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A. SILFVERSPARRE.

BREECH MECHANISM FOR BREECH LOADING GUNS.

(Application filed Aug. 15, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

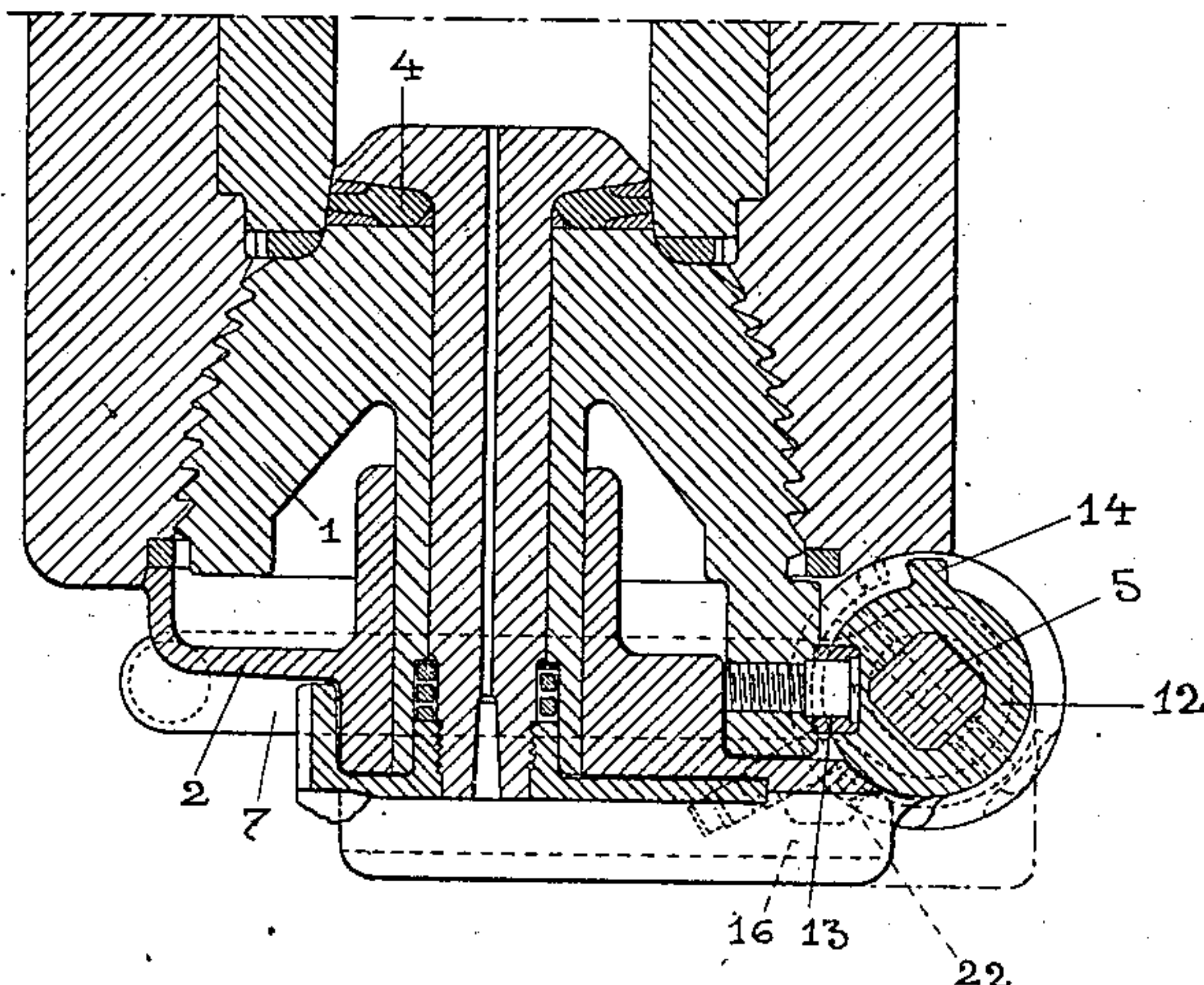
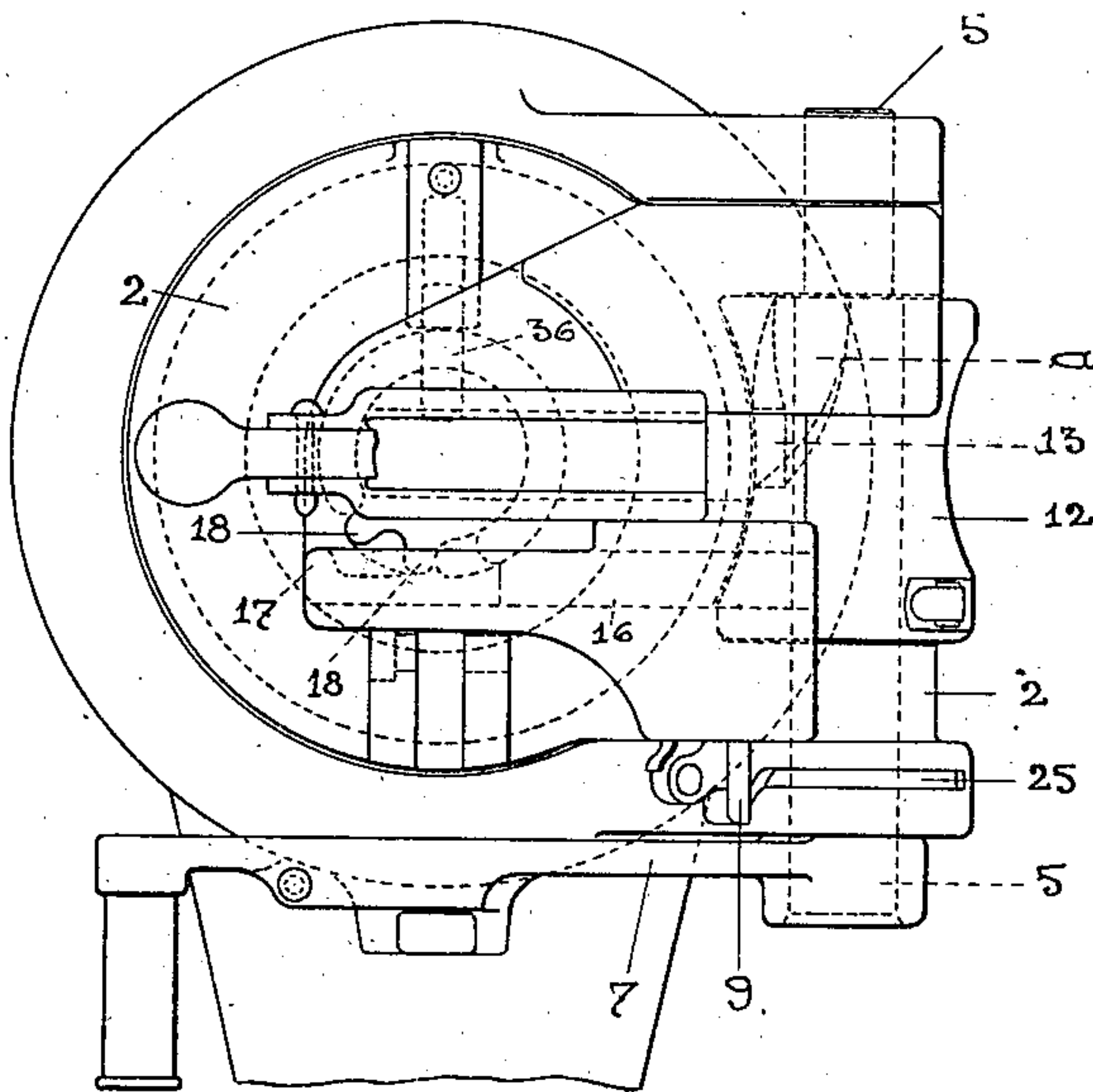


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## BREECH MECHANISM FOR BREECH-LOADING GUNS.

SPECIFICATION forming part of Letters Patent No. 661,775, dated November 13, 1900.

Application filed August 15, 1900. Serial No. 26,909. (No model.)

*To all whom it may concern:*

Be it known that I, ARCUT SILFVERSPARRE, mechanical engineer, of Bofors, county of Wermland, Sweden, have invented certain Improvements in the Breech Mechanism of Breech-Loading Guns; and I do hereby declare the nature of my invention to be as follows.

In the drawings my improved breech mechanism is illustrated in its closed position and in a longitudinal section in Figure 1 and in a rear view in Fig. 2. Fig. 3 is a longitudinal section of the breech mechanism opened. Figs. 4 to 7 illustrate some details.

The breech-screw 1, as usual, is revolvably mounted on the door 2, which by means of the vertical pin 5 is hinged at the rear end of the gun. On the pin 5 is mounted a roll 12, in the circumference of which is arranged a groove *a*, Figs. 2 to 7, the latter of which shows the groove developed in plan, said groove on a portion of its length being horizontal or nearly horizontal, while the other portion is steeply inclined. In said groove slides a pin projecting radially from the breech-screw and provided with a friction-roller 13. On the back of the door is arranged a sliding toothed rack 16, with which engages, when the door by means of the operating-lever 7, rigidly secured to the hinge-pin, is to swing outward from its closed position, a cog or tooth 22 on the roll 12, which tooth in the rotary motion of the roll shifts the rack longitudinally. During the first portion of this rotation the friction-roller 13 slides in the horizontal portion of the roll-groove, the screw then remaining stationary; but at the continued rotation of lever 7 the friction-roller 13 enters into the inclined portion of the roll-groove, and the screw is thereby by great force compelled to rotate through a small angle, which rotation, however, is sufficient to loosen it and disengage it from the obturator 4. When this movement has taken place, a tooth 17 on the rack engages between teeth 18, arranged on the screw 1, and rotates the screw still farther at a great velocity until the motion is arrested by a stop-pin 36, arranged on the door, said pin engaging in a slot in the screw. At the continued rotation of the roll 12 while actuated by the operating-lever 7 a tooth 14 on the circumference of the roll engaging in a corre-

sponding recess *b* in the screw compels the latter to move rectilinearly rearward, guided by its neck. During the rotation and rearward motion of the screw 1 the door 2 remains locked to the gun by means of a sliding latch 9, arranged in the door parallel to the hinge-pin, which latch is provided at its lower end with a projection or lug *c*, engaging in the axially downward-pointing end portion *d* of a slot 25, arranged at the circumference of the lower ear of the hinge, and the remainder of which slot is situated in a plane perpendicular to the axis of the hinge-pin—*i. e.*, horizontally in the drawings, Figs. 4, 5, and 6, the last mentioned of which shows the slot developed in plan. The said latch 9 also at its upper end has a projection or lug *e*, which at the same time engages in the forward portion of a slot 24, arranged in the roll 12; but this portion of the slot 24 is situated in a plane perpendicular to the axis of the hinge-pin—*i. e.*, horizontally in the drawings—so that the rotation of the roll can take place without interference. When the roll has been rotated enough to complete the turning of the screw and shift it rearward, the lug *c* of the latch 9 strikes an inclined edge of the slot 24, causing the latch to be shifted upward, so as to move its lower lug *c* out of its engagement with the axial portion of the slot 25 in the ear of the hinge and into its horizontal portion, while at the same time the upper lug *e* enters into the axially upward-pointing end portion *f* of the slot 24. The door is thereby disengaged from the ear of the hinge and instead locked to the roll, being thus compelled to take part in the continued rotation of the latter and to be swung outward, together with the screw. This coupling of the door to the roll also continues during the inward motion of the door until in closing the latter is again brought close to the rear plane of the gun, the latch 9 being then once more depressed into engagement with the axial part of the slot 25, thus locking the door to the ear of the hinge. When the screw 1 is fully withdrawn, the rack 16 is retained in its position by the tooth 22, previously mentioned.

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—



In breech mechanisms for breech-loading guns the combination of the breech-screw 1 rotatably mounted on a door 2 adapted to be swung sidewise on a vertical hinge attached to the gun, a roll 12 secured on the rotary hinge-pin 5 and having on its circumference a slot *a* which on a portion of its length is horizontal while the remainder of it is inclined, a pin projecting radially from the breech-screw and adapted to be shifted sidewise by the inclined part of the slot and thus rotate the screw so as to loosen it from the obturator 4, a sliding toothed rack 16 arranged on the door 2 and engaging, when the door is swung outward from its closed position, with a cog or tooth 22 located on the roll 12 and shifting the rack longitudinally, a toothed segment 18 on the rear end of the screw 1 and engaging with the rack at its movement, thus turning the screw still farther at a great velocity until its motion is arrested by a stop-pin 36 secured on the door, a tooth 14 located on the circumference of the roll 12 and adapted to engage, on the completion of the rotation of the screw required for its extraction, in a recess *b* made in the screw, thus at the continued rotation of the screw compelling

it to move rectilinearly rearward guided by its neck, and a vertical sliding latch 9 arranged in the door 2, said latch being movable longitudinally to the hinge-pin and during the rotation and rearward motion of the screw 1 engaging, by means of a lug *c* projecting from its lower end, with an axial recess *d* of a horizontal slot 25 arranged in the circumference of the nearest hinge-ear, thus locking the door to the gun while at the same time a lug *e* at the upper end of the latch slides in the horizontal portion of a slot 24 in the roll, the farther end portion of which slot has such shape that during the final rotation of the roll it moves the latch out of engagement with the hinge-ear and into engagement with the roll so that the door will be disengaged from the hinge-ear, coupled to the roll and thus compelled to partake in the rotation of the latter and be moved outward together with the breech-screw.

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

AROUT SILFVERSPARRE.

Witnesses:

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