

(No Model.)

4 Sheets—Sheet 1.

J. B. G. A. CANET.
BREECH LOADING GUN.

No. 474,288.

Patented May 3, 1892.

Fig. 1.

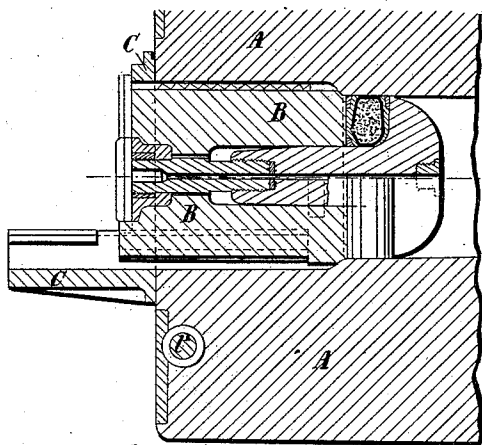


Fig. 6.

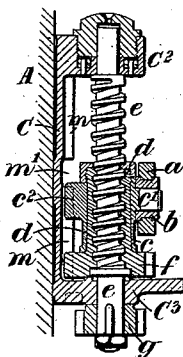


Fig. 7.

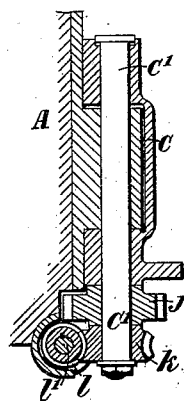
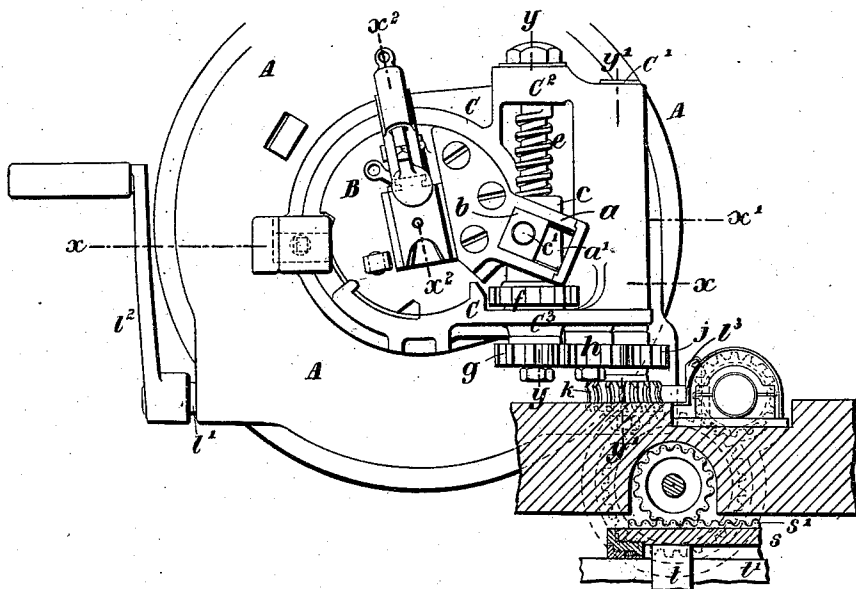


Fig. 2.



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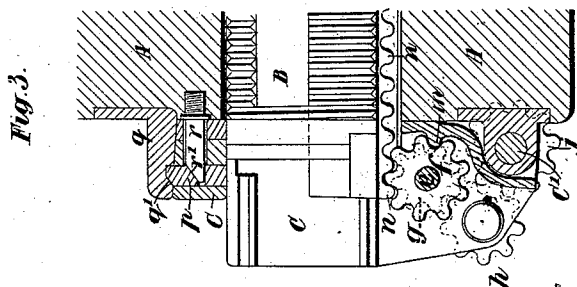
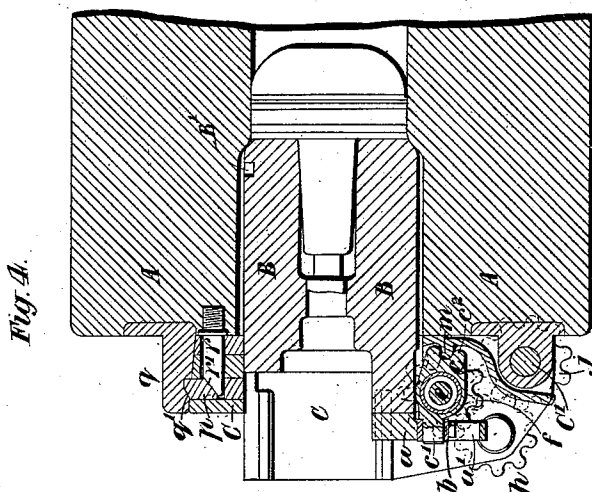
(No Model.)

4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

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Fig. 5.

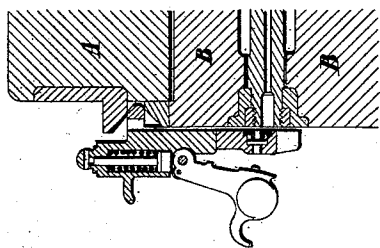


Fig. 8.

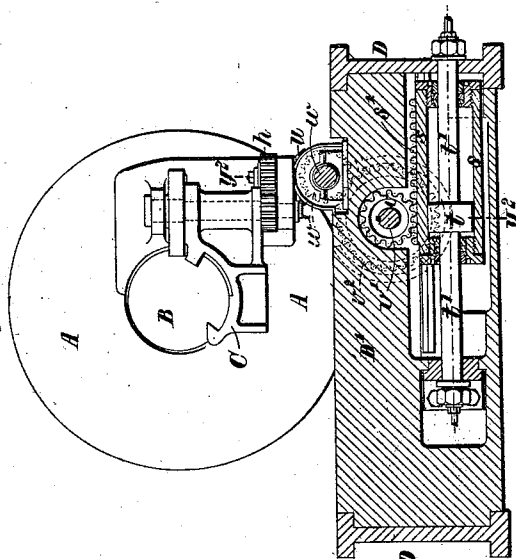


Fig. 10.

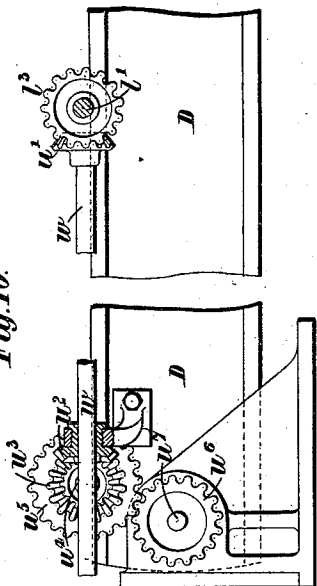
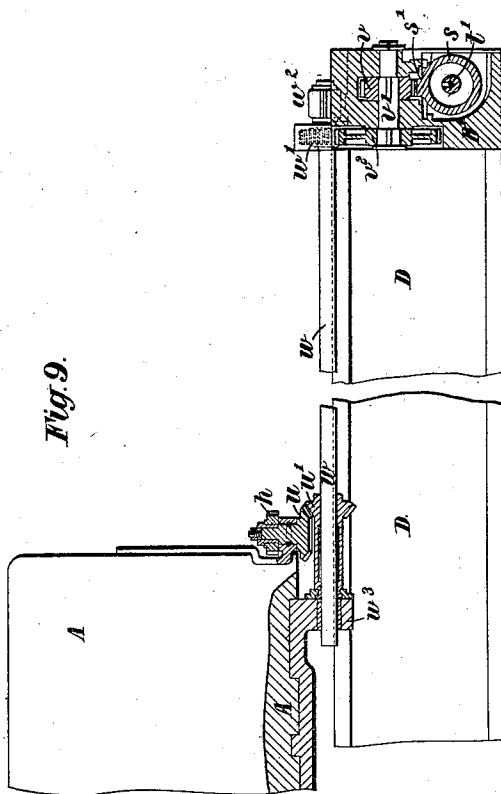


Fig. 9.



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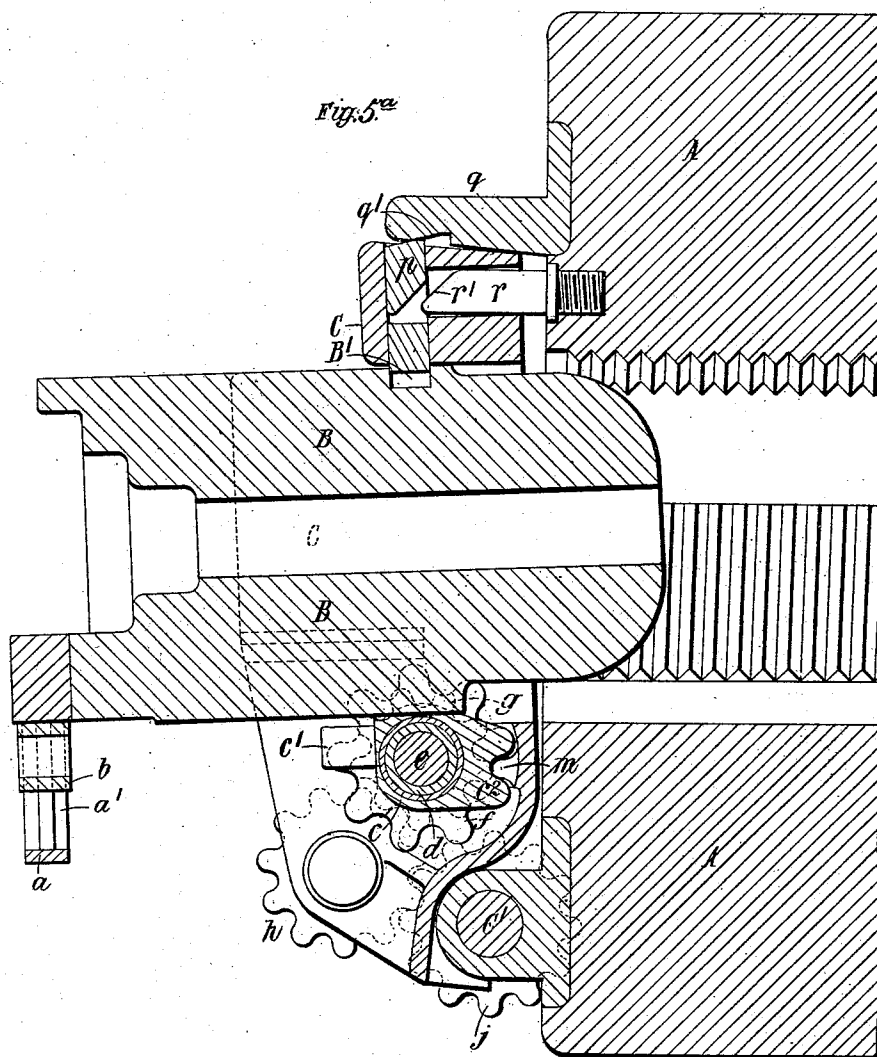
(No Model.)

4 Sheets—Sheet 4.

J. B. G. A. CANET.
BREECH LOADING GUN.

No. 474,288.

Patented May 3, 1892.



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UNITED STATES PATENT OFFICE.

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OF OPENSHAW, ENGLAND.

BREECH-LOADING GUN.

SPECIFICATION forming part of Letters Patent No. 474,288, dated May 3, 1892.

Application filed February 18, 1889. Serial No. 300,299. (No model.) Patented in France June 7, 1887, No. 184,079, and in England July 12, 1887, No. 9,813.

To all whom it may concern:

Be it known that I, JEAN BAPTISTE GUSTAVE ADOLPHE CANET, engineer, a citizen of the Republic of France, and a resident of Paris, France, have invented certain new and useful Improvements in Breech-Loading Guns, (for which I have obtained patents in the following countries: in France, No. 184,079, dated June 7, 1887, and in Great Britain, No. 9,813, dated July 12, 1887,) of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to guns of the kind or class wherein the breech is closed by a breech-screw provided with an interrupted screw-thread adapted to engage with a corresponding interrupted screw-thread in the breech of the gun.

My said invention comprises means whereby the disengagement and withdrawal of the breech-screw from the breech and the swinging of the said breech-screw, with its supporting-bracket, about the hinge or pivot of the latter, so as to leave the breech clear for loading, may be effected by the continued movement of a crank-handle or other operating device in one direction and the closing of the breech may be effected by the movement of the said crank-handle or other operating device in the reverse direction.

My said invention also comprises means whereby the bracket for supporting the breech-screw will be locked to the gun until the said breech-screw is disengaged and withdrawn from the breech and will then be unlocked from the gun, so that it is free to turn with its supporting-bracket about the hinge or pivot of the latter, and at the same time the breech-screw will be locked to the said bracket.

My said invention also comprises means for opening and closing the breech by hydraulic power whatever may be the position of the gun upon its slide.

In the accompanying drawings I have shown how my said invention may be conveniently and advantageously carried into practice.

Figure 1 is a vertical longitudinal central section of part of a gun having my present improvements applied thereto. Fig. 2 is a

rear elevation of the said gun. Fig. 3 is a horizontal section on the line xx , Fig. 2, the breech-screw being shown in plan. Fig. 4 is a horizontal section on the line $x'x'$, Fig. 2, the breech-screw being shown in the position which it occupies when disengaged from the screw-thread in the breech. Fig. 5 is a section on the line x^2x^2 , Fig. 2. Fig. 5^a is a view similar to Fig. 4, showing the breech-screw and its bracket or carrier partly turned about the hinge-joint of the latter to move them away from the breech. Fig. 6 is a vertical section on the line yy , Fig. 2. Fig. 7 is a vertical section on the line $y'y'$, Fig. 2. Fig. 8 is a rear elevation, partly in transverse section, illustrating another form or modification of my invention. Fig. 9 is a vertical section on the line y^2y^2 , Fig. 8; and Fig. 10 is a side elevation illustrating a further modification of my said invention.

A is the body of the gun; B, the breech-screw; C, the bracket for supporting the said breech-screw when out of the breech. This bracket is hinged or pivoted at C' to the body of the gun.

The breech-screw B is provided with an extension or lug a , formed with a groove a' . A block or bearing b is fitted to slide to and fro in this groove, and in the said sliding block or bearing works a pin or stud c' , formed on or rigidly attached to a sleeve c . A nut d is fitted to rotate in the sleeve c , and in this nut works a screw-shaft e . This screw-shaft is fitted to rotate in suitable bearings C² C³ in the bracket C, but is prevented from endwise movement therein. The nut d has formed on its lower end a toothed pinion f , for the purpose hereinafter specified.

A toothed pinion g is fixed upon the screw-shaft e below the bearing C³ and is geared by means of an intermediate toothed wheel h with a toothed pinion j , mounted upon the pivot-pin C' of the bracket C. The said pinion j has formed therewith or firmly attached thereto a worm-wheel k , with which is geared a worm or endless screw l , fixed upon a shaft l' , carried in bearings in the breech of the gun and provided with a crank-handle l^2 for operating it. The shaft l' is in some instances

provided with a bevel-pinion l^3 , whereby it is connected with suitable mechanism for operating the breech by hydraulic or other power. In this case the crank-handle l^2 may be dispensed with.

The sleeve c is formed with a toothed projection c^2 , which engages with a rib or projection m , formed on the bracket C , for the purpose of guiding the said sleeve in its up-and-down movement and preventing its rotation with the nut d . The said rib or projection m , moreover, engages with the pinion f and prevents rotation of the said pinion until the latter is raised, as hereinafter described, sufficiently to bring it opposite a slot or gap m' in the said rib m . As the width of this slot is slightly greater than the thickness of the pinion f , the latter will then be free to rotate with the nut d and screw-shaft e , as hereinafter specified; but the said slot or gap is not of sufficient width to permit the disengagement of the sleeve c from the said rib.

The breech-screw B is provided with a longitudinal toothed rack n , Fig. 3, with which the pinion f is adapted to engage, as hereinafter described, for the purpose of withdrawing the said breech-screw from the breech.

I provide the device hereinafter described whereby the bracket C will be locked to the breech of the gun while the breech is closed, and as soon as the breech-screw is withdrawn from the breech the said bracket will be unlocked from the latter and the breech-screw locked to the said bracket, and whereby in the operation of closing the breech, after the breech-screw is swung into position to enter the breech, the said breech-screw will be unlocked from the bracket C and the latter again locked to the breech. This locking device comprises a bolt p , which is fitted to slide in a slot in the bracket C . One end of this bolt is adapted to enter a notch in a projection or lug q , formed on or firmly attached to the body of the gun, when the breech is closed and the said bolt is at one extremity of its movement, as in Fig. 4. The other end of the said bolt is adapted to enter a notch B' in the breech-screw when the latter is withdrawn from the breech and the said bolt is at the other extremity of its movement, as in Fig. 5^a. The notch in the projection q is made with an inclined surface q' , and a stud r , provided with an inclined surface r' , is firmly fixed in the body of the gun. The bolt p is made with corresponding inclined surfaces, so that it will be automatically operated in the opening and closing of the breech, as hereinafter specified.

To open the breech, the shaft l' is rotated in the proper direction by means of the crank-handle l^2 or otherwise. Motion is thus transmitted through the worm l , worm-wheel k , and toothed wheels jhg to the screw-shaft e , which by its rotation raises the nut d , pinion f , and sleeve c . The pin or stud c' of the sleeve c , acting upon the extension or lug a of the breech-screw, turns the said breech-screw about its axis and disengages it from the

screw-thread in the breech of the gun. As soon as this disengagement is effected the upper end of the sleeve c abuts against the bearing C^2 and the pinion f arrives opposite the slot m' in the rib m and gears with the rack n on the breech-screw. The nut d and pinion f then rotate with the screw-shaft e , the said nut turning in the sleeve c , and the breech-screw is thus withdrawn from the breech. The bolt p up to this moment has served for firmly locking the bracket C to the breech of the gun. At the termination of the rearward movement of the breech-screw in the said bracket the pinion f abuts against the extremity of the rack n , thus preventing further rotation of the said pinion and the screw-shaft e about their common axis, and the notch B' in the breech-screw is in line with the bolt p . In the continued rotation of the shaft l' the pinion j , acting upon the intermediate wheel h , turns or swings the bracket C , together with the breech-screw, about the hinge or pivot C' . At the commencement of this movement the bolt p , being acted upon by the inclined surface q' , is disengaged from the projection q . The bracket C is thus unlocked from the breech of the gun, so that it can turn freely about its hinge or pivot C' , and the bolt p is at the same time caused to enter the notch B' in the breech-screw, thereby locking the said breech-screw to the bracket C , as in Fig. 5^a.

It will be seen from the foregoing description that the rotation of the breech-screw about its axis, its withdrawal from the breech, and the swinging of the bracket about its hinge or pivot take place in succession during the rotation of the crank-handle in one direction. The closing of the breech is effected by the continued rotation of the said crank-handle in the reverse direction. It will be seen, moreover, that in the opening of the breech the movement of the bolt p in one direction is effected automatically by the inclined surface q' when the rearward movement of the breech-screw is arrested by the contact of the pinion f with the extremity of the rack n , which prevents further rotation of the said pinion f . In the closing of the breech the movement of the sliding bolt p in the reverse direction is effected by the inclined surface r' .

To provide for the opening and closing of the breech by hydraulic power, I employ a hydraulic cylinder s , provided with a piston t , the rod t' of which extends through both ends of the said cylinder and is firmly secured between the pivoted beams or other supports upon which the gun is arranged to slide. The cylinder s , which is capable of longitudinal movement, is provided with a rack s' . This rack is connected by a suitable train of gearing with the bevel-wheel l^3 , as shown in Fig. 2, or with a bevel-wheel u , fixed on the shaft of the pinion h , as in Figs. 8 and 9.

In the modification of my invention illustrated in Figs. 8 and 9 the rack s' is geared with a pinion v , fixed on a shaft v' . This shaft

is carried in bearings in a cross-piece or transom D', connecting the pivoted beams D. A toothed wheel v^2 is also fixed on the shaft v' and is geared with a pinion w' , fixed on a shaft w , which is supported in a bearing w^2 , attached to the said transom, and in a bearing w^3 , movable with the gun. A bevel-wheel u' is mounted upon the shaft w and is geared with the bevel-wheel u . The bevel-wheel u' is connected with the shaft w by means of a key fitting in a long keyway in the said shaft, so that although the said bevel-wheel u' must rotate with the shaft w it can slide longitudinally with the gun in the recoil and return movements of the latter. Therefore the opening and closing of the breech can be effected by means of the said hydraulic apparatus, whatever may be the position of the gun upon the pivoted beams D and whatever may be the angle of elevation of the gun.

In the modification of my invention shown in Fig. 10 I provide for accomplishing this result by the employment of the following mechanism—that is to say, the bevel-wheel u^3 is geared with a bevel-wheel u' , fixed upon a shaft w , which is supported in bearings attached to the gun or to the cradle or carriage in which it is mounted, so that the said shaft will move with the gun. A bevel-wheel u^2 is mounted upon the shaft w and is so connected therewith that the said bevel-wheel u^2 will rotate with the shaft, but the said shaft can slide longitudinally in the said bevel-wheel, the latter being supported in a bearing attached to one of the pivoted beams D. The bevel-wheel u^2 is geared with another bevel-wheel u^3 , fixed upon a shaft w^4 , which is supported in bearings also attached to the said pivoted beam and upon which is fixed a toothed wheel w^5 . This toothed wheel w^5 is geared with another toothed wheel w^6 , fixed upon a shaft w^7 , which serves as the pivot for the said beams D and which is arranged to be operated by manual power or by means of suitable hydraulic or other apparatus. By this arrangement the mechanism for opening and closing the breech may be operated whatever may be the position of the gun upon the said beams or its angle of elevation. Moreover, the operating-handle does not require to move with the gun in its recoil and return movements.

My improvements are applicable to all guns provided with means for opening and closing the breech by the continued movement in one or the other direction of gear-wheels or of a screw-shaft fitted to rotate in suitable bearings but restrained from endwise movement, and the construction of my improved mechanism may be modified according to the construction and arrangement of the devices for operating the breech-screw and its supporting bracket.

What I claim is—

1. In a breech-loading gun, the combination, with the breech-screw and the pivoted bracket for supporting the same, of a grooved or slot-

ted extension or lug on the said breech-screw, a block or bearing arranged to slide in the said grooved or slotted extension, a screw-shaft fitted to rotate in bearings in the said bracket, a nut working on the said screw-shaft, and a sleeve secured upon the said nut and provided with a pin or stud working in the said sliding block or bearing, substantially as and for the purposes set forth.

2. In a breech-loading gun, the combination, with the breech-screw and the pivoted bracket for supporting the same, of a block or bearing fitted to slide in a groove or slot in an extension of the said breech-screw, a screw-shaft fitted to rotate in bearings in the said bracket, a nut on the said screw-shaft having formed with it a pinion adapted to gear with a longitudinal rack on the breech-screw, a sleeve on the said nut provided with a pin or stud working in the said sliding block or bearing, a pinion fixed upon the said screw-shaft, a pinion mounted on the pivot of the said bracket and geared with the pinion on the said screw-shaft, and means for rotating the said pinion on the pivot of the bracket, substantially as and for the purposes set forth.

3. In a breech-loading gun, the combination, with the breech-screw B and the pivoted bracket C, of the grooved or slotted extension a and rack n on the said breech-screw, the sliding block or bearing arranged to move in the groove or slot of the said extension, the screw-shaft e , the nut d , working thereon, the pinion f , attached to the said nut and adapted to gear with the said rack n on the breech-screw, a sleeve c on the said nut, provided with a pin or stud c' , working in the said sliding block or bearing, a pinion g , fixed on the said screw-shaft, a pinion j , mounted on the pivot C' of the said bracket and geared with the said pinion g , and means, substantially such as above described, for imparting rotary motion to the said pinion j , all substantially as and for the purposes set forth.

4. In a breech-loading gun, the combination, with the breech-screw and the pivoted bracket for supporting the same, of locking mechanism comprising a bolt fitted to slide in the said bracket and adapted to enter a notch in the breech-screw when the latter is withdrawn from the breech, substantially as and for the purposes above specified.

5. In a breech-loading gun, the combination, with the breech-screw and the hinged or pivoted bracket for supporting the same, of a locking-bolt which slides in the said bracket, a projection or lug on the body of the gun, provided with a notch, into which the said bolt is adapted to enter, and with an inclined surface which when the said bracket is swung about its pivot to open the breech disengages the bolt from the said notch and causes it to enter a notch in the breech-screw, and a pin or stud fixed in the body of the gun, which when the said bracket is swung about its pivot to close the breech disengages the said bolt from the breech-screw and causes it to

enter the notch in the said projection or lug, substantially as and for the purposes above specified.

6. In a breech-loading gun arranged to re-
5 coil upon a beam or slide, the combination,
with a breech-screw having interrupted
threads and a bracket or carrier hinged to
the gun for supporting the said breech-screw
when out of the breech, of breech-opening
10 mechanism comprising a shaft supported in
bearings attached to the said bracket or car-
rier, a pinion fixed on the said shaft, an op-
erating-shaft, and gearing connecting the said
operating-shaft with the said pinion and com-
15 prising a toothed wheel rotatively connected

with but free to slide longitudinally upon a
shaft parallel to the longitudinal axis of the
gun, whereby the opening and closing of the
breech can be effected whatever may be the
position of the gun upon its beam or slide 20
and whatever may be the angle of elevation
of the gun.

In testimony whereof I have hereunto signed
my name in the presence of two subscribing
witnesses.

JEAN BAPTISTE GUSTAVE ADOLPHE CANET.

Witnesses:

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