W. J. WHITING.

HAMMERLESS AUTOMATIC SMALL ARM.

APPLICATION FILED JULY 20, 1914.

1,143,472.

Patented June 15, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

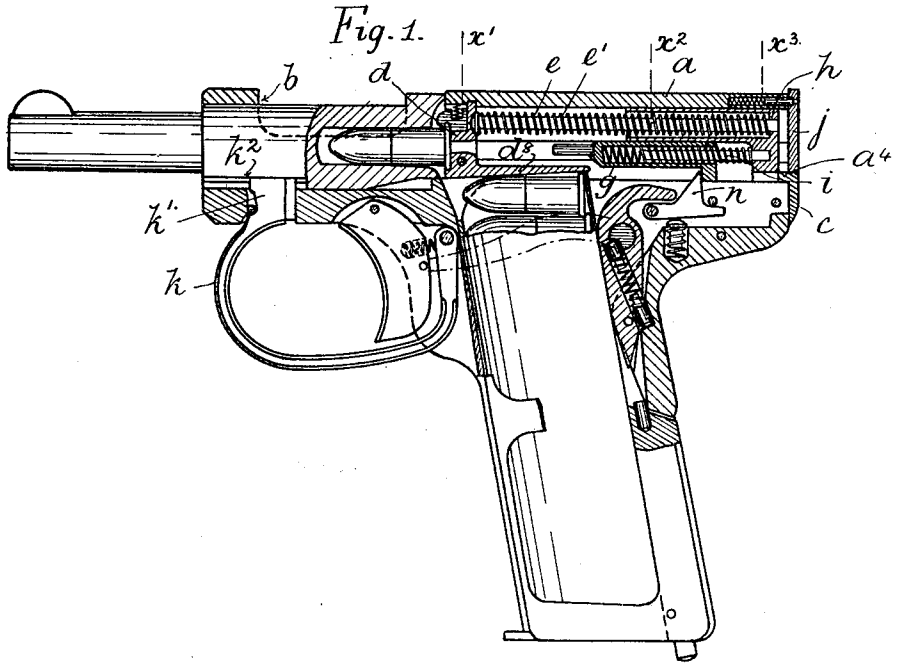
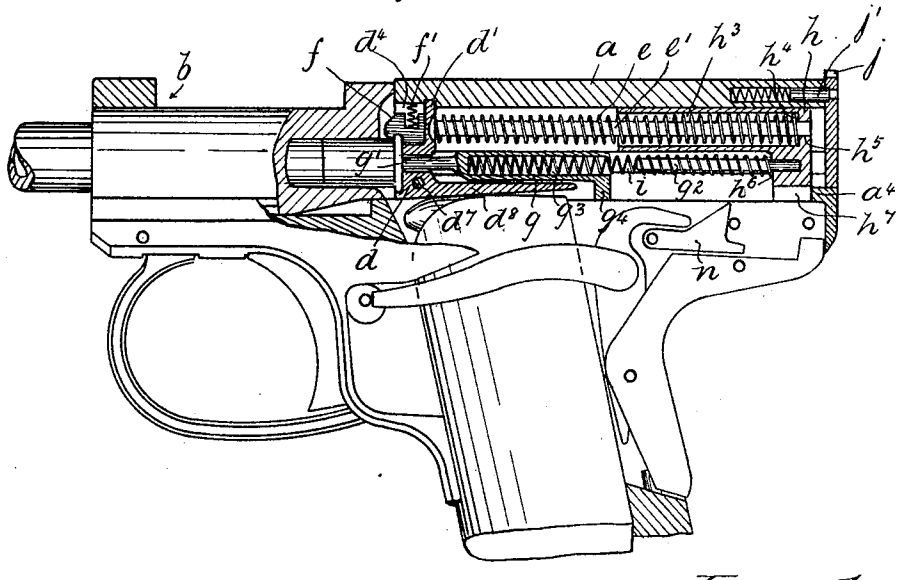


Fig. 2.



Witnesses:
M. E. McDade.
A. D. Kasten

Inventor
William J. Whiting.
by James L. Norris
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

W. J. WHITING.

HAMMERLESS AUTOMATIC SMALL ARM.

APPLICATION FILED JULY 20, 1914.

1,143,472.

Patented June 15, 1915.

3 SHEETS—SHEET 2.

Fig. 3.

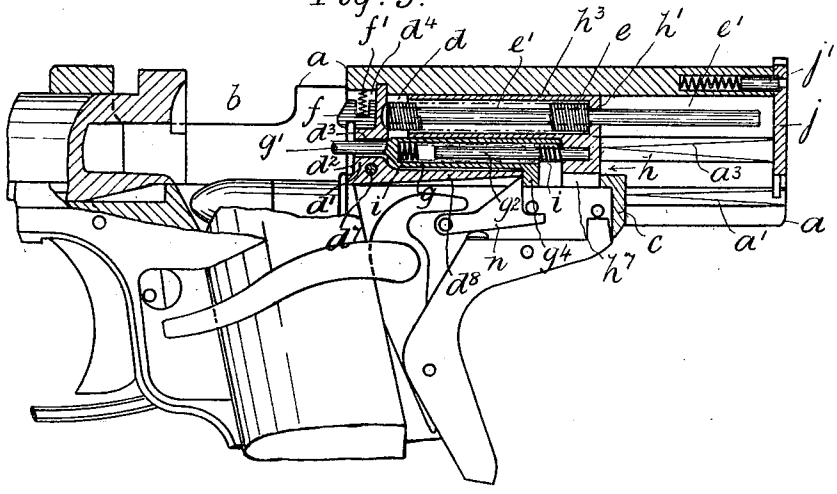


Fig. 4.

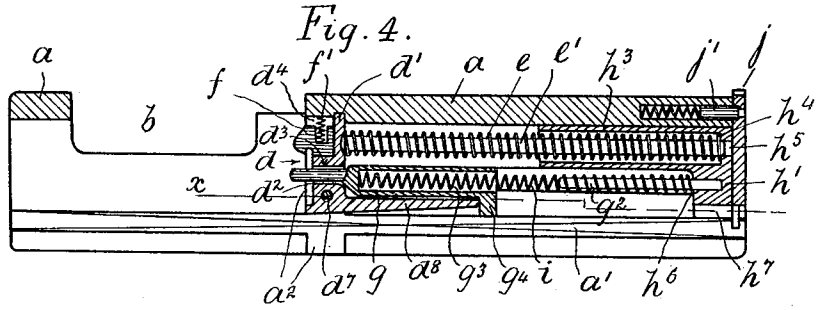
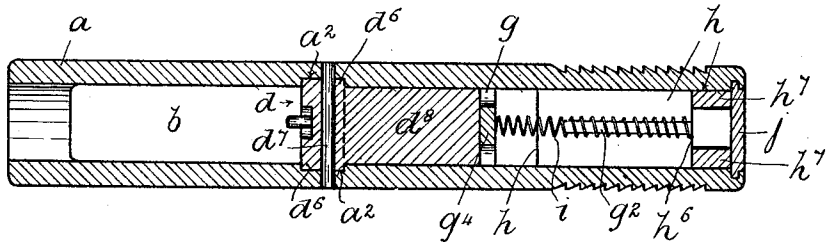


Fig. 5.



Witnesses:
M. E. McDade.
[illegible]

Inventor
William J. Whiting.
by James L. Norris
Attorney.

M.E. NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

W. J. WHITING.

HAMMERLESS AUTOMATIC SMALL ARM.

APPLICATION FILED JULY 20, 1914.

1,143,472.

Patented June 15, 1915.

3 SHEETS—SHEET 3.

Fig. 6.

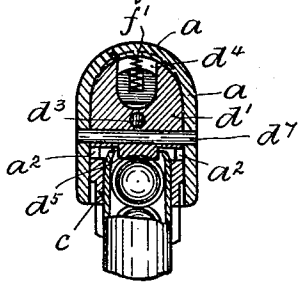


Fig. 7.

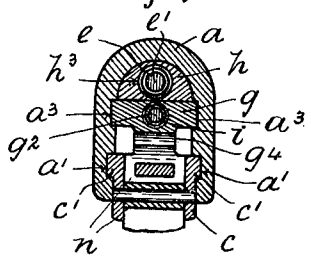


Fig. 8.

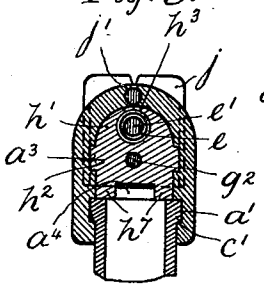


Fig. 9.

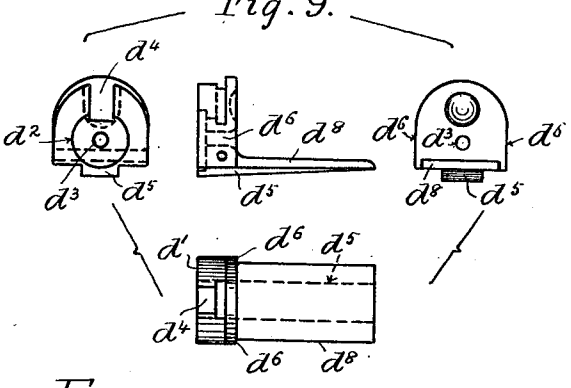


Fig. 10.

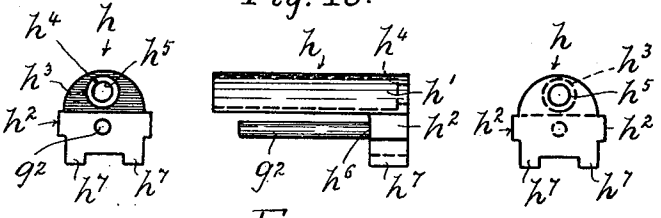
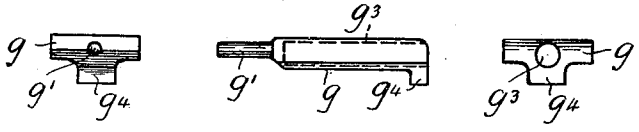


Fig. 11.



Witnesses:
M. E. McClade.

Inventor
William J. Whiting
by James L. Norris
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM JOHN WHITING, OF HANDSWORTH, BIRMINGHAM, ENGLAND.

HAMMERLESS AUTOMATIC SMALL-ARM.

1,143,472. Specification of Letters Patent. Patented June 15, 1915.

Application filed July 20, 1914. Serial No. 851,997.

To all whom it may concern:

Be it known that I, WILLIAM JOHN WHITING, subject of the King of Great Britain, residing at 111 Antrobus road, Handsworth, Birmingham, England, director of Public Company, have invented certain new and useful Improvements in Hammerless Automatic Small-Arms, of which the following is a specification.

This invention has relation to hammerless automatic pistols and other small-arms of the recoiling breech-sleeve type, and consists in certain improvements as hereinafter described in the construction of the breech sleeve, in the arrangement of the recoil-absorbing and sleeve-return spring system, and in the construction and arrangement of the striker element of the hammerless lock or firing mechanism.

According to the said invention, the breech-sleeve is adapted to contain a spiral spring that functions to absorb recoil and to return the sleeve to its normal position after each discharge, and it is also fitted with a slidably-mounted and spring-influenced striker which is cocked, or taken into engagement with the sear of the lock mechanism, by the said breech-sleeve during its rearward or recoil movement, while the striker-spring is adapted to be compressed during the cocking movement of the striker slide and simultaneously with the compression of the sleeve return-spring, and therefore functions as an additional or auxiliary recoil-absorbing spring. Further, the striker slide and its spring are so arranged that they also serve as the ejector of the arm, while the breech-sleeve, with the striker and the springs are so constructed and arranged that they constitute a completely self-contained unit which can be removed bodily from the frame of the pistol without necessitating any disturbance or derangement either of the parts that are located within the said sleeve, or of the sear and other parts of the firing mechanism that are mounted in the said frame, although the said striker and springs can be readily detached or disassembled from the sleeve when required.

Figure 1 of the accompanying drawings represents, in longitudinal vertical section, with parts in elevation, a hammerless automatic pistol constructed in accordance with my invention. This view shows the breech-sleeve in its normal or closed position and the striker cocked ready for firing. Fig. 2 is a larger scale view, showing, in longitudinal vertical section, the various parts of the breech-sleeve unit in the positions they respectively assume at the moment of impingement of the striker against the detonator of a cartridge in the barrel-chamber. Fig. 3 is another view, similar to Fig. 2, but showing the positions assumed by the parts of the breech-sleeve unit when the striker is cocked or reëngaged with the sear of the firing mechanism during the recoiling movement of the sleeve. Fig. 4 is a longitudinal vertical section of the breech-sleeve unit separately, showing the position assumed by the striker and the inclosed springs when the said unit is removed from the frame of the pistol. Fig. 5 is a horizontal section of Fig. 4 on the dotted line x. Figs. 6, 7 and 8 are transverse vertical sections taken respectively on the dotted lines x^1, x^2 and x^3 Fig. 1. Fig. 9 shows four different views of a spring-abutment member which is secured within the front or breech end of the breech sleeve. Fig. 10 shows three different views of another spring-abutment member which is contained in the rear end of the said sleeve but is normally anchored to the frame of the pistol. Fig. 11 shows three different views of the striker.

The same letters of reference indicate corresponding parts in the several figures of the drawings.

In the hammerless automatic pistol shown in the said drawings, the breech-sleeve a is machined to an inverted U section, and is provided with the usual ejection aperture b in the top of its forward part, while its inner side walls are formed, immediately above and parallel to their lower edges, with shallow grooves or channels a^1 for engaging the breech-sleeve guide-ribs c^1 on the frame c of the pistol. The interior of this sleeve is fitted, immediately behind the ejection aperture, with a rigidly-attached member d which serves as a front-abutment for the spiral return-spring e, and also carries a spring extractor-hook. This member d, whose formation is clearly shown in Fig. 9, comprises a solid piece d^1 which is shaped to fit closely inside the sleeve and whose forward face is formed with a circular recess d^2 which registers with the breech end of the cartridge chamber of the barrel and is centrally pierced with a striker hole d^3, while a part above the said recess is adapted to carry the forwardly-projecting extrac-

tor hook f which, in the particular arrangement illustrated, is slidably mounted in a vertical recess d^4 cut in the front of the piece d^1 and is influenced by a spring f^1 that has its bearing against the crown of the sleeve as shown in Fig. 6.

The rear side of the abutment piece d is formed with a seating that receives the forward end of a long rod or pin e^1 that extends along the breech-sleeve from the abutment d to, and through, the abutment h and serves as a guide for the spiral recoil-absorbing and sleeve-return spring e which surrounds the said rod and has its forward abutment against the said piece d^1, as shown in Figs. 1, 2, 3 and 4, while to provide for the cocking of the striker g during the recoiling movement of the breech-sleeve, the lower part of the piece d^1 is formed with a rearwardly-extending tongue d^8 (hereinafter referred to as the cocking extension) which is located in a plane a little below the striker-hole d^3 and has a flat upper surface to admit of the striker traveling over it when making its firing stroke. Further, the underside of the cocking extension of the said abutment member is formed with a central rib of suitable width d^5 whose forward or nose end serves, during the return stroke of the breech-sleeve, to engage the uppermost cartridge in the magazine (see Fig. 3) and push the same into the barrel chamber, while the opposite sides of the piece d^1 are provided with vertical ribs or feathers d^6 which engage in corresponding and open-bottomed grooves or key-ways a^2 cut in the inner sides of the breech-sleeve (see Fig 5) and serve to hold the member d in its prescribed position in the said sleeve; the two parts d, a, when assembled, being fixed together by a removable transverse pin d^7, while the open-bottomed key ways admit of the abutment member d being withdrawn through the bottom of the sleeve, when required, after the pin d^7 has been removed.

The rear end of the return spring e has its bearing on a back-abutment piece h which is contained and inclosed within the sleeve a but is normally anchored to the frame as hereinafter described. This abutment member h (the formation of which is clearly shown in Fig. 10) consists of a block h^1 that is shaped to fit inside the rear end of the breech-sleeve so as to allow the latter to slide freely over the said member h during its recoiling and return movements, and its opposite sides are formed with horizontal feathers or ribs h^2 that engage in corresponding side-grooves or key-ways a^3 cut along the interior of the said sleeve, while its upper part is formed with a bush or tubular chamber h^3 that receives the rear end of the return spring e; the said chamber being shouldered internally at h^4 to provide a bearing for the said spring and pierced, at its back end, with a hole h^5 wherethrough the rear portion of the return-spring guide-rod e^1 travels during the recoiling and return movements of the breech-sleeve.

The front face of the part h^6 of the back-abutment piece which comes below the tubular return-spring chamber is adapted to constitute the abutment for the striker spring i, and carries a forwardly-projecting rod g^2 which is located in the same plane as the striker-hole d^3 in the front abutment member, and is surrounded by the said striker spring, while the underside of the said back abutment is provided with a transverse shoulder or rib h^7 which, when the parts of the pistol are assembled as shown in Figs. 1, 2 and 3, bears against a stop shoulder a^4 at the extreme rear end of the pistol body so that, although the abutment is not actually connected with the said body, it is constantly kept against the body-stop, and is held stationary relative to the reciprocating breech-sleeve, by the rearward thrust of the breech-sleeve and the springs e, i. In order, however, to provide for the sleeve and the whole of the parts d, e, g, h and i being removed bodily or as one unit from the frame, the rear end of the breech sleeve is furnished with a sliding closure-plate j which normally is secured to the said sleeve (by means of a spring bolt j^1 or other suitable fastening so that it lies above the stop-shoulder a^4 on the frame, and a little rearward of the abutment-piece h when the breech-sleeve is in its closed position as represented in Figs. 1 and 2. When, however, the barrel and breech-sleeve units are unfastened (which, in the case of the pistol shown in Fig. 1 is effected by withdrawing the end k^1 of the spring trigger guard k from the recess k^2 of the barrel-base) the expansion of the inclosed springs causes the breech sleeve to move forward along the frame and so bring the closure plate up to the abutment piece h. Then, on the said sleeve being forwardly withdrawn, by hand, from the frame, the said closure piece serves to retain the loose member h within the sleeve and keep all the other members of the breech-sleeve unit in the positions shown in Figs. 4 and 5 until the said unit is restored to the frame and the said member h is reëngaged with its anchoring stop a^4. But if it is required to effect the removal of the springs and striker for dismantling the breech-sleeve unit, this can be done (after the said unit has been withdrawn from the frame) by unfastening the closure plate and sliding it upwardly from the sleeve, whereupon the abutment member h, together with the said springs and striker can be withdrawn by way of the open rear end of the said sleeve.

The striker g consists of a rectangular-sectioned slide (see Fig. 11) whose opposite edges are engaged within the longitudinal grooves a^3 in the sleeve, which grooves, in addition to providing an engagement for the ribs h^2 of the abutment piece h, also serve as guides for the striker. The front end of the striker-slide carries a striker-pin g^1 that projects through the hole d^3 in the front abutment member on the said striker completing its forward stroke, and its rear end is bored at g^3 to take the striker spring i which is disposed between the said striker and the stationary back abutment h, while the underside of the rear end of the slide is formed with a depending rib or lug g^4 which is in alinement with the cocking extension d^8 of the front abutment member d and serves as a shoulder for engaging the nose of the firing-mechanism sear. This sear, in the lock shown in Figs. 1, 2 and 3 of the drawings, consists of a spring-influenced and pivoted limb n which is arranged in a horizontal position in the frame of the pistol, immediately behind the magazine chamber and in the path of the cocking movement which the striker-slide is constrained to make during the recoil of the breech sleeve after a discharge or when the said sleeve is drawn back by hand for cocking purposes; it being understood that, during such rearward movement, the striker slide (after having completed its ejecting function as described later on) is forced back with the sleeve by virtue of the engagement of the cocking extension d^8 of the breech-sleeve member d with the shoulder g^4, and is made to thereby travel over and displace the sear and tension the sear spring, but when the said sleeve has about completed its rearward stroke, the front of the shoulder g^4 clears and comes behind the rear or nose end of the said sear, whereupon the latter is raised by its spring into cocking engagement with the striker, as shown in Fig. 3. During this recoiling and cocking action, both the breech-sleeve and the striker springs are compressed between their respective abutments, and consequently the said striker-spring i serves as a secondary or auxiliary spring which assists the primary spring e to take up or absorb the recoil of the sleeve, while after the striker has been engaged by the sear, the striker-spring is held in compression (see Fig. 1) and the sleeve-spring functions alone to return the said sleeve relatively to the cocked striker. The pistol is then ready for firing and when the sear is operated for disengaging the striker, the latter makes its firing stroke under the expansion of its spring, as shown in Fig. 2.

As the breech-sleeve closes and brings the front of its member d against the breech end of the barrel, the spring extractor-hook engages with the rim of the cartridge in the barrel chamber, while during the initial part of the recoiling movement of the breech-sleeve following a discharge, the spring-influenced striker functions to effect the ejection of the spent cartridge shell—positively but without violence—as soon as the latter has been withdrawn from the chamber by the extractor. This ejection results from the fact that, after the striker has made its firing stroke and has ignited the cartridge, it is brought to rest in the position shown in Fig. 2 in which the shoulder g^4 on its underside is some distance behind the inner end of the cocking extension d^8 of the sleeve-member d, so that the striker spring is still free to act through the striker-nose for exerting a forward pressure against the cartridge head at a point below the part of the rim which is engaged by the extractor hook, and as the breech-sleeve starts its recoil, the cartridge shell is held against the face of the member d by the said extractor, and serves as a medium which transmits the initial rearward or cocking movement to the striker and starts the compression of the striker spring. This first compression of the said spring increases the pressure which the striker nose exerts on the cartridge head, so that immediately the cartridge-shell is fully extracted from the barrel-chamber, the striker-spring momentarily and slightly expands and imparts a slight relative movement to the striker which thereupon levers the said shell out of its engagement with the extractor and ejects the same through the open aperture in the sleeve. This ejecting movement of the striker brings the bent-rib against the cocking extension of the sleeve (see Fig. 3) which then functions to complete the compression of the striker spring and the rearward displacement of the said striker into cocking engagement with the sear.

In the pistol shown in the drawings, the striker which is mounted in the breech sleeve is associated with the rocking sear of a lock that is mounted or carried in the frame of the arm and is combined with a dual-control automatic safety mechanism of the kind described in the specification of my concurrent application for patent No. 851,996 but I wish it to be understood the improved breech-sleeve, striker and spring arrangement herein described may be used in conjunction with a lock having a slidably-mounted sear as shown in Fig. 12 of the drawings accompanying my said application No. 851,996, or with any other type or construction of lock that embodies a sear suitable for engaging with the striker and retaining the same in its cocked position either during the recoiling stroke of the said breech sleeve, or when the sleeve is drawn

back to cock the pistol by hand. Further, in cases where it is not required to make use of the striker and its spring for the purpose of ejecting the spent cartridge shells in the manner herein described, the cocking extension at the back of the spring abutment member *d* may be dispensed with and the said striker may be arranged so that the shoulders at its forward end come into actual contact with the rear side of the said abutment on the striker-pin impinging against the cartridge detonator, which enables the sleeve and striker to move back together, or to make a collective movement, during the whole of the cocking stroke. And when the cocking extension is not employed, the striker need not be formed with a depending lug or rib for the sear to engage with, but may be provided, at the underside of its rearward end, with any other suitable or convenient shoulder, according to the type or kind of sear which is embodied in the lock mechanism in the frame or body of the arm.

One of the principal advantages of the construction disclosed is the facility and cheapness with which it may be manufactured and assembled. Thus, the breech sleeve proper may be made from a flat metal blank and the various key-ways for the sliding parts can be machined while the blank is in flat form. Afterward, the blank can be pressed into its operative U-shaped cross-section, at which time it is ready to receive the operating parts. The assemblage of the operating parts is so simple that it can be performed by practically unskilled labor, the front abutment piece *d* being first slid into position in the groove a^2, after which the striker, the springs, and the rear abutment piece *h* can be inserted from the open back end, and finally, the unit can be completed by inserting the rear closure piece *j*.

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

1. A hammerless automatic pistol or small arm comprising, in combination, a frame, a breech sleeve mounted thereon, an abutment piece fixed within the front portion of the sleeve, a loose abutment piece slidably connected to the sleeve, the frame having a stop against which the loose abutment piece bears, a recoil-absorbing return-spring interposed between said abutment pieces and exerting a thrust against the loose abutment piece to hold the latter against said stop, a striker slidably connected to said sleeve and a spring interposed between said striker and said loose abutment piece, the sleeve being arranged to be slid on or off the frame for the purpose of assembling or disassembling.

2. A hammerless automatic pistol or small arm comprising, in combination, a frame, a breech sleeve mounted thereon, an abutment piece fixed within the front portion of the sleeve, a loose abutment piece slidably connected to the sleeve, the frame having a stop against which the loose abutment piece bears, a recoil-absorbing return-spring interposed between said abutment pieces and exerting a thrust against the loose abutment piece to hold the latter against said stop, a striker slidably connected to said sleeve, a spring interposed between said striker and said loose abutment piece, and a removable closure means for the rear end of the sleeve, the sleeve being arranged to be slid on or off the frame for the purpose of assembling or disassembling and the closure means serving to retain the striker, the springs, and the loose abutment piece within the sleeve when the latter is removed from the frame.

3. A hammerless automatic pistol or small arm comprising, in combination, a frame, a breech sleeve mounted thereon, an abutment piece fixed within the front portion of the sleeve, a loose abutment piece slidably connected to the sleeve, the frame having a stop against which the loose abutment piece bears, a recoil-absorbing return-spring interposed between said abutment pieces and exerting a thrust against the loose abutment piece to hold the latter against said stop, a striker slidably connected to said sleeve, a spring interposed between said striker and said loose abutment piece, the sleeve being arranged to be slid on or off the frame for the purpose of assembling or disassembling and the striker being removable bodily with said sleeve, and a sear carried by said frame for cocking engagement with said striker.

4. A hammerless automatic pistol or small arm comprising, in combination, a frame, a breech sleeve mounted thereon, an abutment piece fixed within the front portion of the sleeve, a loose abutment piece slidably connected to the sleeve, the frame having a stop against which the loose abutment piece bears, a recoil-absorbing return-spring interposed between said abutment piece and exerting a thrust against the loose abutment piece to hold the latter against said stop, a striker slidably connected to said sleeve, a spring interposed between said striker and said loose abutment piece, the fixed abutment piece being constructed to co-act with the striker in ejecting an empty cartridge, and a rearward extension provided on said fixed abutment piece for imparting cocking movement to said striker after the latter has participated in the ejection of the empty cartridge

5. A breech-sleeve unit for hammerless automatic-pistols containing a sliding striker, a recoil-absorbing sleeve-return spring, a recoil-absorbing striker-spring, a front-abutment member which is fixed within the sleeve, a rear-abutment member which is slidably connected to the said sleeve and is

normally anchored to the frame of the arm, and a rear stop or closure-plate located at the back of the rear abutment; the whole of the said parts being arranged in the manner herein described so that they may be removed bodily with the breech sleeve when the latter is detached from the said frame and so also that the springs, the striker and the abutment members may be dis-assembled from the said sleeve when the rear stop or closure plate is withdrawn.

6. A hammerless automatic pistol or small arm comprising, in combination, a frame, a breech sleeve having an inverted U-shaped cross-section and having its sides provided with longitudinal key-ways, the frame having projections which engage in said key-ways and which provide for the removal or assemblage of said breech sleeve by a sliding movement thereof, an abutment member fixed to said sleeve at the front end thereof, the sleeve having other longitudinal key-ways above said first-named key-ways, a loose abutment member having projections which engage in said last-named key-ways, the frame having an end stop against which said loose abutment member bears, a sliding striker having its sides engaged in said last-named key-ways, a recoil-absorbing return-spring interposed between said abutment members, and a spring interposed between said striker and said loose abutment member.

7. A hammerless automatic pistol or small arm comprising, in combination, a frame, a breech sleeve having an inverted U-shaped cross-section and having its sides provided with longitudinal key-ways, the frame having projections which engage in said key-ways and which provide for the removal or assemblage of said breech sleeve by a sliding movement thereof, an abutment member fixed to said sleeve at the front end thereof, the sleeve having other longitudinal key-ways above said first-named key-ways, a loose abutment member having projections which engage in said last-named key-ways, the frame having an end stop against which said loose abutment member bears, a sliding striker having its sides engaged in said last-named key-ways, a recoil-absorbing return-spring interposed between said abutment members, a spring interposed between said striker and said loose abutment member, and a removable closure means for the rear end of the sleeve which serves to retain the striker, the springs, and the loose abutment member within the sleeve when the latter is removed from the former.

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

WILLIAM JOHN WHITING.

Witnesses:
ARTHUR SADLER,
E. J. REESE.

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