No. 659,507. Patented Oct. 9, 1900.

J. M. BROWNING.

RECOIL OPERATED FIREARM.

(Application filed Feb. 8, 1900.)

(No Model.) 5 Sheets—Sheet 1.

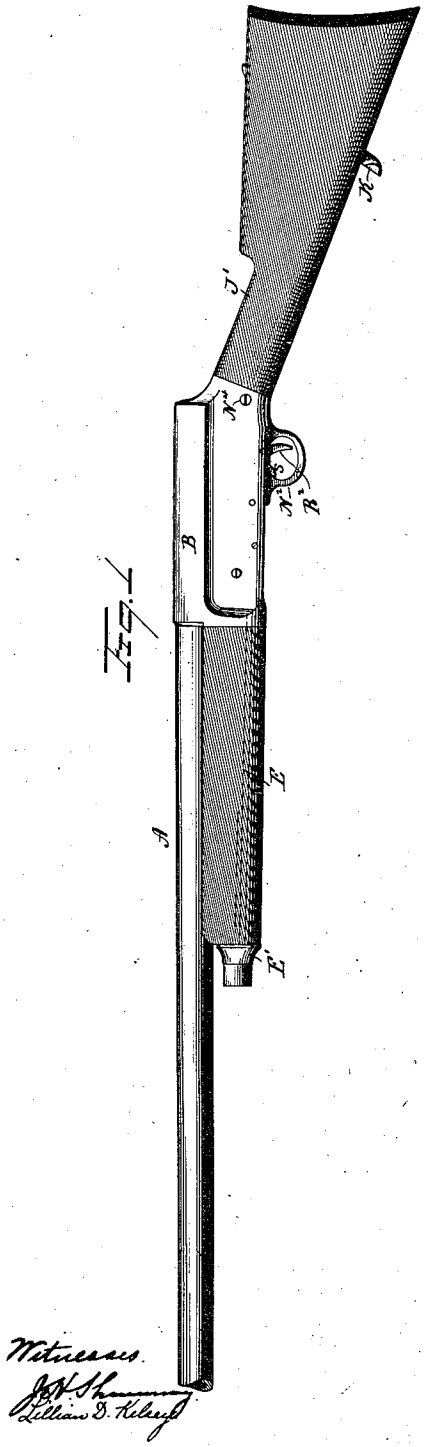

Fig. 1

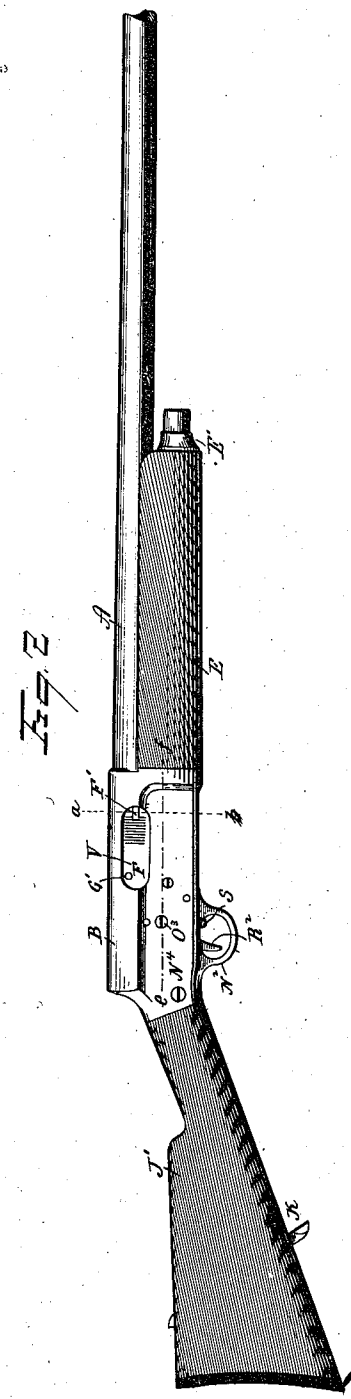

Fig. 2

Witnesses.
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(No Model.) 5 Sheets—Sheet 2.

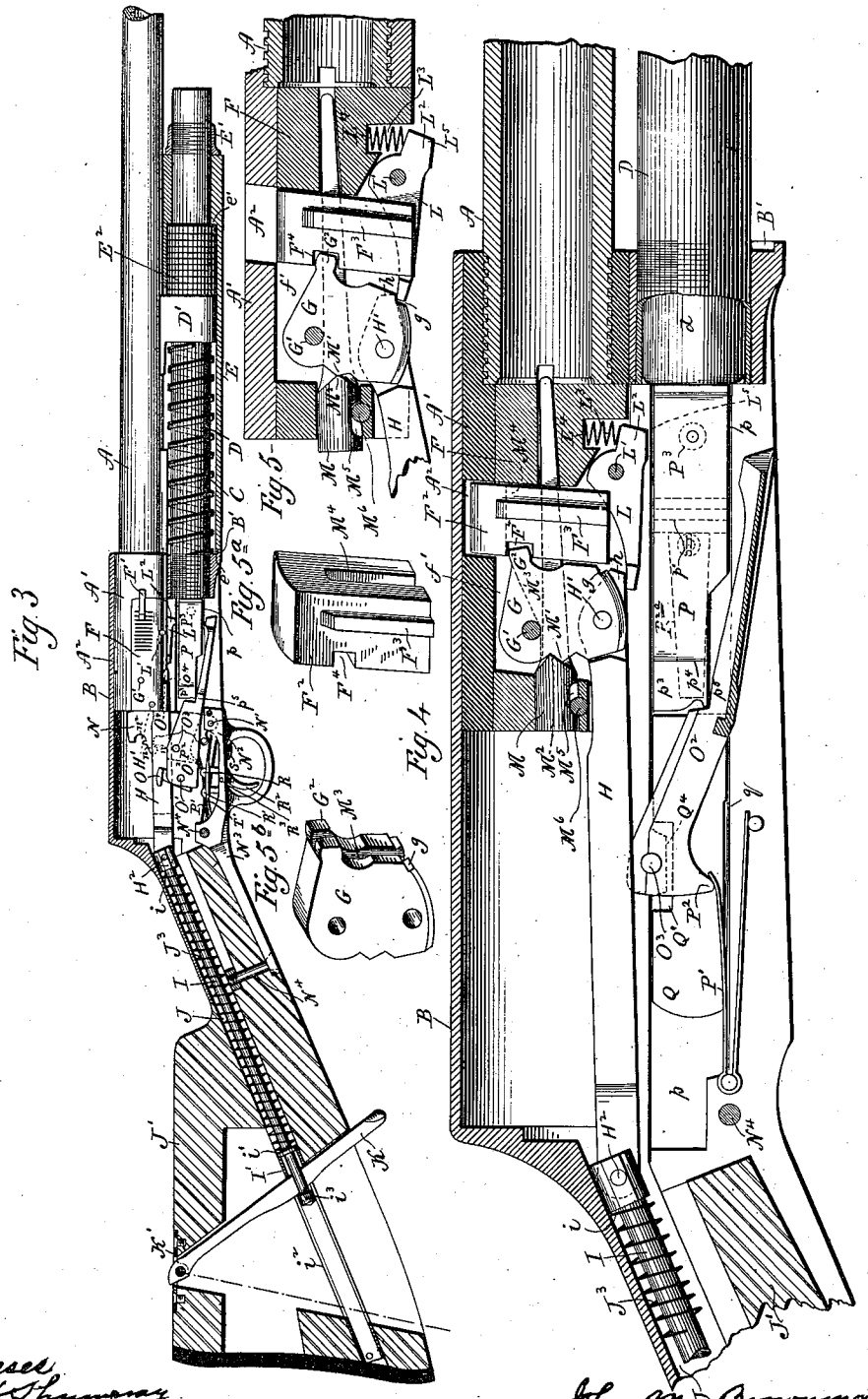

Fig 3

Fig 5

Fig 5a

Fig 5b

Fig 4

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(No Model.) 5 Sheets—Sheet 3.

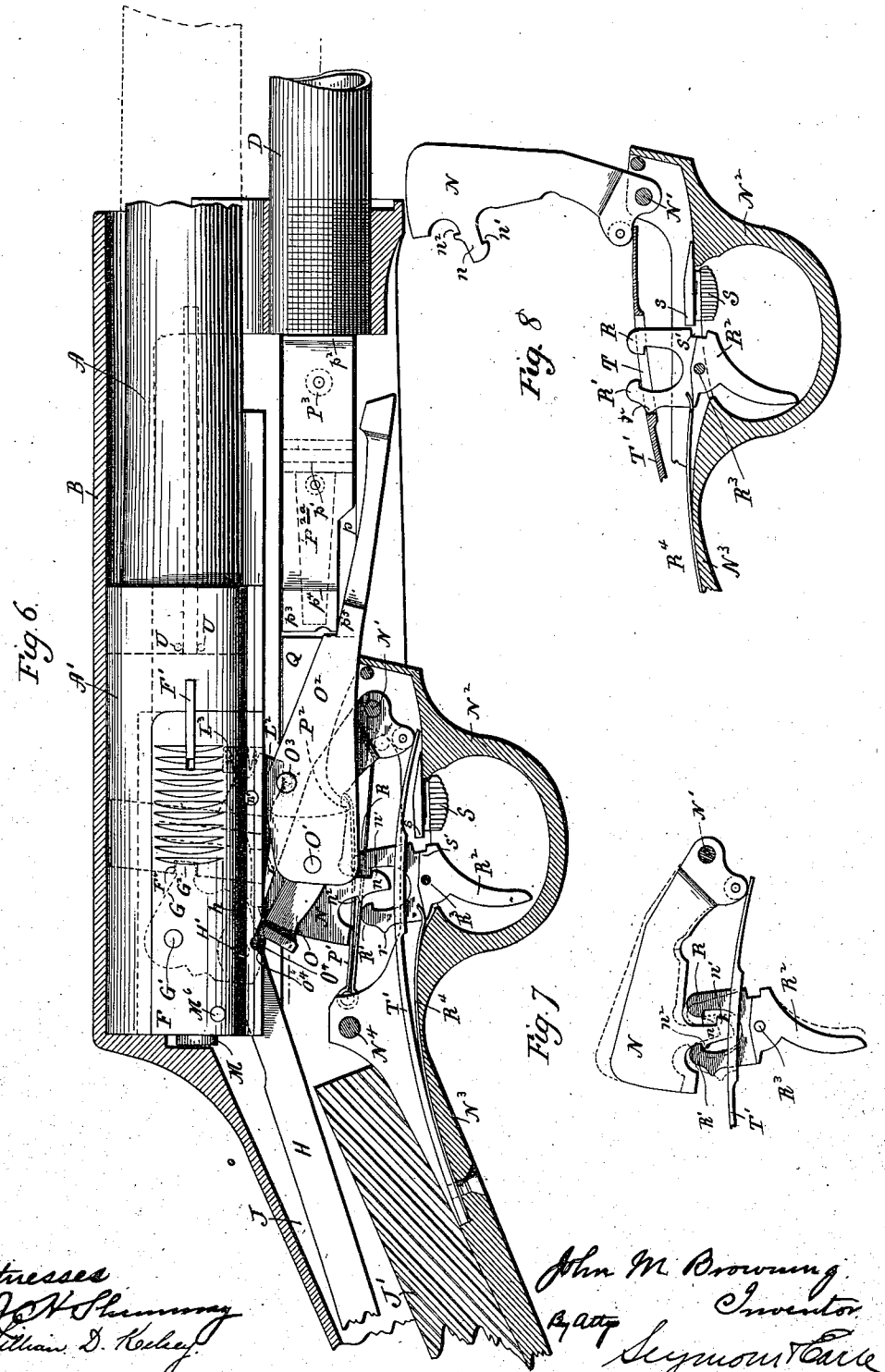

Fig. 6.

Fig. 8

Fig. 7

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(No Model.) 5 Sheets—Sheet 4.

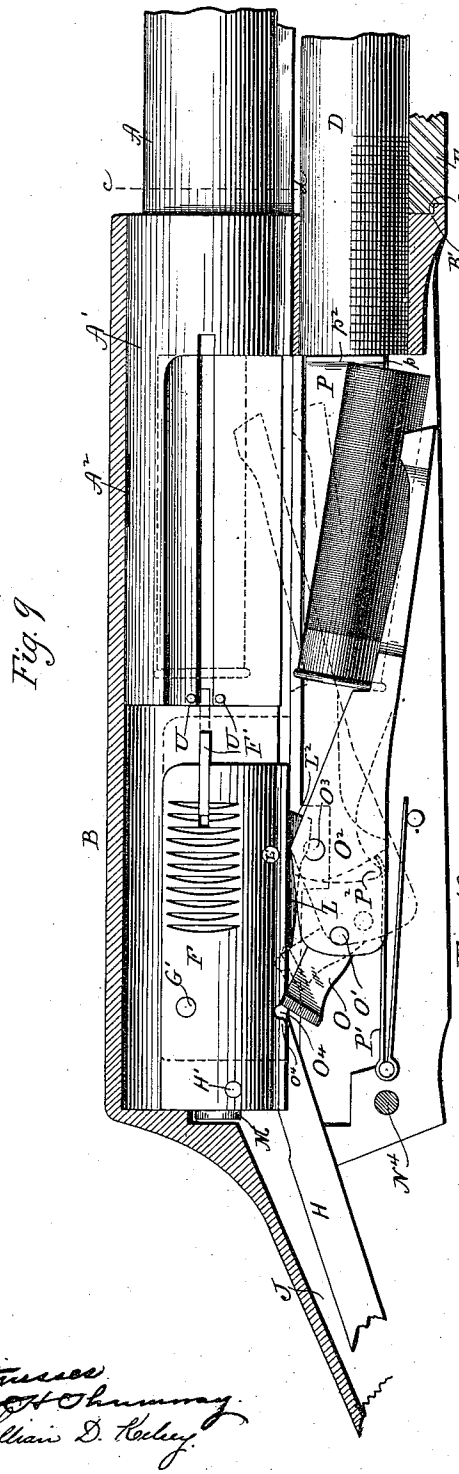

Fig. 9

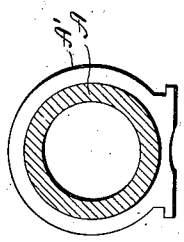

Fig. 11

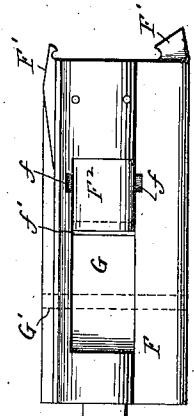

Fig. 12

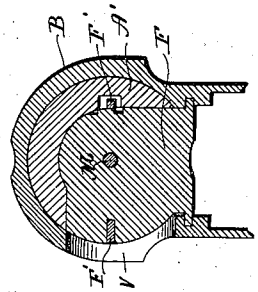

Fig. 10

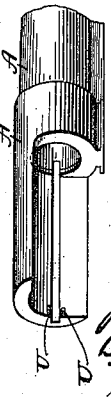

Fig. 22

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No. 659,507. Patented Oct. 9, 1900.

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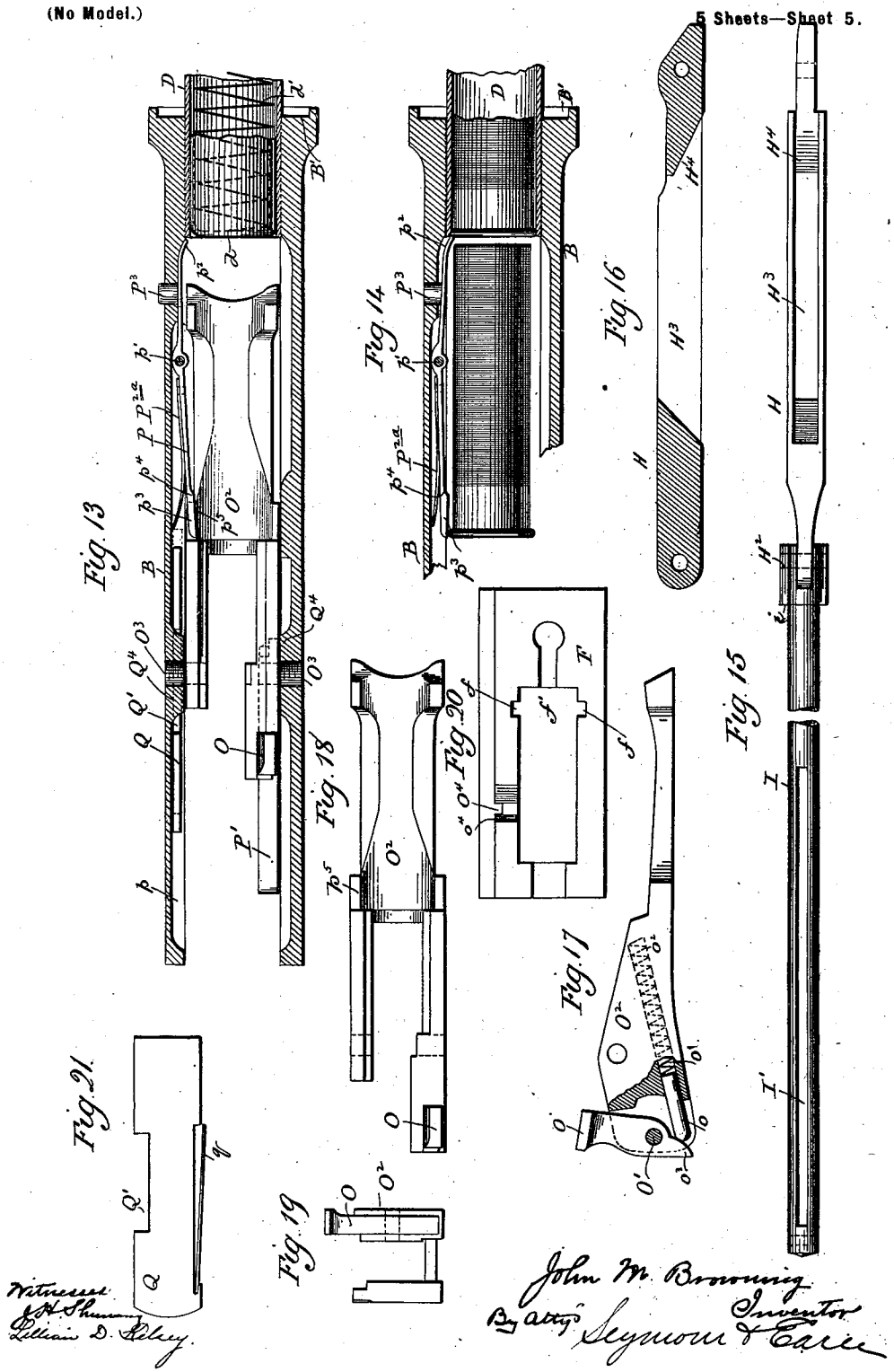
(Application filed Feb. 8, 1900.)

(No Model.) 5 Sheets—Sheet 5.



Witnesses
J. H. Shumway
Lillian D. Kelley.

John M. Browning
Inventor
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UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

RECOIL-OPERATED FIREARM.

SPECIFICATION forming part of Letters Patent No. 659,507, dated October 9, 1900.

Application filed February 8, 1900. Serial No. 4,557. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. BROWNING, of Ogden, in the county of Weber and State of Utah, have invented a new Improvement in Firearms; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of the left-hand side of an automatic firearm constructed in accordance with my invention; Fig. 2, a similar view of the right-hand side thereof, showing the ejection-opening formed in its receiver or gun-frame; Fig. 3, a broken view, in vertical longitudinal section, showing the gun in the closed positions of its parts; Fig. 4, a less comprehensive broken view of the gun in vertical section drawn to full size and with the parts in their closed positions and with the trigger-plate and all of its connected parts removed for the sake of clearness; Fig. 5, a detail section showing the breech-bolt in its closed position, but with the locking-block thereof in the unlocked position into which it is moved by the rocking tumbler; Fig. 5^a, a detached perspective view of the locking-block; Fig. 5^b, a corresponding view of the operating-tumbler thereof; Fig. 6, a broken view of the gun in vertical section, showing its parts in their open positions; Fig. 7, a detail view showing the coaction of the hammer with the two hooks constituting the double sear of the trigger; Fig. 8, a corresponding but more comprehensive view showing the hammer, the trigger with its two hooks, and a safety-catch which is here represented in its blocked or inoperative position; Fig. 9, a broken view of the gun in vertical section, showing the parts of the gun in the positions due to them when the gun has been opened manually instead of automatically. In this view the trigger-plate, with its connected parts has been removed for the sake of clearness; Fig. 10, a broken view, in vertical section, of the receiver on the line *a b* of Fig. 2; Fig. 11, a view in vertical section on the line *c d* of Fig. 9, looking rearward and taken through the gun-barrel at a point close to the extension thereof; Fig. 12, a detached plan view of the breech-bolt, showing the locking-block and rocking tumbler mounted therein; Fig. 13, a broken view, in horizontal section, on the line *e f* of Fig. 2 and designed to show the carrier, the combined cartridge-stop and carrier-catch, and the sliding inertia-piece or carrier-catch lock; Fig. 14, a similar but less comprehensive view showing the carrier-catch in the position which it has after it has been operated by a cartridge for releasing the carrier and is acting as a cartridge-stop; Fig. 15, a detached plan view of the operating-link and operating-rod of the gun; Fig. 16, a detached view in longitudinal section of the link; Fig. 17, a detached broken view, in side elevation, of the carrier; Fig. 18, a detached plan view of the carrier; Fig. 19, a view of the rear end of the carrier; Fig. 20, a detached reverse plan view of the breech-bolt; Fig. 21, a detached view, in side elevation, of the sliding carrier-catch lock or inertia-piece; Fig. 22, a detached perspective view of the barrel extension.

My invention relates to an improvement in automatic portable firearms of the class in which the recoil following the explosion of a cartridge in the gun-barrel is utilized to operate the breech mechanism of the gun, the object of my present invention being to produce an improved arm of this class in which the recoiling parts are housed for their protection, as well as the protection of the user of the arm, and in which the parts are constructed with particular reference to simplicity of construction, strength, durability, and reliability of operation.

With these ends in view my invention consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention as herein shown I provide a gun-barrel A with a tube-like extension A′, into the forward end of which the barrel is screwed. This extension is located within and housed by the upper portion of the gun frame or receiver B, in which the extension reciprocates back and forth, together with the barrel, the rear end of which enters the receiver during the recoil following the explosion of a cartridge in the barrel. The barrel and extension are returned to their normal or closed positions af-

ter the recoil by means of a spiral action-spring C, mounted upon the rear end of the magazine D, the open rear end of which is screwed into the lower portion of the forward end of the receiver, while its forward end extends forward through a heavy sleeve or collar D′ depending from the barrel, to which it is secured in any desired manner. The said magazine and action-spring are inclosed by means of a fore stock E, the rear end of which is formed with a segmental flange *e* to adapt it to be inserted into a recess B′, formed in the forward end of the receiver. At its forward end the fore stock is held in place by the impingement against it of a nut E′, screwed upon the projecting forward end of the magazine, which is threaded for the purpose, as shown in Fig. 3. To take the shock of the return of the barrel and its extension under the action of the action-spring, I employ a buffer, which, as herein shown, consists of a series of vulcanized fiber rings E^2, located in the front stock at a point in front of the collar or sleeve D′, with which the rearmost ring engages, while the outermost ring engages with a shoulder *e′*, formed within the said front stock. If desired, the rings E^2 might be dispensed with and the fore stock itself adapted to act as the buffer.

Within the extension A′, I locate the breech-closure F, which is of the bolt type and which is confined to movement back and forth. This breech-closure is provided at its forward end with two yielding extractors F′ F′, of any approved construction, which project slightly beyond its forward end.

For locking the breech-bolt F in its closed position I employ a vertically-movable locking-block F^2, which is mounted in it and which is provided upon its opposite edges with vertical ribs F^3 F^3, which enter grooves *f f*, cut in the opposite side walls of the vertical chamber *f′*, formed in the bolt, as shown in Fig. 20, for the reception of the locking-block, the upper end of which is adapted to enter a substantially-rectangular locking-opening A^2, formed to receive it in the upper portion of the barrel extension, as seen in Figs. 3 and 4. The locking-block is reciprocated for the purpose of being thrown into its locked and unlocked positions by means of a tumbler G, located in the chamber *f′* aforesaid and swinging on a horizontal pin G′, the ends of which enter the side walls of the breech-bolt. This tumbler is provided at its upper forward corner with an arm G^2, entering a transverse slot F^4, formed in the rear face of the locking-block, the upper and lower faces of these arms being rounded, as seen in Figs. 5 and 5^b. The said tumbler is swung on its pivot G′, as required for raising and lowering the block, by means of an operating-link H, the forward end of which is pivotally connected with the tumbler by means of a pin H′. At its rear end this link is connected by a pin H^2 with the forward end of an operating-rod I, which extends rearward in an inclined position into a long chamber J, formed for its reception in the butt-stock J′. This rod, as shown in Fig. 15, is formed with a very long narrow slot I′, receiving an operating-lever K, which is located in a narrow vertically-arranged slot J^2, formed in the butt-stock J′. The said lever K is pivotally mounted in a small plate K′, set into the upper edge of the butt-stock, while its lower end projects just enough below the lower edge of the butt-stock to permit it to be readily engaged and operated by hand. The forward end of a coiled operating-spring J^3, encircling said rod, impinges against a shoulder *i*, formed at the forward end of the operating-rod I, while its rear end abuts against a washer *i′*, through which the rod is free to play and which is supported upon the forward end of a tube I′, located in the butt-stock and formed with a vertical longitudinal slot i^2 for the downward passage through it of the lever K and receiving a small head i^3, which is secured to the extreme rear end of the rod I. In the automatic operation of the gun the spring J^2 is compressed by the rearward excursion of the breech-bolt, at which time the rod I moves freely rearward without disturbing the lever K, which, as aforesaid, passes downwardly through the long slot J^2. On the other hand, when the gun is opened manually the projecting lower end of the lever is seized by the user with his hand and drawn back, whereby through the head i^3 the rod I is retracted and the operating-spring J^3 placed under tension for returning the breech-bolt to its closed position and for performing the other functions of the said spring.

The forward end of the operating-link II is formed with a nose *h*, coacting with the thin rear end of a locking-lever L, mounted in the lower face of the breech-bolt F and hung upon a horizontal pivot L′, located just in front of the lower end of the locking-block F^2. At its extreme forward end the lever is formed with a lug L^2, impinged upon by a small coiled spring L^3, located within a socket I′, formed within the breech-bolt. The said spring exerts a constant effort to depress the forward end of the lever, and hence lift its rear end into engagement with a transversely-arranged locking-notch *g*, formed in the lower forward corner of the rocking tumbler. When the rear end of the lever L is entered into the said notch *g*, the bolt F^2 is held down in its unlocked position through the medium of the tumbler, as shown in Fig. 5, which represents the breech-bolt in its closed position, with the locking-block in its unlocked position.

A shoulder L^5, formed upon the lug L^2 of the locking-lever L, acts as a secondary cartridge-stop, as will appear later on.

When the gun is ready to be fired, the breech-bolt F is locked to the barrel A through the medium of the locking-block F^2, the upper end of which is entered into the opening A^2 of the barrel extension A′, the locking-

block being held in its locked position through the medium of the rocking tumbler G, the link H, the operating-rod I, and the operating-spring J^3, which exerts a constant effort to push the said rod and link forward, and hence to push the lower end of the rocking tumbler G forward, with the effect of lifting its upper end, and hence lifting the locking-block. At this time the extreme rear end of the locking-lever L is located under the nose *h*, formed at the extreme forward end of the link H. Now when the gun is fired the barrel, barrel extension, and breech-bolt will recoil together, and at the limit of their recoiling movement the rear ends of the breech-bolt and barrel extension will strike the rear wall of the receiver-chamber B'. The rearward excursion of the breech-bolt will thus be arrested, but the momentum of the recoil will carry the rod I and link H still farther rearward, with the effect of rocking the rocking tumbler G downward and rearward, so as to retract the upper end of the locking-block from the opening A^2 in the barrel extension, whereby the breech-bolt will be unlocked from the said extension and barrel, which is now immediately returned to its closed position under the power of the action-spring C. Just as soon as the rocking tumbler G is swung downward, as described, it is caught and locked in such position by the snapping of the rear end of the locking-lever L into its notch *g*, whereby the locking-block F^2 is locked in its unlocked position, in which it is maintained until in the closing movement of the breech-bolt the locking-block F^2 has passed the rear end of the barrel extension A', whereby the locking-block is prevented from being prematurely moved into its locked position and so as to engage with the rear edge of the barrel extension. Soon after the locking-block passes the rear edge of the barrel extension in the forward excursion of the breech-bolt the rear end of the locking-lever L is pushed downward out of the locking-notch *g* in the rocking tumbler by the nose *h* of the link H, which gradually assumes a horizontal position as the breech-bolt moves forward. Just as soon as the rocking tumbler F^2 is unlocked by having the locking-lever thrown out of engagement with it the operating-spring J acts, through the operating-rod I and link H, to swing the said tumbler upward, with the effect of lifting the locking-block F^2, the upper end of which will then ride over the inner face of the extension until it is "snapped," so to speak, into the locking opening A^2, formed in the said barrel extension, as shown in Fig. 4.

The firing-pin M is operated in being retracted by the rocking tumbler, which is provided for that purpose with a horizontally-arranged tooth-like projection M', which coacts with a doubly-beveled nose M^2, formed at the rear end of the pin, which is longitudinally movable in the breech-bolt and extends forward through a slot M^3 in the rocking tumbler and through a slot M^4 in the locking-block. A short groove M^5, formed in the rear end of the firing-pin, receives a stop-pin M^6, which limits the reciprocation of the pin. When the rocking tumbler is swung downward, as shown in Fig. 5, for the unlocking movement of the locking-block, the projection M' of the rocking tumbler coacts with the nose M^2 of the firing-pin for the retraction of the pin, as shown in the said figure. Then when the rocking tumbler is swung upward the pin is left in its retracted position, in which it is struck by the hammer N.

As has been already explained, the barrel, barrel extension, and breech-bolt recoil together, with the breech-bolt locked to the barrel extension the same as in firing. When the breech-bolt reaches the limit of its rearward excursion, the momentum of the operating rod and link operates the rocking tumbler and locking-block to unlock the breech-bolt from the barrel extension, so as to permit the immediate return of the barrel and barrel extension to their normal positions under the influence of the action-spring C. The breech-bolt does not, however, return with them, as just as soon as it reaches the limit of its rearward excursion it is locked in that position by means of a locking-dog O, mounted in a vertical position upon a pin O' in the extreme rear end of the carrier O^2, which is pivotally hung upon pins O^3, located in the lower portion of the gun frame or receiver B at a point forward of the pin O', upon which the said locking-dog is mounted. The said dog is normally maintained in position to be engaged by the rear end of the breech-bolt by means of a plunger *o*, operated by a spiral spring *o'*, located within a spring-socket o^2, formed in the rear end of the carrier, as clearly shown in Fig. 17, the rear end of the plunger *o* engaging with a finger o^3, formed at the lower end of the dog. For coaction with this dog the breech-bolt is formed upon the right-hand side of its lower edge with a locking-notch O^4, Fig. 20, the rear wall o^4 of which, Fig. 6, constitutes an abutment-face. In the rearward movement of the breech-bolt its lower edge strikes the upper forward corner of the dog O and cants the same rearward against the tension of its spring o^2, as shown in Figs. 6 and 9. The lower edge of the rear end of the bolt then slides over the dog until the locking-notch O^4 in the bolt is brought into registration with the upper corner of the dog, which is then snapped into it by the action of the spring o^2. In this rearward movement of the bolt the abutment-face o^4 of the notch is carried rearward beyond the upper end of the dog, with which the said abutment-face is, however, almost immediately reëngaged for locking the bolt in its rearward position by a slight forward recoil movement of the bolt. The locking-dog when thus engaged with the bolt operates to hold the same in its open position

against the tension of the operating-spring J^3, which exerts a constant effort to move the breech-bolt forward against the locking-dog, which is held up in its locking position by the carrier, which is in turn held in its depressed position by the carrier-catch P, Fig. 13, which is released by the cartridges as they are fed rearward from the tubular magazine, as will be hereinafter described. When the carrier-catch is disengaged from the carrier, the forward pressure of the spring J^3 will be transmitted, through the rod I, link H, and bolt F, to the locking-dog, which will be pushed downward and forward and acts to swing the carrier upon its pivot O^3, whereby the forward end of the carrier is elevated, as shown by broken lines in Fig. 9, for the purpose of lifting a cartridge up in front of the forward end of the breech-bolt, in which position the carrier is temporarily held by the engagement of the free end of the carrier-spring P′ with the rear beveled face of an operating-nose P^2, formed at the rear end of the carrier. As the bolt moves forward the dog takes a position which permits the bolt to ride over it, whereby the dog is released from the notch in the bolt. The dog is shown by broken lines in Fig. 9 in the position which it has when it has been operated, as described, to lift the carrier. When the breech-bolt moves into its closed position, its lower face engages with the elevated forward end of the carrier and depresses the same sufficiently to cause the point of the nose P^2 of the carrier to be snapped rearward of the free end of the carrier-spring P′, which then acts to throw the carrier into its depressed position, as shown by full lines in Fig. 9. The construction of the nose P^2 and spring P′ is such, as I may here remark, that the elevation of the carrier into its intermediate position, as shown by broken lines in Fig. 9, for loading the magazine is not sufficient to cause the said nose to be snapped over the spring, which will therefore operate to return the carrier to its depressed position between the feeding of each cartridge into the magazine D. The carrier-catch P is located in a shallow recess p, formed in the inner face of the left-hand wall of the gun frame or receiver and hung upon a vertically-arranged pivot p'. The forward end of the catch is bent inward, as at p^2, to constitute a cartridge-stop, while its rear end is enlarged to form a locking-finger p^3, formed at its base with a bevel p^4, which is engaged by the rims of the cartridges just before they reach their final positions upon the carrier, for pushing the said locking-finger p^3 of the catch outward and away from the locking-surface p^5 of the carrier, with which the said finger normally engages to hold the carrier in its depressed position. A spring P^{2a}, coacting with the rear end of the catch, exerts a constant effort to throw its locking-finger inward over the locking-surface p^5 of the carrier. It will be understood, of course, that when the locking-finger p^3 is pushed outward by a cartridge the stop-finger p^2 at the forward end of the catch will be thrown inward in position to act as a cartridge-stop. At its forward end the carrier-catch is provided with a push-button P^3, which projects through the left-hand wall of the frame and provides means for manually operating the carrier-catch to unlock the carrier when there are no cartridges in the magazine D, which, as I may here state, is provided with the usual plunger d and plunger-spring d'.

In order to prevent the carrier from being unlocked before the barrel and barrel extension have completed their forward movement, (either by the premature operation of the catch P by a cartridge before the said barrel and barrel extension have completed their said forward movement or by the jolting of the catch out of engagement with the carrier under the shock of stopping the recoiling parts at the limit of their forward and rearward movements,) I employ a sliding lock, or, as I prefer to term it, an "inertia-piece" Q, which is constructed, arranged, and operated to temporarily lock the said catch P. This inertia-piece Q is located in the rear portion of the long shallow recess p before mentioned and is formed with a central longitudinal opening Q′, receiving the hub Q^4, which provides a bearing for the screw O^3, upon which the carrier swings. The opening Q′ is made long enough to allow the inertia-piece a limited movement forward and backward. A spring q, mounted in the inertia-piece so as to ride upon the bottom wall of the recess p, is employed to hold the inertia-piece in either its forward or rearward position. In its normal position its forward end is just back of the rear end of the catch P.

The operation of the inertia-piece is as follows: When the gun is fired, the recoiling parts recoil until the rear end of the barrel extension and the rear end of the breech-bolt strikes the rear end of the receiver. This blow drives the receiver rearward, together with its contained parts, including the carrier-catch, the rear end of which is thus driven rearward back of the forward end of the inertia-piece, which, not being positively connected with any portion of the carrier, stands practically still, while the receiver and its contained parts are driven rearward, as described. The recoiling parts are immediately started forward by the forward pull of the action-spring, and if a cartridge feeding rearward from the magazine should complete its rearward movement before the barrel reaches the end of its forward excursion it will strike the catch, which will be prevented from operating to release the carrier by the inertia-piece; but when the barrel completes its forward movement the shock of stopping it and its connected parts drives the receiver and the parts connected therewith forward, whereby the rear end of the catch is pulled away, so to speak, from the forward end of the inertia-piece, which stands practically

still when the receiver is being driven forward, as described. In this way the catch is disengaged from the inertia-piece and left free to be forced outward by the cartridge, so as to release the carrier. It will also be seen that the inertia-piece prevents the rear end of the catch from being jolted away from the carrier, so as to unlock the same, by the shock of stopping the recoiling parts at the limit of their rear of their forward movement.

The hammer N is hung by a pivot N′ in the forward end of the trigger-plate N^2, the rear end of which is extended to form the lower tang N^3, which is secured in place by a bolt N^4.

In order to prevent the entire charge of cartridges in the magazine from being fired by one pulling of the trigger and to require a separate action of the trigger for the explosion of each cartridge, I provide the hammer with a finger *n*, formed with a cocking-notch *n′* and a safety-notch n^2, the former being located nearer the lower end of the finger than the latter. These notches respectively coact with a cocking-hook R and a safety-hook R′, arranged in opposition to each other, with sufficient space between them for the reception of the finger *n* of the hammer, these two hooks being virtually sear-hooks and formed integral with the trigger R^2, which is hung on a pin R^3 and provided with a trigger-spring R^4. The hammer, as it will be understood, passes upward through a long slot H^3, formed in the link H, and is automatically cocked during the recoil of the gun by the beveled forward end wall H^4 of the slot H^3 in the said link H, whereby the safety-notch n^2 of the finger *n* of the hammer is engaged with the safety-hook R′, which holds it cocked when a rearward draft is maintained upon the trigger by the finger of the user of the gun. On the other hand, if this draft upon the trigger is removed the spring R^4 will swing the trigger so as to disengage the hook R′ from the notch n^2; but this swinging movement of the trigger only brings the cocking-hook R into position to strike into the cocking-notch *n′* of the hammer before the hammer has time to escape, so that thereafter the hammer will be held by the trigger until the same is again pulled. In this way automatic action of the gun is limited to the reloading of a single cartridge by the recoil following the explosion of a previously-fed cartridge. If desired, the construction just described may be reversed by locating the finger *n* upon the trigger and the hooks R R′ upon the hammer.

For the purpose of locking the trigger so that it cannot be moved in either direction I employ a sliding safety-catch S, formed at its rear end with a nose *s*, adapted to enter the notch *s′*, formed in the forward side of the trigger in such position with reference to the nose that the latter can only be entered into the former when the hammer is in its cocked position. In order to prevent the safety device from being accidentally brought into use, I provide the safety-hook R′ of the trigger with a nose *r*, which coacts with the rear wall of an opening T, formed in the main or hammer spring T′ for the forward passage through it of the arms R and R′. When the hammer is cocked, the spring is depressed and the rear end wall of the said opening is cleared from registration with the projection *r*, whereby the trigger may be swung rearward into position to bring its notch *s′* into registration with the nose *s* of the safety-catch S. When, however, the hammer is released for firing, the spring is lifted, so that the rear end wall of the opening T engages with the projection *r* and tilts the trigger forward, so as to remove its notch *s′* from registration with the notch S. It will thus be seen that the safety-catch can only be utilized for locking the trigger when the hammer is cocked. This is necessary, because if it were possible to lock the trigger against movement in either direction with the hammer in its uncocked position then should the hammer be thrown back breakage would result, because the trigger must move freely to permit the engagement of the hammer with it.

For the purpose of ejecting the spent cartridges I provide the barrel extension at its rear end and along its left-hand side with two ejecting-pins U U, which when the extension and barrel are near the limit of their return movement under the power of the action-spring C engage with the rim of the spent cartridge, which is at this time held by the extractors, and swing the cartridge from left to right, causing its ejection through the ejection-opening V, formed in the right-hand side of the receiver. On the other hand, if the gun should be opened by hand through the instrumentality of the operating-lever K the rim of the cartridge will be drawn against the pins U U with sufficient force to cause the cartridge to be ejected through the said opening V.

Having fully described my improved firearm, I will now describe the operation thereof. I shall, however, do this only briefly, for the reason that the operation of the gun has been so largely explained in connection with the description of the mechanism thereof.

Let it be assumed, in the first place, that the magazine has been charged with cartridges and that the last cartridge introduced thereinto has been moved back by the magazine-spring to engagement with the shoulder L^5 upon the under face of the locking-lever L, mounted in the breech-bolt. The gun must now be manually opened by drawing back upon the projecting lower end of the operating-lever K, whereby the breech-bolt is unlocked from the barrel extension and withdrawn to the limit of its rearward excursion without disturbing the barrel or barrel extension, but at the same time cocking the hammer and placing the operating-spring J^3 under tension. The said cartridge will now be pushed rearwardly by the magazine-

spring and coact with the rear end of the combined carrier-catch and cartridge-stop, so as to unlock the carrier. The operating-spring J will now assert itself and push the breech-bolt forward, with the effect of lifting the unlocked carrier, the cartridge upon which will then be forced into the gun-barrel. Then after the breech-bolt has reached its closed position it will be locked therein by the locking-block F^2, which will be moved into its locked position by the locking-tumbler acting under the power of the said spring F. During this forward movement of the bolt the carrier will be forced downward into its depressed position against the tension of the carrier-spring. As soon as the carrier reaches its depressed position the combined cartridge-stop and carrier-catch will snap over it and lock it in that position. This movement of the said combined parts clears its forward end from its cartridge-stopping position in front of the rear end of the magazine, from which another cartridge will now immediately emerge and engage with the shoulder L^5 on the under face of the locking-lever L. The trigger is now pulled for firing the cartridge, the explosion following which will carry the barrel, barrel extension, and breech-bolt back, together with the bolt and barrel extension, and hence the barrel, locked together by means of the locking-block, which will be retracted, so as to unlock the barrel extension and barrel from the bolt after the bolt has reached the limit of its rearward excursion by the momentum of the parts connected with the rocking tumbler. As soon as the bolt reaches the limit of its rearward excursion it will be locked in that position by means of the locking-dog carried by the carrier. Just as soon as the breech-bolt has been unlocked from the barrel extension the barrel and barrel extension will be returned to their closed positions by means of the action-spring C. In the meantime the cartridge, which was resting against the shoulder L^5 upon the locking-lever L, travels back to its final position upon the carrier and pushes aside the carrier-catch and unlocks the carrier, which is now free to be lifted to lift the cartridge in front of the breech-bolt, which is pushed forward into its closed position by means of the operating-spring J^3, which also locks the bolt in its closed position. The gun is now ready for being fired by pulling the trigger, the operation of reloading it having been effected entirely automatically by the recoil following the explosion of the preceding cartridge, and so on. When the last cartridge is fired, the bolt will remain open.

I may explain that preparatory to loading the magazine the push-button P^3 must be pushed inward, so as to operate the carrier-catch in releasing the carrier and permit it to be raised sufficiently to allow the cartridges to be fed under it. This movement of the carrier-catch will bring the cartridge-stop into play. This action of the catch as a cartridge-stop does not, however, prevent the cartridges from being fed into the magazine, as the stop is yielding and is readily pushed aside under the pressure placed upon the cartridges in pushing them into the rear end of the magazine.

The arm herein shown and described is what is known as a "take-down" arm, or, in other words, an arm constructed with reference to the detachment without the use of tools of the barrel and magazine from the receiver, so as to permit the barrel and magazine to be packed in a case side by side with the butt-stock and receiver.

To take down my improved gun, the nut E' is removed from the forward end of the magazine and the operating-lever K drawn back until the breech-bolt is caught and locked at the limit of its rearward excursion by the locking-dog mounted in the rear end of the carrier. The barrel and barrel extension and the front stock may now be drawn forward and separated from the receiver and magazine. For convenience the front stock is then restored to the magazine, upon which it is held by the restoration of the nut E'. The parts may now be conveniently packed in a case no longer than the length of the barrel and barrel extension.

To reassemble the gun, the barrel extension is entered into the open mouth of the receiver, the magazine again passed through the collar D', depending from the gun-barrel, the front stock is again placed over the magazine and reëngaged at its rear end with the forward end of the receiver, and the nut E is screwed home, the action-spring C, encircling the magazine, being placed under tension at the time the front stock is restored to position thereupon.

I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations therein as fairly fall within the spirit and scope of my invention.

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

1. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the said bolt, and adapted to be entered into a locking-opening formed in the barrel extension, and means mounted in the said bolt for operating the said block in locking and unlocking the bolt to and from the barrel extension.

2. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the breech-bolt for locking the same to and unlocking it from the barrel extension, and for locking the breech-bolt at the limit of its rearward excursion while the barrel and its extension are returned to their closed positions, and a gun

frame or receiver constructed to house the said parts, and containing a laterally-arranged ejection-opening.

3. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the said bolt and movable therein for engagement with the locking extension, whereby the bolt is locked to the said extension, and means connected with the said locking-block and operated by the momentum of recoil, to move the locking-block into its unlocked position after the breech-bolt has reached the limit of its rearward excursion.

4. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the breech-bolt and adapted to be entered into a locking-opening formed for its reception in the barrel extension, and means connected with the said block and operated by the momentum of recoil for moving the block into its unlocked position after the breech-bolt has reached the limit of its rearward excursion.

5. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a locking-block mounted in the breech-bolt and coacting with the extension for locking the bolt thereto, a rocking tumbler also mounted in the said bolt and coacting with the said block for moving it into its locked and unlocked positions, and means connected with the said tumbler and operated by the momentum of the recoil for rocking the tumbler and moving the block into its unlocked position after the bolt has reached the limit of its rearward excursion.

6. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the breech-bolt, a rocking tumbler also mounted in the said bolt, and coacting with the block for moving the same into its locked and unlocked positions, an operating-rod extending rearwardly into the butt-stock of the gun, and a link connecting the forward end of the said rod with the said tumbler, which is rocked by the momentum acquired by the link and rod, which continue to move rearward after the bolt has reached the limit of its rearward excursion.

7. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the breech-bolt and adapted at its upper end to be entered into a locking-opening formed in the extension, a rocking tumbler also mounted in the said bolt and engaging with the said block for operating the same, and means connected with the said rocking tumbler and operated by the momentum of the recoil, for unlocking the locking-block after the breech-bolt has reached the limit of its rearward excursion.

8. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block coacting with the extension to lock the bolt in its closed position, a rocking tumbler for operating the block, means coacting with the tumbler for rocking the same, and a locking-lever coacting with the tumbler for holding the same in its depressed position in which the tumbler holds the block in its unlocked position, the said block, tumbler and lever being mounted in the said bolt.

9. In a firearm, the combination with a recoiling barrel, of a breech-bolt, a vertically-movable locking-block mounted in the breech-bolt for locking the breech-bolt to the barrel, a locking-lever mounted in the breech-bolt for locking the said block in its unlocked position, and means coacting with the said locking-lever to operate the same in releasing the said block.

10. In a firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block for locking the bolt to the said extension, a rocking tumbler coacting with the said block for operating the same, a locking-lever coacting with the said tumbler for holding the same in its depressed position, and means coacting with the said lever to operate the same in releasing the said tumbler and hence the locking-block, the said block, tumbler and lever being mounted in the breech-bolt.

11. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block for locking the bolt to the barrel extension, a rocking tumbler for operating the block, a locking-lever coacting with the tumbler for holding the same in its depressed position in which the tumbler holds the block in its unlocked position, a link connected with the rocking tumbler, and coacting with the locking-lever for disengaging the same from the rocking tumbler, and an operating-rod extending rearwardly into the gun-stock, and connected with the link which coacts with the rod in moving the bolt into its unlocked position by the momentum they acquire by the recoil of the gun, the said locking-block, rocking tumbler and locking-lever being mounted in the breech-bolt.

12. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a locking-block, a rocking tumbler coacting with the said block for the operation thereof, and a firing-pin mounted in the bolt, and coacting with the rocking tumbler which retracts it.

13. In a firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the said bolt, a spring-actuated operating-rod extending into the butt-stock of the gun, and means connecting the said rod with the said block which is operated by the rod for manually unlocking the bolt and opening the gun.

14. In a magazine-firearm, the combination with a reciprocating barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the bolt for locking the same to the extension, an operating-rod extending into the butt-stock of the gun, a spring encircling the said rod, a transversely-arranged operating part mounted in the stock of the gun, connected with the rear end of the said rod, and adapted to be manually operated for retracting the rod and placing the said spring under tension, and means connecting the forward end of the said rod with the said locking-block.

15. In a magazine-gun, the combination with a reciprocating barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted therein, a rocking tumbler mounted in the said bolt for operating the block, an operating-rod extending into the butt-stock of the gun, a link connecting the said rocking tumbler with the forward end of the said rod, a transversely-arranged operating-spring encircling the rod, and an operating-lever mounted in the butt-stock, connected with the rear end of the rod for retracting the same, and adapted to be manually operated.

16. In a magazine-gun, the combination with a reciprocating barrel and barrel extension, of a breech-bolt, a vertically-movable locking-block mounted in the breech-bolt, an operating-rod extending into the butt-stock of the gun, connection between the said rod and block, an operating-spring encircling the said rod, a tube located in the butt-stock and receiving the rear end of the rod, a washer mounted upon the forward end of the tube, forming a bearing for the rear end of the spring, and having the rear end of the rod extended rearwardly through it, and a transversely-arranged operating-lever pivoted in the upper portion of the butt-stock, extending downward through the rear end of the rod, projecting below the lower edge of the butt-stock for manual operation, and passing through the said tube which is slotted for the purpose.

17. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a pivotal carrier, and means mounted in the carrier itself for locking the bolt at the limit of its rearward excursion.

18. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a pivotal carrier, and a locking-dog mounted in the rear end of the carrier itself for engaging with the breech-bolt and locking the same at the limit of its rearward excursion.

19. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a pivotal carrier, a locking-dog mounted in the carrier itself and engaging with the breech-bolt to lock the same in its open position while the barrel and barrel extension are returned to their closed positions, and an operating-spring placed under tension by the recoil of the gun, and acting through the said bolt and the said locking-dog to lift the carrier into its elevated position when the bolt moves forward.

20. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a locking-block mounted therein for locking it to the said extension, a rocking tumbler mounted in the breech-bolt for operating the said block, an operating-rod extending into the butt-stock of the gun, a link connecting the said rod and the said rocking tumbler, a pivotal carrier, a locking-dog pivotally mounted in the rear end of the carrier at a point to the rear of the pivot thereof, and adapted to coact with the bolt to lock the same in its open position, and an operating-spring, whereby the locking-dog acts to lock the bolt in its open position, and to lift the carrier, under the power of the said spring, into its elevated position.

21. In a magazine-firearm, the combination with a recoiling barrel, of a tube-like barrel extension laterally cut away for the ejection of the spent cartridges, a breech-bolt adapted to enter the said extension, a vertically-movable locking-block mounted in the said bolt for locking the same to the said extension, a rocking tumbler also mounted in the said bolt for coacting with the rocking tumbler, means extending rearward from the said tumbler for operating the same and a gun frame or housing inclosing the said parts and formed with a lateral ejection-opening.

22. In a magazine-gun, the combination with a pivotal carrier, of a combined carrier-catch and cartridge-stop which in one position locks the carrier in its depressed position and in another position acts as a cartridge-stop, these two functions being performed alternately.

23. In a magazine-firearm, the combination with a pivotal carrier, of a combined cartridge-stop and carrier-catch for locking the carrier in its depressed position, pivotally mounted upon a vertical pivot located in a recess formed in the inner face of one of the side walls of the gun-frame.

24. In a magazine-gun, the combination with a pivotal carrier, of a combined cartridge-stop and carrier-catch for locking the carrier in its depressed position, and adapted to be operated to release the carrier by the head of a cartridge.

25. In a magazine-gun, the combination with a pivotal carrier, of a combined cartridge-stop and carrier-catch for locking the carrier in its depressed position, and a part brought into operation by the recoil of the gun for preventing the premature operation of the said combined part in unlocking the carrier.

26. In a magazine-gun, the combination with a pivotal carrier, of a combined cartridge-stop and carrier-catch for locking the carrier in its depressed position, and a sliding inertia-piece coacting with the carrier-catch end

of the said combined part and brought into operation by the recoil of the gun, for preventing the premature operation of the said combined part in unlocking the carrier.

27. In a magazine-firearm, the combination with a pivotal carrier, of a combined cartridge-stop and carrier-catch for locking the carrier in its depressed position, and an inertia-piece brought into operation by the recoil of the gun, and coacting with the carrier-catch for preventing the premature operation thereof in unlocking the carrier, the said combined part and inertia-piece being located in a recess formed in the inner face of one of the side walls of the gun.

28. In a magazine-firearm, the combination with a recoiling barrel and barrel extension, of a breech-bolt, a locking-block, a rocking tumbler for operating the block, an operating-link connected with the said tumbler, an operating-rod connected with the said link, and a hammer passing upward through the said link which engages with it to automatically cock it.

29. An automatic firearm, having a hammer and a trigger, one of the said parts having a locking-notch and a safety-notch, and the other part having a locking-hook and a safety-hook, the said notches and hooks coacting to prevent the hammer from being released by the trigger except as the rearward draft upon the trigger is first relieved to permit the hold of the hammer to be transferred from the safety-notch and safety-hook to the cocking-notch and cocking-hook.

30. In a magazine-firearm, the combination with a hammer provided with a finger containing a locking-notch and a safety-notch, of a trigger provided with a locking-hook and a safety-hook arranged in opposition to each other and sufficiently separated from each other to permit the finger containing the said notches to pass down between them, and respectively coacting with the said notches to prevent the hammer from being released by the trigger except as the rearward draft upon the trigger is first relieved to permit the hold of the hammer to be transferred from the safety-notch and safety-hook to the cocking-notch and cocking-hook.

31. In a firearm, the combination with a hammer and a trigger, of a safety-catch for locking the trigger, and a mainspring constructed and arranged to prevent the catch from being engaged with the trigger to lock the same except when the hammer is in its cocked position.

32. In a magazine-firearm, the combination with a pivotal carrier formed at the extreme lower corner of its rear end with a nose, of a carrier-spring bent at its free end to conform to the curvature of the said nose with which it coacts to hold the carrier in its elevated and in its depressed positions, and to return it to its depressed position after it has been pushed upward for feeding a cartridge into the magazine.

33. In a firearm, the combination with the receiver and tubular magazine thereof, of a recoiling barrel and barrel extension, a front stock through which the forward end of the magazine projects, an action-spring placed under tension by the front stock, and means applied to the projecting forward end of the magazine for detachably connecting the front stock with the magazine, whereby when the front stock is removed from the magazine, the recoiling barrel and barrel extension may be withdrawn from their connection with the receiver.

34. In a firearm, the combination with the receiver and tubular magazine thereof, of a recoiling barrel and barrel extension, an action-spring located within the said front stock for restoring the barrel and barrel extension to their closed positions, a front stock within which the action-spring is located and through the forward end of which the magazine extends, and a buffer for taking the shock of the forward excursion of the barrel and its extension, and engaging with the said front stock to which the shock is transmitted.

35. In a firearm, the combination with the receiver and tubular magazine thereof, of a recoiling barrel and barrel extension, a front stock applied to the magazine and receiver, an action-spring located within the front stock, and a nut applied to the forward end of the magazine and engaging with the front stock to hold it in place.

36. In a firearm, the combination with a recoiling barrel, of a barrel extension formed at or near its rear end with one or more ejecting pins or projections located in position to engage directly with a rim of a spent cartridge, a breech-bolt adapted to enter the said extension, one or more extractors carried by the said bolt, a gun frame or housing inclosing the said parts and formed with a lateral ejection-opening, and an action-spring for restoring the barrel and barrel extension to their closed positions, during which act of restoration the said ejecting means effect the expulsion of the spent cartridge.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN M. BROWNING.

Witnesses:
JOHN E. RAMSDEN,
N. GAIL NORTON.