

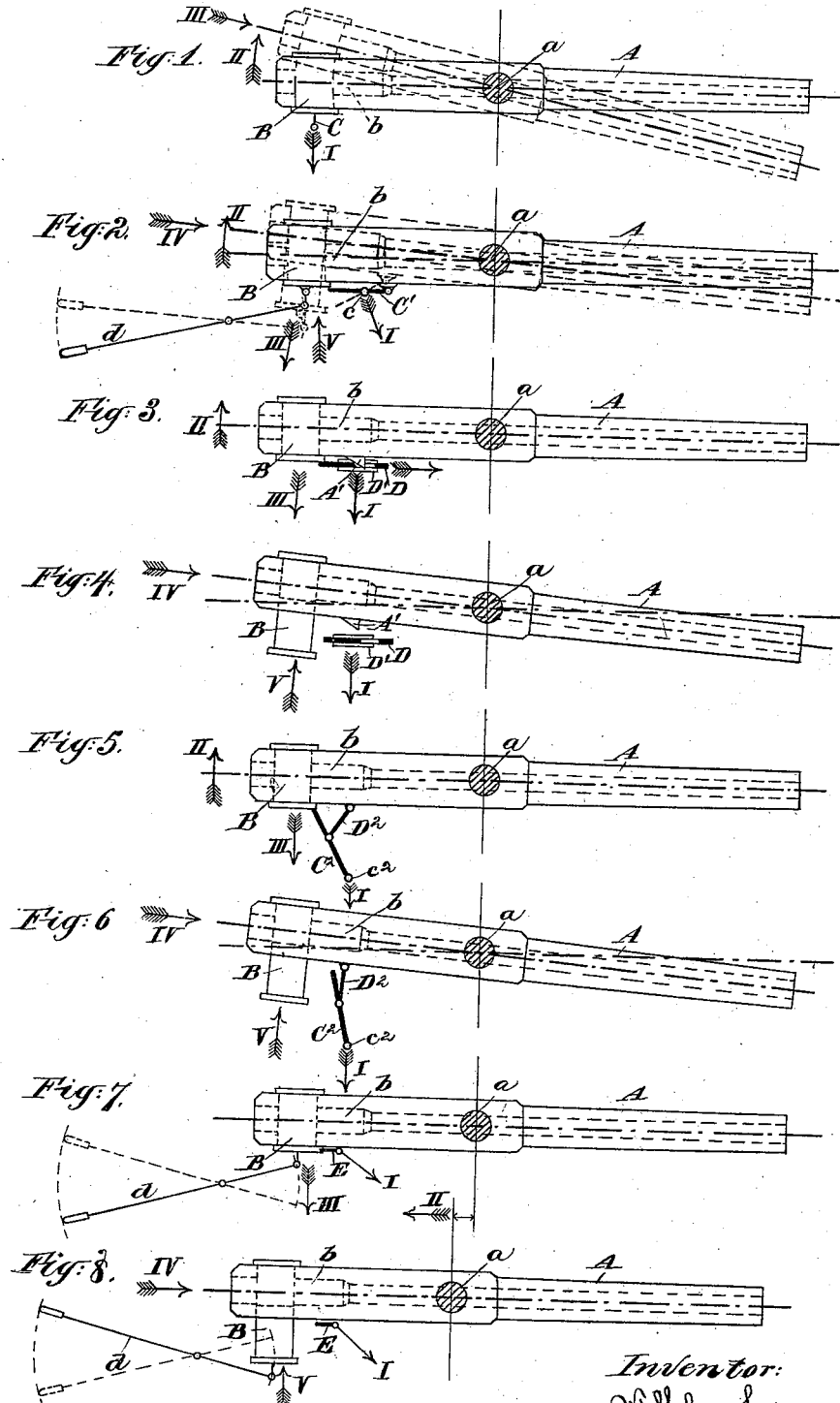
(No Model.)

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VERTICAL BREECH CLOSING MECHANISM FOR GUNS.

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WILHELM LORENZ, OF CARLSRUHE, BADEN, GERMANY.

VERTICAL BREECH-CLOSING MECHANISM FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 381,628, dated April 24, 1888.

Application filed July 14, 1887. Serial No. 244,373. (No model.)

To all whom it may concern:

Be it known that I, WILHELM LORENZ, of Carlsruhe, in the Grand Duchy of Baden, Germany, have invented a certain new and useful Improvement in Vertical Breech-Closing Mechanism for Guns, of which the following is a specification

This invention has for its object, in breech-loading guns, to utilize those movements of the gun relatively to the carriage which occur at firing for automatically opening the cartridge-chamber. This movement may be only the tilting by which the rear part of the gun moves upward by the turning of the gun on its trunnions, probably due to the elastic action of the metal after the discharge has caused the gun to act strongly on the elevator-screw, or it may be the stronger bodily recoil backward of the entire gun within the carriage, due to the direct force of the discharge when there is provided any suitable contrivance—as rubber buffers, springs, hydraulic resistances, &c.—for allowing such motion within the carriage, or both of these movements combined may be made available. It will be understood that the breech-block is arranged to slide vertically through or partially through the breech of the gun.

For utilizing the tilting of the gun either of the following methods may be adopted: The breech-block may be held to the carriage, so that the hind part of the gun immediately after the firing will rise upward from the breech-block, while the block is retained by the carriage. This upward movement of the breech of the gun beyond the corresponding movement of the breech-block may be allowed only so far as will be necessary to open the cartridge-chamber for introducing a new charge. The movement may be arrested by any suitable contrivance, as a spring or latch disposed either on the breech-block or on the gun or carriage, and the parts may be held so that a portion of the breech-block remains in the gun. After the recharging of the chamber and the releasing of the arresting contrivance the gun, by the overweight of its hindmost portion, will sink down on the block, thus effecting also automatically the closing of the cartridge-chamber.

Another method consists in simply releas-

ing the breech-block by the tilting of the gun. After the releasing, the block, by virtue of its own weight, will slide down in the hole and open the breech. The releasing may take place either near the middle or near the end of the upward movement of the hind part of the gun, or it may progress during a great part of such movement. The sliding downward of the breech-block relatively to the gun may be allowed to go only so far as will be necessary to open the cartridge-chamber for introducing a new charge. For closing the cartridge-chamber, the breech-block may be raised and brought into connection with the arresting-gear, or the closing may be done automatically by the sinking back of the gun into its initial position, or by means of the attendants. Finally, the block will again be retained in its closed position.

The devices for strongly and reliably holding fast the block in its closed position may be of any suitable character which will allow of being thus operated. They may consist, for example, in a lever mechanism, a bolt, a stay, &c. A double-branched or toggle lever may be pivoted on the carriage, and the one end of the lever may be so fastened to the gun that the other end of the lever will hold fast the breech-block in its closed position in the hole. In the upward movement of the hind part of the gun the lever end attached to the gun will follow this upward movement, and the lower lever will be turned on its pivot, which is fastened to the carriage, and thus the lever end which holds the breech-block will be moved forward. By this last movement the block loses its support, and by virtue of its weight now may slide downward in the hole. During this movement the breech-block may remain in connection with the supporting lever end—for example, by means of a joint-piece—or it may be wholly released from the said lever end and fall down freely. When the block is retained in its closed position by a bolt, the guiding-piece or the bearing is to be secured to the carriage, and the bolt, by means of a projection or a nose disposed on the gun, will be forced below or so tightly against the breech-block that the same is held fast in its closed position. In the rapid upward movement of the breech of the gun immediately after firing

the nose will be withdrawn from the bolt, and the latter then by any suitable means—as, for example, a spring, a rubber buffer, a weight, &c.—will be withdrawn from the block, so that the same may slide, as desired, down in the hole.

When a stay is employed for supporting the block in its closed position, the stay will be pivoted or placed movably on the carriage, and be connected by a joint-piece or a drawing-piece with the gun, so that at the upward movement of the hind part of the gun a drawing operation is effected on the stay, by which the stay will be withdrawn from the block, so that the latter may slide downward in the hole.

In order to make use of the backward movement of the gun within the carriage for automatically opening the breech, the vertically-placed block will be retained in its closed position by means of any arresting contrivance, which will be secured fast to the carriage—as, for example, a spring, a latch, a bolt, &c.—and this arresting contrivance will be released at firing by the backward movement of the gun with the block, which to a certain extent takes place within the carriage, so that by this working the block will be automatically withdrawn from the arresting contrivance, and then, by virtue of its weight, will slide down in the hole. This sliding down of the block needs only to be allowed so far as will be necessary for laying free the space (the cartridge-chamber) for introducing a new charge. The sliding-down movement of the block therefore may be arrested by any suitable automatically-working contrivance—as, for example, a spring, a latch, a nose, &c.—disposed on the block, or on the gun, or in the hole, or by means of a stay contrivance disposed on the carriage, and the block thereby be retained in a convenient lower position, so as to leave a portion of the block in the hole, in order to be raised therein without difficulty when the breech of the gun is to be closed again. After having received the recoiling effect of the explosion-gases the gun, with the breech-block, by means of the reaction exercised by the rubber buffer, springs, &c., compressed before by the recoil, will be forced back into the initial position in the carriage and consequently also into the initial position toward the arresting contrivance. In this position the block for again closing the cartridge-chamber may be raised, and then, either by hand or automatically, be brought in connection with the arresting contrivance, and thereby be retained in its closed position. In the annexed drawings such breech-pieces are represented in different variations.

The accompanying drawings form a part of this specification. All the figures are side views showing the novel parts with so much of the ordinary parts as is necessary to indicate their relations thereto. Several different modes are shown for carrying out the invention.

Figure 1 shows means for opening and clos-

ing positively by the tilting motion. Figs. 2 to 6, inclusive, show means for simply liberating and relocking by such motion. Fig. 2 shows in strong lines the breech closed and secured. The same figure shows in dotted lines the breech liberated and opened. Fig. 3 shows the breech closed and secured by means differing from those shown in Fig. 2. Fig. 4 shows the same mechanism as Fig. 3, with the breech-block liberated and moved downward to open the breech. Fig. 5 shows another mechanism holding the breech-block in the closed position. Fig. 6 shows the same mechanism after the breech-block has been liberated and moved to open the cartridge-chamber. Figs. 7 and 8 show provisions for operating by the recoil movement. Fig. 7 shows the cartridge-chamber closed. Fig. 8 shows the positions of the parts after the breech-block has been liberated by the recoil movement and has been lowered by the attendants, so as to open the cartridge-chamber.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

It must be noted that arrows to indicate motions are differently marked in the several figures.

All the figures show a gun, A, tilting on pivot *a*, with vertical breech-block B.

In Fig. 1 the strong lines show the block in the closed position. The arrow I indicates that the block is attached to the carriage. At the tilting of the gun the hind part moves in the direction of arrow II into the dotted position in which it is arrested in any suitable way, while the breech-block B, having been earlier restrained by the attachment C to the carriage, remains near its original position, so as to lay free the charging-space *b*. A new charge may be introduced, as indicated by arrow III, and after the releasing of the holding contrivance (not shown) the gun, by virtue of the overweight of its hindmost part, will sink down on the breech-block into the position as shown by the strong lines, thus closing the cartridge-chamber.

In Fig. 2 the breech-block B is retained by a lever, C', of which the forward end is connected with gun A. The pivot *c* is connected to the carriage. (Not shown.) At the tilting of the gun the hind end of the gun moves in the direction of arrow II into the position indicated by the dotted lines. Thereby the lever C' is withdrawn from the breech-block, so that this block may slide down in the direction of arrow III. In this position of the breech-block the charging-space is laid free, so that a new charge may be introduced in the direction of arrow IV. For again closing the cartridge-chamber a lever, *d*, is provided, by which the breech-block B may again be raised into closed position, as indicated by arrow V, in order again to be retained there by lever C' in the initial position.

Fig. 3 shows a gun provided with a nose,

A', which, in the represented position of rest, holds the bolt D against or below the breech-block B and retains the latter in its closed position. The arrow I is to indicate that the
5 guiding-way D' for the bolt is held fast upon the carriage.

Fig. 4 shows the same gun with its hind part swung upward and the bolt D released from nose A', and by any suitable means (not
10 shown)—as, for example, a spring, a weight, a rubber buffer, &c.—withdrawn from under the breech-block and the latter has moved down into the position to open the cartridge-chamber. After introducing a new charge in
15 direction of arrow IV into the cartridge-chamber thus laid free, the breech-block is again lifted in the direction of arrow V into its closed position, and by the sinking down of the rear end of the gun into its original position the
20 bolt D is urged into place by means of the nose A', and the breech-block will be retained through the agency of said bolt.

Figs. 5 and 6 show a gun which at the tilting draws by joint-piece D² a stay, C², from under the
25 breech-block B, so that this block may slide down in the direction of arrow III. The stay is pivoted at c² on the carriage. (Not shown.) After introducing a new charge in direction of arrow IV, the block is raised by the attendants in di-
30 rection of arrow V, and when all is ready the sinking down of the gun into its initial position moves the stay C², by means of joint-piece D², beneath the breech-block, and sustains the latter in its closed position.

Figs. 7 and 8 show a gun, A, arranged by any well-known means (not shown) to be movable backward on its carriage. Fig. 7 shows
35 the gun in the initial position, in which an arresting contrivance, E, retains the breech-block in the closed position. The arrow I is to indicate that E is secured to the carriage. At the firing the gun moves within the carriage to the extent indicated by Fig. 8 in the direction of arrow II, so that the breech-block
45 B, being carried back with the gun, will be liberated from the arresting contrivance E,

which remains unmoved. Then the breech-block slides down in direction of arrow III, so as to open the charging-space b, and a new
50 charge, as indicated by arrow IV, may be introduced. For closing again, the cartridge-chamber a lever, d, is provided, by means of which the block B, as indicated by arrow V, may be again lifted into the closed position, to be there held fast by the arresting contrivance E.

Further modifications may be made in the details without departing from the principle or sacrificing the advantages of the invention.

Other means than the lever d may obviously
60 be used to operate the breech-plug by the attendants after it has been liberated by the motion of the gun relatively to the carriage.

I claim as my invention—

1. The gun A and the breech-block B, movable vertically therein, in combination with
65 a link one end of which normally supports said breech-block, the other end being attached to the carriage, and connections between said gun and link, whereby the latter is automati-
70 cally operated by the motion of the gun in firing to disengage its supporting end from said breech-block and allow the latter to fall, as and for the purpose specified.

2. The gun A and the breech-block B, movable vertically therein, in combination with
75 a link, D, horizontal guides D' on the gun-carriage for supporting said link, and a nose, A', on said gun, having a beveled face adapted to strike said link for automatically forcing it
80 beneath and into engagement with said breech-block for supporting it by the descent of the breech of said gun after its displacement by the recoil of firing, as herein specified.

In testimony that I claim the foregoing as my
85 invention I have signed my name in presence of two subscribing witnesses.

WILHELM LORENZ.

Witnesses:

FRIEDRICH LORCH,
ADOLF LEHNE.