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Fig. 1.

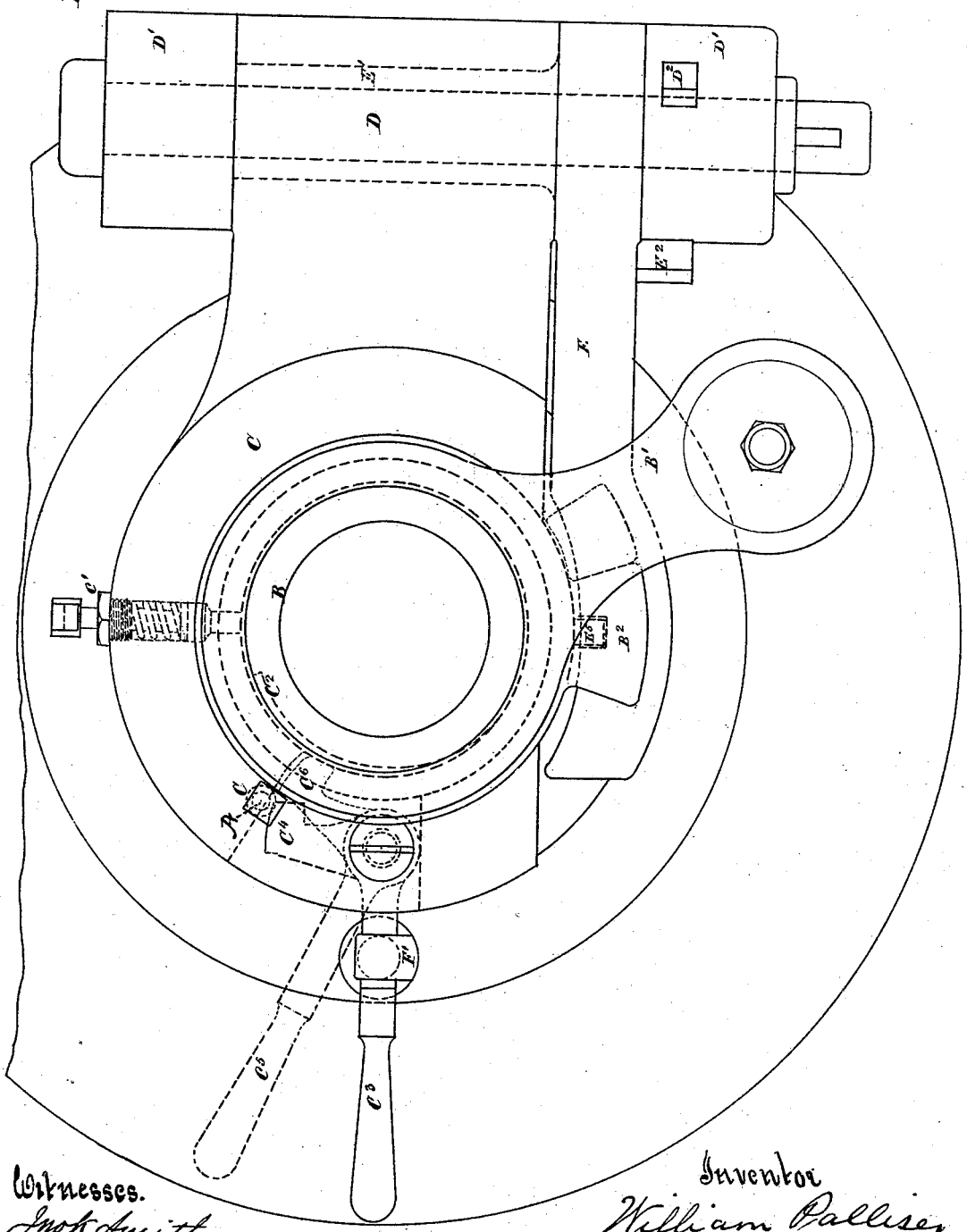

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Fig. 2

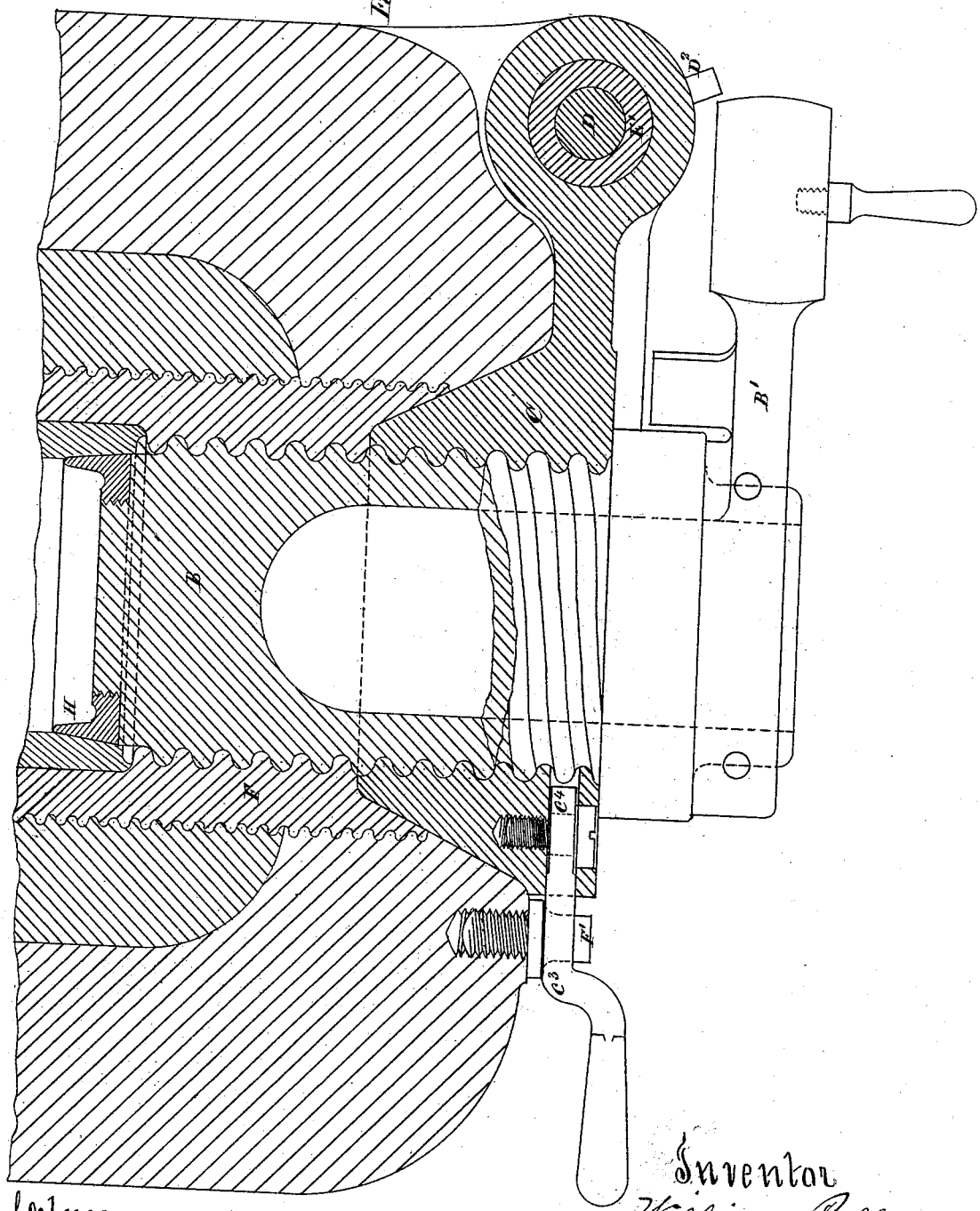

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Fig. 4.

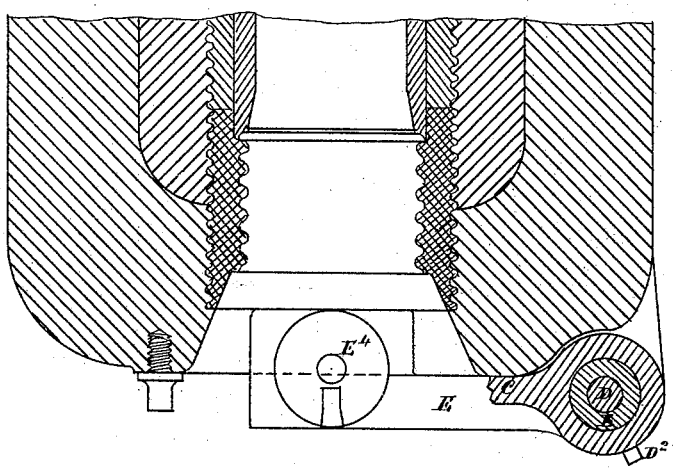
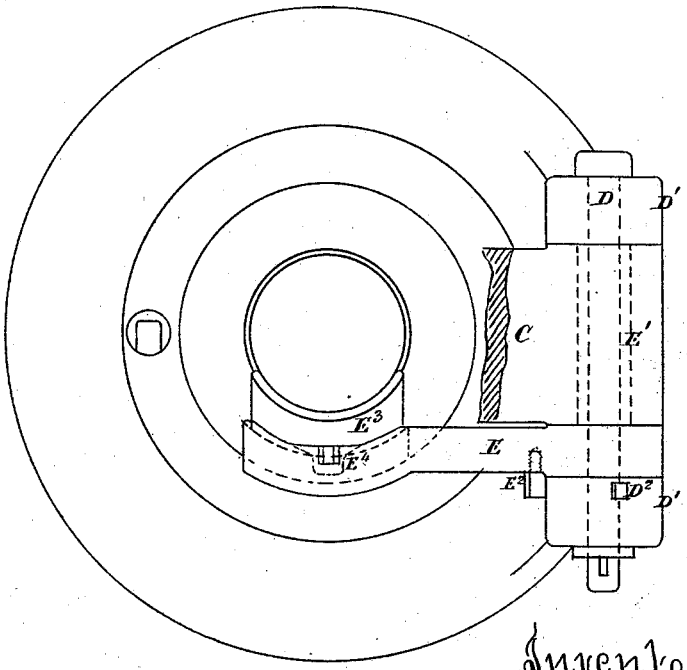


Fig. 5.



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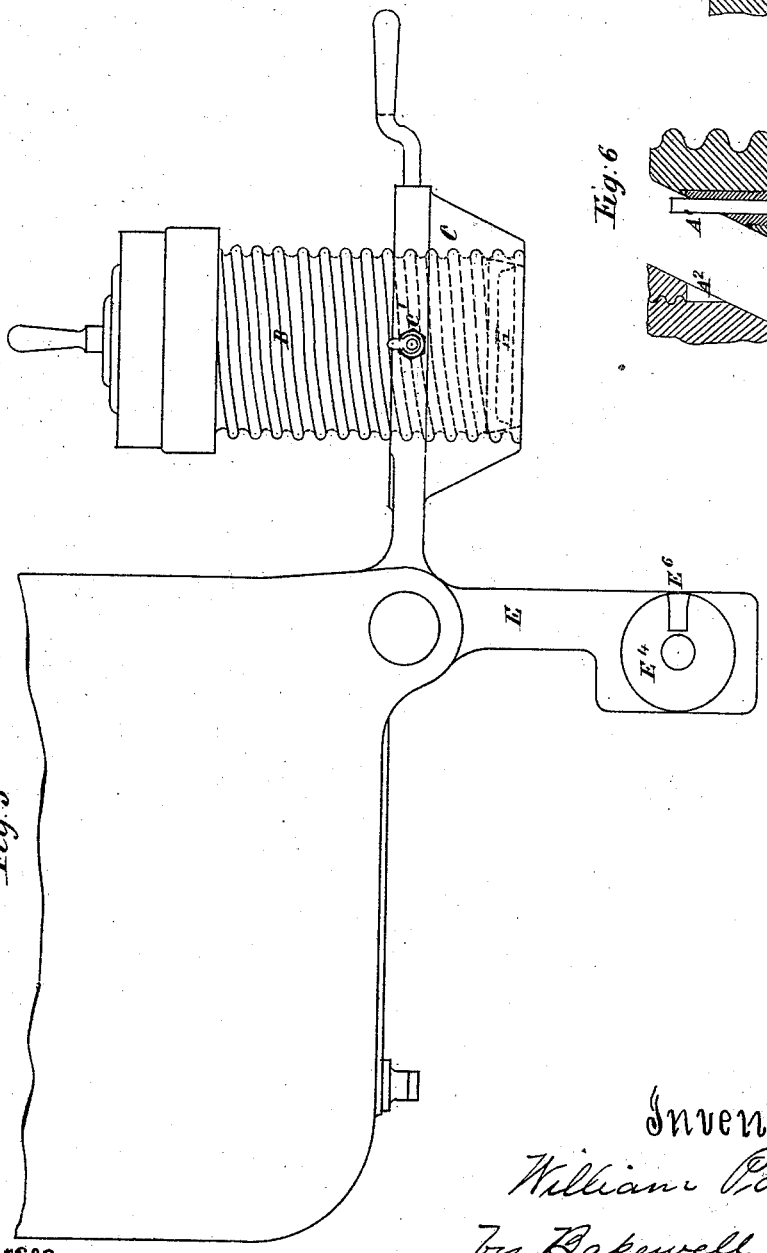

Fig. 5

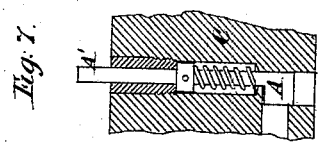

Fig. 7.

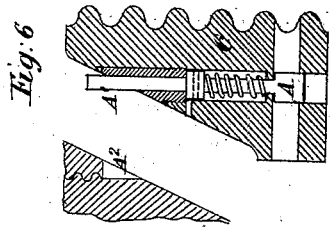

Fig. 6

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Fig. 11.

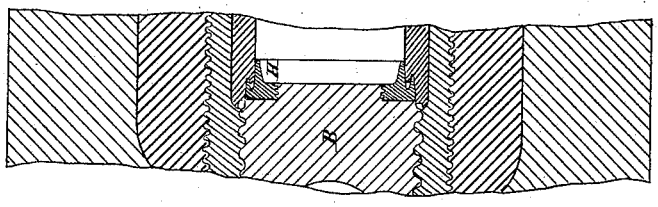


Fig. 10.

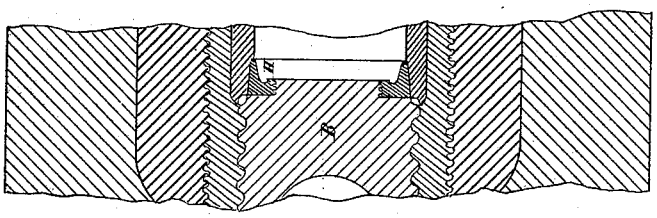


Fig. 9.

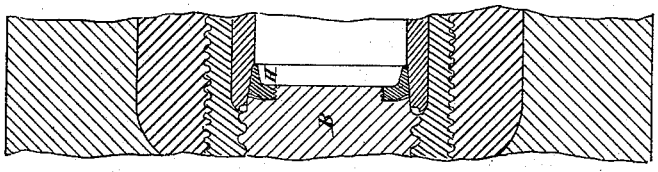
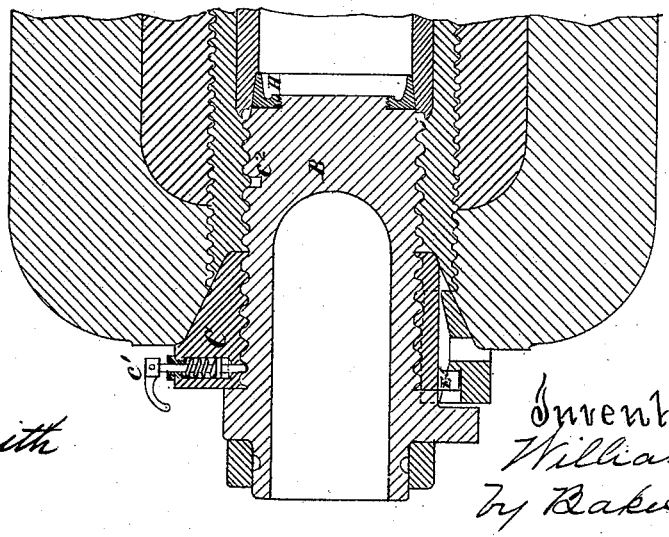


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM PALLISER, OF EARL'S COURT SQUARE, COUNTY OF MIDDLESEX, KENSINGTON, ENGLAND.

IMPROVEMENT IN BREECH-LOADING ORDNANCE.

Specification forming part of Letters Patent No. **221,419**, dated November 11, 1879; application filed September 27, 1879; patented in England, March 4, 1879.

To all whom it may concern:

Be it known that I, WILLIAM PALLISER, of Earl's Court Square, Kensington, in the county of Middlesex, England, Knight, have invented an Improvement in Breech-Loading Ordnance; and I do hereby declare that the following description, taken in connection with the accompanying sheets of drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvement by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to secure by Letters Patent—that is to say:

In the specification to Letters Patent No. 197,168, granted to me in the United States, dated November 13, 1877, I described a breech-loading apparatus for ordnance, according to which a breech-plug is screwed in a collar hinged to the breech end of the gun, so that when the plug is unscrewed from the breech it, with the collar, can be folded back on the hinge, leaving the breech-opening free for admitting the charge.

My present invention relates to an improved construction of this apparatus, combined with means of facilitating the charging of the gun, as I will explain, referring to the accompanying drawings.

Figure 1 is an end view of the breech of the gun, with the apparatus in position for firing. Fig. 2 is a plan, chiefly sectional, of the same. Fig. 3 is an end view, and Fig. 4 a sectional plan, with the plug and its collar supposed to be removed in order to show more clearly the charging-gear; and Fig. 5 is a plan of the breech, showing the position of the plug and collar and charging-gear when the gun is about to be charged. Figs. 6 and 7 are two part sections, at right angles to each other, through the spring-catch marked A in Fig. 1; and Figs. 8, 9, 10, and 11 are part longitudinal sections, showing several modified constructions of the cup that forms the gas-check.

The breech-plug B, which is partly hollowed out for the sake of lightness, is screwed into a collar, C, which is coned in front, so as to enter a conical recess in the breech of the gun, and which is hinged on a sleeve, E′, fitted on a pin, D, that is passed through two ears, D′ D′, projecting from the breech at one side thereof. The plug B is turned by means of a tappet-lever, B′, having a stud acting against a projection, B^2, from the plug, that projection being so situated that when the plug is fully screwed back up to a stop, hereinafter to be described, the weight of the tappet-lever B′ bears upon it, tending to screw it still farther back, and this weight serves to prevent the plug from being accidentally screwed forward, holding it back always, except when it is purposely screwed forward, by means of the tappet-lever for closing the breech.

The plug, besides screwing in the collar C, screws also into a thread, F, formed in the body or lining tube of the gun.

The collar C is provided on its upper side with a spring-pin, C′, the point of which bears on the bottom of the screw-thread of the plug. At one part, C^2, this is cut a little deeper in a sloping direction, so that when the plug is screwed back sufficiently far the point of the pin C′, being pressed by its spring into the hollow C^2, acts as a stop against the end of that hollow, preventing the plug from being screwed farther back. If, however, it should be desired to screw the plug quite out of the collar C, then the pin C′ can be raised by the finger, and the plug can be screwed out, if desired.

The hollow C^2 is sloped in one direction, so that the pin C′ has no effect in preventing the plug from being screwed forward, the slope raising the pin gradually as the plug is turned. The collar C is also fitted with a latch-lever, C^3, which, when the collar is closed in, engages over a latch, F′, projecting from the breech of the gun.

The latch-lever C^3 has a tail-piece, forming a pawl-tooth, C^4, which, when the lever C^3 is raised to the position indicated by the dotted lines C^5 in Fig. 1, is set forward, as shown at C^6, engaging in a notch cut in the screw-thread of the plug B. As this notch occurs only at one particular place in the screw-thread, the lever C^3 can only be raised when the plug has been unscrewed to the extent that brings the notch to face C^6—that is, quite out of the thread F—at which point its further unscrew-

ing is stopped, as already described, by the spring-pin C′. The plug having been so far unscrewed, the latch-lever C^3 can be raised to the position C^5 clear of the catch F′, and the collar C can then be folded back on its hinge-joint D, exposing the breech of the gun open for charging.

The latch-lever C^3, having been raised so that its tail C^6 catches in the notch of the plug-thread, is kept in the raised position by a spring-pin, A, fitted to slide in the collar, as shown by the sections Figs. 6 and 7. It is pressed by a spring acting against its collar, so that its tail A′ projects a little beyond the conical surface of the collar C.

When the collar is shut against the breech of the gun the tail A′ meets a shoulder, A^2, of a notch in the coned part of the gun-breech, and is pressed back so that its head A comes clear beyond the tail C^6 of the latch-lever C^3, leaving the lever free to drop into the position C^3, where it is engaged with the catch F′. The plug B, having its thread now freed from C^6, can be screwed in, and when it is so screwed the latch-lever C^3 cannot be raised out of the catch, because the notch for C^4 is no longer in the place to receive it.

When the gun has been fired the plug is unscrewed as far as the pin C′ will permit. The lever C^3 is then lifted so that C^6 catches in the notch, and on the collar C being moved a little back the spring-pin A comes behind C^6 and prevents the tail C^6 from coming out of the notch, so preventing the plug from being further turned in either direction.

The notch for the pin C′, and also that for the tail C^6, are so situated that the plug when unscrewed is held so far back as to bring the gas-check cup H within the front face of the collar C, so that it is protected from injury when the collar is folded back, as shown in Fig. 5. This gas-check cup H may be made of several forms, as shown in Figs. 8, 9, 10, and 11, being in all cases made as a separate piece from the plug B, and screwed onto it, so that it may be readily replaced when it is damaged or worn. As shown in Figs. 2 and 8, it is simply coned to fit a slightly-coned mouth of the bore of the gun; or it may be a little larger, as shown in Fig. 10, so that its lip comes up to a shoulder of the bore. Its outer edge may be made not quite to bear on the face of the plug, but to have between it and that face a sloped groove, as shown in Fig. 9, so that when the pressure of the discharge acts on the face of the cup it tends to bend it a little backward, and so make its front lip bear hard against the interior of the bore. It may be made with a double lip, as shown in Fig. 11, the inner lip fitting the interior of the bore, and the outer lip entering an annular recess in the breech end of the bore.

In combination with the parts above described, which are all for the purpose of opening the breech for charging the gun and closing it for discharging, I employ mechanism for facilitating the loading, which I will now describe.

The collar C, as already explained, swings on a hinge-joint consisting of a pin, D, surrounded by a sleeve, E′. This sleeve is in one piece with an arm, E, projecting from it below the collar C. This arm can swing round the pin D, as on a hinge, being steadied by the long bearing of its sleeve E′. It has on its under side a stud, E^2, which, when it is swung back through an arc of about ninety degrees, meets a stud, D^2, fixed on the ear D′, so as to prevent it swinging farther, the collar C being, nevertheless, free to swing still farther back, as shown in Fig. 5. The arm E, being in the attitude shown in Fig. 5, presents an end on which is placed the cradle E^3, Fig. 3, carrying the projectile, this cradle or short carrier being steadied in position by a stud on its lower side projecting down into a hole, E^4, in the end of the arm E. The shot-carrier being placed on the arm when it is in the position shown in Fig. 5, the front end of the projectile is directed into the bore of the gun by turning the arm E toward the breech; and its weight being supported on the arm E, it does not injure the screw-threads F by bearing on them. When the arm E is closed in against the breech the projectile will rest by its front part in the bore of the gun, and by its hinder part on the cradle E^3, and it can then be pushed by hand into the bore. The cartridge or powder-charge being afterward inserted and pushed somewhat forward, the collar C is swung round to the breech till the latch-lever C^3 engages with the catch F′, whereupon the plug B is screwed home by means of the tappet-lever B′, and the gun is in condition for firing. When the collar C is swung forward a stud, E^5, on its lower side takes into a notch, E^6, in the end of the arm E, and carries the arm E with it and keeps it close up to the breech. After firing the plug B is unscrewed the required distance, as determined by the stop to the pin C′, the latch-lever C^3 is lifted, and the collar C is swung back, bringing with it the arm E until that is stopped after traversing about ninety degrees. The collar itself being swung still farther back, the parts occupy the position shown in Fig. 5, leaving the breech open for sponging and recharging the gun.

Having thus described the nature of my said invention, and the best means I know of carrying it into practical operation, I claim, in respect of a breech-loading gun having a breech-plug screwed in a collar hinged to the breech of the gun—

1. The combination of the catch F′, latch-lever C^3, its tail C^4, the notch in the plug for its reception, and the spring-pin A, substantially as and for the purposes herein set forth.

2. The combination of the catch F′, latch-lever C^3, its tail C^4, the notch in the plug for its reception, and the spring-pin A with the

spring-pin C′ and the sloped notch C^2 for its reception, substantially as and for the purposes herein set forth.

3. In combination with the hinged breech-collar C, the loading-arm E and its sleeve E′, substantially as herein described.

4. The combination, with the breech-plug, of a gas-check cup, the parts being constructed and arranged with relation to each other so as to form an annular sloping space between the same, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 3d day of June, 1879.

WILLIAM PALLISER.

Witnesses:

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J. DEAN,

17 *Gracechurch Street, London, E. C.*