

E. OLSSON.
BREECH LOADING MECHANISM FOR ARTILLERY GUNS.
APPLICATION FILED MAR. 23, 1909.

1,040,001.

Patented Oct. 1, 1912.

5 SHEETS—SHEET 1.

Fig: 1.

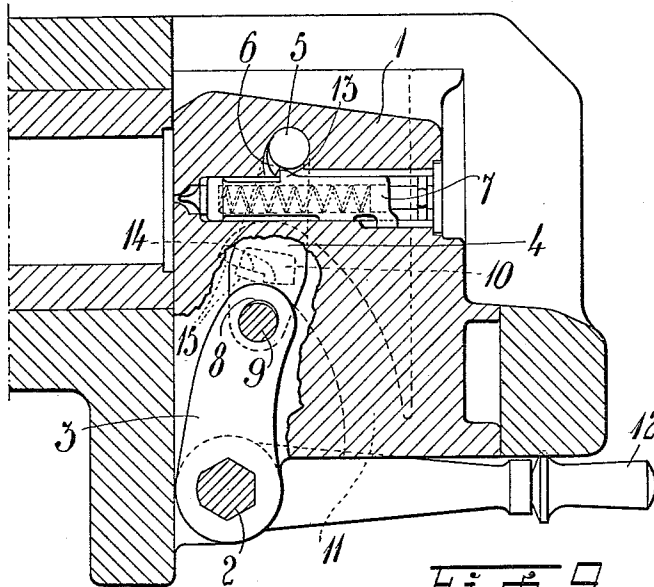
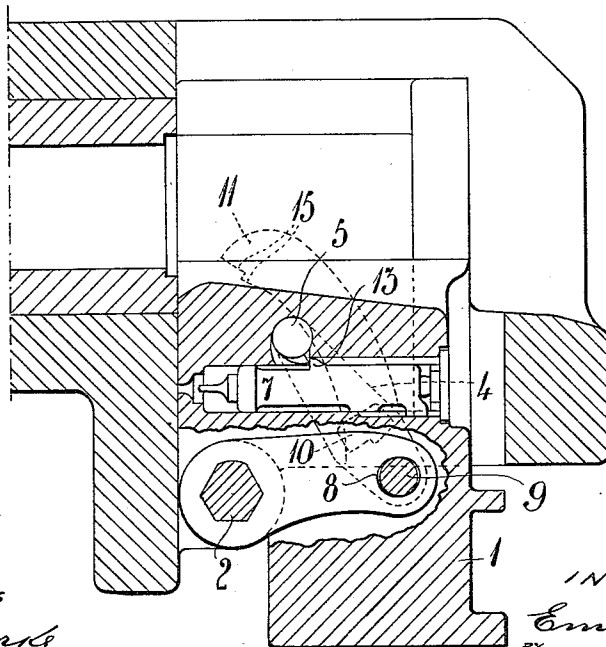


Fig: 2.



WITNESSES
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Emil Olsson
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5 SHEETS—SHEET 2.

Fi 3.

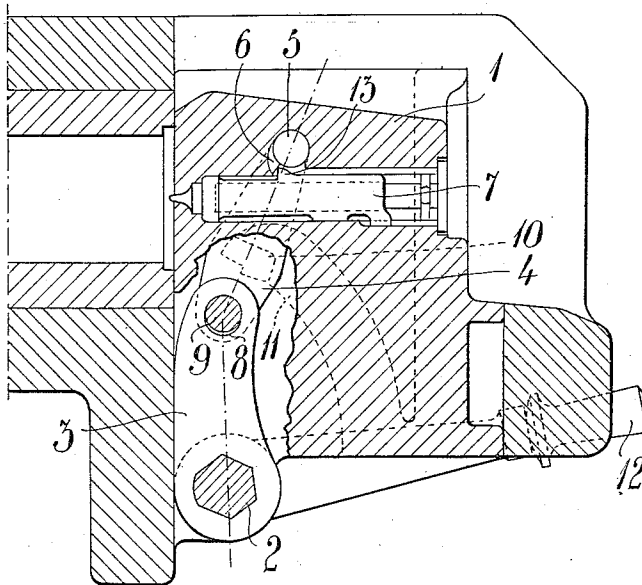
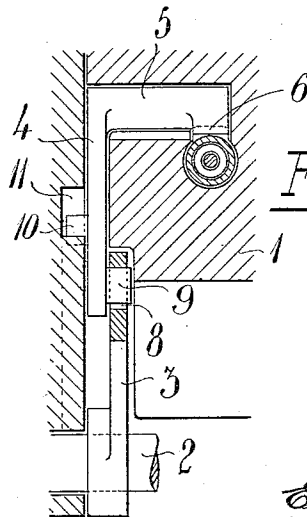


Fig: 4.



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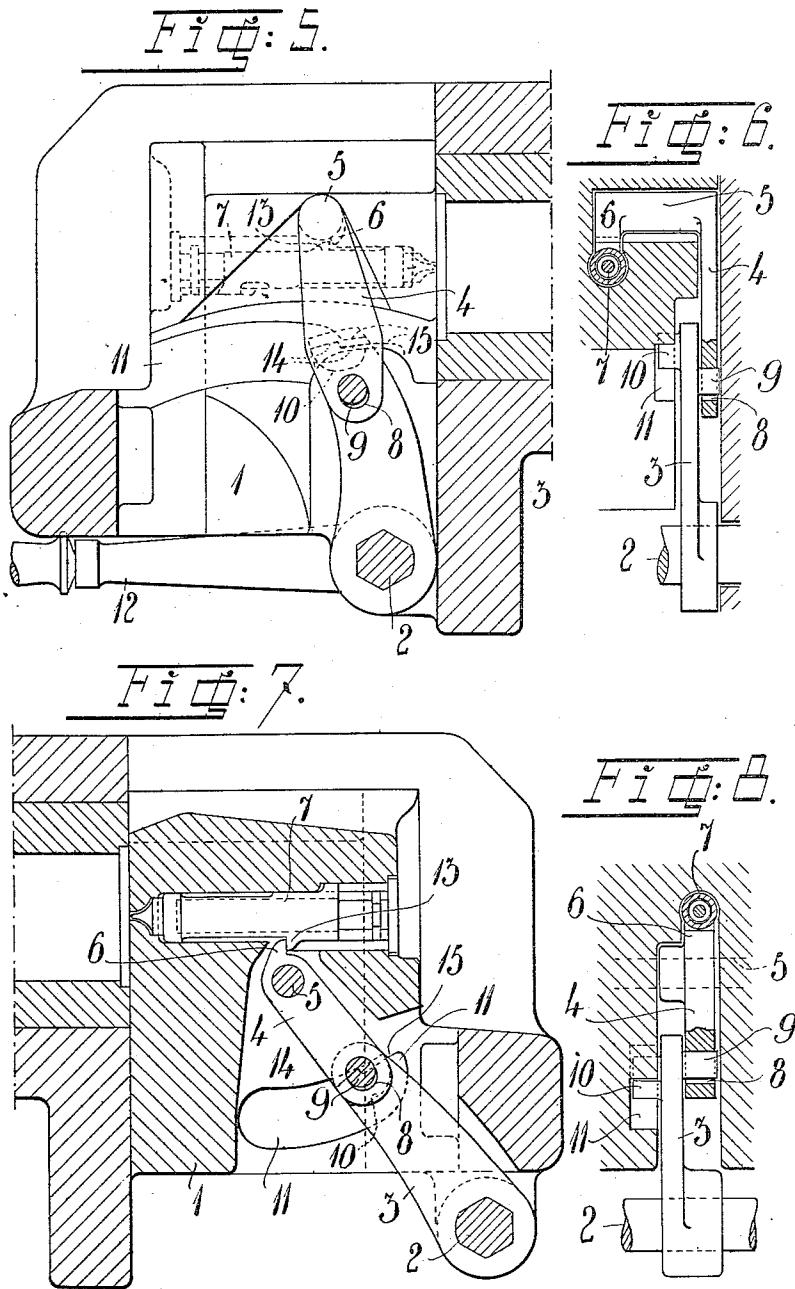
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WITNESSES

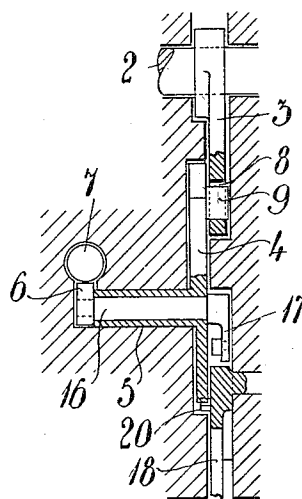
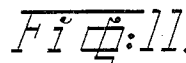
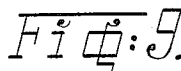
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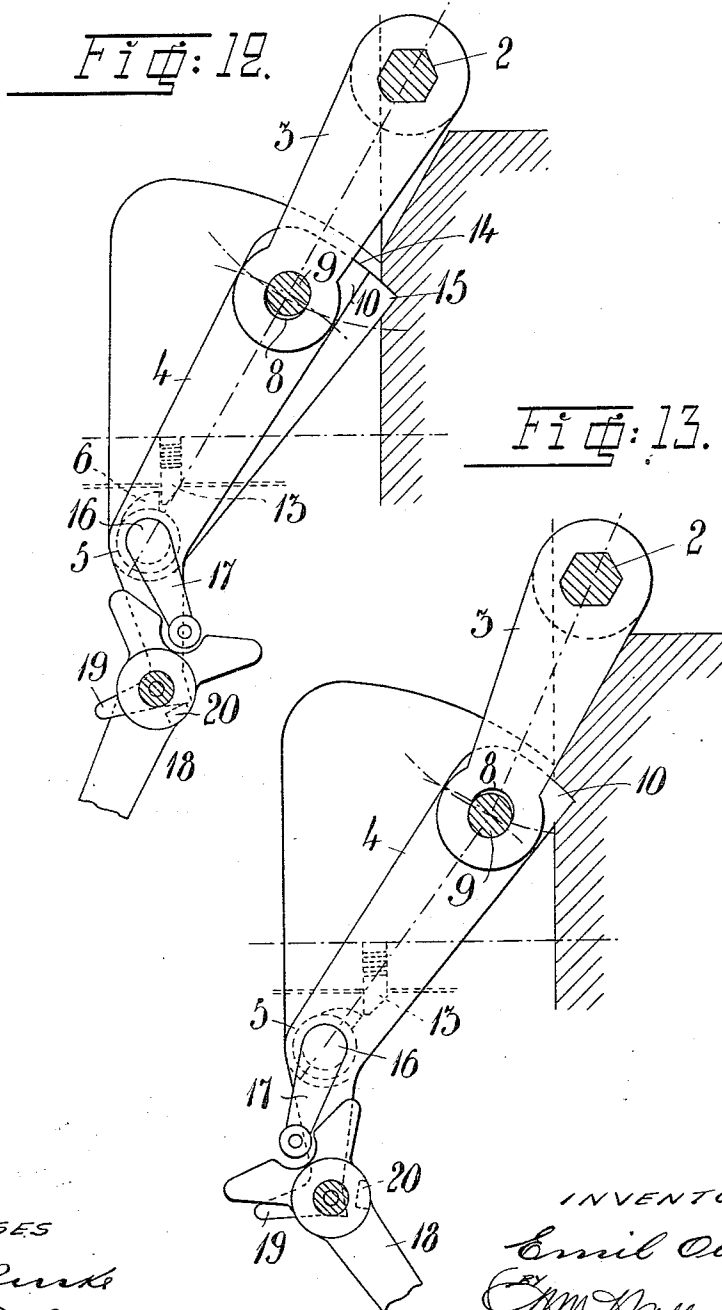
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6 SHEETS—SHEET 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

EMIL OLSSON, OF BOFORS, SWEDEN, ASSIGNOR TO AKTIEBOLAGET BOFORS-GULLSPÅNG,
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BREECH-LOADING MECHANISM FOR ARTILLERY-GUNS.

1,040,001.

Specification of Letters Patent.

Patented Oct. 1, 1912.

Application filed March 23, 1909. Serial No. 485,275.

To all whom it may concern:

Be it known that I, EMIL OLSSON, subject of Sweden, residing at Bofors, county of Wernmland, Kingdom of Sweden, have invented new and useful Improvements in Breech-Loading Mechanism for Artillery-Guns, of which the following is a specification.

The present invention relates to such breech loading mechanism for artillery guns in which the breech-piece is closed by means of a breech-block displaceably arranged in a transverse opening and connected with a lever or some other device by the aid of two levers, the one journaled in the breech-block, the other in the gun-barrel.

The chief object of this invention is to attain security against premature discharge, and this is attained, in the case of such mechanism where the percussion-lock is cocked on the mechanism being opened, by this means; that the firing pin is prevented from striking the detonator until the mechanism is quite closed, and, in the case of mechanisms with continuous pull trigger by this means; that the cocking of the firing pin and the firing are prevented until the mechanism is completely closed. In the case of mechanisms of the kind first named the further advantage is also gained that, on the mechanism being opened, the breech block is prevented from moving until the firing-pin has been moved so far back that its point no longer touches the detonator and cannot rub against the back-surface of the same during the movement of the breech block.

The characteristic feature of the invention by means of which these objects are attained is, that when the breech block takes up a perfectly closed position, *i. e.*, when the firing pin is directly opposite the detonator, the levers which serve to close the mechanism can be moved through a certain angle, while at the same time, the breech block remains still.

The accompanying drawings illustrate some forms of construction of the invention.

Figures 1, 2 and 3 show longitudinal sections in three different positions of a mechanism with percussion-lock, and Fig. 4 a transverse section of the mechanism in question. Figs. 5, 6 7 and 8 show respectively longitudinal and transverse sections of two other mechanisms with percussion-lock;

Figs. 9 and 10 longitudinal sections and Fig. 11 a transverse section of a mechanism with a continuous pull trigger in accordance with the present invention and Figs. 12 and 13 the arms of the same mechanism on a larger scale.

In the breech-block 1 (Figs. 1-4) there is rotatably journaled by means of a pin 5 a lever 4 which, by means of another pin 9 is rotatably connected with another lever 3 which, by means of a handle 12, can be swung around a bolt 2 journaled in the gun-barrel, all in a manner already well-known. The pin 5 carries a projection 6, which, in the position shown in Fig. 1, in which the breech-block is quite closed, and by means of coöperation with a corresponding projection 13 on the firing pin 7, prevents said firing pin from moving forward. On opening (see Fig. 2, which shows the mechanism in fully open position), the firing pin is drawn, by means of the said projections, so far back that it is seized by the pawl of the firing-mechanism. The lever 4 is provided with a projection 10 which engages in a groove 11 in the wall of the gun-barrel. One face of the projection 10 is provided with curved surfaces 14 formed from arcs of concentric circles, the centers of which are the center of the pin 5, and the barrel is provided with similar surfaces 15 with which the surfaces 14 of the projection 10 are adapted to engage. When the parts are in the position shown in Fig. 1, the surfaces 14 and 15 are about to engage with one another and when the parts are in the position shown in Fig. 3 the surfaces are in engagement, thereby forming a support for the breech-block. The hole 8 in the lever 3 for the pin 9 is somewhat oval, so that, when the swinging of the lever 3 is continued past the position shown in Fig. 1, the lever 4 is permitted to rotate around the pin 5 (in which movement the surfaces 14, 15 slide against each other), until the levers take up the position shown in Fig. 3. The projection 6 then comes so far forward that, when the firing pawl is pulled the firing pin can strike the detonator and the gun is fired off. When the mechanism is opened again after firing, the firing pin is drawn back, before the breech-block has begun to move, by means of the projections 6, 13, to the position shown in Fig. 1, so that it no longer touches the detonator but, on

the breech being opened, is prevented from rubbing against the back surface of the same, after which the whole mechanism can be operated in the way already described.

5 The form of construction shown in Figs. 5 and 6 differs from the one just described, chiefly in this respect, that the shoulder 10 is arranged on the lever 3 instead of on the lever 4, another result of which is; that the axis of the cylinder-surfaces 14, 15 which at the end of the closing of the mechanism and at the beginning of its opening respectively, slide against each other, lies in the vicinity of, or coincides with that of the bolt 2, instead of with that of the pin 5, in addition to which, the groove 11 is in the material of the breech-block instead of in that of the gun-barrel. Fig. 5 shows the mechanism with the breech-block closed but before the surfaces 14, 15 have slid up on each other, and thus corresponds to Fig. 1. The manner of operation is exactly the same as in the form of construction just described.

25 In Figs. 7 and 8 the levers 3 and 4 are arranged in a recess in the breech-block, and the shoulder 10 is arranged on the arm 3, while the groove 11 is situated in the material of the breech-block instead of in that of the gun-barrel. This form of construction is, in other respects, like the preceding ones. Fig. 7 shows the parts in the same position as Figs. 1 and 5.

35 Finally, Figs. 9-13 illustrate a form of construction of a continuous pull trigger mechanism. Fig. 9 shows it in longitudinal section when the breech-block is quite moved in but with the discharge still rendered impossible, and Fig. 10 shows the same view when the levers have taken up such a position that the discharge can take place, and Fig. 11 a transverse section along the broken lines A-B-C-D-E (Fig. 9.) Figs. 12 and 13 show the arms in the said mechanism on a larger scale in the same positions as in Figs. 9 and 10 respectively.

40 As in the forms of construction already described, the breech-block 1 is here put into motion by means of the levers 3, 4 from the bolt 2 which is journaled in the material of the gun-barrel, and said levers are connected together by means of the pin 9 which is journaled in an oval hole. The pin 5 which connects the lever 4 with the breech-block is here tubular in form and serves as a bearing for an axle 16 which at the one end carries a projection 6 which acts on the spring plunger 13 of a firing pin 7, while the other end of the axle supports a lever 17 which, on the gun being discharged in the well-known way, is acted on by a forked trigger 18. The cylinder-surfaces 14 and 15 which, at the end of the closing movement slide against each other, are here arranged on the end of the lever 4 itself, which is formed into

a guide-shoulder 10, and in the gun-barrel respectively, and have a common axis in, or in the vicinity of, the axis of the pin 5. On that end of the lever 4 nearest the last-named axis there is arranged a projection 19 of such form that, together with a shoulder 20 arranged on the trigger 18, it prevents said trigger from acting on the lever 17 before the mechanism has been fully closed. This appears more plainly from Figs. 12 and 13 which illustrate the mechanism in Figs. 9-11 on a larger scale during the closing and when fully closed. From Fig. 12 it is seen how the projection 19 on the lever 4 lies in the way of the shoulder 20 on the trigger 18, and hinders the movement of the latter, while the said projection 19, when the mechanism is closed (Fig. 13) lies out of the way of the shoulder so that the latter can be moved and thus, that the trigger can also be so rotated as to act on the lever 17. The method of action of the mechanism shown in Figs. 9-13 is, in other respects, not essentially different from those previously described. The surfaces which slide against each other need not be cylindrical but may consist of other rotation-surfaces.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In breech-loading guns in combination, a barrel, a breech-block adapted to be moved relatively thereto, and mechanism for moving said block to and from its closed position, said mechanism comprising a lever pivoted to said barrel and a second lever pivoted to said block, a connection between said levers permitting them to be movable through a certain angle while the breech-block is at rest in its closed position and co-acting supporting members carried by one of said levers and said barrel for supporting the block when in its closed position.

2. In breech-loading guns, in combination, a barrel, a breech-block adapted to be moved relatively thereto, a mechanism for moving said block to and from its closed position, said mechanism comprising a lever pivoted to said barrel and a second lever pivoted to said block, said levers being connected together by means of a pin and a hole of greater cross-sectional area than the pin and co-acting supporting members carried by one of said levers and said barrel for supporting the block when in its closed position, for the purpose of permitting the levers to move through a certain angle while the breech-block is at rest in the said closed position.

3. In breech-loading guns, in combination, a barrel, a breech-block adapted to be moved with respect thereto, a lever pivotally mounted upon said barrel, a second lever pivotally mounted upon said block, said levers being connected to one another and

co-acting supporting members carried by one of said levers and said barrel for supporting the block in its closed position, said members being provided with co-acting curved 5 faces.

4. In breech-loading guns, in combination, a barrel, a breech-block adapted to be moved with respect thereto, a lever pivotally mounted upon said barrel, a second lever 10 pivotally mounted upon said block, said levers being connected to one another and co-acting curved supporting members carried by one of said levers and said barrel for supporting the block in its closed position, 15 the curvature of said members being formed by arcs of circles the center of which is the pivot of the lever which is mounted upon said block.

5. In breech-loading guns, in combination, 20 a breech-block, adapted to be moved relatively to the barrel of the gun, means comprising two pivotally connected levers for moving said breech-block to its closed posi-

tion, the connection between said levers permitting them to be movable through a certain angle while the breech-block is supported in its closed position by means of co-acting supporting members carried by one of said levers and said barrels, a firing-pin movably carried by said block, a projection 30 upon said firing-pin and movable means controlled by the movement of the levers adapted to engage said projection, said movable means being moved out of the path of said projection during the final movement 35 of the levers in closing direction and causing the withdrawal of the firing-pin from the detonator during the initial movement of the levers in opening direction.

In witness whereof I have hereunto set 40 my hand in presence of two witnesses.

EMIL OLSSON.

Witnesses:

KARL A. R. SVANBERG,
VICTOR HAMMAR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."