No. 663,955. Patented Dec. 18, 1900.

A. BURGESS.

AUTOMATIC FIREARM.

Application filed Dec. 11, 1897.

(No Model.) 2 Sheets—Sheet 1.

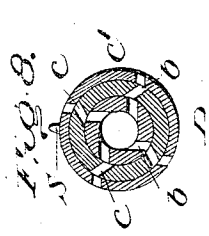


Fig. 8.

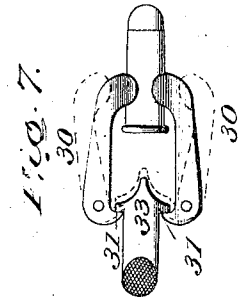


Fig. 7.

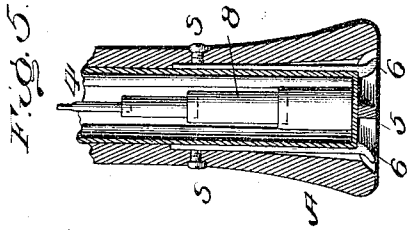


Fig. 5.

Fig. 1.

Fig. 11.

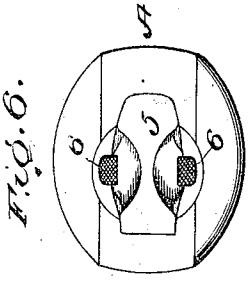


Fig. 6.

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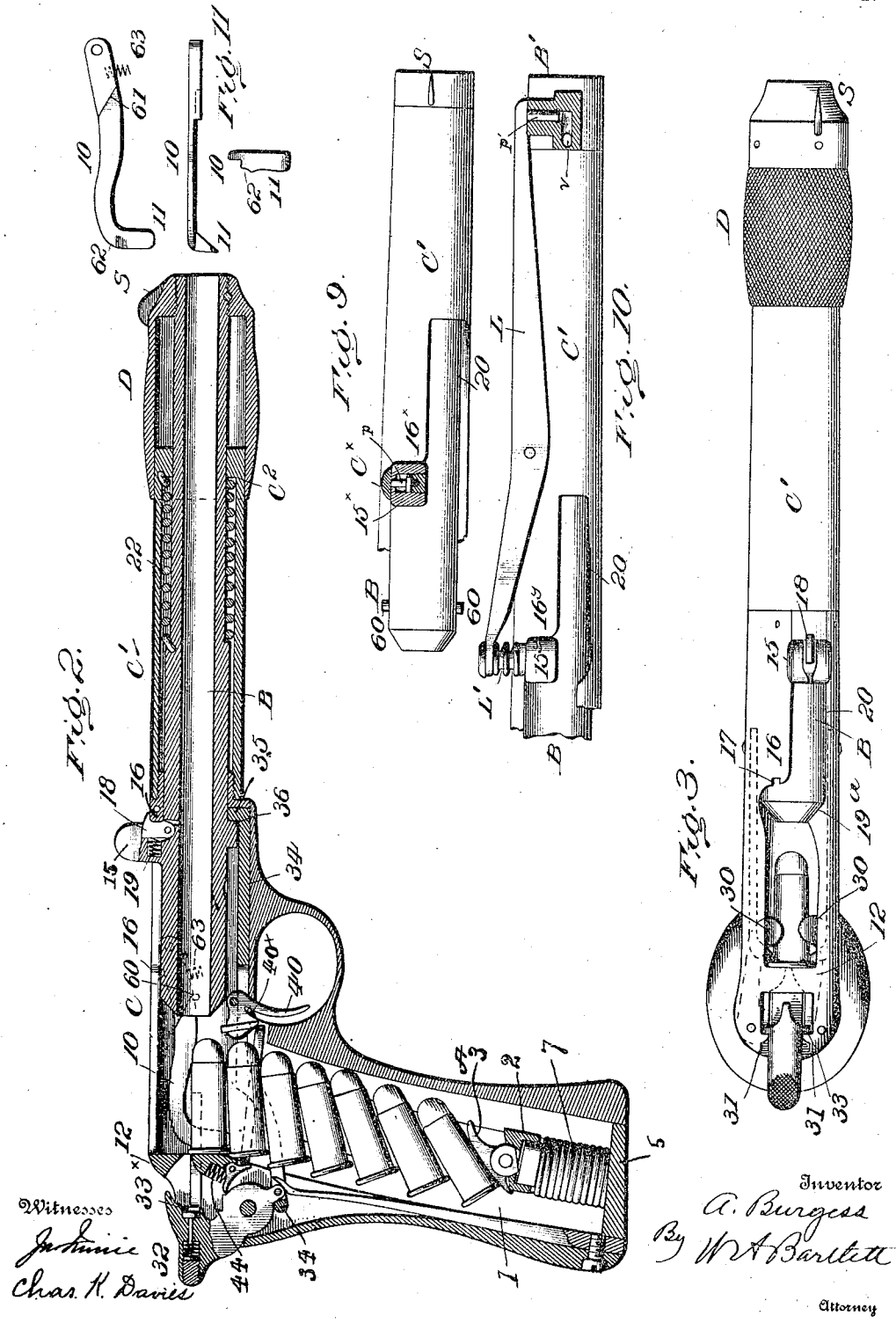
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UNITED STATES PATENT OFFICE.

ANDREW BURGESS, OF BUFFALO, NEW YORK.

AUTOMATIC FIREARM.

SPECIFICATION forming part of Letters Patent No. 663,955, dated December 18, 1900.

Application filed December 11, 1897. Serial No. 661,583. (No model.)

To all whom it may concern:

Be it known that I, ANDREW BURGESS, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Firearms, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to automatic firearms.

The object of the invention is to produce a gun in which the gas-pressure may be utilized to open the breech with as little lost motion as practicable; also, to improve the construction of guns so that the pressure of gas will unlock the fastening device by a slight rocking of a movable part of the gun on its axis, so that thereafter the breech-opening may be quickly effected; also, to improve the cartridge-feed mechanism, the shell-extracting mechanism, and various other parts of the gun.

Figure 1 is a longitudinal section of the gun or pistol in closed position. Fig. 2 is a similar section of the same weapon with breech open, as at the instant after firing. Fig. 3 is a top plan with the parts in position of Fig. 2. Fig. 4 is a cross-section, and Fig. 5 a broken central section, nearly vertical, of the magazine and stock. Fig. 6 is a bottom or end view of the stock and magazine-fastening. Fig. 7 is a top plan of cartridge-detent. Fig. 8 is a cross-section of a barrel modification, with turbine-rotating device. Fig. 9 is a plan of a modification of unlocking mechanism, and Fig. 10 a plan of still another modification. Fig. 11 shows side, top, and end views of the extractors detached.

A denotes the stock, B the barrel, and C the casing of the barrel, of an automatic magazine-pistol.

In general the same construction may be applied to larger guns; but there are some features of construction which specially adapt this invention to pistols.

The stock A contains a magazine 1, in which cartridges may be placed on top of each other, the general form of the magazine being similar to the longitudinal section of a cartridge. A follower in the magazine has a floor-piece 3, pivoted to the plunger 2, and floor-piece 3 is kept in the general line of direction of the cartridge resting thereon by pressure of the spring-follower on a flattened part of the knuckle, by which the floor-piece is pivoted to the follower. The magazine may be simply a recess in the stock, or it may have a lining-tube 4 of the general form of the opening and removable from the stock with the cover or end piece 5 of the magazine, which may be fixed to the tube 4. In either case the cover may be held in place by spring-hooks 6, which hooks lie in grooves and are secured to the stock, as by screws *s*, so as to spring over the head or cover 5 of the magazine to hold it in place and so that by springing the hooks 6 apart the magazine cover and attachments may be removed from the stock. The lower ends of the hooks have finger-pieces thereon. The follower 2 is lifted by the coiled spring 7, which lies between the magazine-cover and the follower and tends at all times to lift the follower. A telescopic rod or tube 8 may connect the magazine-cover and follower. This rod or tube will close into itself when the follower is pressed toward the magazine-cover. The magazine, as shown, curves slightly from the perpendicular. The cylindrical head or follower 2 and the coiled spring will follow a curved passage of this kind, and a longer passage or magazine will thus be formed, besides providing for the taper of the cartridge.

The central portion of the magazine-recess is of such diameter as to receive a coiled spiral spring 7 of greater diameter than the diameter of the cartridge. The magazine-recess in front and rear of such spring-chamber is of lesser diameter, approximating the diameter of a cartridge. The central recess of the magazine thus serves to guide the follower-spring, while the front and rear recesses of the magazine guide the point and head of the cartridge and of the floor-plate 3. When cartridges are placed in the magazine, the follower 2 and magazine-cover 5 are placed behind such cartridges and will press the cartridges (few or many in number) toward the upper part of the magazine. (See Fig. 2.) The magazine guides the cartridges toward the firing-shield or recoil-abutment 12 at the rear of the barrel.

For loading the first cartridge the barrel may be pushed forward in the casing and the top cartridge in the magazine impelled by the spring-actuated follower will rise into

the grasp of the extractors 10. These extractors 10 are pivoted to the inside of the stock or casing a little forward of the rear end of the barrel and extend back alongside the barrel, the rear ends of the extractors turning downward and the extreme rear edge of the extractors forming wedged-shaped pieces 11, which embrace the cartridge just in front of the flange or head. The wedge-shaped pieces 11 close in behind the barrel and embrace the cartridge-head just in rear of the barrel when the barrel is closed back. As the barrel moves forward a pin 60 at each side of the barrel strikes the inclined shoulder 61 of the extractors, thus giving the extractors an upward impulse, and as the inside of the casing is concave this upward impulse causes the rear ends of the extractors to bear against the concave surface, and as these ends rise they close toward each other and clasp the rising cartridge. As the pivot of the extractors 10 is a little above the jaws 11, this upward movement of the extractors causes them to press backward on the flange of the cartridge as well, binding the flange against the firing-abutment. When the barrel moves back, the pin or boss 60 no longer supporting the extractors, the extractors will fall downward and spread slightly, the scoop-like upper curve 62 of the extractors still being against the cartridge, but in such position that the rising column of cartridges may throw out the empty shell when the barrel releases the shell on its next forward movement. The elasticity of the extractors may be insured by springs, as 63, bearing against the frame and extractors. When the barrel is moved back to inclose the cartridge, the head of the cartridge rests against the recoil shield or abutment 12, where the cartridge may be fired by a blow of the hammer. The barrel is held back by the engagement of a locking shoulder or boss 15 on the barrel with a complementary shoulder 16 on the casing. The shoulder 16 is round or concaved, and the front boss 15 is convex, as shown in the drawings, Figs. 2 and 3. In the boss 15 there is a small spring-actuated catch 18, which closes into a notch 17 in the locking-shoulder of the casing under the impulse of the spring 19. A minute opening in the barrel permits gas escape just in front of this catch 18, and the gas so escaping will force the catch 18 out of the notch 17.

The barrel B is inclosed in whole or in part in the casing C, which casing is rigid with the stock. The barrel B may not only have a longitudinal movement in the casing, but may also have a slight rotary movement on its axis in the casing. The tendency of the barrel to fly forward under the impulse of the powder charge causes the engagement of the inclined surfaces 15 16 of the locking-shoulders to translate the forward movement of the barrel into a partial rotary movement until the boss 15 enters the longitudinal slot 20 in the casing, when the barrel may move forward, the slot 20 in the casing guiding the barrel by the extension of the boss 15 into this slot. The rear face of the boss 15 is partly rounded, and an incline 19^a at the side of the slot 20 causes the barrel to rotate on its axis on the return of the barrel to closed position. This return is induced by the spring 22, which rests in a recess between the barrel and casing, bearing against a shoulder on each. By usual and well-known constructions the coiled spring 22 may be connected to the barrel in such manner as to assist the rotation here shown by turning the respective ends of the spring into the barrel and casing.

For convenience in assembling the casing is preferably made in two parts, the front part C′ being merely a tubular piece with an internal shoulder C^2 and engaging the part C by a screw-thread. The shoulder C^2 forms the bearing for the spring 22, and the barrel neatly fits the tubular casing in front of this shoulder.

The front of the barrel may have a sleeve D attached by a screw-thread near the muzzle of the barrel and telescoping over the casing C′ in the barrel movement. The part D forms a handle by which the barrel movement may be effected by hand when it is undesirable to effect such movement by firing the gun. The front sight S may be carried by this sleeve or handle.

The casing C has an opening for the escape of the cartridge-shells, as usual in this general kind of automatic guns, and the shell is thrown out by the impulse of the follower bearing upon the column of cartridges. The extractors 10, as has been described, tend to close on and hold down the top cartridge after the spent shell has been thrown out; but to avoid a possible escape of the top cartridge or of the whole column of cartridges from the magazine when the barrel is forward I provide cartridge-detents 30, which are in the form of crank-levers and project over the column of cartridges when the barrel is forward. (See Figs. 3 and 7.) These detents are pivoted to the frame or casing and their front ends curve inward. The detents may be elastic and borne inward by their elasticity; but to give them a sudden and positive impulse to close over the cartridge I cause a nosepiece 33 on the hammer to engage the short arms 31 of the detent-levers 30 as the hammer is thrown back to its extreme position, which is a little back of the position of "full-cock." In Fig. 2 the nosepiece 33^x is movable in the hammer and provided with a spring to retire it backward. By this means the detents are made elastic and quicker in operation.

The hammer 32 is cocked by the sliding draw-piece 34, which connects with the hammer below the hammer-pivot and at one side of the magazine. The draw-piece has a projection 35 in line of movement of a shoulder or abutment 36 on the barrel. Thus when

the barrel moves forward the piece 35 is struck by the projection on the barrel. This contact of the barrel with the draw-piece or cocking-slide is preferably just before the barrel completes its forward movement, and the resistance of the hammer-spring (arranged as usual in a gun) serves somewhat to check the forward movement of the barrel. The leverage on the hammer can be so proportioned that a very slight movement of the cocking-slide is sufficient to cock the hammer. When the hammer falls to fire the cartridge, the cocking-slide or draw-piece 34 is drawn back by the connections indicated from the position of Fig. 2 to that of Fig. 1. The nose-piece 33, engaging the short arms 31 of the detents 30, throws those detents inward toward each other over the cartridge at the instant the barrel is about at its forward position. As the barrel moves back under impulse of the spring 22 the conical end of the barrel spreads the detents apart and the barrel enters and moves back between them. The nose of the hammer having moved back slightly beyond full-cock position moves forward a trifle as soon as the cocking-slide by the backward movement of the barrel permits it to do so, and the detents may then spread out laterally. When the spring nose-piece is used, as in Fig. 2, it allows this without change in the position of the hammer. The front of the cartridge extending in front of the detents 30 will enter the barrel as the barrel moves back, and when so entered the barrel will hold the cartridge from rising. The conical rear end of the barrel also serves to push down the next lower cartridge.

The trigger 40 has a slight beveled projection 41, which may enter a recess or hollow in the barrel when the barrel is at its rearmost or closed and locked position, but will prevent the trigger being pulled when the barrel is partly forward by engaging the side of said barrel. A push-pin 42 and sear 43, rocked by the sear-spring 44, serve to hold the hammer cocked and to release the hammer by a pull on the trigger, operating to force back the push-pin. The trigger is made thin and elastic to allow of its quick withdrawal from the hollow in the barrel without too great shock to the trigger-finger, and a vertical slot 40^x in this trigger increases the elasticity. The trigger may be pulled so hard when the barrel is forward as to hold the barrel from coming back under impulse of the spring 22, the point 41 being by the pull brought firmly against the barrel. When the barrel is almost at its rearmost or locking position, the pull of the trigger may project the point 41 into the inclined recess in the barrel and so force the barrel to locked position. The safety device 64 will be hereinafter explained.

In the modification shown in Fig. 8 the barrel B has apertures *b* extending tangentially through the barrel and communicating with reverse tangential passages *c* in the casing C' and the sleeve D, these passages being indicated by dotted lines near the muzzle in Fig. 1. The effect of this zigzag or turbine arrangement of the passages is to cause the gas escaping through such passages to give a strong rotary impulse to the barrel at the instant of the gas escape. When the barrel has moved far enough, these passages will be cut off, the openings *b* being no longer in communication with the openings *c*, and the rotary impulse ceases.

Fig. 9 shows a modification wherein the locking-boss 15^x is made with a substantially flat front face to rest against the flat locking-shoulder 16^x in the casing C'. In such modification the catch 18 is omitted. The boss 15^x is perforated into the bore of the gun, the mouth of the vent being sidewise against a boss C^x on the fixed casing. Gas passing through the opening in the barrel will strike the boss or abutment C^x on the casing and cause the barrel to partially rotate, so that the boss 15^x can move forward in slot 20 as the barrel moves forward. A valve or piston pin *p*, cased in the above gas-opening, strikes the boss to turn the barrel without the escape of gas.

In the modification of Fig. 10 the unlocking pressure of the gas is through a vent *v* near the muzzle of the barrel B. The gas from said vent *v* impinges against a pin *p'* in the vent, the outer end of said pin bearing against the lever L, which lever is pivoted to the casing C'. The other end of lever L carries a spring-pin L', which bears against the boss 15^y. This lever and spring-pin L' cause a delay action, so that the rotary movement of the barrel shall not take place until the projectile has left the muzzle, the gas being taken from near the muzzle and the lever acting to first compress the spring at L' until the pressure of such spring overcomes the resistance of the boss 15^y to side or rotary movement.

The different modifications are to provide for difference in ammunition. When firing bullets, it is desirable not to move the barrel until the bullet has left the muzzle lest the aim be deranged. Hence the provision for delay action, the gas-pressure in the barrel being still strong enough to produce the forward movement of the barrel after the bullet leaves the muzzle with some ammunition. With other ammunition and in shooting shot or blank cartridges the gas-pressure to move the barrel may be obtained from the bore nearer the breech of the gun and in other ways, as has been described.

The operation has been generally described; but a brief résumé may be given. The magazine is charged by turning the stock over, removing the bottom plate and filling the magazine with cartrigdes, and then pressing the follower upon the column of cartridges, when the spring of the follower will be compressed. When the catches have grasped the end or cover of the magazine, the magazine is charged and may be turned back to firing position.

The barrel of the arm is then moved forward by hand, when the top cartridge will be raised by the follower and prevented by the extractor-fingers and detents from rising beyond the line of the bore. The forward movement of the barrel also cocks the hammer. The spring 22 will close the barrel back over the cartridge. A pull of the trigger may then fire the cartridge, and the gas-pressure developed unlocks the barrel in either of the ways described. The forward pressure of the gas or the movement of the charge then carries the barrel forward, and the loading is thereafter effected automatically as long as there are cartridges, the firing being all the time under control of the trigger. The hammer may be let down, as in other guns, and cocked just before firing.

As will be understood by an expert in this art, the construction may be modified in various ways without departing from the spirit of the invention, which is believed to be fairly set forth in the following claims.

A loop or slide piece 64, (see Figs. 1 and 2,) resting in grooves in the rear arm of the trigger 4, is free to move up and down in said grooves, its length being greater than the trigger-arm. The lower end of this slide, which is inclined, will engage the push-pin 42 when the top of said slide is against the barrel, and thus push on the said push-pin; but when the barrel is forward, as shown in Fig. 2, it cannot hold down this slide 64, and the incline at its end will cause the piece 64 to rise above the push-pin 42 and so not operate the same.

I claim—

1. In a magazine-gun, the magazine having a follower in position to feed a column of cartridges upwardly, the barrel and recoil-shield above said magazine, means for moving the barrel forward, and a pair of vertically-vibrating arms pivoted to the frame in front of the breech of the barrel and closing toward each other onto the head of the top cartridge to prevent the escape of the column of cartridges when the barrel moves forward, all combined substantially as described.

2. In a magazine-pistol, the hollow stock opening at the bottom and having a magazine at the ends approximating the shape of a cartridge and an enlarged center, the cover having a follower provided with a coil-spring of greater diameter than the cartridge and adapted to enter said enlarged opening of the magazine and be guided thereby, the magazine-cover and the detaining-catches, substantially as described.

3. In a magazine-gun, a magazine-tube, a spiral spring, and a follower pressed forward by such spring, and a telescopic guide-tube connected to said follower, all combined substantially as described.

4. In a magazine-gun, the combination of the magazine-tube, the spring-pressed follower, and the floor-piece pivoted to the follower and having a flattened knuckle-piece borne on by the spring, whereby the floor-piece is held at the proper elastic inclination to press on the cartridges, all combined substantially as described.

5. In a magazine-gun, the magazine and its follower feeding cartridges upward toward the firing position, the barrel having a longitudinal movement to close on the top cartridge, the pivoted detents closing inward from the sides over the upper live cartridge, and a moving part connected to the barrel and acting on said detents to close them as described and thus prevent the rise of the column of cartridges, all combined substantially as described.

6. In a magazine-gun, a magazine and follower adapted to feed the cartridges upward, a pair of extractor-arms pivoted to the frame forward of the rear end of the barrel and closing onto the cartridge-head behind the end, the forwardly-moving barrel, and an abutment on the barrel engaging inclines on the extractors to lift and clamp said extractors by the longitudinal movement of the barrel, all combined substantially as described.

7. In a magazine-gun, the fixed recoil-abutment, the concave casing, the extractor-arms pivoted to said casing, and the forwardly-moving barrel having contact-pieces engaging the extractor-arms to lift them as the barrel moves forward, said arms closing toward each other as they lift by engagement with the concave casing, substantially as described.

8. In a magazine-gun, the upwardly-feeding magazine, the forward-moving barrel, the pivoted cartridge-detents, and the hammer engaging said detents to turn them into the line of movement of the cartridges as the hammer moves backward, and a spring to give elasticity to the detents, substantially as described.

9. In a magazine-gun, the casing, longitudinally-moving barrel, cartridge-detent levers pivoted in the casing and having inwardly-projecting arms, and the hammer having a nosepiece in position to engage said arms and turn the detents inward by the extreme backward movement of the hammer, substantially as described.

10. In a magazine-gun, the magazine and follower, the cartridge-detents, the hammer engaging the detents to turn them in the way of the column of cartridges, the forwardly-moving barrel, and mechanism connecting the barrel and hammer so that the barrel movement cocks the hammer, substantially as described.

11. In an automatic gun, the casing and recoil-abutment, the longitudinally-movable barrel, the locking-shoulders of said parts engaging by a partial rotation of the barrel, and a gas-pressure device in the barrel operating to apply a rotative force to the barrel to unlock the same, substantially as described.

12. In a gun, the recoil-shield and the slotted casing, the barrel having a boss moving in the slot in said casing, and the sleeve con-

nected to the barrel and closing over the casing, in position to serve as a handle, substantially as described.

13. In an automatic gun, the recoil-shield and casing, the barrel having a boss in the slot and a spiral spring surrounding the barrel and resting against shoulders on the barrel and casing, and the sleeve connected to the barrel near the muzzle and closing over the end of the casing, substantially as described.

14. In an automatic gun, the casing in sections connected by a screw-thread, the barrel and coiled spring inclosed in the casing substantially as described, and the sleeve or handle connected to the barrel by a screw-thread and closing over the casing, substantially as described.

15. In a magazine-gun, the longitudinally-moving barrel, the cocking-slide engaged by said barrel, the hammer cocked by said slide, and the cartridge-detents actuated by the backward movement of said hammer, substantially as described.

16. In a magazine-gun, the longitudinally-movable barrel having a notch therein, the trigger and firing connections, said trigger having a projection which may enter the notch in the barrel when the barrel is closed and locked but is otherwise held against movement, substantially as described.

17. In an automatic gun, the barrel, the trigger, and firing connections substantially as described, said trigger having an elastic finger-piece, and a connection of the trigger arranged to engage with inclined bearing in a depression in the barrel.

18. In a magazine-gun, the upwardly-feeding magazine having narrow ends and an enlarged central recess, spring-clasps at the sides of said recess, and the magazine-cover in position to be engaged by said clasps, said cover having a telescopic tube connected thereto, a cylindrical follower connected to the tube, and a spiral spring between the cover and follower, all substantially as described.

19. In an automatic gun, the frame, the forwardly-movable barrel and means to return it to closed position, and the trigger hung in the frame and having an arm in position to bear on the barrel and retard the closing movement, substantially as described.

20. The combination of the barrel, the trigger, a movable piece on the trigger held down by the barrel when the barrel is in locked position but otherwise free to move, and the push-pin and sear, said push-pin rendered operative to release the sear when the barrel is closed, but otherwise inoperative, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW BURGESS.

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