

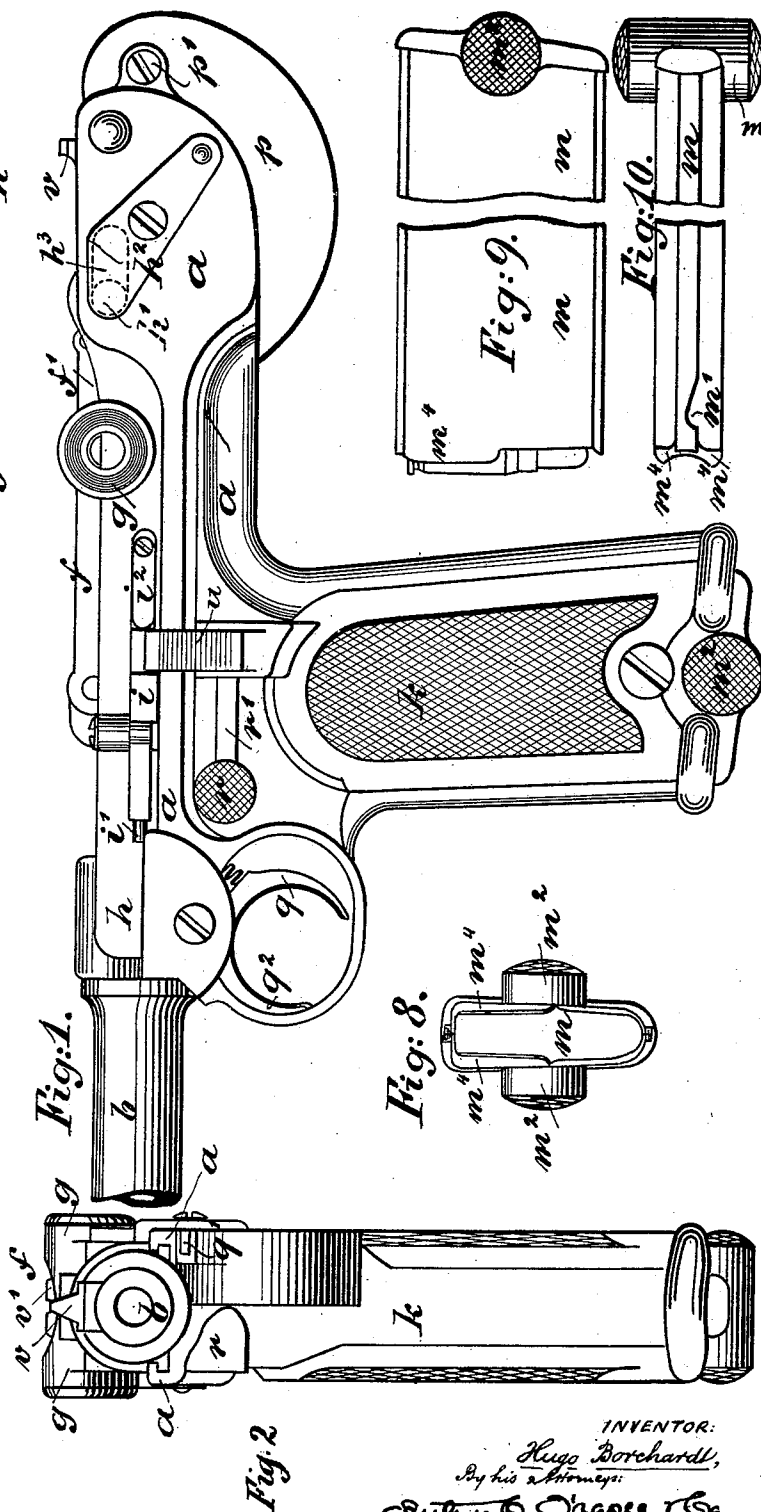
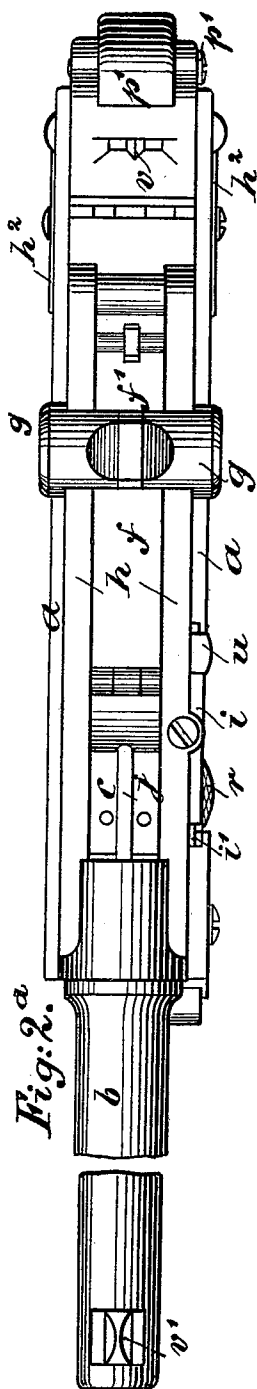
(No Model.)

3 Sheets—Sheet 1.

H. BORCHARDT.
RECOIL MAGAZINE PISTOL.

No. 571.260

Patented Nov. 10, 1896.



WITNESSES:

Fred White
Thomas H. Wallace

INVENTOR:

Hugo Borchardt,
By his attorneys:
Arthur C. Chase & Co.

(No Model.)

3 Sheets—Sheet 2.

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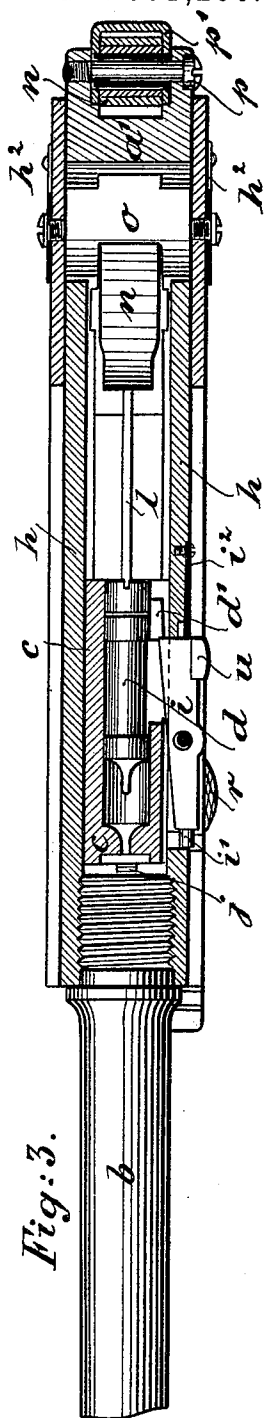


Fig:3.

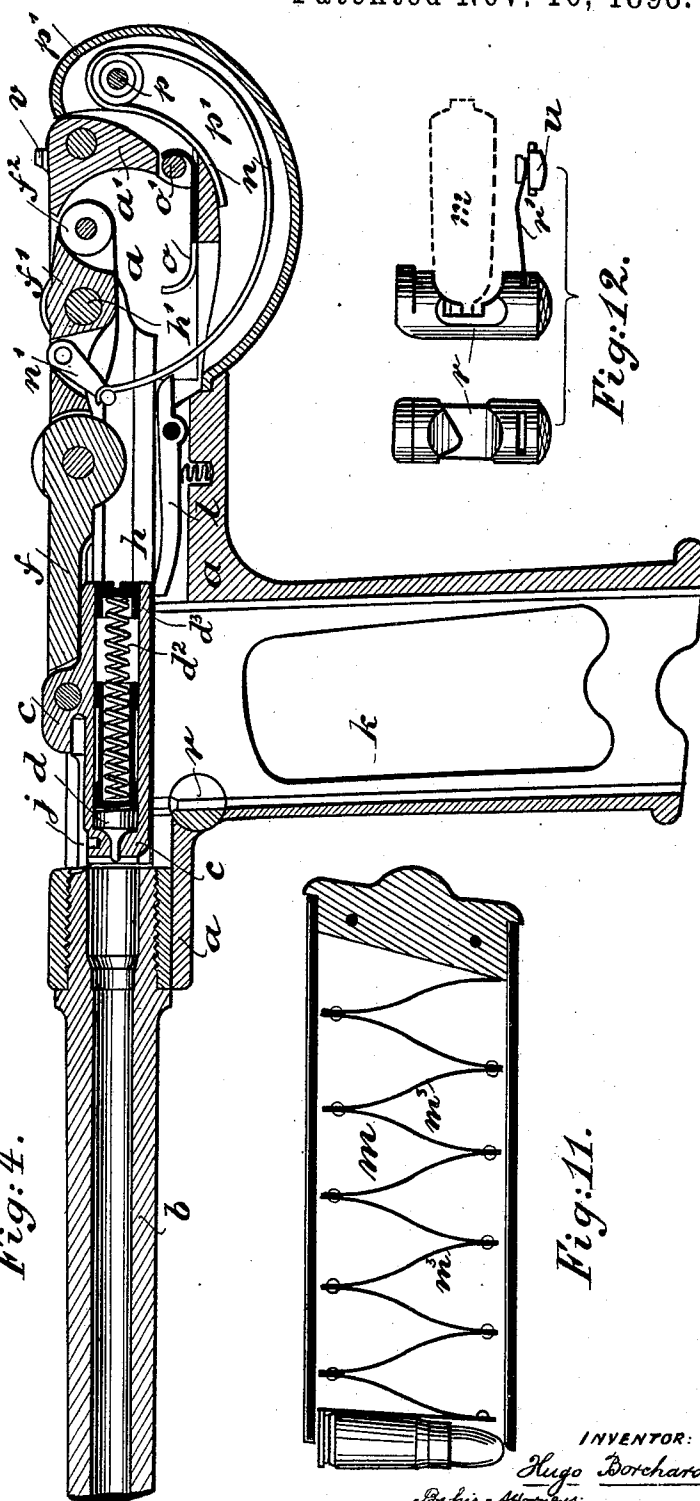


Fig:4.

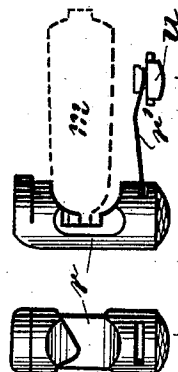


Fig:12.

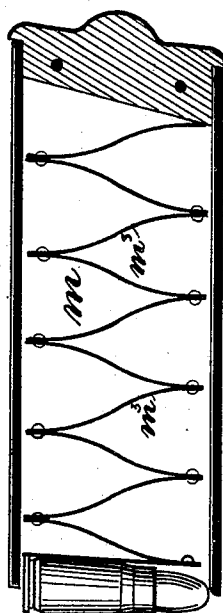


Fig:11.

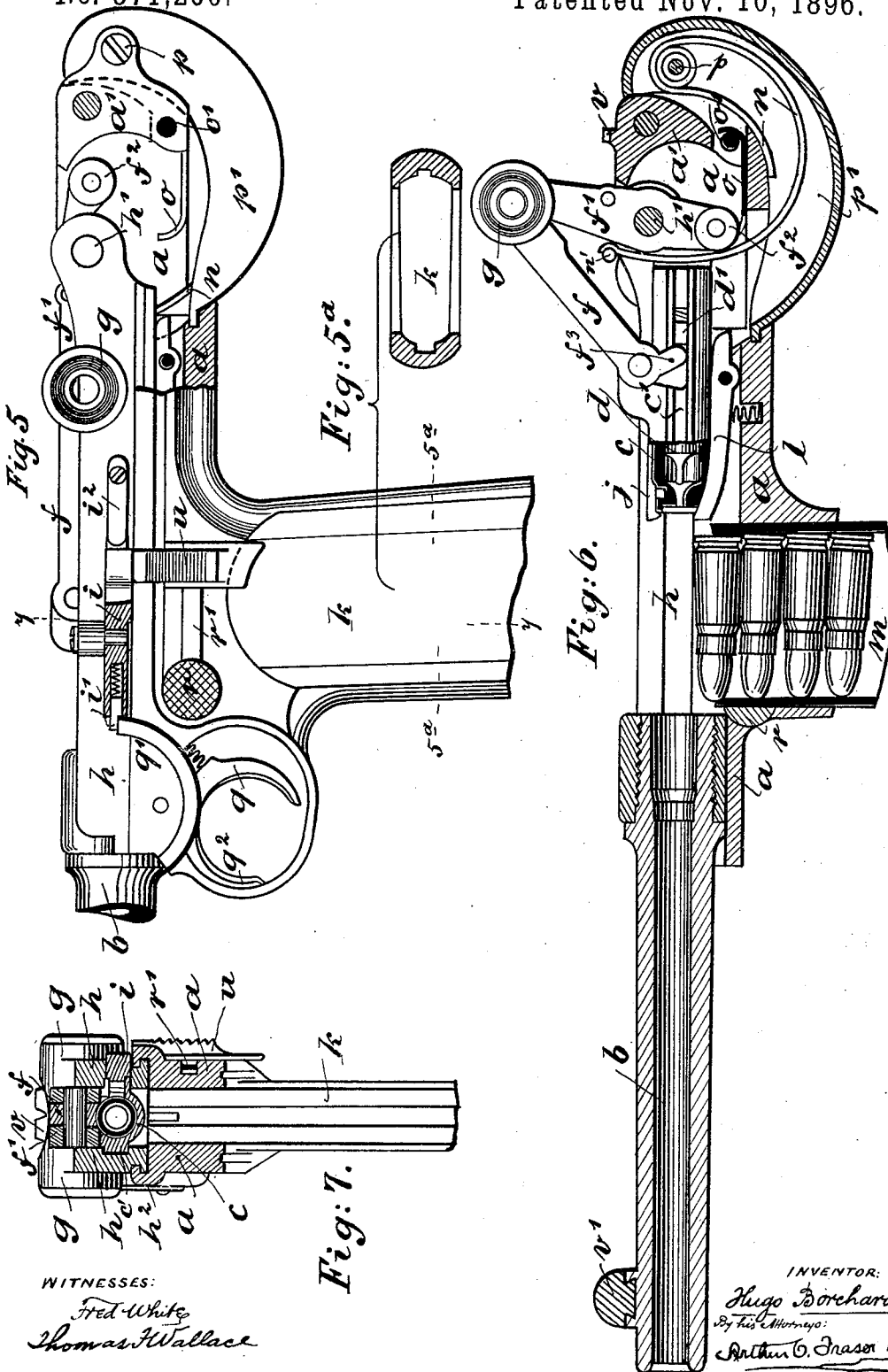
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UNITED STATES PATENT OFFICE.

HUGO BORCHARDT, OF BERLIN, GERMANY.

RECOIL MAGAZINE-PISTOL.

SPECIFICATION forming part of Letters Patent No. 571,260, dated November 10, 1896.

Application filed October 21, 1893. Serial No. 488,759. (No model.) Patented in Germany September 9, 1893, No. 75,837; in Austria-Hungary September 11, 1893, No. 49,411 and No. 81,626; in Switzerland September 16, 1893, No. 7,296; in Belgium September 18, 1893, No. 106,460; in Norway September 19, 1893, No. 3,324; in France September 21, 1893, No. 232,975; in Italy September 25, 1893, No. 285; in Spain September 29, 1893, No. 15,014, and in England October 6, 1893, No. 18,774.

To all whom it may concern:

Be it known that I, HUGO BORCHARDT, a citizen of the United States, at present residing in the city of Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful improvements in Recoil Magazine Pistols and Firearms, of which the following is a specification.

This invention is the subject-matter of Letters Patent in England, No. 18,774, dated October 6, 1893; in Germany, No. 75,837, dated September 9, 1893; in France, No. 232,975, dated September 21, 1893; in Austria-Hungary, No. 49,411 and No. 81,626, dated September 11, 1893; in Switzerland, No. 7,296, dated September 16, 1893; in Italy, No. 285, dated September 25, 1893; in Spain, No. 15,014, dated September 29, 1893; in Norway, No. 3,324, dated September 19, 1893, and in Belgium, No. 106,460, dated September 18, 1893.

This invention relates to breech-loading magazine pistols and firearms, and particularly to those actuated by the recoil of the fired cartridge to reload and cock the pistol or arm.

Heretofore recoil-operated firearms have been constructed with a longitudinally-movable barrel actuated by the recoil, a breech-bolt, links connecting said breech-bolt and barrel, means for returning the barrel to position after recoil, and mechanism for actuating the links to withdraw the breech-bolt and open the breech, and for returning the breech-bolt to normal position.

The object of the invention is to provide various improvements in such arms and to provide a repeating pistol, furnished with a magazine containing a number of cartridges and inclosed in the butt, which by the recoil of the fired cartridge opens the breech, extracts and ejects the empty shell, cocks the firing-pin, shoves the cartridge which has ascended from the magazine into the barrel, and closes the barrel, so that the arm is ready to be fired again. The recoil of the arm is used directly for opening the breech against the momentum of the parts and against the force of different springs, which are com-

pressed or distorted, and it executes thereby so much work that this power is completely balanced, so that the hand holding the arm feels no shock. While the parts are reaching their extreme backward position, the uppermost cartridge in the magazine rises in the path of and in front of the bolt. After the recoil is exhausted, at which time the parts are in the extreme backward position, the different springs compressed by the recoil exert their reacting power in pushing forward the bolt and with it the uppermost cartridge until the latter is driven home into the barrel and the breech closed. In this way the recoil is used indirectly for closing the breech. The pistol is now again ready to be fired by pressing the trigger.

It is a very remarkable feature of the new pistol that the butt stands out at about right angles to the direction of the barrel at the under side of the pistol, whereby the weapon lies much more firmly and more conveniently in the user's hand than did the old-fashioned arm having a sloping butt. Therefore, as the hand and arm muscles are not strained unnaturally in holding the weapon, the aiming is easier and more exact, and this effect is sustained by the absence of any shock at the discharge and by the novel disposition of the weight of the arm, so that the barrel is counterbalanced by the back portion of the pistol extending backward above the hand and about to the wrist, more or less, according to the size of the pistol.

In the accompanying drawings, which show the preferred adaptation of the invention, Figure 1 is a fragmentary elevation of the left side of a pistol. Fig. 2 is a front elevation thereof. Fig. 2^a is a fragmentary plan view thereof. Fig. 3 is a fragmentary horizontal axial section thereof, the barrel being in plan. Fig. 4 is a fragmentary vertical axial section thereof. Fig. 5 is a fragmentary side elevation thereof corresponding to Fig. 1, but showing some of its parts broken out and in section. Fig. 5^a is a cross-section of the butt on the line 5^a-5^a, Fig. 5. Fig. 6 is a fragmentary vertical axial section of the arm, the parts being shown in the open position. Fig. 7 is

a fragmentary vertical cross-section cut on the line 7-7 of Fig. 5, the parts being in the closed position. Fig. 8 is a plan view of the magazine removed. Fig. 9 is a fragmentary side elevation thereof. Fig. 10 is a fragmentary front elevation thereof. Fig. 11 is a vertical longitudinal section thereof; and Fig. 12 is a top and face view of the magazine-lock and its spring, the magazine being shown in dotted lines.

Referring to the drawings, I will now describe the preferred embodiment of my invention, in which the pistol consists of four main parts, namely, the butt *k*, constituting the handle of the arm and forming with the casing inclosing the lock mechanism and hereinafter called the "frame" *a* one piece, and the trigger-guard; the barrel *b*, guided by its rearwardly-projecting slides *h*, which are rigid separated extensions of the barrel, movably engaging with the frame *a*; the bolt *c* with the firing-pin *d*; and the toggle-joint *f f'*, and springs and other details belonging to it; and the trigger arrangement, cartridge-magazine, safety device, and other details, are provided besides.

The ammunition used is in the form of the usual metallic shell-cartridges with caps in the bottom. These cartridges are placed in a separable sheet-metal magazine *m*, which is slipped into the butt *k*, and the cartridges are pressed up by a spring *m*³ into a position in front of the retracted breech-bolt *c* as soon as the latter has reached its extreme rearward position, as shown in Fig. 6. After the cartridge has been pushed forward and driven home into the barrel *b* by the forward sliding movement of the breech-bolt, and after the breech is closed by the breech-bolt, the cartridge is exploded by the springing forward of the firing-pin *d* upon pulling the trigger. The recoil created by the explosion forces the barrel *b*, together with its slides *h*, bearing the movable parts of the lock, to slide backwardly in the grooves of the frame *a*. At the rear ends of the slides *h* is pivoted a spindle *h'*, on which turns the rear link *f'* of the toggle-joint which works between the slides *h*, the projecting ends of the pivotal spindle *h'* being guided in two horizontal slots *h*³ in the walls of the frame, (shown in dotted lines in Fig. 1,) whereby the rearward motion of the barrel *b* is limited. The slots are covered on the outer sides of the case by plates *h*², which protect the spindle against lateral displacement.

The rear portion of the link *f'* is widened to fit between the walls of the frame *a* and is furnished with one or more friction-rollers *f*², Fig. 4. The front end of the link *f'* is widened to form finger-handles *g g*, extending to opposite sides beyond the slides *h* to enable the breech to be opened by hand. The link *f'* is jointed between these handles to the rear end of the front link *f* of the toggle-joint, and the opposite end of this front link is jointed to the top side of the bolt *c*, the link

being formed on its left side with a projecting arm or finger *f*³, Fig. 6, which enters in front of a stop *d'*, formed on the firing-pin *d*, which works within the bolt. The bolt moves between the slides *h* of the barrel, being guided by two side ribs *c'*, formed on its opposite sides and working in grooves in the slides *h*, Fig. 7. The left-hand one of these ribs *c'* is also grooved longitudinally to make room for the nose of the sear *i*, as shown in Fig. 3, so that the sear strikes and holds the stop *d'* of the advancing bolt, whereby the firing-pin *d* is arrested and cocked. This firing-pin is cylindrical with the exception of the stop *d'*, and being hollow is actuated by a spring *d*² within it, the back end of which bears against a screw-plug *d*³ in the rear end of the bore in the bolt. The front end of the bolt is recessed so as to receive the base of the cartridge, and is furnished at its top with a spring claw or extractor *j* and at its bottom with a slot or recess into which the end of the cartridge-ejector *l* may enter when the bolt in its rearward movement reaches its extreme backward position.

The frame *a* is closed at its rear end by a thrust-piece *a'* with the exception of the openings necessary for the springs *n* and *o*, the shape of the front wall of the thrust-piece *a'* being that of a cam, preferably concavely curved, as shown in Figs. 3 and 6. The screw *p*, which passes through two ears of the frame *a*, serves not only to keep the protecting-cap *p'* in its place between the walls of the frame *a*, but also constitutes a fulcrum for the spring *n*. The shorter arm of the spring *n* bears against the frame *a*, as shown in Fig. 6, while its longer arm sweeps around in a bow and at its free end engages a link *n'*, which is pivoted to the rear toggle-link *f'* and swings freely in a socket in the latter. The spring *o*, called the "buffer-spring," is secured by a pin *o'* within the lower rear part of the frame *a*, and its front portion is bent upward and is forked to allow the spring *n* to enter the gap thus formed.

Upon the discharge of the pistol the barrel *b* and its slides *h* and pin *h'* are thrown back, as already stated, until the friction-rollers *f*² (see Fig. 4) of the toggle-link *f'* strike the thrust-piece *a'*, and by reason of its rounded or cam shape are forced downward, thereby bending the toggle-joint, throwing its central portion upward, and pulling back the bolt *c* relatively to the barrel until this bolt has slid back to the position shown in Fig. 6, which shows the termination of the retractile movements of the parts. During this movement the empty shell is drawn back by the claw *j*, and, its lower side striking the ejector *l* after its front end emerges from the barrel, it is thrown upward and ejected from the breech. The backward movements caused by the recoil are opposed by the tension of the firing-pin spring *d*² and the spring *n*, which springs so ease the backward movement that the buffer-spring *o*, by which this movement is

finally checked and stopped by its engagement with the friction-rollers f^2 , is subjected to but little strain. By reason of this close balancing of forces this new pistol imparts little or no shock to the hand of the person firing it. When the recoil of the discharge and the momentum of the parts have been exhausted, the stored-up energy in the compressed springs comes into play. The spring n pulls the toggle-joint $f f'$ down and straightens it out, being assisted at first by the spring o . The bolt c on being thus driven forward pushes before it the next cartridge which has been pushed up from the magazine into the breech and rams this cartridge home into the barrel, and during the forward movement of the bolt the firing-pin d advances with it until its stop d' comes in contact with the sear i , which stops it, holding it cocked, as in Fig. 3. These motions occur so quickly that the eye cannot follow them, and the finger, which in firing the arm has pulled the trigger q , has ordinarily no time to release it. In order, therefore, that the stop d' shall find the sear i already pressed in so that it stands in its path to arrest it and cock the firing-pin, (without which the pistol upon being reloaded would immediately fire itself without control of the operator,) the sear i is provided at its front end with a small pin i' , seated against a coiled spring and adapted to be pressed back into the bore-hole in the lever against this spring. The sear i being pivoted to the left-hand slide h moves backward and forward with it, and in its forward movement if the trigger be still pressed by the finger the pin i strikes squarely against the trigger-arm q' and is pressed back into its socket thereby, remaining there until the release of the trigger, whereupon the arm q' moves out of the way of the pin and the latter springs out into its proper position, where it lies against the beveled upper end of the trigger-arm.

The trigger-arm is placed on the left side of the frame a in front of the butt k , and works in and is guided by an arc-shaped groove in the frame a , being retained therein by a cover. The arm q' is preferably made in one piece with the trigger q and counter-trigger q^2 , which as usual is pressed forward by a spring. Because of the one-sided position of the arm q' the triggers and trigger-guard have been placed to one side, although these parts might be arranged in the middle. The rear arm of the sear i is pressed inward by the spring i^2 .

Fig. 5 shows the pistol ready to be fired. On pulling the trigger the beveled upper end of the trigger-arm q' slides across the pin i' and presses this end of the sear inwardly, thereby swinging out the sear-nose and releasing the stop d' of the firing-pin, so that the pin is released and fires the cartridge.

The cartridge-magazine m is shoved up from below into the hollow butt k , and is kept in place by a spring-snap r , (shown detached in Fig. 12,) catching into a corresponding re-

cess m' , Fig. 10, in the upper end of the rib formed by the junction of the sheet-metal walls of the magazine. To release the magazine, the head of the snap r , projecting at the left side of the frame, is pressed in, thereby disengaging it from the magazine, whereupon the latter may be drawn down by means of the side knobs m^2 , so that it may be refilled or replaced by another full magazine. The cartridges are held in the magazine against the upward pressure of the spring m^3 by inwardly-turned lips m^4 of the opposite magazine-walls partially overlapping the rear portion of the uppermost cartridge, as shown in Figs. 8, 9, and 10. The rear of the magazine is cut out at its top, so that the advancing bolt c is enabled to push the cartridge along between the lips m^4 and forward into the barrel b . The snap r is actuated by a flat spring r' , Fig. 12, which bears also under the safety-slide u for steadying its motion. This safety-slide is guided by a corresponding groove milled in the left-hand outer side of the frame a .

To enable the pistol to be fired, the safety-slide must be drawn down until its top edge is flush with that of the frame a , the slide being then entirely below the sear i ; but when it is desired to lock the pistol so that it cannot be fired the safety-slide is slid upward, so that its upper part projects across the rear arm of the sear i behind a projection thereon, as shown in Figs. 1 and 3, so that the sear-nose is held from moving outward to release the firing-pin, and the barrel b with its slides h is made immovable. At the same time the trigger q is fixed in position, since the trigger-arm q' lies across the now immovable pin i' . The safety-slide u is conveniently operated by the thumb of the right hand, which holds the pistol by the butt k . So also is the snap r . The sight v is mounted upon the top of the thrust-piece a' of the frame a , and the front sight v' is mounted upon the barrel near the muzzle, so that the aim is made very accurate.

I do not claim as my invention, broadly, a firearm having a longitudinally-movable barrel actuated by the recoil, a breech-bolt, links connecting said breech-bolt and barrel, means for returning the barrel to position after recoil, and mechanism for actuating the links to withdraw the breech-bolt and open the breech and for returning the breech-bolt to normal position, as such firearm is, broadly, old prior to my invention; but what I do claim is those features of improvement in firearms of this general character or of any analogous or recoil-operating character which are hereinafter set forth in the claims constituting part of this specification.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. An automatic repeating firearm, comprising, a frame provided with a grip at its front part and a curved thrust-piece at its

rear end, an automatically-operating cartridge-magazine arranged in the said grip under the breech, and a trigger mechanism, a sear, and an empty-shell ejector, all carried by the said frame; in combination with a barrel provided with slides, a breech-bolt slidable in the said slides, a firing-pin slidable in the said breech-bolt, and a toggle-joint pivoted to the said breech-bolt and to the said slides and adapted to strike the said thrust-piece thereby opening the breech, the said slides together with all the said elements carried by them being slidable in the said frame; and a spring connected to the toggle-joint and to the frame and operating to push forward the said slides and all the elements carried by them together with a cartridge after the said parts have been forced rearwardly by the recoil on firing a cartridge and the empty shell has been ejected, substantially as set forth.

2. In a recoil magazine-pistol, the combination with the supporting-frame having slide-ways, of the sliding barrel having slides working in said ways, the sliding bolt, the toggle-joint ff' , having its rear link pivoted to said slides and its front link connected to said bolt, and the cam-faced thrust-piece a' fixed in the frame and engaged by the rear toggle-link during the recoil to double up the toggle and open the breech.

3. In a recoil magazine-pistol, the combination with the supporting-frame a having slide-ways, of the sliding barrel b having slides h working in said ways, the sliding bolt c , the toggle-joint ff' with its front link jointed to the bolt and its rear link pivoted on a transverse spindle h' , the said spindle connected to said slides h and sliding in slots h^3 in the lock-case, and the cam-faced thrust-piece a' engaged by the rear toggle-link to double up the toggle during the recoil movement.

4. In a recoil magazine-pistol, the combination with the supporting-frame and sliding barrel and breech-bolt, of a toggle-joint ff' one link of which is jointed to the breech-bolt and the other link turns on an axis and is connected to the barrel and frame so as to receive the recoil of the barrel, and a spring n seated in said frame and connected to the toggle-joint to be compressed by the doubling up of the latter during the recoil and exerting its tension against the toggle-joint for straightening the latter and thereby restoring the barrel and closing the breech.

5. In a recoil magazine-pistol, the combination with the supporting-frame and sliding barrel and breech-bolt, of a toggle-joint ff' the front link of which is jointed to the breech-bolt and the rear link turns on a spindle connected to the barrel and has a rearward arm bearing a roller, a cam-shaped thrust-piece a' fixed in the lock-case and which is engaged by said roller to double up the toggle-joint upon the recoil movement, and a buffer-spring o which engages said

roller toward the end of said movement and arrests the moving parts.

6. In a recoil magazine-pistol, the combination with the supporting-frame and sliding barrel, breech-bolt and firing-pin, the latter having a stop d' , of a toggle-joint ff' connected to the barrel and frame to be doubled up by the recoil movement, with its front link f jointed to the bolt to draw it back during said movement and formed with an arm f^3 engaging said stop d' for cocking the firing-pin during the same movement, the sear i engaging said stop to hold the firing-pin cocked during the forward or reloading movement, and a trigger q in mechanical connection with said sear.

7. In a recoil magazine-pistol, the combination with a supporting-frame, the sliding barrel, the breech-bolt and the firing-pin, the latter having a stop d' , of mechanism acting during the recoil movement to draw back the breech-bolt and open the breech and to draw back the firing-pin within the breech-bolt, a sear i connected to the barrel so as to slide therewith and engaging said stop d' to hold the firing-pin cocked, and a trigger q mounted on the stationary frame and having a mechanical connection with said sear when the pistol is loaded and ready for firing.

8. In a recoil magazine-pistol, the combination with the supporting-frame, the sliding barrel, the breech-bolt and the firing-pin, the latter having a stop d' , of mechanism acting during the recoil movement to draw back the breech-bolt and to draw back the firing-pin within the breech-bolt, a sear i connected to the barrel and engaging said stop d' to hold the firing-pin cocked, a trigger q mounted on the stationary frame and having a trigger-arm q' formed with an inclined face, and a spring-pin i' mounted in the sear and engaged by said inclined face on the trigger-arm when the pistol is loaded and ready for firing.

9. In a recoil magazine-pistol, the combination with the supporting-frame and the sliding barrel, breech-bolt and firing-pin and the reloading mechanism operated by the recoil, of a sear i for engaging the firing-pin and holding it cocked, connected to said barrel and movable therewith during the recoil movement, and a trigger q having a trigger-arm q' pivotally mounted on the stationary frame and arranged in position to engage the sear when the pistol is loaded.

10. In a recoil magazine-pistol, the combination with the supporting-frame and the sliding barrel, breech-bolt and firing-pin, the reloading mechanism operated by the recoil, and the sear i for holding the firing-pin cocked, of a safety-slide u mounted on the side of the frame and movable into or out of engagement with said sear and adapted when in engagement therewith to block its releasing movement.

11. In a recoil magazine-pistol, the combination with the supporting-frame and the sliding barrel having slides sliding in said

frame, the breech-bolt, firing-pin and reloading mechanism operated by the recoil, and the sear for holding the firing-pin cocked, of a safety-slide *u* mounted on the side of the frame and movable into or out of engagement with a shoulder on said barrel-slide and with said sear, whereby when moved into engagement with said parts it renders the trigger-lever and barrel as well as their connected parts, immovable.

12. In recoil-operated firearms, a longitudinally-movable barrel actuated by the recoil, means for returning said barrel to position, a bolt movable toward and from said

barrel, and a frame movably carrying said barrel, in combination with a link pivoted to said bolt at one end, a second link connected at one end to and operating said first link, fulcrumed to said barrel and projecting at its other end beyond said fulcrum and operated by its projecting end to move said bolt.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HUGO BORCHARDT.

Witnesses:

W. H. EDWARDS,
W. HAUPT.