

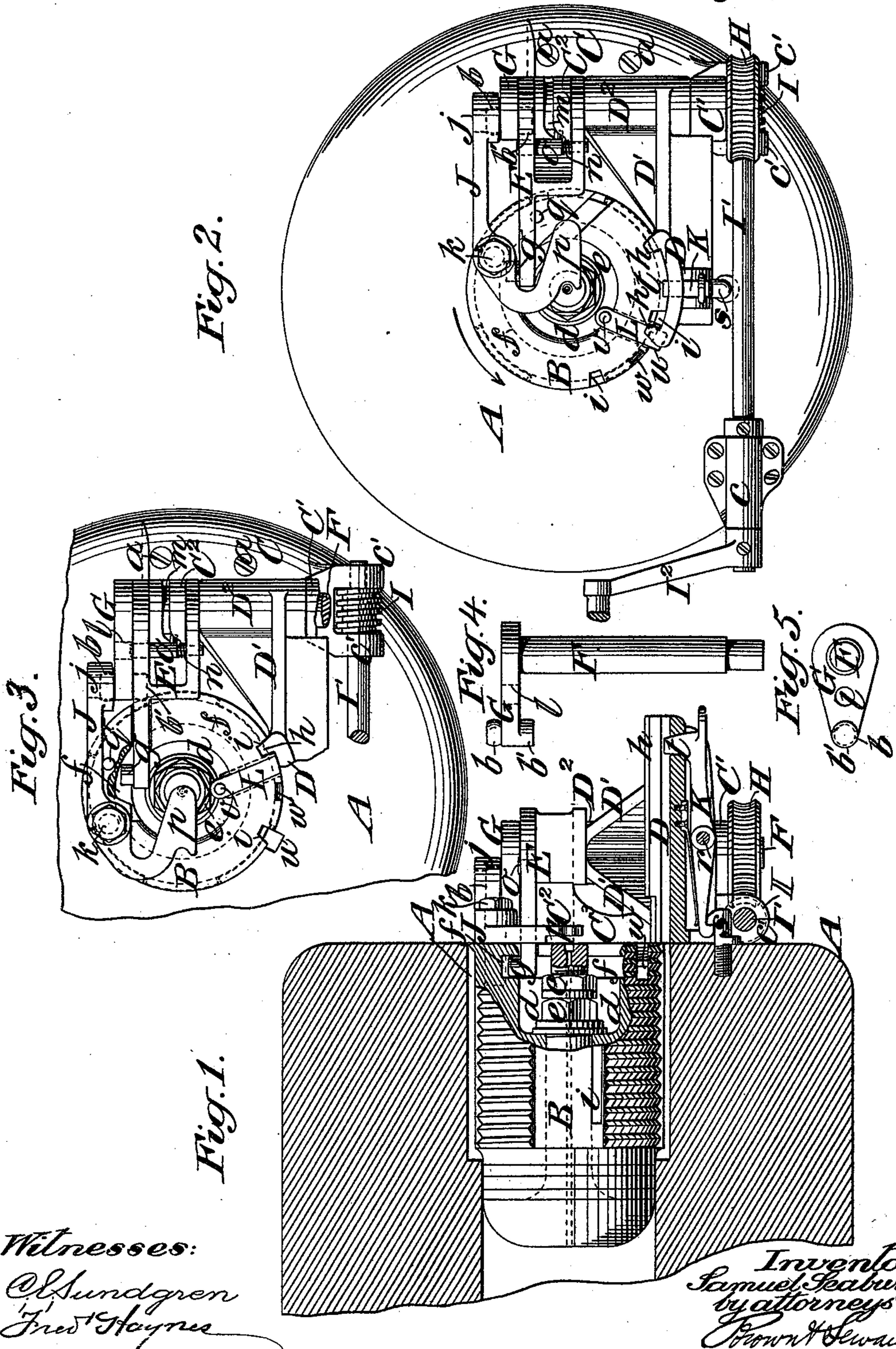
(No Model.)

2 Sheets—Sheet 1.

S. SEABURY.
BREECH LOADING CANNON.

No. 479,957.

Patented Aug. 2, 1892.



Witnesses:
O. Sundgren
Fred Haynes

Inventor:
Samuel Seabury
by attorneys
Brown & Seward

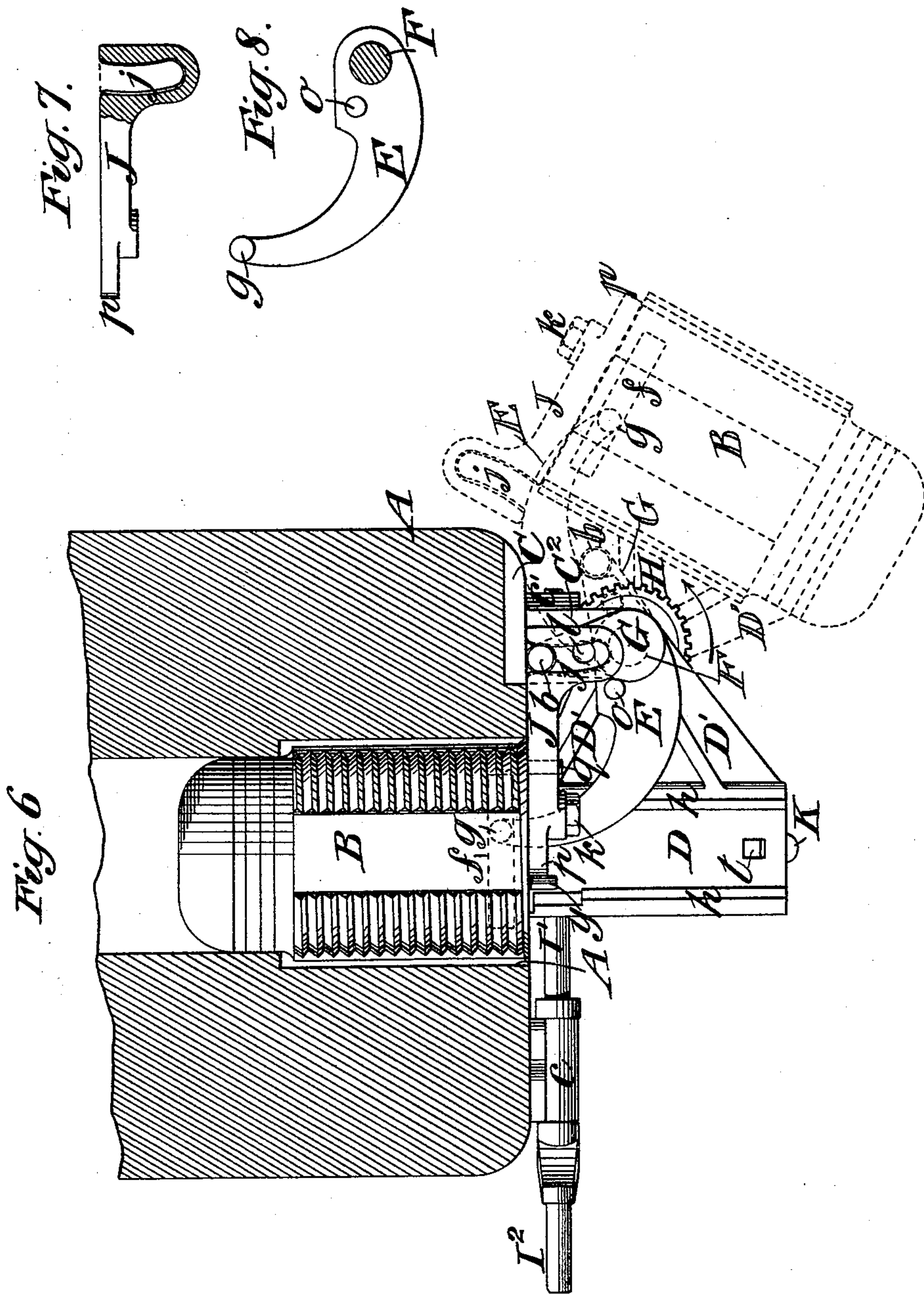
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UNITED STATES PATENT OFFICE.

SAMUEL SEABURY, OF THE UNITED STATES NAVY.

BREECH-LOADING CANNON.

SPECIFICATION forming part of Letters Patent No. 479,957, dated August 2, 1892.

Application filed February 12, 1892. Serial No. 421,337. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL SEABURY, lieutenant in the United States Navy, 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.

This invention relates particularly to breech-loading cannon in which, according to my United States Patent No. 425,584, dated April 15, 1890, a screw breech-block movable directly back and forth into the breech of the gun is employed, in combination with a swinging carrier, which is hinged to the breech of the gun and into which the said block is received when withdrawn from the breech, and with a swinging retractor, which is hinged to the breech to move independently of the said carrier for the purpose of withdrawing the said block from the breech into the said carrier and pushing it therefrom into the breech.

I will first describe my invention with reference to the accompanying drawings of the breech portion of the gun to which it is applied, and will afterward specifically point out its novelty in claims.

Figure 1 represents a central vertical section of the breech and carrier and shows the breech-block partly in section and partly in side view and screwed up. Fig. 2 is a rear view corresponding with Fig. 1. Fig. 3 is a rear view of a portion of the breech and of the breech-block and its operating mechanism, showing the breech-block unscrewed and ready to be withdrawn. Fig. 4 is a side view of the pin which constitutes the pivot of the hinge of the carrier and retractor, the said pin having affixed to its upper end a crank for operating the retractor. Fig. 5 is an inverted plan of the pin and crank. Fig. 6 represents a horizontal section of the breech of the gun and a plan of the breech-block and its operating mechanism. Fig. 7 is a plan view, partly in section, of the rotator by which the turning of the breech-block is effected. Fig. 8 is a plan of the breech-block retractor.

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

A is the breech, bored, screw-threaded, and grooved to receive a mutilated screw-threaded breech-block B, which is represented as of ordinary pattern externally, the said breech and

block having, preferably, four longitudinal grooves that the block may be unscrewed and screwed up by one-eighth of a turn.

C C' C² C³ designate a hinge-bracket affixed to the breech for the purpose of attaching the breech-block carrier D D' D² and the breech-block retractor E, the said bracket consisting of a plate C, which is dovetailed into the breech, two arms C' C² projecting rearwardly from said plate, and a strengthening-web C³ between said plate and arms. The dovetailed plate C of the said bracket is secured to the breech by screws *a a*.

F is the hinge-pin, upon which the breech-block carrier D D' D² and breech-block retractor E are fitted to swing freely, the said pin having forged in the same piece with it or otherwise affixed to its upper end a crank-arm G, which carries two wrist-pins *b b'*, one above and the other below, the upper one *b* being for the purpose of unscrewing and screwing the breech-block, and the lower one *b'* being for the purpose of operating the breech-block retractor E. The said pin F is fitted to turn freely in the fixed arms C' C² of the hinge-plate. The lower end of the said pin is represented as having securely affixed to it a worm-gear H, which engages for the purpose of turning it with an endless screw I on the horizontal shaft I', which is fitted to bearings *c c' c'* on the breech, the said bearings *c' c'* consisting of lugs projecting from lower arm C' of the hinge-bracket. This shaft I' is represented as furnished with a hand-crank I², by which it is turned for the purpose of turning the hinge-pin to produce the operations of the breech mechanism.

J is what I term the "breech-block rotator" for screwing up and unscrewing the breech-block. This rotator consists of a rod or bar for connecting the breech-block with the upper wrist-pin *b* of the crank G, the said rod or bar having at one end a curved hook or slotted yoke with an open mouth and being permanently attached to the upper part of the rear of the breech-block by a pivot *k*, which is screwed into the block. The hook or yoke *j* receives within it and engages with the crank wrist-pin *b*. The sides of this pin have a rounded profile, and the transverse section of the sides of the hook or yoke *j* are made of corresponding form to accommodate the slight

vertical oscillation which the rotator J has upon the pivot *k* in the turning movement of the breech-block produced through it by the action of the crank G.

5 As during the movement of the hinge-pin F and crank G, which takes place after the unscrewing of the breech-block and prior to screwing it in again, the rotator J is disengaged from and unsupported by the crank, I provide on the back of the breech-block for the support of the said rotator at such times a projection *q*, represented as a pin screwed into the block. This pin supports the rotator, as shown in Fig. 3, in position for its re-engagement with the crank G by the entry of the wrist-pin *b* into its open mouth of its hook or yoke. From that end of the rotator J which is connected with the breech-block there projects downward a tail-piece or extension *p* to serve as a safety-cover for the vent in the breech-block or gas-check.

The rear end of the breech-block is shown as having a central recess *d* to receive the nuts *e e* on the stem of the gas-check, and inside of this recess is a circumferential groove *f*, (shown in section in Fig. 1, and also shown in Fig. 3 by breaking away part of the rear of the block, and shown in Figs. 2 and 6 in dotted outline,) for the reception and engagement of a wrist or pin *g*, which projects upward from the extremity of the breech-block retractor E, the said wrist or pin by operating in the said groove serving to retract the block, and the groove providing for the turning of the block to unscrew it and screw it up without interference with the said retractor, which consists of an arm fitted to swing horizontally upon the hinge-pin F, and which is represented in Figs. 2 and 3 as bifurcated or having two leaves where the hinge-pin passes through it, so that it connects with the said pin above and below the upper arm C² of the stationary hinge-bracket. The said retractor is moved back to withdraw the breech-block by the pressure of the crank-wrist *b'* against its front edge; but as the said wrist will not operate to return the retractor, I here provide, as described in my hereinbefore-mentioned Letters Patent, the return-bolt *o*, which works up and down through guide-holes provided for it in the two leaves of the retractor-arm and into and from a hole *l*, provided for it in the crank G, the said movement being produced by a lateral projection on the said bolt working in a cam groove in the rounded end of the bracket-arm C². I have shown a spring *n* applied to the said bolt to push it upward.

The breech-block carrier D D' D² consists of a tray D, of a common form, to serve as a seat for the breech-block, arms D' D', to the end of which the said tray is attached, and a hub D², from which the said arms project and which is fitted to turn on the hinge-pin between the retractor E and the arm C' of the stationary hinge-bracket. The said tray D has at its sides, as is common, longitudinal parallel guides *h* for the purpose of guiding

the breech-block during its withdrawal from and return to the breech, the said block being provided with grooves *i i*, which come opposite the said guides when the breech-block is unlocked. For locking the carrier to the breech of the gun at all times, but when it is required to take breech-block away therefrom, and for locking the breech-block in the tray of the carrier after it has been withdrawn from the breech into said tray, I provide a tray-latch, such as is well known and is described in my hereinbefore-mentioned Letters Patent, consisting of a hooked lever K, which is pivoted by a pin *r* to the tray D of the carrier and engaging with a hook *s*, affixed to the breech, the said latch being disengaged from the said hook to liberate the carrier by the rear end of the breech-block passing over its upward projection *t*, which projects through an opening in the tray, and the block being afterward locked in the tray by the entrance of the said projection *t* into the notch *w*, provided in the block for its reception.

To lock the breech-block when it is screwed up, I provide what I term a "gravity locking-latch," consisting of a bolt L, having dovetail edges and fitted to work easily in a nearly radial groove of corresponding dovetail form in the rear face of the breech-block. The outer end of this bolt when the breech-block is screwed up drops into a notch *u* in the counter bore or screw-box of the breech, as shown in Fig. 2. Before the unscrewing of the breech-block the said bolt or latch has to be lifted up out of the notch *u* by a handle *v*, provided on it for the purpose, and held so lifted while the block is turned far enough for the end of the said bolt or latch to be supported within the counter bore of the breech, as shown in Fig. 3.

Having now described the construction and separate operations of the several parts of the breech-block and its operating mechanism, I will now proceed to describe the operations for loading and firing the gun.

The gun having been fired and left with the parts of the mechanism in the position in which they are represented in Fig. 2 and in bold outline in Fig. 6, to open the breech, first raise the latch L out of the recess *u*. Then turn the shaft I' by means of the hand-crank I² in the direction to cause the endless screw I to turn the worm-gear H and the hinge-pin F and crank G in the direction of the arrow shown near the hinge in Fig. 6. During the first portion of this movement of the hinge-pin the upper crank-wrist *b*, working in the yoke or hook *j* of the rotator J, produces the turning of the breech-block to the left, as indicated by the arrow shown near it in Fig. 2. When by this movement the block is unscrewed and ready to be withdrawn from the breech, the lower wrist *b'* of the crank comes against the retractor E, and the continued turning of the hinge-pin and crank produces, through the operations of the said wrist *b'* on the retractor and of the wrist

5 *g* of the retractor in the slot *f* of the breech-
 block, a complete withdrawal of the said
 block from the breech into the tray D of the
 carrier, which is now first unlocked from the
 10 breech by the passage of the block over the
 projection *t* of the tray-latch K and then
 locked to the breech-block by the entrance of
 the projection *t* into the notch *w*. By the
 15 further continued turning of the hinge-pin
 the wrist *b'*, continuing in action on the re-
 tractor, pulls back the breech-block and with
 it the carrier until the block and the whole
 of the mechanism are thrown aside to the po-
 sition shown in dotted outline in Fig. 6, leav-
 20 ing the breech completely open for loading.
 Prior to the commencement of the move-
 ments above described for opening the breech
 the tail-piece *p* of the rotator J left the
 vent uncovered, as shown in Fig. 2; but by
 25 the unscrewing of the breech-block the vent
 is brought behind the said tail-piece, as shown
 in Fig. 3, where it remains during the remain-
 der of the opening movements and until the
 breech-block has been again inserted into and
 30 screwed up within the breech, the tail-piece
 thus serving as a safety-cover to the vent at
 all times but when the breech-block is screwed
 up. When in the movement of the crank G
 the lower crank-wrist *b'* has come into con-
 35 tact with the retractor and begins to move it
 and the breech-block, the rotator J, owing to
 its superior speed, due to the difference in
 radial length between the retractor and the
 crank, disengages itself from the wrist *b*, the
 40 yoke and hook *j* in the rotator being made
 open at the end to allow the said wrist to
 pass out. During that part of the movement
 of the crank G which takes place before the
 wrist *b'* begins to act on the retractor the re-
 45 turn-bolt *o* is held down by the groove *m* in
 the arm C² of the hinge-bracket and the crank
 passes over the upper end of said bolt until,
 as the wrist *b'* arrives at the retractor, the
 hole *l* in the crank arrives over the said bolt,
 50 which, as the retractor moves back, is raised
 by its lateral projection running in the said
 groove *m*, and is thereby caused to engage
 the retractor with the crank ready for the
 return movement of the breech-block. To
 55 close the breech, the movement of the hand-
 crank J² is reversed. The return movement
 then takes place as follows: The whole of the
 breech-block-operating mechanism swings
 back, and as the tray D of the carrier with
 the breech-block in it arrives at the breech of
 the gun the tray-latch K is stripped from the
 60 block by the hook-stud *s*, and the continued
 movement of the retractor E with the hinge-
 pin F and its crank G pushes the breech-
 block back into the gun. When this position
 is reached, the return-bolt *o* has been nearly
 withdrawn from the crank-arm by its move-
 65 ment in the groove *m* of the hinge-bracket
 arm C², and the further turning movement
 causes the return-bolt to be withdrawn from

the crank G. As the crank is thus released
 from the retractor, its wrist *b* operates in the
 yoke or hook *j* of the rotator J, (the rotator
 having overtaken the crank-wrist *b* while the
 block was being pushed into the gun,) and
 70 pulling the latter to the right turns the block
 from the position shown in Fig. 3 to that
 shown in Fig. 2, thus completing the closing
 of the breech. As soon as the breech-block
 is screwed up the gravity-latch L drops into
 75 its notch *u* in the gun, and upon firing the
 gun takes the strain of the turning effort,
 thus relieving the various parts of the breech-
 block-operating mechanism. The endless
 screw I and worm-wheel H effect another
 80 lock always in action should its latch L be
 dispensed with. The vent is uncovered, as
 shown in Fig. 2, by the final movement of
 the breech-block and the rotator during the
 operation of screwing up, and a primer may
 85 then be inserted in the vent. Although the
 vent is covered by the rotator at all times ex-
 cept when the breech-block is screwed up, it
 is not thus rendered inaccessible for clearing
 when the breech is open, for, should the clear-
 90 ing be necessary, by lifting the hooked end
 of the rotator the tail-piece or safety-cover *p*
 may be carried clear of the vent. Only de-
 sign, however, will enable this to be done. It
 cannot occur through accident. 95

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

1. The combination, with a breech-loading
 cannon and a breech-block for the same which
 has both a rotary and a backward-and-for- 100
 ward movement, a swinging carrier for said
 breech-block, and a hinge-pin attached to the
 breech and constituting a pivot upon which
 the said carrier swings, of a crank on said
 pin and a bar or rod pivoted to the breech- 105
 block and having a hook or slotted yoke en-
 gaging with a wrist of said crank, substan-
 tially as and for the purpose herein set forth.

2. The combination, with a breech-loading
 cannon and a breech-block for the same which 110
 has both a rotary and a backward-and-for-
 ward movement, a swinging carrier for said
 breech-block, a swinging retractor for draw-
 ing the breech-block into the carrier and push-
 ing it therefrom into the gun, and a hinge- 115
 pin attached to the breech and constituting
 a pivot on which said carrier and retractor
 swing independently of each other, of a bar
 or rod pivoted to the said breech-block and
 having a curved slotted yoke or hook and a 120
 crank on the hinge-pin having two wrists, one
 of which engages with the said slotted yoke
 or hook for turning the breech-block and the
 other engages with the retractor for with-
 drawing the breech-block from the gun, sub- 125
 stantially as herein set forth.

3. The combination, with the breech-load-
 ing cannon and a breech-block which has both
 a rotary movement and a backward-and-for- 130
 ward movement in the breech thereof and in

which there is a circumferential groove, of a breech-block retractor hinged to the breech and engaging in said groove in the breech-block, substantially as and for the purpose ; herein set forth.

4. The combination, with a breech-loading cannon and a breech-block having a turning movement therein, of a pin pivoted to the breech, a crank on said pin, and a bar or rod, which is pivoted to the breech-block and connects the crank therewith and a portion of which covers and leaves uncovered the vent in the breech-block as the latter is turned in

one direction or the other, substantially as herein set forth.

5. The combination, with the breech of a breech-loading cannon and a screw breech-block fitted to the same, of a locking-bolt fitted to slide in a substantially radial groove in the said block and engaging in a notch within the breech when the block is screwed up, substantially as herein specified. 15 20

SAMUEL SEABURY.

Witnesses:

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GEORGE BARRY.