

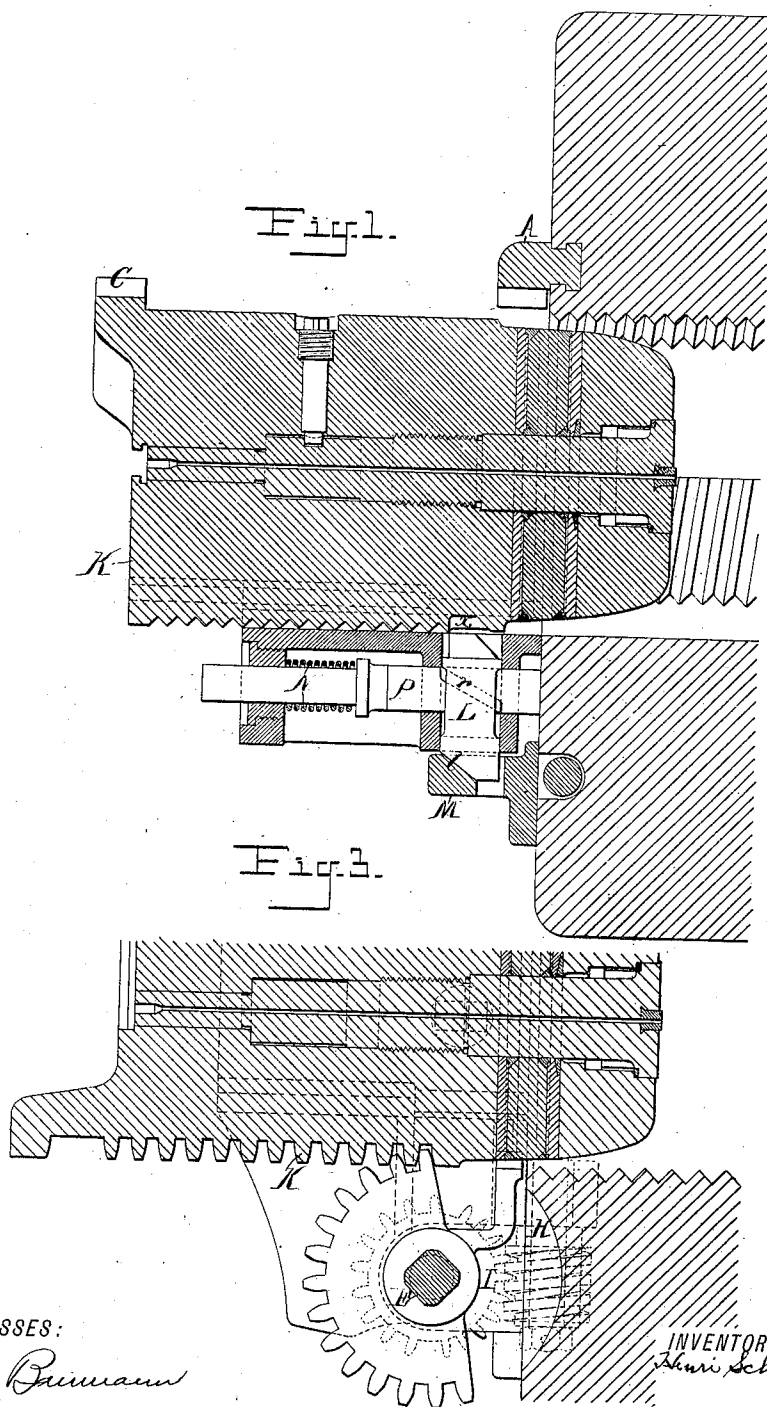
(No Model.)

4 Sheets—Sheet 1.

H. SCHNEIDER.
BREECH CLOSING MECHANISM FOR ORDNANCE.

No. 464,678.

Patented Dec. 8, 1891.



WITNESSES:

George Baumann
John Revell

INVENTOR
H. Schneider

BY
Howson and Howson
his ATTORNEYS

(No Model.)

4 Sheets—Sheet 2.

H. SCHNEIDER.

BREECH CLOSING MECHANISM FOR ORDNANCE.

No. 464,678.

Patented Dec. 8, 1891.

Fig. 2.

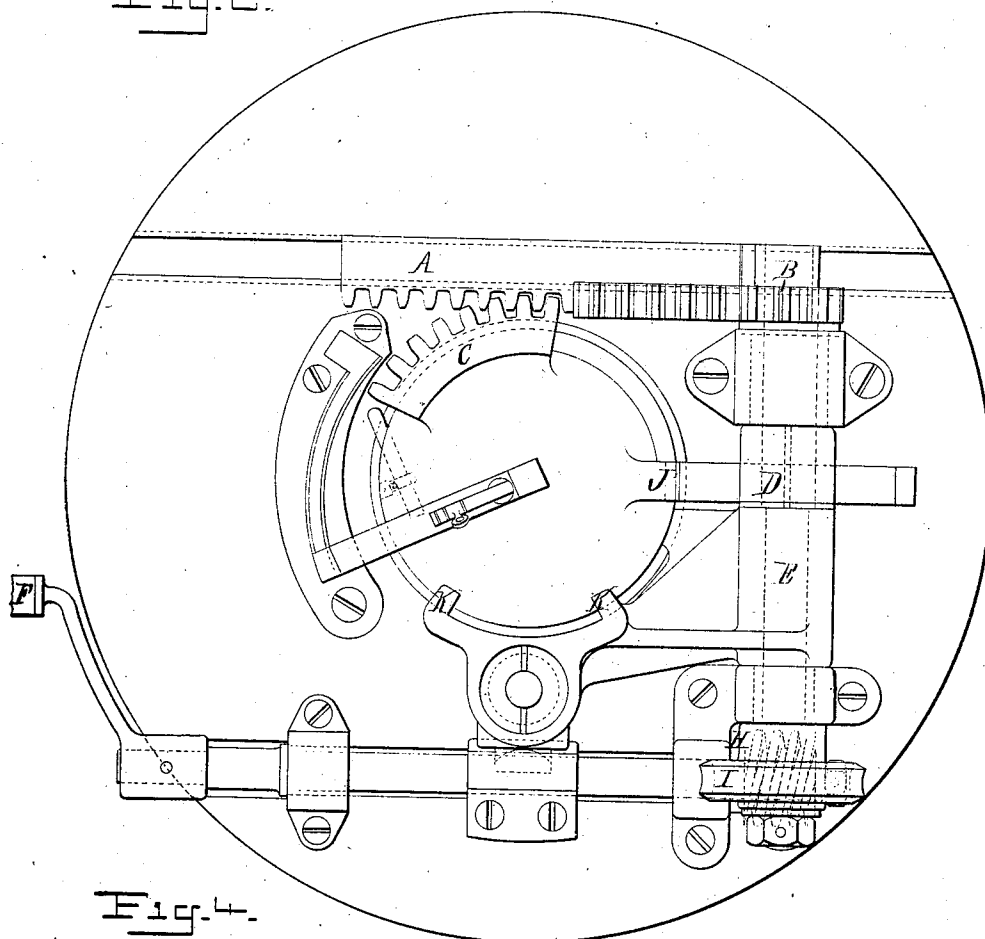
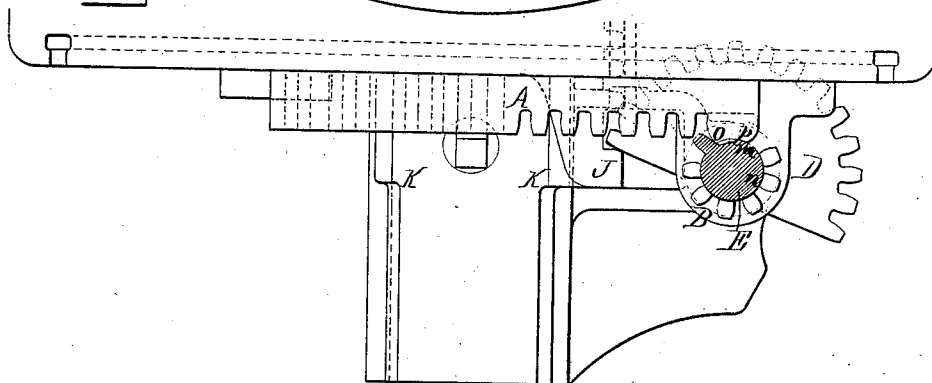


Fig. 4.



WITNESSES:

George Baumann
John Revell

INVENTOR

Henri Schneider

BY

Howson and Howson
his ATTORNEYS

(No Model.)

4 Sheets—Sheet 3.

H. SCHNEIDER.
BREECH CLOSING MECHANISM FOR ORDNANCE.

No. 464,678.

Patented Dec. 8, 1891.

Fig. 5.

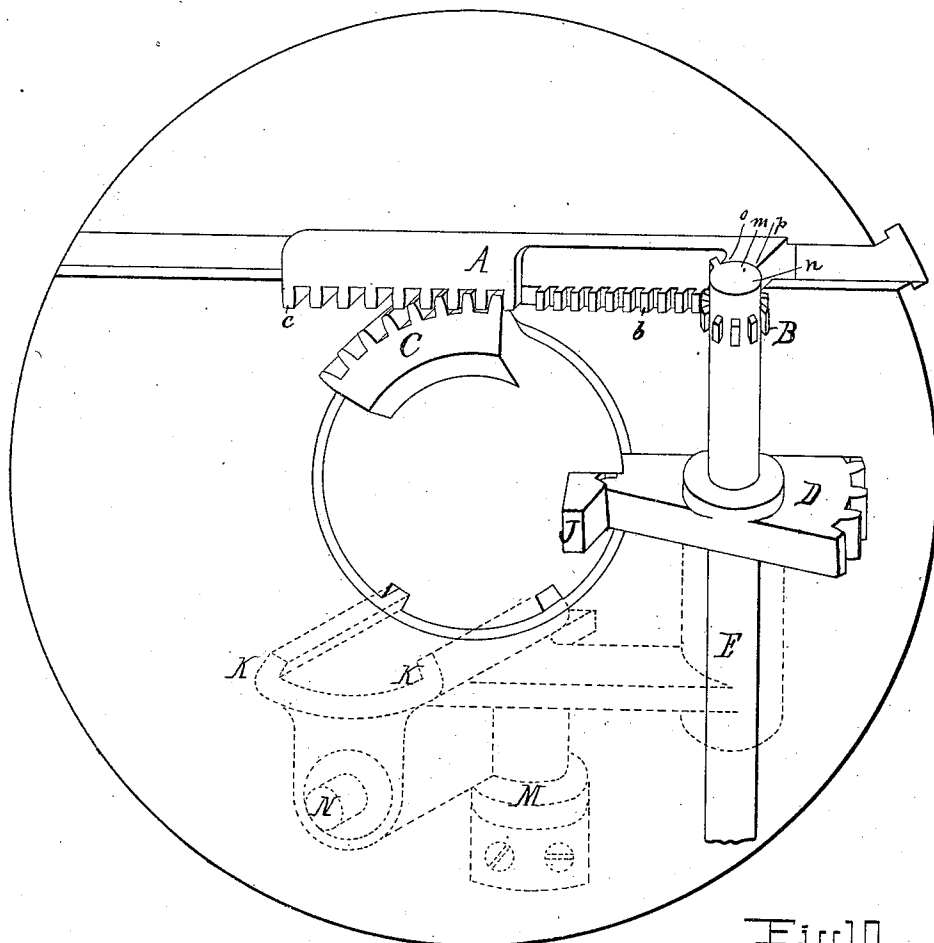
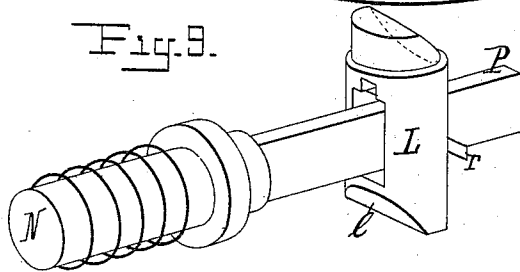


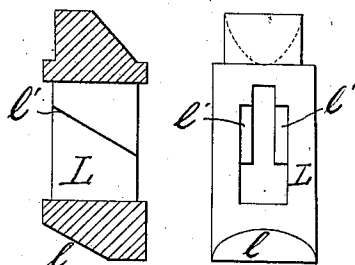
Fig. 9.



WITNESSES:

George Baumann
John Revell

Fig. 10.



INVENTOR

Henri Schneider

BY

Horsey and Horsey
his ATTORNEYS

(No Model.)

4 Sheets—Sheet 4.

H. SCHNEIDER.

BREECH CLOSING MECHANISM FOR ORDNANCE.

No. 464,678.

Patented Dec. 8, 1891.

Fig. 5.

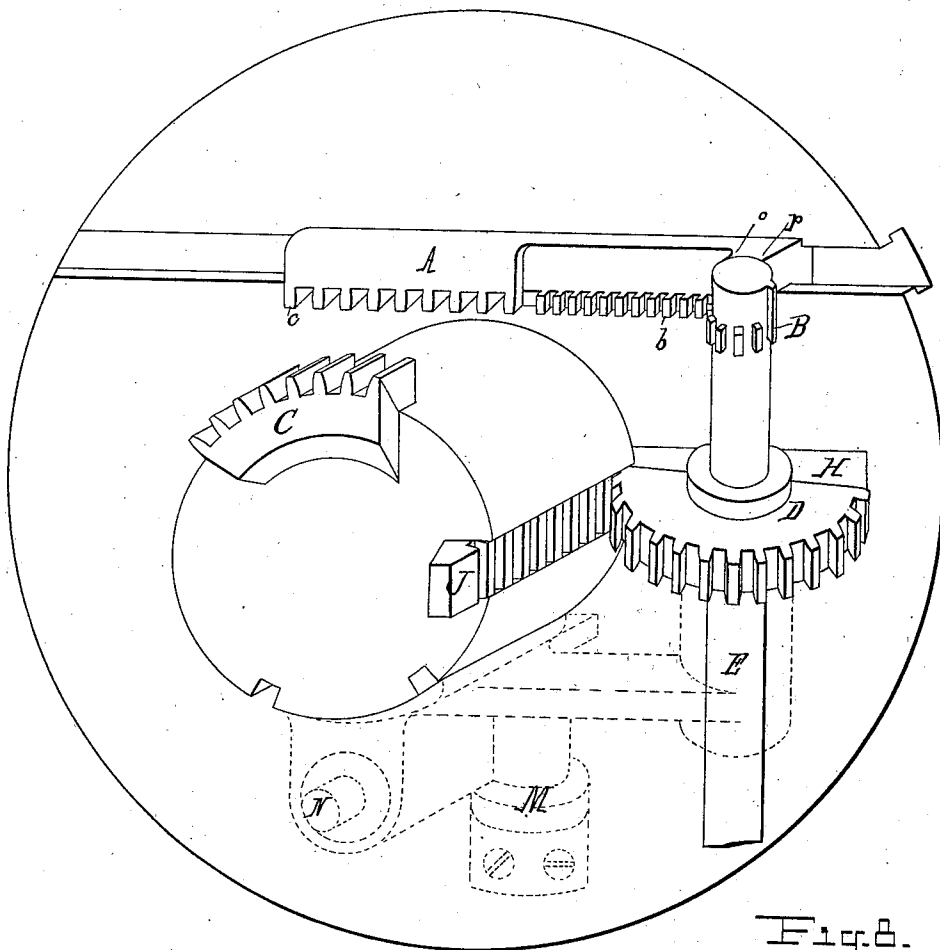


Fig. 6.

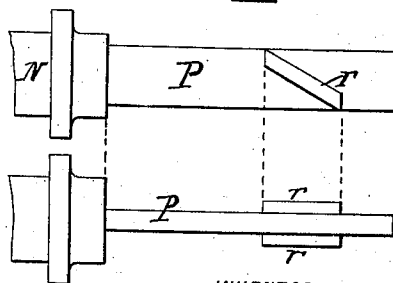
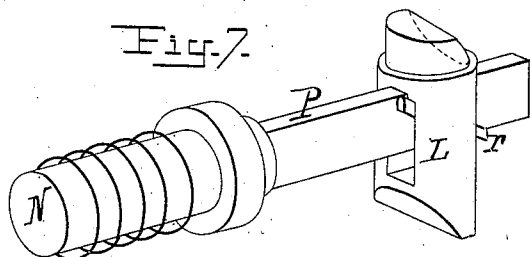


Fig. 7.



WITNESSES:

George Baumann
John Revell

INVENTOR

Henri Schneider

BY
Horvath and Horvath
his ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRI SCHNEIDER, OF PARIS, FRANCE, ASSIGNOR TO SCHNEIDER & CO., OF
SAME PLACE.

BREECH-CLOSING MECHANISM FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 464,678, dated December 8, 1891.

Application filed January 9, 1891. Serial No. 377,205. (No model.)

To all whom it may concern:

Be it known that I, HENRI SCHNEIDER, iron-master, of "Le Creusot," (Saône-et-Loire,) of Paris, 56 Rue de Provence, in the Republic of France, have invented certain Improvements in the Breech-Closing Mechanism of Ordnance, of which the following is a specification.

This invention relates to improvements in the breech-closing mechanism of ordnance.

In heavy guns the operations of opening and closing the breech by hand present great difficulties and sometimes even impossibilities, owing to the great weight of the breech and bracket support. The breech-closing mechanism, according to this invention, enables the breech of a piece of ordnance to be opened and closed with great facility by means of a continuous rotary movement.

In the accompanying drawings, Figure 1 represents the mechanism in vertical section. Fig. 2 is a front elevation of the same. Fig. 3 is a horizontal section through the axis of the barrel, and Fig. 4 represents the mechanism in plan. Figs. 5 and 6 are perspective views of the mechanism. Figs. 7, 8, 9, and 10 are enlarged views of the locking device.

The breech-screw has interrupted threads—such as are employed in the French artillery and in a certain number of foreign artilleries. When this screw is disengaged from the barrel, it is supported by a brass bracket. The breech opening and closing mechanism is composed, essentially, of two racks A and J, placed at right angles and worked by two pinions of different diameters keyed upon the same shaft. The upper rack A, which has two sets of teeth, moves in a recess formed in the rear face of the breech. It receives movement from the small pinion B on the shaft E and transmits it to the breech-screw in order to produce one-sixth of the revolution in one direction or in the other by the intervention of a quadrant C, fixed on the breech-screw. (See Fig. 5.) The lower pinion D is provided with teeth for about one-half of a circle only. The two pinions are keyed upon their common shaft E at such an angle that when the pinion B quits its rack A the lower pinion D engages with the second rack J in the side of the breech-screw.

A special arrangement of the upper pinion B enables the corresponding rack A to be rendered immovable during the withdrawal or return of the screw and the rotation of the bracket, and insures at the same time the re-engagement of the rack and its gearing in the rotation of the pinion in the opposite direction. With this object the teeth of the pinion B, with the exception of one tooth, extend over one-half only of the height of the pinion, and the teeth on the rack A also extend but one-half of the height of the rack. At the extremity of the rack is formed a projection having a concave outer surface *o p*, adapted to engage with the cylindrical part *n m* on the upper part of the pinion B; Figs. 4, 5, and 6.

The breech is opened by causing the shaft E common to the two pinions to partake of a continuous rotary motion, and the breech is closed by rotating the said shaft in the opposite direction. In guns of large size this rotation is obtained by means of a worm-wheel I on the shaft E and a worm H on a horizontal shaft, which is provided with a crank-handle F. (See Fig. 2.)

The bracket K, mounted loosely on the hinge E, is held stationary until the breech-screw is drawn fully out by a bolt L, engaging with a sear M on the barrel. Fig. 10 shows a side section and a full view of this bolt, which is formed of a cylindrical piece having oppositely-beveled ends. It is freely mounted in the bracket K and tends to descend by itself into the sear M. Through the center of the bolt is an opening having inclines *l'* to be acted upon by projections *r r* on the counter-bolt P. Fig. 8 is a side elevation and a plan of this counter-bolt.

When the breech-screw is closed, the bolt P, which passes through the opening in the bolt L, is pressed against the face of the breech against the action of its spring N. In this position (shown in Figs. 1 and 7) the inclines *r r* allow the bolt L to descend, so that its lower end enters the sear M and locks the bracket K to the gun-barrel.

To open the breech the crank-handle F is moved continuously in one direction, and through the medium of the worm H and worm-wheel I, Fig. 2, the hinge E is rotated. At

the beginning of the rotation the pinion B, gearing with the teeth *b*, moves the rack A. The teeth *c*, gearing with the teeth of the quadrant C, cause the screw to describe one-sixth of a revolution by means of the quadrant C. When the sixth of a revolution is completed, the pinion B leaves its rack. The lower pinion D, which up to this moment has rotated without gearing, becomes engaged with its rack J. The rotation of the hinge E continuing, the pinion D exerts force upon the rack J and compels the breech-screw to move out of its chamber. During this period the cylindrical part *m n* of the upper pinion engages with the corresponding cylindrical part *o p* of the rack A. The breech-screw, being moved completely out of its chamber, rests upon the bracket. The projection on the bracket having reached the ends of the grooves in which they work on the breech-screw the breech-screw cannot move farther along on the bracket, and as the pinion D continues to move it causes the breech-screw to exert a pull on the bracket and rotate it on the hinge E. At the moment when the breech-screw is completely withdrawn an opening *z*, Fig. 1, therein comes directly over the upper end of the bolt L. As soon as the bracket begins to rotate, the bolt L, by means of its lower bevel, rides out of the sear M and the upper end of the bolt enters the opening *z*. Then as the bracket K leaves the face of the breech the counter-bolt P is released and the inclines *r r*, passing under the inclines *v v* in the bolt L, lock the bolt L in its upper position, (shown in Fig. 9,) which locks the bracket to the breech-screw. By these means in the closing movement the breech-screw cannot be pushed into its chamber until after the bolt P has been returned to its place by coming in contact with the rear face of the breech and allowing the bolt L to be depressed. The continuous movement of rotation of the hinge-shaft is thus converted into two reciprocating rectilinear movements, one that which causes the engagement or disengagement of the screw, the other that which causes the displacement of the breech-screw, and also into a movement of rotation causing the bracket and the screw to oscillate upon the hinge in order to clear the opening of the breech.

The materials, proportions, forms, and di-

mensions, as well as the accessory arrangements hereinbefore described, may be modified according to circumstances.

I claim as my invention—

1. Mechanism for opening and closing breech-guns, consisting of two racks, one rack operating loosely in a groove in the rear face of the breech and provided with two sets of teeth, the other connected to the breech-screw, a toothed quadrant carried by the breech-screw and adapted to mesh with one set of teeth on the loose rack, and two pinions on the same shaft, one to operate each rack, substantially as set forth.

2. The combination, in a breech-loading gun, of a breech-screw and a bracket to support the breech-screw, with a locking device to first lock the bracket to the breech and then the bracket to the breech-screw, the said locking device consisting of a bolt L, working loosely in the bracket, and a counter-bolt to lock the bolt L in either position, substantially as set forth.

3. The combination, in a breech-loading gun, of a breech-screw and a bracket to support the breech-screw, with a locking device consisting of a sear on the breech, a bolt with oppositely-beveled ends and provided with an opening through the center, the said opening having inclines, and a spring-actuated counter-bolt passing through the opening in the bolt, the counter-bolt having inclined projections to act on the inclines in the bolt, as and for the purposes set forth.

4. Breech-closing mechanism consisting of a rack provided with two sets of teeth and working loosely in the rear face of the breech, a rack on the side of the breech-screw, a toothed quadrant on the breech-screw, a shaft E, carrying two pinions to operate the said racks and provided with a worm-wheel I, a supporting-bracket mounted loosely on the shaft E, and a shaft provided with a crank-handle and a worm H, gearing with the wheel I, all substantially as set forth.

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

HENRI SCHNEIDER.

Witnesses:

ROBT. M. HOOPER,
CHARLES BRENOR.