

(No Model.)

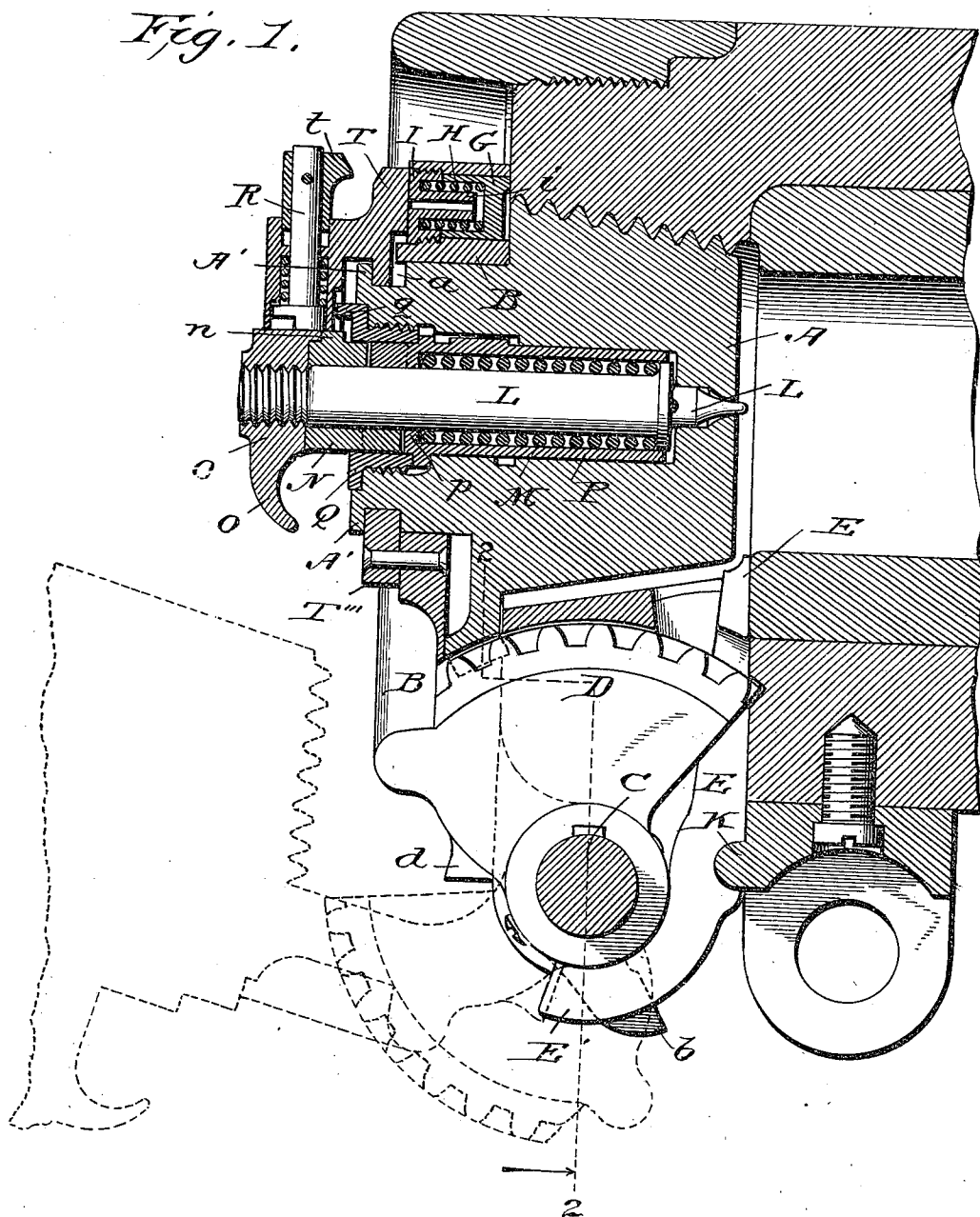
5 Sheets—Sheet 1.

A. C. KOERNER.  
BREECH ACTION FOR RAPID FIRE GUNS.

No. 537,465.

Patented Apr. 16, 1895.

Fig. 1.



Witnesses  
*W. H. Shiden.*  
*A. R. Johnson*

Inventor  
*Alfred C. Koerner*  
by *Woodbury Lowrey*  
his Attorney

(No Model.)

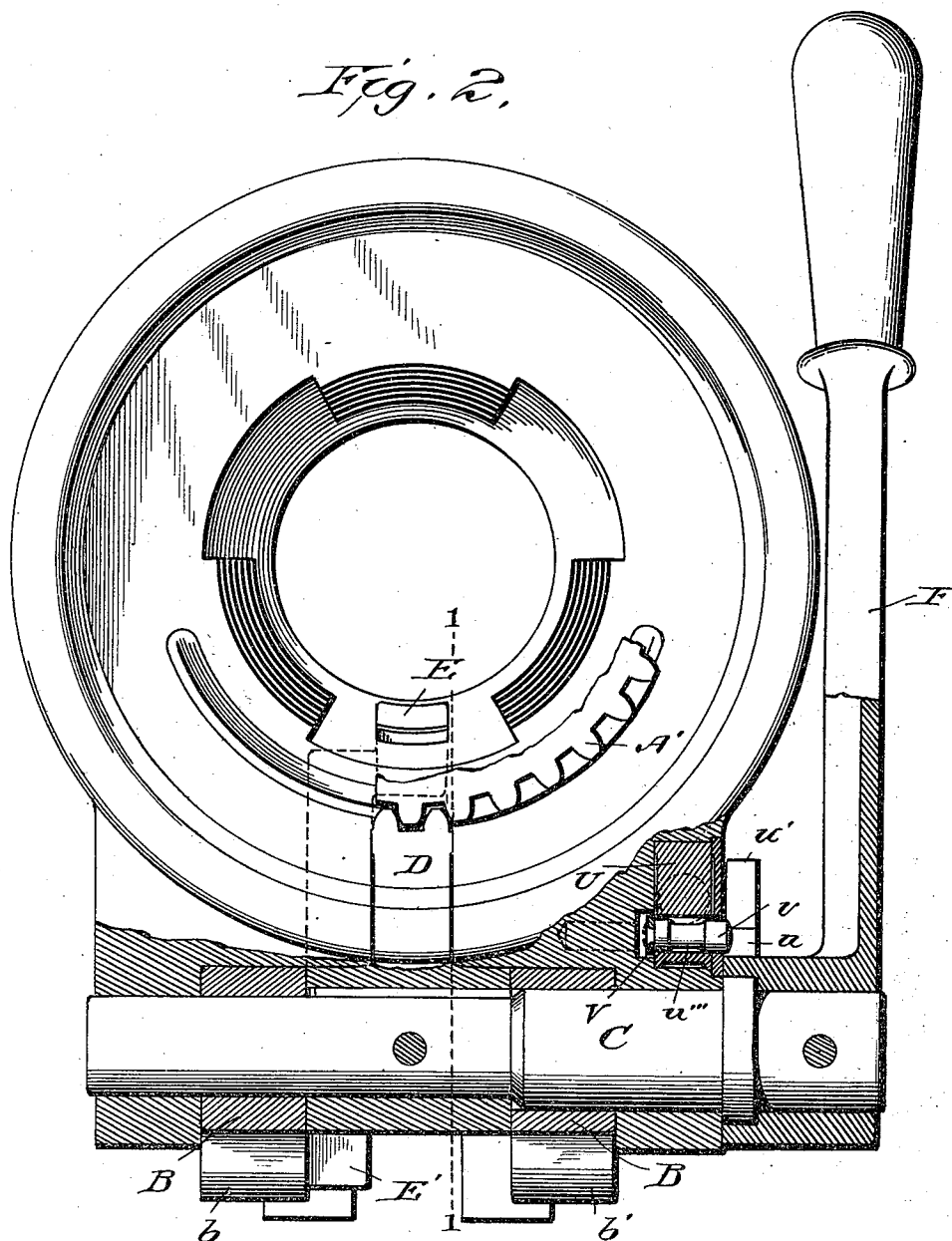
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*Fig. 2.*



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(No Model.)

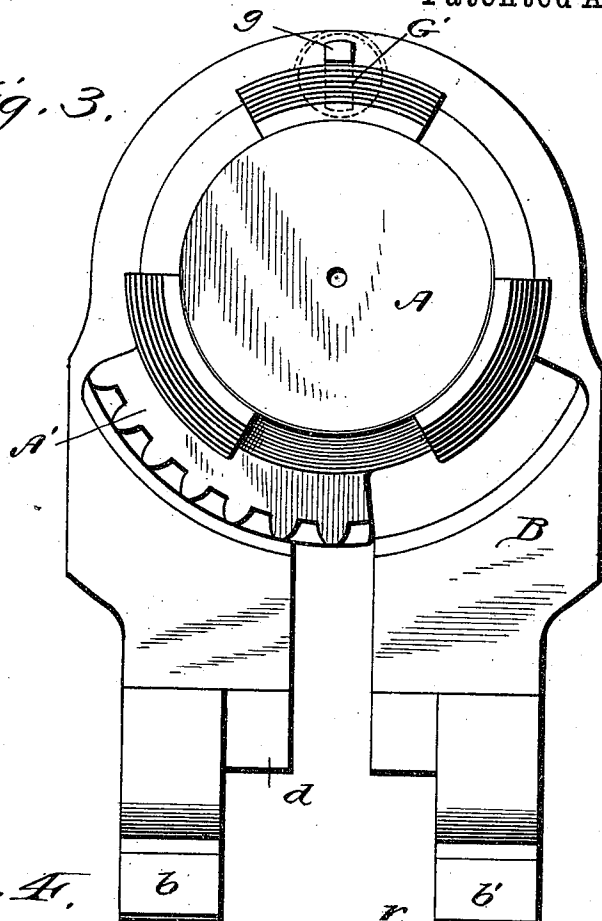
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A. C. KOERNER.  
BREECH ACTION FOR RAPID FIRE GUNS.

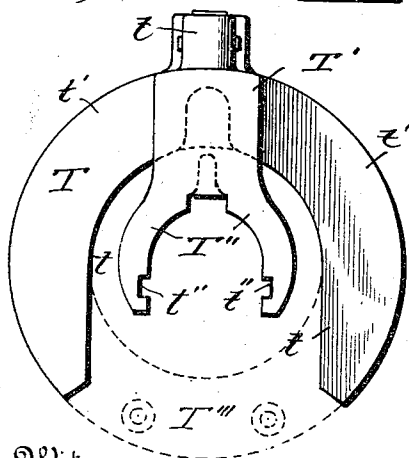
No. 537,465.

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*Fig. 3.*

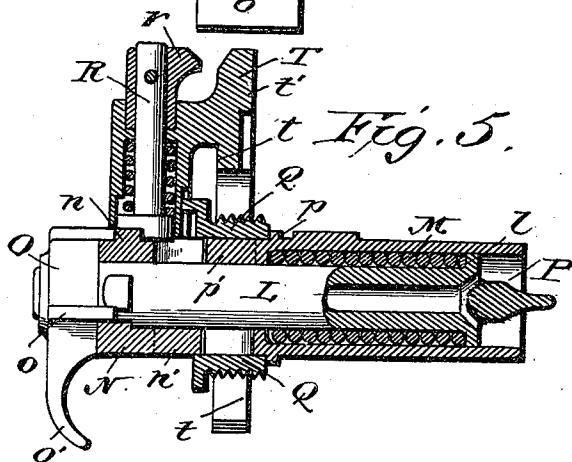


*Fig. 4.*



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*Fig. 5.*



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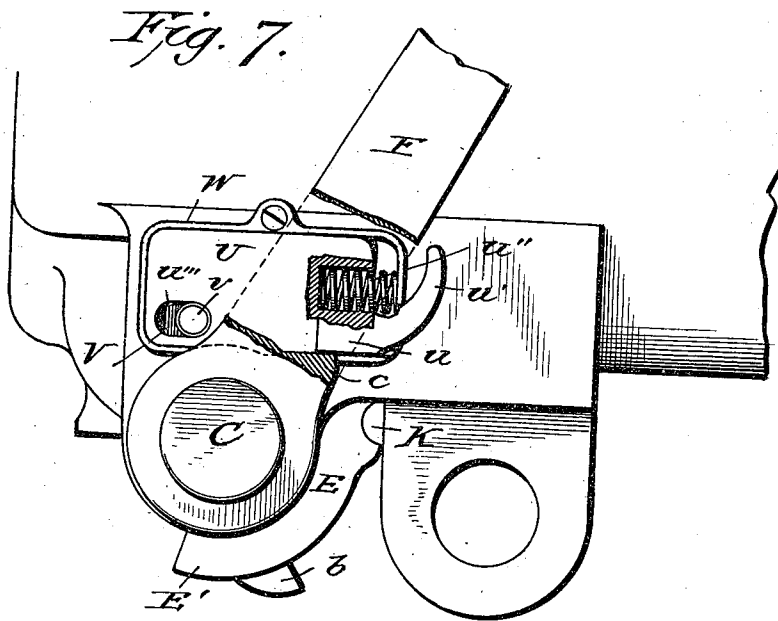
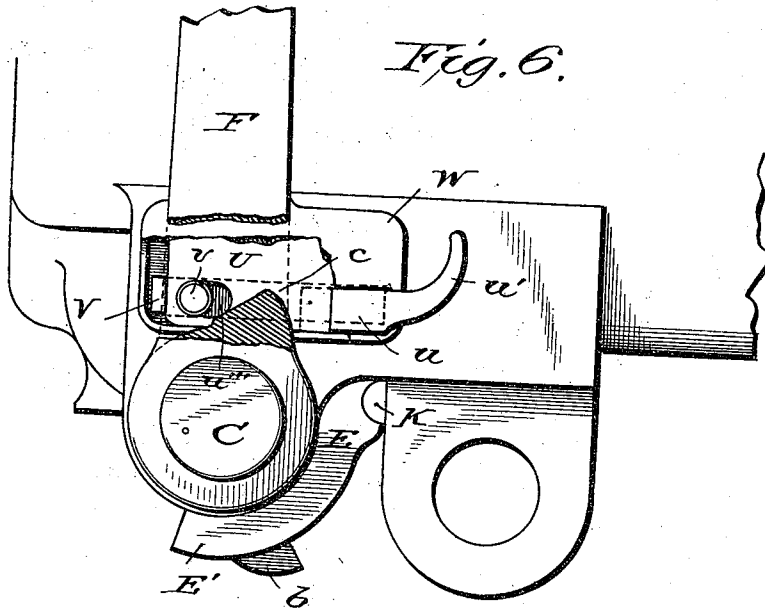
(No Model.)

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BREECH ACTION FOR RAPID FIRE GUNS.

No. 537,465.

Patented Apr. 16, 1895.



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(No Model.)

5 Sheets—Sheet 5.

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BREECH ACTION FOR RAPID FIRE GUNS.

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Fig. 8.

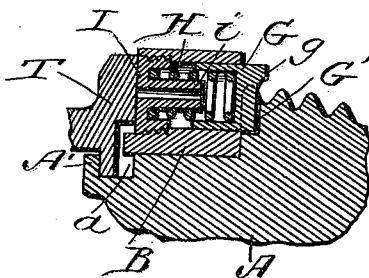


Fig. 9.

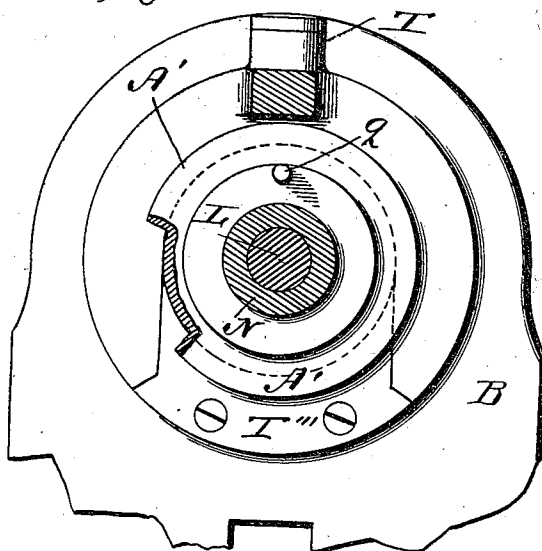


Fig. 10.

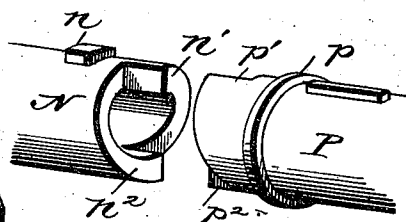
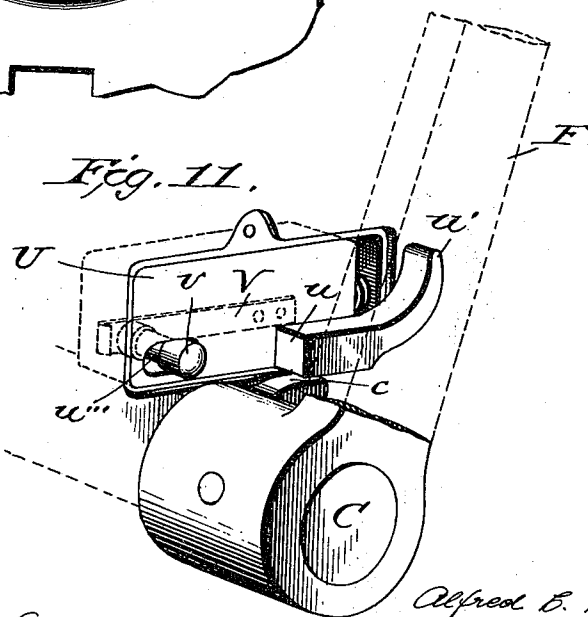


Fig. 11.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ALFRED C. KOERNER, OF PARIS, FRANCE, ASSIGNOR TO THE HOTCHKISS  
ORDNANCE COMPANY, LIMITED, OF LONDON, ENGLAND.

## BREECH-ACTION FOR RAPID-FIRE GUNS.

SPECIFICATION forming part of Letters Patent No. 537,465, dated April 16, 1895.

Application filed May 18, 1894. Serial No. 511,686. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED C. KOERNER, a subject of the Queen of Great Britain, residing at Paris, France, have invented new and useful Improvements in Breech-Action for Rapid-Firing Guns, of which the following is a specification.

My invention relates to improvements in guns which fire metallic ammunition, *i. e.*, a cartridge which serves as a gas check for the breech and containing the percussion primer, and in which the breech action consists of an interrupted screw-plug, operated by a single motion of a hand lever, which unscrews the breech plug and withdraws it and at the same time extracts the fired cartridge case and cocks the firing apparatus for the next shot; and the object of my improvement is to provide a self-contained firing apparatus mounted in and removable from the interrupted screw plug, and automatically cocked by the operation of opening the gun breech; a trigger supported by the carrier ring and which automatically locks the firing apparatus in the cocked position; means for holding the interrupted screw plug to the carrier ring; an extractor which ejects the cartridge shells after the gun has been fired; a safety catch for locking the gun in case of a misfire, and other details of construction hereinafter more fully described.

In the accompanying drawings which illustrate my invention—Figure 1 is a longitudinal section of the gun-breech on the line 1—1 of Fig. 2, showing the breech closed and the firing apparatus snapped. Fig. 2 is a cross section of the same on the line 2—2 of Fig. 1. Fig. 3 is a view of the inner face of the carrier ring with the interrupted screw-plug mounted therein. Fig. 4 is a rear elevation of the horse shoe piece which holds the interrupted screw-plug to the carrier ring and the trigger device mounted thereon. Fig. 5 is a longitudinal section of the firing apparatus, showing the same in the cocked position. Fig. 6 is a side elevation of the hand-lever for operating the breech action with the safety catch withdrawn. Fig. 7 is a similar view with the safety catch locked. Fig. 8 is a cross section similar to Fig. 1 showing the spring catch locking the carrier ring to the breech block, when the latter has be-

come disengaged from the interrupted screw of the breech and is being withdrawn. Fig. 9 is a rear elevation of the carrier ring with the breech block mounted therein and having the sear and cocking hammer removed in order to show the manner of securing the breech block in the ring by means of the horse shoe piece. Fig. 10 is a view in perspective of part of the cocking hammer and the firing pin sleeve showing the retracting cams, and Fig. 11 is a view of the safety latch showing the hand lever in the locked position.

In general outline the breech action consists of the cone shaped interrupted screw plug A, which engages in the female screw in the gun body, its hinged carrier ring B, the hand lever shaft C, carrying the toothed segment D which rotates the interrupted screw, the extractor E and the percussion firing apparatus contained in the interrupted screw A. The cone shaped interrupted screw plug A which can also be made in steps of different diameters or in any other well known way has its thread cut away in three equal parts. It is held and rotates in the carrier ring B. This carrier ring is hinged on the horizontal shaft C, which carries at the right side the hand lever F.

On the shaft C there is mounted the segment D with teeth, which engage in similar teeth cut into a projecting segment A' on the interrupted screw A.

On turning the hand lever F and with it the horizontal shaft C the interrupted screw plug A is turned one-sixth of a turn and then the screw threads are disengaged from the screw threads in the body of the gun. By continuing the motion of the hand lever the hinged carrier ring B is swung down and with it the interrupted screw. The breech is then open; as the conical shape of the screw plug obviates the necessity of its withdrawal into the carrier ring to permit of its removal from the gun breech. The opposite movement closes it again.

Two stops *b* and *b'* which are formed on the lower part of the hinge of the carrier ring bear against the body of the gun and prevent its opening further than necessary.

The interrupted screw plug A is held in the carrier ring B by the following devices:

The rear end of the screw plug A which projects beyond the rear face of the carrier ring B has a peripheral groove *a* which extends entirely around it near the edge, thus forming a laterally projecting flange A' on the end of the screw plug. After the screw plug A has been seated in the carrier-ring B, the crescent or horse shoe piece T (Figs. 4 and 9) is dropped into the groove *a*, its lower outside face *t* bearing against the flange A' of the screw plug and its upper inner face *t'* bearing against the carrier ring, thus locking the two together while permitting of the rotation of the screw plug in the act of opening the breech. A segmental locking collar T''' projecting under the flange A' of the screw plug and abutting against the lower ends of the horse shoe piece T is secured to the carrier ring B and prevents the horse shoe piece from rocking in its seat. To prevent the interrupted screw A from turning in the carrier ring, except when the breech is so far closed that the face of the screw threads are in line with those of the body of the gun, there is a spring latch G fitted in the upper portion of the carrier ring B.

The spring latch (Figs. 1 and 8) consists of the screw head I having a spindle *i* which projects into a chamber in the carrier ring B. Over the spindle *i* fits the tubular cap G, extending partly over the outer rim of the interrupted screw plug and partly against the gun body. A spring H coiled between the spindle head and the tubular cap tends to push the latter out when not prevented by the projection *g* bearing against the gun body. When, in order to open the gun the screw plug A is rotated in the breech to the position in which it can be withdrawn therefrom, a recess G' cut in the rear face of the screw plug registers with the catch G and as the screw plug is swung free of the breech the catch engages therewith, locking the screw plug to the carrier ring to prevent further rotation.

In closing the breech the projection *g* of the catch bears against the end of the gun body and the catch G is thus withdrawn from the recess in the interrupted screw. Then this is free to turn and to be screwed entirely home by the action of the hand lever and the toothed segments A' and D.

The firing apparatus is so arranged that it is entirely self contained and can be withdrawn from the breech screw, as shown in Figs. 5 and 10. It consists of the striker pin L mounted in the sleeve P which turns freely upon it and with the screw plug and having the spring M coiled around the pin between the flange *l* on the striker pin and the head *p* of the sleeve; the cocking hammer N mounted on the striking pin L and having two similar male cams *n' n''* which bear against two female cams *p' p''* cut in the outer end of the sleeve P, and the assembling nut O, which screws upon the end of the striker pin, and secures the sleeve, pin and cocking hammer together. The head of the sleeve *p* thus hold-

ing these parts together fits into a suitable cavity in the interrupted screw plug A where it is held in place by the screw collar Q, having a guide to prevent its turning in the interrupted screw plug.

T' is a downwardly projecting bracket, forming part of the horse shoe piece T, and having the pendent arms T'' provided with the guide grooves *t'' t'''* in which run the laterally projecting guides *o o* of the assembling nut O, and thus prevents the rotation of the assembling nut with the striker pin, which remain free to move back and forth in the sleeve P and guide grooves *t'' t'''*. The action of this part of the firing apparatus is as follows: The interrupted screw plug A being turned by the motion of the hand lever, rotates the sleeve P with it around the striker pin L which is prevented from turning by the guides *o o* of the assembling nut and the grooves *t'' t'''* or the horse shoe bracket T'. As a result the cams *p' p''* of the sleeve P pressing against the cams *n' n''* of the cocking hammer N, drive the hammer and with it the striker pin backward into the cocked position, whereupon it is locked by the sear R, which consists of the spring actuated pin R (Fig. 5) located in a chamber in the bracket T, so as to engage with the shoulder *n* on the cocking hammer N, when the latter is driven back. After closing the breech and turning the breech plug A into the locked position, the sear R is released and the firing apparatus snapped by inserting an olive shaped button on the end of a firing lanyard under the tail *r* of the sear and pulling the lanyard. The guides *o o* serve at the same time to keep the horse shoe piece T in place, and this again also serves to keep the interrupted screw in the carrier ring.

The firing apparatus is shown snapped in Fig. 1 and cocked in Fig. 5.

It is made possible to cock the firing apparatus by hand if required, by drawing on the projecting hook *o'* formed on the assembling screw.

The striker pin L is perforated as shown in Fig. 5 in order to allow free escape of the gas in case of a blow back of the primer and so obviate the fouling of the firing apparatus and consequent cause of misfires.

The extraction of the fired cartridge case is accomplished by the following mechanism: The lever extractor E is hinged on the projection K of the gun-body. The lever arm of the extractor projects upward and under the rim of the cartridge head and can move in a suitable mortise in the breech of the gun. At the lower end there is a projecting tail E', which is struck by a projection *d* formed on the carrier ring B when this is swung downward. This causes the extractor E to rotate around its axis K and so to eject the fired cartridge case from the chamber of the gun.

In order to prevent the gunner opening the breech before the discharge of the gun when there is a misfire, or a hang fire, a safety

lock is provided, which is withdrawn automatically by the discharge of the gun and then allows the hand lever F to be turned and the breech opened.

5 The safety lock (Figs. 6, 7 and 11) consists of the recess W containing the longitudinally sliding bolt U actuated by the recoil of the gun and provided with an off-set *u* which projects into the path of the nose *c* on the hand lever shaft C when the bolt is shot forward, and having a hook *u'* for withdrawing the bolt by hand when required. The coiled spring *u''* between the end of the bolt and the end of the recess W is compressed by the inertia of the bolt U on the discharge of the gun, whereupon the hooked end of the flat spring V which forms the sear of the bolt and is secured at one end to the bottom of the recess in the rear of the bolt, engages the outer end of the bolt and locks it in position with the off-set *u* withdrawn out of the path of the nose *c* to permit the turning of the hand lever and opening of the breech. On closing the breech the nose *c* passing over the beveled or rounded head of the spring button *v* projecting through a slot *u'''* in the bolt and the recess cover into its path, presses down the button, see Fig. 2, and disengages the spring V from the bolt, allowing the latter to fly forward and lock the hand lever until again released by the discharge of the gun.

Figs. 7 and 11 show the hand lever locked by the safety lock. Fig. 6 shows it released and in course of opening the breech. On the discharge of the gun the safety lock is withdrawn by the shock of the discharge. The hand lever F is pulled backward by the gunner. During the first part of the movement the interrupted screw A is caused to rotate by means of the toothed segments D and A'. During this period of rotation the striker pin is cocked by the action of the cams *p' n'* and *p'' n''* and held cocked by the sear R. As soon as the one sixth turn of the interrupted screw A is completed the screw threads are disengaged and the screw backed out to the amount given by the pitch. As the carrier ring begins to swing backward on the shaft C the spring catch G is enabled to go forward under the action of its spring and to enter the notch G' in the interrupted screw and so prevent any further rotation of the same in the carrier ring B. On the continuation of the movement of the hand lever the whole breech closing apparatus is swung backward around the hinge formed by the shaft C until the projection *d* on the carrier ring strikes against the tail E' of the extractor E and so the fired cartridge case is jerked out of the gun. In the meantime the projecting lugs *b* and *b'* of the carrier ring have brought the breech action to a stop by striking against the bottom of the gun body. A new cartridge is now inserted into the chamber and the breech is closed by reversing the movement of the hand lever from backward to forward. The safety lock is slipped over the nose *c* and

the hand lever is locked. The gun is now ready for firing.

To fire the gun a lanyard carrying a small steel button at its end is now inserted under the projecting hook *r* on the sear. On pulling the lanyard the button lifts the sear and the striker pin can fly forward under the action of its spring and strikes the primer in the cartridge and the discharge takes place. At the same time the safety lock is automatically withdrawn and the breech of the gun can again be opened.

Should it be necessary to open the breech without discharging the gun, then the safety lock must be first withdrawn by pulling on its hook *o'*.

For large caliber guns where it is desirable to have the gun open sidewise on account of the weight of the breech, the general arrangement of the breech action is similar to the first described, but the hinge for carrier ring, &c., is placed on the side and the handle for opening and closing the breech is fitted to swing around in the horizontal plane.

The sear which controls the striker is arranged so that the lanyard can be hooked on to a bell crank lever, the one branch of which serves to lift the sear.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a breech loading gun having the slotted screw system of fermeture, the combination with the carrier ring, of the screw plug seated therein and having a circumferentially grooved rearward part projecting through said ring, and a horseshoe shaped collar locking into said groove and bearing against the rearward face of the carrier ring, substantially as described.

2. In a breech-loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw plug seated therein, a self contained and removable firing mechanism seated in and cocked by the rotation of the screw plug and a sear which engages the firing mechanism when cocked, mounted in a horse shoe shaped collar connecting the screw plug to the carrier-ring substantially as described.

3. In a breech-loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw plug seated therein, a spring actuated firing pin extending through an axial chamber in the screw plug, a sleeve mounted in said axial chamber and turning with the screw plug, a retracting cam on the firing pin, a cam on the sleeve bearing against the firing pin retracting cam, and a non-rotating longitudinal firing pin guide exterior to the screw-plug and held stationary by the carrier ring, whereby when the screw is rotated, the pin is cocked, substantially as described.

4. In a breech loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw plug seated



therein, a spring actuated firing pin extending through an axial chamber in the screw-plug, a sleeve mounted in said axial chamber and turning with the screw plug, a retracting cam on the firing pin, a cam on the sleeve bearing against the firing pin cam, a non-rotating longitudinal firing pin guide and a spring actuated sear, both exterior to the screw plug and held stationary by the carrier ring, substantially as described.

5. In a breech-loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw-plug seated therein and having a circumferentially grooved rearward part projecting through said ring, a horse-shoe shaped locking-collar locking into said groove and bearing against the carrier ring, a spring actuated firing pin extending through an axial chamber in the screw plug, a sleeve mounted in said axial chamber and turning with the screw plug a retracting cam on the firing-pin, a cam on the sleeve bearing against the firing pin retracting cam, a non-rotating longitudinal firing-pin guide and a spring actuated sear both exterior to the screw-plug and secured to the locking-collar, substantially as described.

6. In a breech loading gun having the slotted screw system of fermeture, the combination with the screw plug having an axial chamber of the self-contained removable firing apparatus consisting of the tubular firing pin L, the sleeve P surrounding and turning on the firing pin, and with the screw plug the spring M located within the sleeve between the bearing I of the firing pin and the head of the sleeve, the sear shoulder n on the firing pin and the retracting cams n' n'', the cams p' p'' on the head of the sleeve, the assembling nut O mounted on the end of the firing pin, and the screw-collar Q mounted on the sleeve and having the guide g, substantially as described.

7. In a breech loading gun having the slotted screw system of fermeture, the combination of the carrier ring B, the catch located in a recess in the carrier ring and consisting of the nut and spindle I i and the spring actuated cap G on the spindle projecting through the carrier ring partly over the screw-plug and the gun body, and the screw plug A seated in the ring and having the recess G' on its rim which registers with the catch, when the screw plug is rotated to open the breech, substantially as described.

8. In a breech loading gun having the slotted screw system of fermeture operated by a single motion of a hand lever, the combination with the shaft C having the nose c and the operating hand lever F mounted on the shaft, of the safety lock secured to the gun body and consisting of the recess W containing the sliding bolt U actuated by the recoil of the gun and having the off-set u in the path of the nose c, the spring u'' located between the rear end of the bolt and the recess, the

spring sear V attached to the case at one extremity and engaging with the bolt at the other and having the button v projecting through the slot u''' in the bolt and cover of case into the path of the nose c, substantially as described.

9. In a breech-loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw-plug seated therein and having a circumferentially grooved rearward ring, a horse-shoe shaped collar locking into said groove and bearing against the carrier ring and a sear mounted on the horse-shoe shaped collar, which engages the firing mechanism when cocked, substantially as described.

10. In a breech loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw-plug seated therein, and provided with an axial chamber, a spring actuated firing pin extending through said axial chamber, a retracting cam on the firing pin, a cam within the axial chamber, rotating with the screw-plug and bearing against the firing pin retracting cam, and a fixed non-rotating longitudinal firing pin guide, exterior to the screw plug and sustained by the carrier ring, whereby, when the screw-plug is rotated, the pin is cocked, substantially as described.

11. In a breech loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw-plug seated therein and provided with an axial chamber, a spring actuated firing pin extending through said chamber, a retracting cam on the firing pin, a cam within the axial chamber rotating with the screw-plug and bearing against the firing pin retracting cam, a non-rotating longitudinal firing pin guide and a spring actuated sear, both exterior to the screw plug and both held stationary and supported by the carrier ring, substantially as described.

12. In a breech loading gun having the slotted screw system of fermeture, the combination of the carrier ring, the screw-plug seated therein and having an axial chamber and a circumferentially grooved rearward part projecting through said ring, a horse-shoe shaped locking collar connecting the screw-plug to the carrier ring, a spring actuated firing pin extending through said axial chamber, a retracting cam on the firing pin, a cam within the axial chamber rotating with the screw-plug and bearing against the firing pin retracting cam, a non-rotating longitudinal firing pin guide and a spring actuated sear both exterior to the screw-plug and secured to the horse-shoe shaped collar, substantially as described.

13. In a breech-loading gun having the slotted screw system of fermeture, the combination with the screw-plug having an axial chamber and a sleeve mounted in and turning with the screw-plug, a spring actuated firing pin extending through said axial cham-

ber and sleeve, a retracting cam on the firing  
pin, a cam on the sleeve bearing against the  
firing pin retracting cam, a non-rotating lon-  
gitudinal firing pin guide, exterior to the  
5 screw-plug and sustained by the carrier-ring,  
whereby when the screw is rotated, the pin  
is cocked, substantially as described.

In testimony whereof I have hereunto set  
my hand in the presence of two subscribing  
witnesses.

ALFRED C. KOERNER.

Witnesses:

LAWRENCE V. BENÉT,  
CHARLES KURER.