No. 663,956.

Patented Dec. 18, 1900.

A. BURGESS.

AUTOMATIC FIREARM.

(Application filed Sept. 5, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

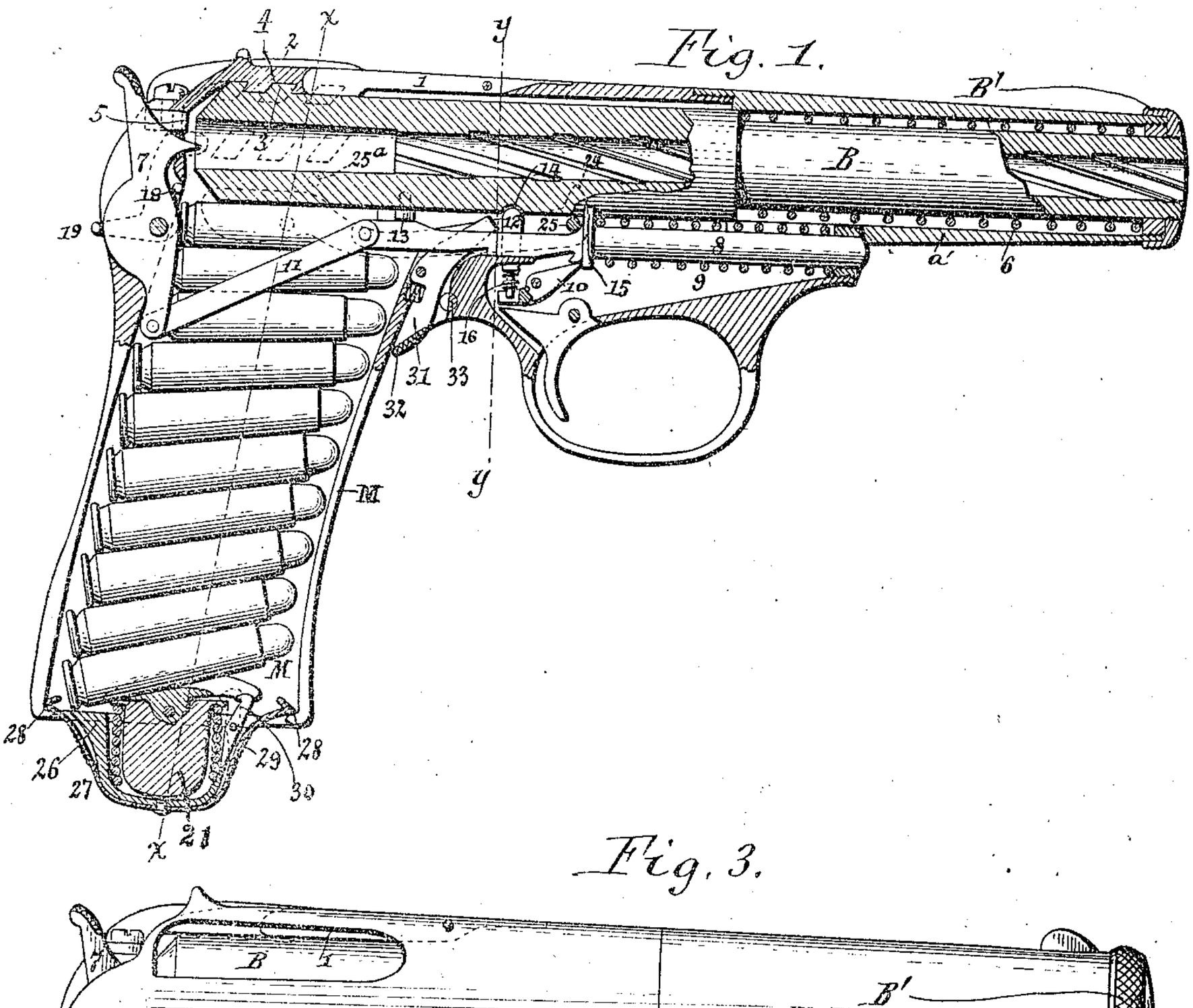
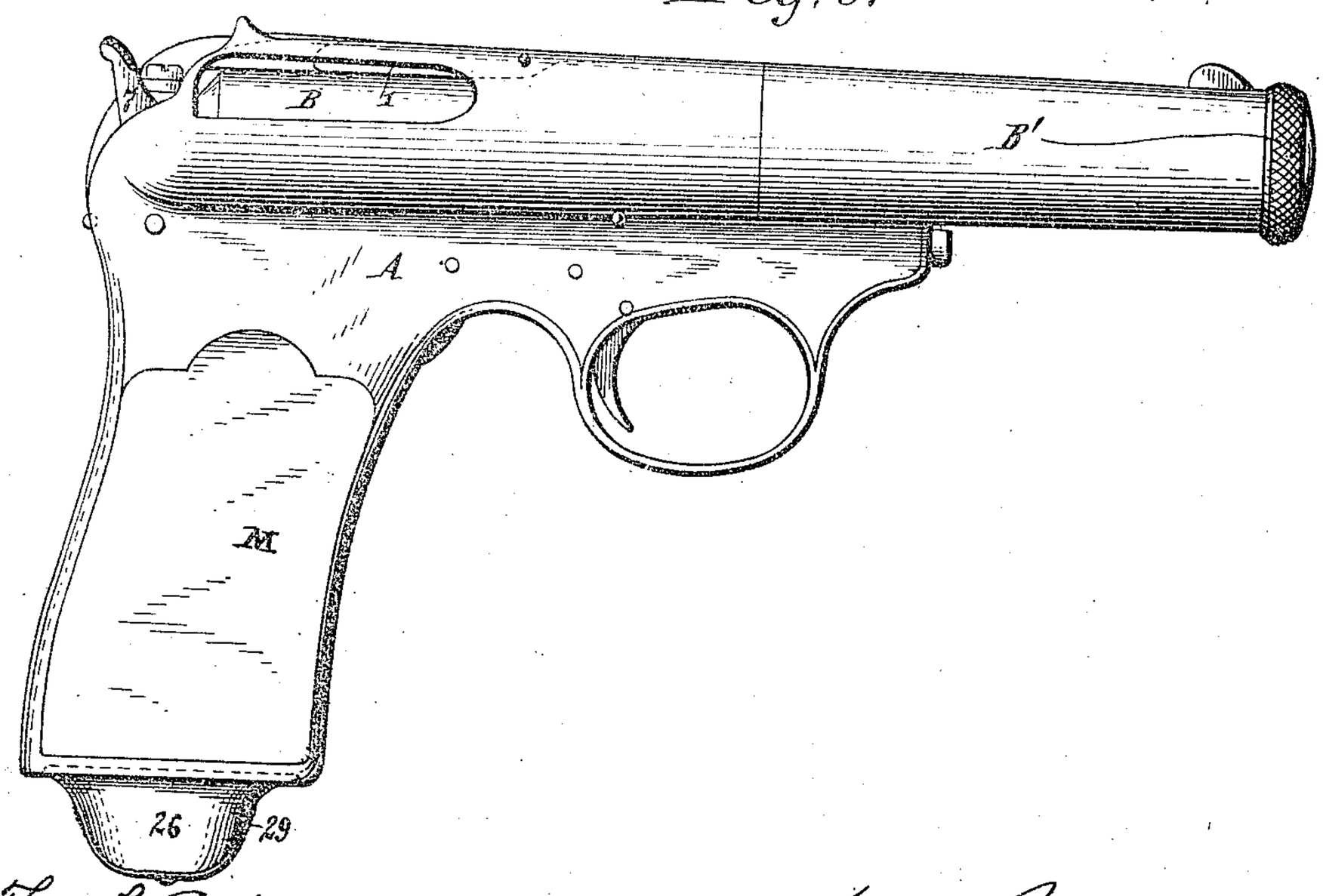


Fig. 3.



Theo. L. Popp
E. A. Volk
} Witnesses.

Andrew Burgess
Inventor.

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Fig. 2.

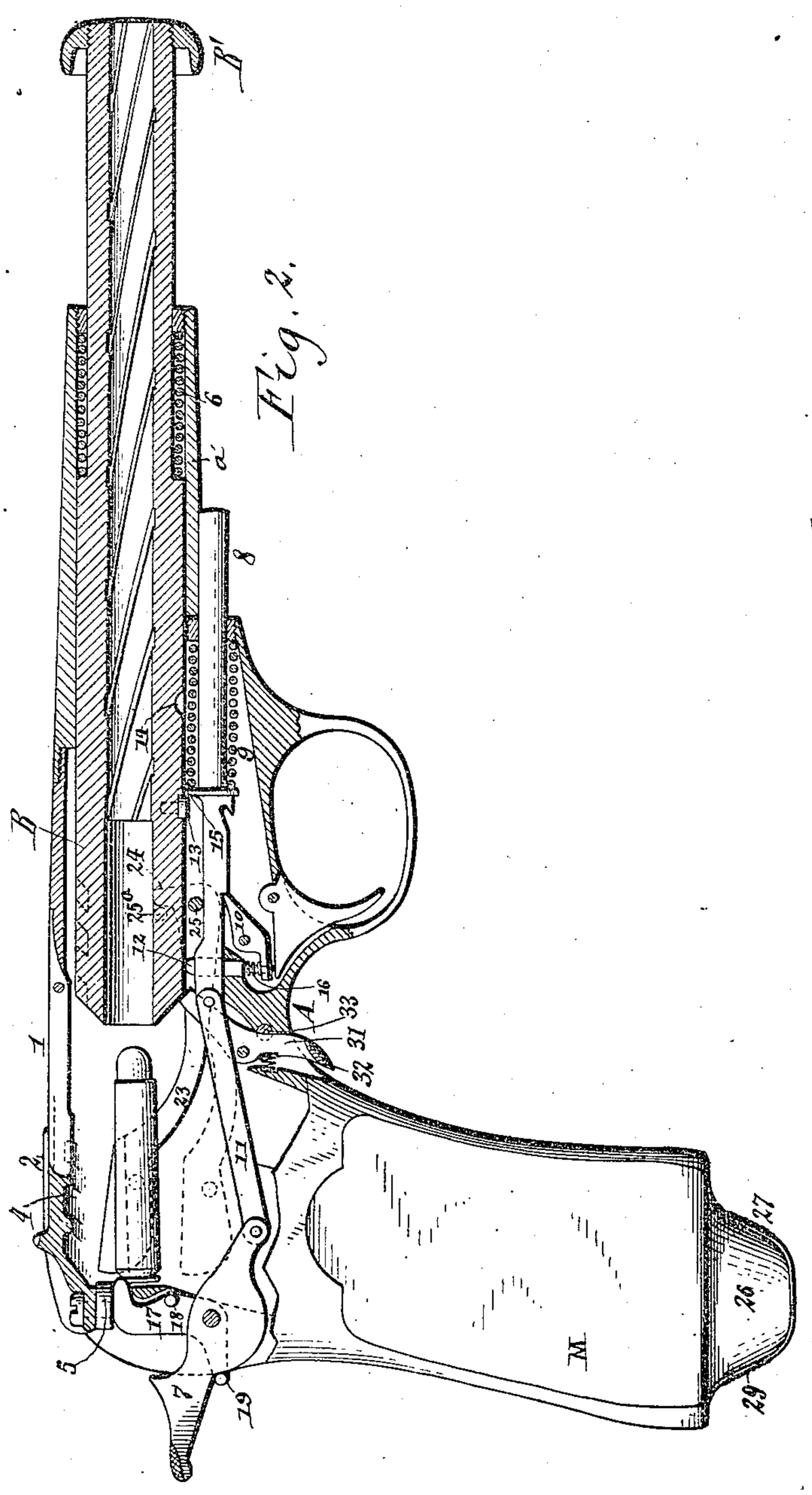
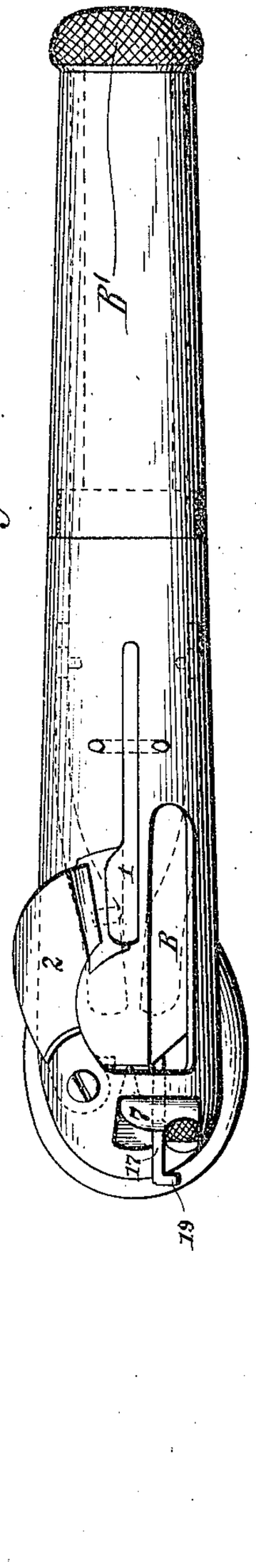


Fig. 4.



Witnesses:
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3 Sheets—Sheet 3.

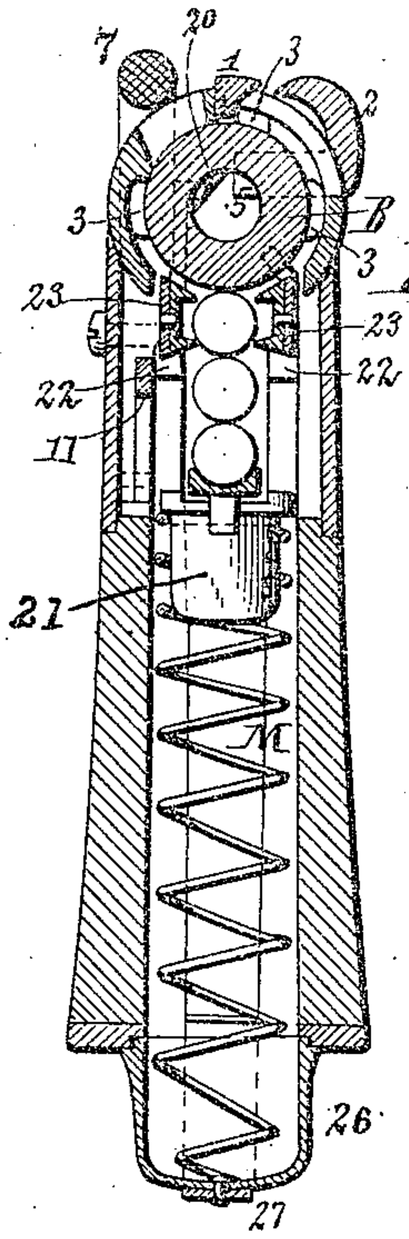


Fig. 5.

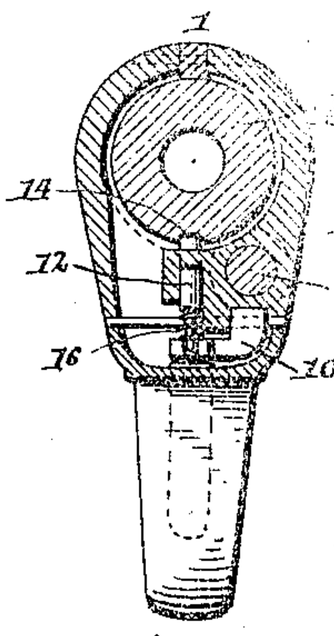


Fig. 6.

Fig. 7.

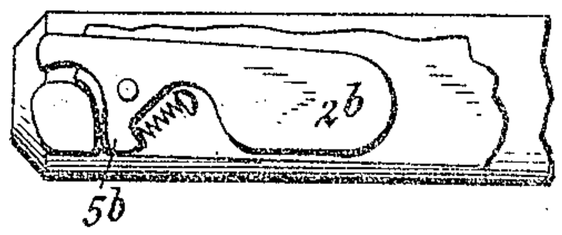


Fig. 8.

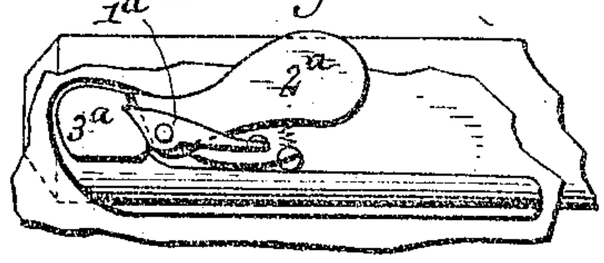
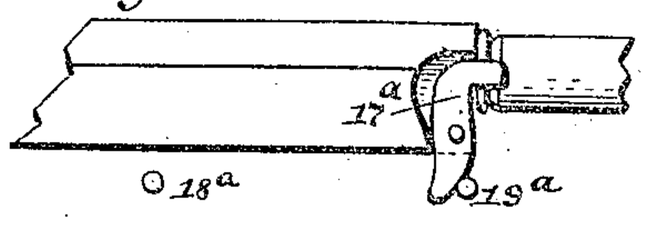


Fig. 10.



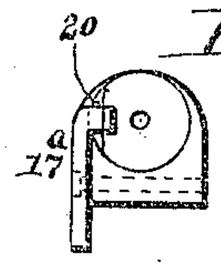
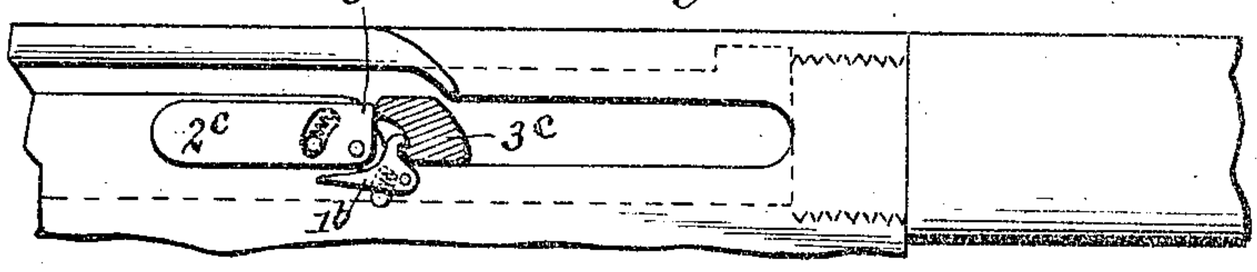


Fig. 11.

Fig. 9.



Witnesses:
Theo. L. Popp.
E. A. Volk.

Andrew Burgess
Inventor.

UNITED STATES PATENT OFFICE.

ANDREW BURGESS, OF OWEGO, NEW YORK.

AUTOMATIC FIREARM.

SPECIFICATION forming part of Letters Patent No. 663,956, dated December 18, 1900.

Application filed September 5, 1899. Serial No. 729,437. (No model.)

To all whom it may concern:

Be it known that I, ANDREW BURGESS, a citizen of the United States, residing at Owego, county of Tioga, and State of New York, have invented a new and useful Improvement in Automatic Firearms, of which the following is a specification.

This invention relates to automatic or self-acting firearms.

The object of the invention is to make automatic arms of simple construction and reliable operation; and it consists of devices and methods of unlocking the breech by the discharge with proper delay to then allow the later pressure to open the breech, a magazine with stop, guide, and alining feeder, a safety-lock adapted to said magazine, a combined extracting and ejecting device, together with other improvements and combinations of parts, hereinafter set forth and described in connection with the accompanying drawings.

Figure 1 shows a partly-vertical longitudinal section of this arm in pistol form with parts of lock and barrel in elevation. Fig. 2 is a similar view showing some parts in broken lines and the breech open. Fig. 3 is a side elevation, showing part of mechanism in dotted lines. Fig. 4 is a top or plan view. Fig. 5 is a cross-section through the barrel and magazine on the line $x\ x$ of Fig. 1 looking backward, but with fewer cartridges. Fig. 6 is another cross-section on lines $y\ y$ of Fig. 1. Fig. 7 shows a modification of the breech locking and unlocking device. Fig. 8 is another modification of same. Fig. 9 shows a similar modification as applied to a reciprocating breech-closure. Fig. 10 shows a side elevation of this extracting and ejecting device as applied to a reciprocating bolt, and Fig. 11 is a front elevation of the same.

In the drawings, A is the frame or receiver of the arm, B the barrel, and M the magazine. The barrel is guided to reciprocate in the frame and make a part turn (say one-eighth) to lock the breech. The locking is effected by studs or projections 3 on the barrel, which enter corresponding cuts 4 in the frame in a well-known manner. These locking-shoulders, however, are made at a very high angle or "pitch," so that normally the push of the charge in firing would turn the barrel to unlock it.

While the resistance of the inertia of the turning barrel might under some circumstances suffice to hold the barrel, it would be uncertain and irregular.

I pivot a spring locking-catch 1 in the frame to engage a locking-stud 3, as shown in Figs. 1 and 5, to hold the barrel from turning to unlock; but an unlocking-lever 2 is hung in the frame at the rear of the barrel. This lever has a short arm 5, which is engaged by the rear of the cartridge-shell, so that on firing said shell being forced violently back against said short arm turns the long forward arm 2, and thereby strikes the catch 1 out of its engagement with the stud 3 to allow the barrel to rotate and unlock the breech. A similar unlocking-lever may be operated by the locking-stud on the barrel, as shown in the modifications of Figs. 7 and 8, to either unlock the stud, as in Fig. 8, by a delayed action of the heavy lever 2^a, which (having lost motion, as before) is thrown by shock from the locking-stud 3^a against the locking-catch 1^a to turn and release it or, as in Fig. 7, (in which the stud engages its shoulder on the frame more squarely, so that the barrel will not be pushed to rotate so easily,) to start the barrel unlocking by a blow from the heavy long arm of the lever 2^b, caused by the shock of the locking-stud against its short arm 5^b.

When the unlocking-lever is operated by the shell against its short arm, as described, a very slight movement suffices, and the shell may be set but little, if any, deeper or more loosely in its chamber than usual, or when the similar levers are operated by the locking-stud it may be but slightly rearward of firm engagement with its shoulder in the frame, as the elasticity of the metal in the violent shock of firing conduces materially to throw the unlocking-lever. Another means of turning the barrel is shown in Fig. 1. The bore of the barrel is shown spirally grooved or rifled in the left-hand-screw direction, while the locking-shoulders of the barrel have

a pitch in the contrary or right-hand direction. The top of the barrel must turn to the right to unlock.

The projectile in starting bears to the right on the inclined plane of the top of the grooves in the barrel with all the force its inertia gives in taking the rotary motion.

While the turning force of the projectile is too transitory to be easily imparted to a heavy barrel, with a very light barrel and by a nicely-adjusted pitch on the locking-shoulders practical unlocking by this means alone may be secured.

To utilize the above method of unlocking and to make the automatic opening of the breech effective, the said unlocking must be so timed as to leave sufficient pressure after the breech is unlocked to force it open and compress the return-spring 6. When a slight delay is required, a little lost motion of the forward heavy arm of the unlocking-lever, as shown in Figs. 4, 7, and 8, is provided to delay its moment of striking the catch or locking-stud.

In the modification Fig. 9 the device for regulating the unlocking is shown applied to a reciprocating bolt. The locking-catch 1^b is pivoted to the frame of the arm, as before, and the unlocking-lever 2^c has its short arm 5^c against the locking-stud 3^c, to be operated thereby to release the catch 1^b and allow the bolt to be turned by residual pressure from the charge in the same manner as the barrel is turned to unlock and open in the other figures, but in the reverse direction. It will be seen that the return breech-closing spring 6 is arranged around the barrel and housed in the extension a' of the frame.

A knurled piece B' is fixed to the muzzle of the barrel to serve as a handle to move the barrel forward when it is desired to open the breech by hand.

The hammer 7 is hung in one side of the rear of the frame with its striking-point bent to the center. A reciprocating hammer-operating rod 8 is also arranged in the side of the frame forward of the hammer and is provided with the spring 9 to press it rearward and a projection 15 to be engaged by the stud 13 on the barrel in its former movement to press the rod 8 forward, where it may be retained by the sear 10, as shown in Fig. 2. A link 11 connects the rod 8 with the hammer below its pivot, to thereby move the striking-top of said hammer in reverse direction to the movement of the rod 8.

To prevent pulling off by the trigger when the breech is unlocked, a foil-pin 12 is arranged vertically in the frame, its upper end impinging against the bottom of the barrel by force of the sear-spring 16 and its lower end passing through the rear part of the sear 10 into the path of movement of the trigger, as shown in Fig. 2.

A depression 14 is made in the bottom of the barrel to register with the top of the pin 12, but only when the barrel is in its backward and turned to its locked position, as shown in Figs. 1 and 6, when the trigger being no longer obstructed by said pin it may pull off the sear in the ordinary manner, and the mainspring 9 will then throw the rod 8 back to strike top of the hammer forward.

The sear-spring 16 is conveniently carried by the lower small part of the foil-pin to also operate said pin, as described.

The lever extractor and ejector 17 is hung at the side of the hammer in the frame and has a shoulder 18 to be engaged by the hammer when striking to force its hook over the flange of the cartridge, which it grasps in the usual manner.

The cartridge-shell having been extracted by the opening of the breech near the last part of that movement, a shoulder of the hammer reaching the projection 19 on the extractor-lever turns the lever to move the extractor-hook back rearward of the cartridge-seat on the breech to eject the shell. To effect this ejection easily, an arc 20 of the cartridge-seat is cut away, as shown in Figs. 5 and 11, to permit the shell to turn and be tripped outward. It will be understood that by this method the hook of the extractor is retired out of the breech-opening to not then obstruct a feeding cartridge.

In the modification of Figs. 10 and 11, where the extractor-lever is hung in the bolt, it operates the same, except that the shoulders 18^a and 19^a operating it are fixed in the frame and the lever is moved against them by the bolt.

The magazine M is contained in the stock and is provided with a follower 21, operated by a coiled spring, to raise the cartridges against the rear part of the barrel.

In cross-section the magazine is substantially the form of the cartridge, but with a widened center, as shown in Fig. 5, to accommodate the larger diameter of the follower and spring, which are thereby guided.

The widened center of the magazine has stops 22 22 near the top to there stop the follower from rising into the barrel-trunk in the frame.

When a feeding cartridge reaches the barrel or as high as the follower can carry it, it must still be raised a little to attain the axial line of the bore of the barrel. To further raise and aline the cartridge, spring-levers are hung on pivot 25 in the sides of the frame, said levers having short arms 24 forward of the magazine and long arms 23, with pivoted concaved ends, extending back along the top of the magazine. The arms 23 are forced apart by the barrel when in its rear position, as shown in Fig. 5; but when the barrel moves forward, as in Fig. 2, the arms 23 spring in and grasp the topmost cartridge, and stands 25^a on the barrel, then reaching the short arms 24, turn the levers to raise their long arms, and thereby the cartridge within their

grasp, as shown in said Fig. 2, so that when the barrel springs rearward it takes in the cartridge and at the same time presses down and apart the long arms to position for grasping another cartridge. The rocking concaved ends of the long arms of levers are to hold the feeding cartridge in nearly a horizontal position, their rear ends being stopped and turned by the narrowing top of the frame in rising and their forward ends lowered and leveled by the closing of the barrel over them. When there are no more cartridges in the magazine, these spring-arms insure the ejection of the shell.

To conveniently close the magazine and make more room for the spring and follower, a thick downwardly-extending hollow cover 26 is fitted to the opening and provided with bow-spring 27 with ends to spring into the opening above abutments 28 28 at the lower end of the magazine, to thereby hold the cover 26 in place. The spring 27 has finger-holds 29 29, by which it can be grasped to compress it and retire its ends from their engagement with the shoulders 28 28. A catch 30 is also arranged in the magazine-cover to engage and hold the follower down in the cover 26 when this part is carried separate from the arm, but the said catch is released from the follower by act of insertion of the cover, as shown in Fig. 1.

The magazine-cover may be attached to a removable pocket fitting the magazine-trunk to carry the cartridges. This forms a convenient loading-pocket for insertion and to remain in the magazine until empty.

A spring-barrel catch 31 is pivoted in the frame with a finger-piece 32 projecting rearward of the trigger in position to be grasped at will by the second finger when firing. When said catch is thus held out of action, the barrel will return by force of its spring 6 whenever thrown forward; but by releasing the finger from this catch it springs up to hold the barrel forward at every discharge, as shown in Fig. 2, so that the catch must be "pulled" to release it before the barrel can return and the trigger pulled to release the sear. The oil-pin 33 may be used to render the catch 31 inoperative.

In the drawings I show the invention in the construction of a pistol; but it is applicable also to shoulder-guns and artillery, and I do not confine my claims to the construction shown, but claim the various modifications and constructions to which knowledge of the art and mechanical skill adapt it.

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

1. In a firearm, a barrel, a frame holding a breech-abutment to resist the cartridge, means for locking the barrel by a turning movement, a swinging lever hung in the frame, having a short arm engaged in the act of firing, to throw the long arm of said lever against the locking parts to release the breech, all arranged as described, whereby the remaining pressure of the charge will open the breech, all in combination and with a return-spring to close the breech.

2. In a firearm, a frame, a barrel housed to reciprocate therein, locking-shoulders on the barrel and in the frame to make engagement by the turning of the barrel, but so slanting in pitch as not to lock barrel firmly; in combination with a catch to hold such shoulders locked, and a lever operated by movement from the shock of the discharge to release said catch.

3. In a firearm, the frame, a fixed breech-locking shoulder therein, a lever hung in the frame in proximity to said shoulder, a movable part of the arm with shoulder to lock against the said shoulder in the frame, a short arm of the lever obtaining against the shoulder on the movable part to throw the lever by shock from said part in firing to start the unlocking of the breech, all in combination substantially as described.

4. In the lock of a firearm, a hammer hung rearward of the barrel in the frame with a striking end above its pivot, an extension below its pivot, an actuating-rod connected to said extension, a reciprocating barrel having a shoulder to force forward said rod and a spring to return said rod, all in combination, and with a sear to hold and release the rod substantially as set forth.

5. In a firearm provided with reciprocating parts to open and close the breech, and having a cartridge-seat to resist the rearward movement of the shell, and an arc or section of said seat cut away, in combination with an extractor having a hook to engage the cartridge-flange, and means to force said hook forward, and means to retire said hook backward to thereby trip the shell, substantially as specified.

6. In a magazine-firearm, a reciprocating barrel, a magazine with a spring to feed the cartridges upward, as described, in combination with levers to grasp the top cartridge and engaging means on the barrel and levers whereby said levers are raised by the movement of the barrel.

7. In a magazine-firearm, a frame, a barrel reciprocating in the frame, a magazine debouching into the hollow of the frame rearward of the barrel, when said barrel is in forward position, in combination with levers actuated by the forward movement of the barrel to raise a cartridge from the magazine to aline it with the bore of the barrel.

8. In a firearm, a magazine of the class described, having an opening at the bottom and shoulders therein, in combination with a hollow projecting cover and a bow-spring whose ends engage said shoulders to retain the cover in place and finger-holds to release it.

9. The magazine with followers and spiral spring guided as described, and the hollow

downward-projecting cover, and a catch to hold the follower and spring within the hollow of the cover, all combined as set forth.

10. In an automatic firearm, a barrel arranged to be moved forward by the discharge, in combination with a catch to hold said barrel forward and a projection from said catch in position to be grasped by the second finger while the first pulls the trigger, substantially as specified.

Witness my hand this 1st day of September, 1899.

ANDREW BURGESS.

Witnesses:
THEO. L. POPP,
F. F. SCHERZINGER.