector. Fig. 12 is an edge view of same. Fig. 14 is an enlarged longitudinal section of the breech-piece, said section being taken on a line
55 transversely to the one shown in Fig. 1; and Fig. 13 is a side elevation of one of the extractor-levers.

As represented in the drawings, A designates the breech of a breech-loading cannon, 60 the same being constructed substantially as described in the specification of my Letters Patent, hereinbefore referred to. B designates a breech-piece for said cannon, which is also constructed substantially as described 65 in my former specification, above referred to, excepting in the following particulars: As shown in the drawings, said breech-piece is provided with a lock mechanism which is automatically set by the rotative movement of 70 the breech-piece preparatory to swinging the latter out of the breech-chamber of the cannon.

C designates the carrier-ring for carrying the breech-piece B. The said carrier-ring is 75 made substantially in the form and hinged to the breech of the cannon in the manner as described in my aforesaid specification, with the slight difference that, as shown in Figs. 7 and 8, the opposite edges of the hinge-arm D 80 are each provided with a curved groove 1, arranged eccentrically to the center of the hinge-pin E, and the inner end of said hinge-arm is provided with a recess 2 for receiving the hinge end of an ejector F, which is pivoted 85 to swing on the hinge-pin E for said carrier-ring. A coiled spring 3, which encircles said hinge-pin, bears against the rearward side of the ejector F for the purpose of forcing said ejector into the position shown in Fig. 7 when 90 not forced therefrom by the shoulder 4 of the carrier-ring, as shown in Fig. 8. For the purpose of imparting a slow initial motion to said ejector, extractor-levers G are pivoted, as at 5, in recesses 7, formed in the opposite walls 95 of the radial opening of the breech of the cannon. Said extractor-levers are provided with a stud 8 at one end for the purpose of engaging in the curved grooves 1 of the carrier-ring when the latter is swung into the re- 100 quired position for effecting such engagement, each of said grooves having a guiding-

face 9 to insure the entrance of said stud into the groove, and the opposite end of said lever is provided with a lug 10, which engages in a recess 11 in the corresponding edge of the ejector F. The latter is provided with lips 12, which are fitted to engage with the circumferential flange commonly formed on the rear end of the metallic cartridge-shell.

The ejector F is operated in the following manner: When the parts are in the positions shown in Fig. 7, as the carrier-ring C is swung away from the rear end of the breech of the cannon the grooves 1 of said carrier-ring will cause the extractor-levers G to oscillate on their pivots 5, so as to cause the lugs 10 to impart a slow initial motion to the ejector F, so as to start the cartridge-shell quietly from the bore of the cannon. Then by the continued movement of the carrier-ring the shoulder 4 of said ring will be brought into forcible contact with the ejector to impart a rapid movement to the latter, and thereby sufficient impetus will be given to the cartridge-shell to cast it out from the breech-chamber. In returning the carrier-ring to the position shown in Fig. 7, as soon as the shoulder 4 of said ring has been cleared from the inner face of the ejector F the spring 3 will cause said ejector to swing toward the bore of the cannon. Then as the closing movement of said ring is continued the studs 8 will enter the grooves 1 and effect the restoration of the extractor-levers G to their normal position.

The breech-piece B has a recess 13 formed in its outer end that is fitted to receive a hammer-setting lever H, which is fulcrumed on an arbor 14, fixed in a transverse position in the head of the breech-piece B. The outer end of said lever is provided with a globular head 15, which is pivoted on said lever and is fitted to engage in a spiral groove 16, formed in a segmental extension of the carrier-ring. The angle of said spiral groove is inclined in the opposite direction from the angle of the screw-threads on the breech-piece, so that the endwise movement of the breech-piece produced by said screw-threads in the operations of securing and releasing the breech-piece will impart an increased movement to the lever. Preferably the screw-threads are made with a left-hand pitch, and the spiral groove 16 has a right-hand pitch. The inner end of the hammer-setting lever is bifurcated to form arms 17, and each of said arms is provided with a slotted opening 18 at its extremity.

I designates the firing pin or hammer, which is located centrally in the breech-piece and has a sliding movement in the latter. The inner end of said hammer is reduced in diameter and protrudes from the inner end of the breech-piece B, so that the point of said hammer can be carried into forcible contact with the head of a metallic cartridge, so as to ignite the fulminate contained in the cartridge. Said hammer is provided with a radial lug 19,

that is fitted to slide in a longitudinal slot 20 in the breech-piece, and said slot forms a guide for said lug, which prevents the hammer from rotating on its axis. A spring 21 is inserted in the slot 20, and is fitted to exert its pressure against the lug 19 to force the hammer endwise into its protruded position from the inner end of the breech-piece. A screw-plug 22, provided with a center opening for allowing the point of the hammer to protrude therethrough is inserted in the inner end of the breech-piece to form a closure for the opening through the latter. A collar 23 is fitted to slide loosely on the hammer I, which is provided with a feather 24 for preventing said collar from acquiring a rotatory motion on said hammer. Said collar is provided with oppositely-located trunnions 25, which engage in the slotted openings 18 of the lever H, so as to transmit a motion from said lever to the collar 13. A second collar 26 is secured to the hammer I near its outer extremity, and the collar 26 is provided with two circumferential grooves 27 and 28, with which the end of a spring-actuated trigger J engages to retain the hammer in its intruded positions. The groove 27 forms the "full-cock" notch, and the groove 28 the "half-cock" notch on the hammer. The collar 26 should be secured on the hammer by a set-screw 29, or other means, which will allow said collar to be partially rotated on said hammer, so that when the grooves have become worn by use an unworn portion of the grooves can be presented for the reception of the trigger. A nut 30 is screwed upon the outer extremity of the hammer I and bears against the outer end of the collar 26 for the purpose of securely retaining said collar in place on said hammer. Said nut is provided with an eye 31, which affords the means for setting the hammer I by hand and for easing down the hammer when set without forcibly protruding the hammer. The trigger J is made with a concave end, which is fitted to enter either of the circumferential grooves in the collar 26, said trigger being arranged to slide in a radial direction in respect to the hammer I in a slot formed in the cap-plate K, which fits over the outer end of the breech-piece B. Said slot is beveled on its inner side to form a dovetail opening, and the opposite edges of the trigger J are made to conform thereto, so that when the cap-plate K is fixed over said trigger the latter will be prevented from escaping from its place. The inner face of the trigger is provided with a lug 32, which is fitted to slide in a groove 33, formed in the outer end of the breech-piece, and a spiral spring 34 is inserted in said groove and is arranged to exert its pressure against the lug 32, so as to force said trigger inwardly toward the hammer. The trigger J is provided with a finger-piece 35, which affords the means for drawing said trigger outwardly away from the hammer when the latter is to be released from the retention of said trigger. The cap-

plate K, which is provided with a central opening that forms a guide for the outer end of the hammer I, shuts over the outer end of the breech-piece B and forms a cover for the lock mechanism. Said cap-plate is secured in place by screws 36.

The operation of my lock mechanism is as follows: The parts being in the positions shown in Fig. 1, which is their condition after each firing of the cannon, a partial rotation of the breech-piece B, as required to effect the releasement of the screw-threads of the breech-piece from the screw-threads of the breech-chamber, will cause the outer end of the lever H to be depressed toward the end of the breech-piece, this action being effected by reason of the spiral groove 16, and the bifurcated end of said lever will move in a direction to push the collar 23 toward the outer end of the breech-piece. The collar 23 during said movement bears against the inner end of the collar 26 and effects a movement of the hammer I outwardly until the trigger J engages in the groove 27 to hold the hammer at the full-cock position. On closing the breech-piece and making a partial rotation of the same to secure the breech-piece in the breech of the cannon, the outer end of the lever H will be moved in the spiral groove 16 to restore said lever to its initial position, and thereby the collar 23 will be moved inwardly away from the collar 26, leaving the hammer I at its full-cock position, as shown in Fig. 2, and the collar 23 will be in a position where it will not interfere with the free action of the hammer to effect an explosion of a cartridge. In the position shown in Fig. 2 the spring 21 is fully compressed, so that when the trigger J is withdrawn from its engagement with the groove 27 the resilient action of said spring will forcibly protrude the point of the hammer I from the end of the breech-piece B to effect the ignition of the fulminate of the cartridge by percussive action. Until the breech-piece B is fully screwed home in the breech of the cannon the bifurcated end of the lever H will retain the collar 26 in such a position that it will prevent the hammer I from protruding sufficiently to effect the firing of the cartridge, the protrusion being prevented by reason of the collar 23 encountering the collar 26, and, for the reason last stated, my lock mechanism affords a safeguard to prevent premature explosions of the cartridges. The outer end of the breech-piece B is recessed to receive a lever L for operating the locking-bolt M, by which the breech-piece is retained in its closed position. Said recess is formed to allow the lever L to lie flush with the outer end of the breech-piece and to afford a slight lost motion for said lever, so as to effect a retraction of said locking-bolt from a notch in the carrier-ring C before said lever begins to effect the unscrewing of the breech-piece B preparatory to the opening of the breech of the cannon. The hub of the lever L is provided with a radial tooth or cog 37, which is

fitted to enter a notch 38 in the locking-bolt M in such manner that said tooth can have a slight lost motion in said notch, so as to allow the lever L to return to the position shown in Fig. 4, when the locking-bolt M is retracted from the locking-notch 38 in the carrier-ring C. The lock-bolt M is provided with a tongue 39, which slides in a groove 40 in the head of the breech. A spring 41, preferably made in a flattened spiral form, is inserted in a recess 42 of the breech-piece, where it exerts its force to push the locking-bolt M outwardly.

The operation of my locking mechanism is as follows: The locking-bolt M and lever L being in the positions shown in Fig. 4, on the first movement of the lever L to effect the unscrewing of the breech-piece from the breech of the cannon said lever will be moved before any rotative movement of said breech-piece can be effected to effect the retraction of the locking-bolt M from the locking-notch in the carrier-ring C, and thereby the breech-piece B will be left free to receive a rotatory motion. Then by the continued movement of the lever L the breech-piece will be turned to release the screw-threads of said breech-piece from the screw-threads in the breech-chamber of the cannon. On the completion of the unscrewing movement of the breech B the lever L will be in position with the cog 37 at the outer end of the notch 38, so that the spring 41 will be free to press the locking-bolt M outwardly. Then by turning the breech-piece B in a direction to screw it into the breech-chamber, as soon as the locking-bolt M has reached a position where it will coincide with the notch in the carrier-ring C, the resilient action of the spring 41 will force the locking-bolt into said notch and thereby secure the breech-piece from being rotated.

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

1. In a breech-loading cannon, the combination of a carrier-ring provided with an inclined groove in the bore thereof, a breech-piece having a partial rotation in said carrier-ring, said breech-piece being provided with a lock mechanism whose hammer is automatically set by the rotative movement of said breech-piece in said carrier-ring, the outer end of the hammer-setting lever of said lock mechanism being constantly engaged in the inclined groove of the carrier-ring, and a trigger fitted to engage with the hammer of said lock mechanism, as and for the purpose herein specified.

2. In a breech-loading cannon, the combination of a carrier-ring provided with an inclined groove, a breech-piece having a partial rotative movement in said carrier-ring, a hammer-setting lever fulcrumed in said breech-piece, said lever having its outer end engaged in the inclined groove of the carrier-ring and its inner end connected with a sliding collar on the hammer, a spring-actuated hammer having a notched head, and a trigger

fitted to engage in the head of said hammer, as and for the purpose specified.

3. In a breech-loading cannon, the combination of a carrier-ring having a hinge-arm
5 which is fitted to swing in a radial opening in the breech of the cannon, said hinge-arm being provided with curved grooves which are eccentric to the hinge-pin of said carrier-ring and with a recess fitted to receive the
10 hinge end of an ejector, extractor-levers pivoted to vibrate in recesses in the walls of said radial opening and provided with a stud fitted to engage in said curved grooves and having a lug fitted to engage with an ejector,
15 an ejector hinged to the hinge-pin of said carrier-ring and provided with lips which are fitted to engage with a cartridge-shell, the initial movement of said ejector in one direction being imparted by said extractor-levers
20 and the final movement in the same direction being effected by the hinge-arm of said car-

rier-ring, and a torsion-spring fitted to bear against said ejector, as and for the purpose herein specified.

4. In a breech-loading cannon, the combination of a carrier-ring provided with a lock- 25 ing-notch and a breech-piece having a partial rotative movement in said carrier-ring, said breech-piece having a lever pivoted thereto in such manner that a slight move- 30 ment can be imparted to said lever without affecting the breech-piece, the hub of said lever having a radial tooth fitted to engage in a spring-actuated locking-bolt which is fitted to slide in said breech-piece and to en- 35 gage in the locking-notch of said carrier-ring, as and for the purpose herein specified.

GREGORY GERDOM.

Witnesses:

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