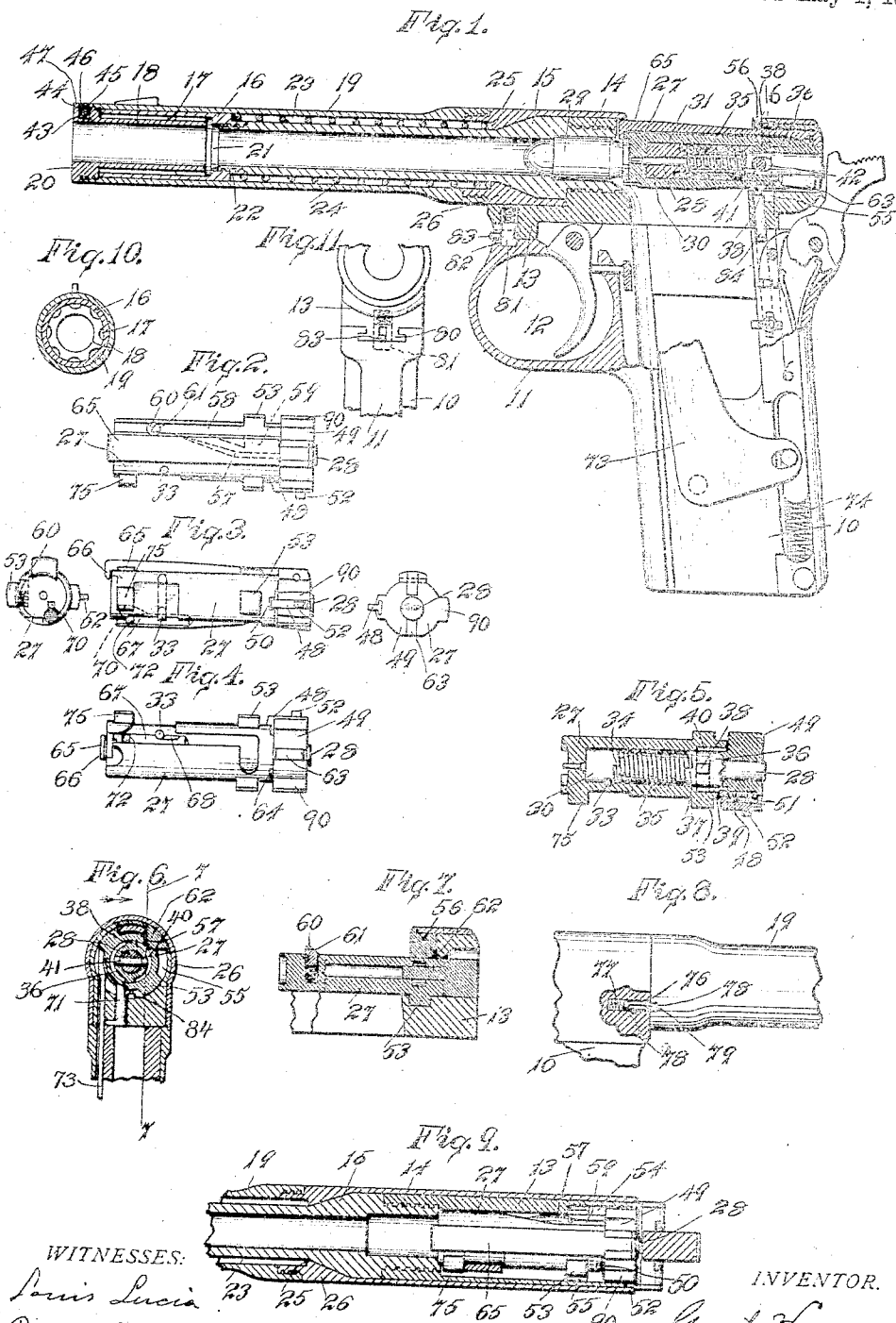


1,138,377.

Patented May 4, 1915.



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FIREARM.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GRANT HAMMOND, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Firearm, of which the following is a specification.

My invention relates more especially to that class of firearms that are self acting or "automatic" in their operation, and an object of my invention, among others, is to provide a firearm that shall be extremely accurate in its fire, effective and safe in operation, and one that shall withstand to a maximum degree the injurious effects produced by the gases of explosion or products of combustion.

One form of mechanism embodying my invention and in the construction and use of which the objects hereinabove set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a view partly in side elevation of a firearm embodying my invention with parts broken away to show construction. Fig. 2 is a detail top view of the breech-bolt. Fig. 3 is a detail side view of the same, this figure also showing views of each end of the bolt. Fig. 4 is a detail bottom view of the breech-bolt. Fig. 5 is a detail view in central longitudinal section through the breech-bolt. Fig. 6 is a view in cross section through the upper part of my improved pistol on plane denoted by dotted line 6—6 of Fig. 1. Fig. 7 is a detail view in lengthwise section through the upper part of the pistol showing the means for releasing the breech-bolt from the casing. Fig. 8 is a detail view showing the construction and operation of the catch for holding the casing sections together. Fig. 9 is a detail view in lengthwise section, looking down, illustrating the means for engaging the breech-bolt within the receiver. Fig. 10 is a view in section through the barrel illustrating the construction of the tube forming one wall of the expansion chamber. Fig. 11 is a detail view illustrating the means for connecting the receiver with the frame.

In the accompanying drawings the numeral 10 denotes the handle, 11 the trigger guard, 12 the trigger, and 13 the receiver of

my improved firearm. The receiver has a threaded opening 14 in which the reduced threaded end of a barrel 15 is secured.

A barrel sleeve 16 is secured to the outer threaded end of the barrel, within which sleeve an expansion chamber 17 is located, a tube 18 secured within a casing 19 forming one wall of this expansion chamber. The casing 19 has a sliding fit upon the sleeve 16, the tube 18 having an enlarged end 20 secured within the threaded end of the casing, said tube being located in position to provide a space between it and the sleeve 16 which space constitutes the chamber 17. The sleeve 16 is counterbored to provide the expansion chamber 17, and the end of the barrel terminates a slight distance from this counterbored part forming a relief opening 21 of less diameter than the expansion chamber, but of greater diameter than the opening in the barrel, through which relief opening the gases of explosion pass from behind the bullet and around the sides into the expansion chamber.

A recess 43 is formed in the enlarged end 20 of the tube 18, in which recess a spring seated locking pin 44 is located in position to engage a groove 45 on the inner surface of and at the end of the casing 19.

A space 46 is left between the end of the casing 19 and the flange 47 of the enlarged end 20, within which space a thin instrument or the thumb nail may be inserted to press the locking pin inward and release it from its groove to permit turning movement of the tube 18.

The end of the sleeve is reduced as at 22 to provide an end wall of a spring chamber 23 for a compression spring 24 that rests with one end against the shoulder at the reduced end of the sleeve and presses with its other end against a shoulder 25 within the breech section 26 of the casing, the latter closely fitting the exterior of the receiver and being freely slidable thereon.

A breech bolt 27 is located in a breech bolt chamber in the receiver 13, this breech bolt being movable lengthwise of the chamber to control the opening thereinto.

A firing pin 28 extends through the breech bolt in position for its front end to strike a cartridge 29, a bushing 30 being located in

the bottom of a recess 31 in the breech bolt and the firing pin extending through this bushing. This bushing is held in place by a pin 33 and it has a shoulder 34 against which one end of a breech bolt actuating spring 35 rests, the other end of the spring resting against a shoulder 37 on a firing pin sleeve 36 projecting into the breech bolt. The spring acts by torsional force, the shoulders 34 and 37 resisting rotative movement of the spring. The firing pin sleeve has locking lugs 38 arranged to pass through firing pin releasing grooves 39 into a firing pin locking groove 40 formed in the wall of the opening in the breech bolt. A retainer 41 for the firing pin extends through a slot 42 in the pin, this permitting a limited movement of the pin sufficient, however, to effect its purpose. Force is created in the breech bolt actuating spring by expanding it, and its action upon the breech bolt is therefore a compressing action. This normal tendency to compression causes the coils to lie close together, and therefore should the spring break the broken ends will be forced one against the other and the utility of the spring will therefore not be destroyed from this cause. This is an important feature of my invention.

A spring actuated latch 48 is slidably mounted in the head 49 of the firing pin sleeve to engage within a notch 50 in the end of the breech-bolt. This latch fits within a lipped groove, as clearly shown in the right hand end view of Fig. 3 of the drawing, a spring 51 holding the latch normally in engagement with the notch, in which position of the parts the spring 35 is under tension. The latch has a releasing lug 52, that is adapted to strike the edge of the receiver, or a notch in said edge, when the breech-bolt is inserted in its chamber, and release the latch from engagement with the notch 50. At this time the firing pin sleeve is held from turning movement by reason of the engagement of lugs 90 thereon within the releasing grooves 54 hereinafter mentioned, and the breech-bolt therefore turns (in the construction shown toward the right) upon the firing pin sleeve, under the influence of the spring 35. When the breech-bolt is thus inserted, breech-bolt locking lugs 53 upon the breech-bolt pass through breech-bolt releasing grooves 54 into a breech bolt locking groove 55, which grooves are formed in the wall of the breech-bolt chamber in the receiver 13. At the time of release of the latch 48, and the consequent turning movement of the breech-bolt above described, the lugs 53 register with the locking groove 55, and the turning movement of the breech-bolt therefore locks it in place in the breech-bolt chamber, the tension of the spring having been reduced in this action.

A breech-bolt actuating lug 56 projects from the back edge of the opening through the breech section 26 of the casing into the breech-bolt chamber, this lug being shaped and positioned to be passed along a tensioning groove 57 (see dotted lines in Fig. 2 of the drawings) and also a bolt returning groove 58 and through a bolt returning recess 59 formed in the outer surface of the breech bolt.

A yielding catch 60 is located within the bolt returning groove 58, in the construction shown, this catch being in the form of a pin seated upon a spring within the breech-bolt, said catch having a cam surface 61 to permit passage of the actuating lug 56 thereover, said lug engaging the back of the catch and moving the breech-bolt backward as the breech section 26 of the casing moves backward, the forward movement of said casing causing said lug, acting within the tensioning groove 57, to rotate the bolt and tension the spring, this movement placing the lugs 53 in position to enter the grooves 54 and permit the backward movement of the bolt. These turning movements of the breech-bolt upon the firing pin sleeve are not, however, sufficient to cause the lugs 38 to register with the releasing grooves 39 and the release of the firing pin sleeve is therefore not effected.

A catch releasing lug 62 is formed on the inner surface of the receiver 13, as clearly shown in Fig. 7 of the drawings, the end of this catch releasing lug being located in the same plane as the end of the actuating lug 56, the latter resting against the lug 62, when the casing 26 is at the backward limit of its play. As the breech-bolt is moved backward by the lug 56 the cam 61 on the pin 60 engages the lug 62, causing the catch to be forced downward and released from engagement with the lug 56.

The firing pin has a fin 63 located in a slot in the firing pin sleeve, resting normally against the end of the breech bolt, as shown in Fig. 4 of the drawings, this fin being adapted to enter a firing notch 64 in the end of the breech bolt when the latter is in position for firing. When the breech-bolt is forced ahead to insert a cartridge into the barrel, the fin 63 rests against the end of the bolt, and the firing pin cannot, therefore, in this action, be forced into contact with the primer of the cartridge and thus prematurely discharge it.

An extractor 65 is mounted upon the breech-bolt and has a lip 66 arranged to engage the flange of the cartridge shell to remove it from the chamber in the barrel as the breech-bolt is moved backward, the extractor sliding in engagement with the inner surface of the casing section 26 that prevents its disengagement from the cartridge shell.

An ejector 67 is mounted in a groove in

the under side of the breech-bolt, this ejector having a recess 68 within which the pin 33 holding the bushing 30 extends to limit the sliding movement of the ejector.

5 An ejector finger 70 is located at the end of the ejector in position to strike a cartridge shell as the breech bolt is moved backward, the ejector being moved into this position by an ejector actuating pin 71 located in a hole in the receiver, as shown in Fig. 6 of the drawings. As the breech-bolt is moved backward, this pin engages a shoulder 72 on the ejector, moving it forward at the proper time to engage the shell and force it from the grasp of the extractor 65. The ejector is moved to its normal position by engagement with a cartridge shell as the breech-bolt moves forward.

20 A breech-bolt actuating lever 73 is pivotally mounted in the handle and is forced in one direction as by means of a breech-bolt actuating spring 74 located in a recess in the handle. The upper end of this lever rests behind a lug 75 projecting from the side of the breech-bolt, this lug in engagement with the lever tensioning the spring 74, as the breech bolt is moved backward, and the spring 74 in its reaction on the lever causing the breech-bolt to be moved to its forward position.

35 The breech section 26 of the casing is secured to the forward section thereof by screw threaded parts, and a holder 76, seated upon a spring 77 and held by engagement of a pin 78 in a recess in the holder, engages a notch 79 in the end of the forward casing section and retains the casing sections in locked engagement, the holder 76 being arranged to engage the notch 79 at the time that the sections are seated one against the other as they are screwed together, and projecting beyond the outer surface of the casing for operative purposes.

45 The receiver has a T-shaped lug 80 to enter a groove of like form at the front end of the frame, a receiver holder 81 being located in a recess in the receiver, seated upon a spring, as shown in Fig. 1 of the drawings, and held in place by a small pin engaging a recess in the side of the holder. This holder is adapted to enter a holding recess 82 in the frame, just above the trigger guard and a releasing pin 83 extends from the holder through a slot in the frame. At the rear end of the frame a T-shaped lug is arranged to enter a groove of similar shape in the receiver, this construction, however, not being shown herein.

60 A breech-bolt retaining pin 84 is arranged to engage in front of the bolt and hold it in its rearward position when a magazine is ejected from the handle when the last cartridge is fired. As this also forms no part of my present invention but is the basis of the subject matter of a sepa-

rate application S. No. 779,273 pending concurrently herewith, further and detailed description is omitted herein.

The operation of the mechanism is as follows: The firing pin is inserted in the breech-bolt by passing the lugs 38 thereon along the releasing grooves 39 and when such lugs reach the locking groove 40 the firing pin is turned to the right (looking toward the front end of the breech-bolt) engaging the latch 48 with the notch 50 in the breech-bolt, thus placing the spring 35 under tension, the parts now being in the position indicated in Figs. 2, 3, and 4 of the drawings.

80 The breech-bolt is now inserted in the receiver by passing the lugs 53 thereon and the lugs 90 on the head of the firing pin sleeve along the releasing grooves 54 in the receiver until the releasing lug 52 on the latch 48 strikes the end of the receiver, thus releasing the latch from the breech-bolt and permitting the latter to turn upon the firing pin sleeve under the force of the spring 35, passing the lugs 53 into the locking groove 55 in the receiver, thus locking the breech-bolt in place. The firing pin, during this action, is held from turning movement by engagement of its lugs 90 in the releasing grooves 54 in the receiver. As the bullet passes along the barrel under the force of the exploding charge, caused by the action of the hammer and firing pin, the gases expand into the chamber 17 forcing the casing forward against the tension of the spring 24. In this movement the actuating lug 56, carried by the casing, passes along the tensioning groove 57 in the breech-bolt, rotating the breech-bolt and tensioning the spring 35 therein, and bringing the lugs 53 into alinement with the breech-bolt releasing grooves 54, so that the breech-bolt is now free to move rearward. The lug 56 passes over the catch 60 engaging its front edge, and as the casing moves backwardly under the action of the spring 24, the breech-bolt is moved backwardly to open the breech. This backward movement of the breech-bolt carries the actuating lever 73, tensioning the spring 74, and the extractor 65 pulls the shell of the cartridge 29 from the barrel. In this backward movement of the breech-bolt the ejector 67 encounters the actuating pin 71 moving the ejector forward and snapping the shell out through the breech-bolt opening. At the termination of this backward movement of the breech-bolt, the cam surface 61 engages the releasing lug 62 forcing the latter downward, disengaging it from the lug 53 and the breech-bolt being thus released now moves forward under the force of the spring 74 transmitted through the lever 73. In this forward movement of the breech-bolt the groove 58 passes along the lugs 56 and

62 and the latch 48 encountering the end of the receiver, at the termination of the forward movement of the breech-bolt releases the latter from engagement with the firing pin sleeve and the breech-bolt is returned to its locked position under the action of the spring 35, the lugs 53 passing into the breech-bolt locking groove 55, when the firing operation may be repeated.

10 I claim—

1. A firearm including a frame and a receiver having interengaging locking grooved parts, a spring seated pin inclosed within one of said parts and adapted to engage a recess in the opposite part to positively lock said parts together, and a releasing pin projecting from the spring seated pin through an opening in the frame to the outer surface thereof to release said spring seated pin to permit disengagement of said parts.

2. A firearm including a frame having a lipped groove and a recess in the bottom of said groove, a receiver having a lipped projection to engage said groove, a holder slidably inclosed within the receiver and adapted to engage said recess to positively lock said parts together, and a releasing pin secured to said holder and projecting through an opening in the receiver to the outer surface thereof to release said holder to permit disengagement of said parts.

3. A firearm including a frame containing loading, firing and ejecting mechanisms, a barrel secured to the frame, said barrel having an extension constituting an expansion chamber at the muzzle end thereof, a casing movably mounted on the barrel, and a tube secured to the casing and projecting into the barrel extension to form one wall of said expansion chamber.

4. A firearm including a frame containing loading, firing and ejecting mechanisms, a barrel secured to the frame and having an extension constituting an expansion chamber at its muzzle end, a casing movably mounted on the barrel, and a tube secured to said casing and projecting into the barrel extension to form one wall of said expansion chamber, the outer surface of the inner end of said tube being recessed to permit passage of gases into said expansion chamber.

5. A firearm including a frame containing loading, firing and ejecting mechanisms, a barrel secured to said frame and having an extension constituting an expansion chamber at its muzzle end and a relief opening into said expansion chamber, a casing movably mounted on the barrel, and a tube secured to the casing and projecting into the barrel extension to form one wall of the expansion chamber.

6. A firearm including a frame, a barrel secured thereto, a sleeve removably secured to the outer end of the barrel and having an opening larger than the opening through

the barrel and a counter-bored opening forming an expansion chamber, a casing movably mounted on the barrel, and a tube secured to said casing and projecting into the barrel sleeve to form one wall of said expansion chamber.

7. A firearm including a frame with a barrel secured thereto, a casing movably mounted on the frame, said barrel having an extension constituting an expansion chamber, a tube removably secured to the casing and projecting into the barrel extension to form one wall of the expansion chamber, and means for securing said tube removably in place.

8. A firearm including a frame with a barrel secured thereto, a sleeve removably secured to the end of the barrel and having an opening larger in diameter than the opening in the barrel to form an expansion chamber, a casing slidably mounted on said sleeve, and a tube secured to said casing and projecting into the sleeve to form one wall of the expansion chamber, said tube having an opening of substantially the same diameter as that in the barrel.

9. A firearm including a frame with a barrel secured thereto, a sleeve larger in diameter than the barrel and removably secured to the outer end thereof, said sleeve forming a shoulder, a casing slidably mounted upon the barrel and upon said sleeve, an actuating spring resting against the shoulder on said sleeve and against a shoulder within said casing, and a tube having an enlarged end removably fitting within said casing, said tube projecting into the barrel sleeve and forming one wall of an expansion chamber within said sleeve.

10. A firearm including a frame having a breech-bolt chamber with a breech-bolt locking groove therein, a breech-bolt removably located in said chamber and having locking lugs adapted to enter said locking grooves, a spring located within the breech-bolt to rotate it, means for tensioning said spring, and means for rotating the breech-bolt in opposition to said spring.

11. A firearm including a frame having a breech-bolt chamber therein with a breech-bolt locking groove in said chamber, a breech-bolt removably located in said chamber, a tensioning spring located within the breech-bolt and arranged to be expanded when placed under tension, means for tensioning said spring, and means for rotating the breech-bolt in opposition to said spring.

12. A firearm including a frame having a breech-bolt chamber therein, said chamber having a breech-bolt locking groove, a breech-bolt removably located in said chamber and having a locking lug to enter said groove, a spring located within the breech-bolt, a sleeve projecting into the breech-bolt to engage said spring to hold it under

tension, means for holding said sleeve when the spring is under tension, and means upon the frame to engage and release said holding means in the operation of the mechanism.

13. A firearm including a frame having a chamber therein, said chamber having a breech-bolt locking groove, a breech-bolt removably located in said chamber and having a lug to enter said groove, a spring located within the breech-bolt, a sleeve extending into the breech-bolt to engage said spring to hold it under tension, a latch upon the sleeve arranged to engage a shoulder in the breech-bolt to hold the sleeve and breech-bolt against relative turning movement under tension of the spring, means to engage said latch to release it, and means for holding the sleeve against turning movement when said latch is released.
14. A firearm including a frame having a breech-bolt chamber therein, a breech-bolt mounted in said chamber and having a cam groove therein, a casing movably mounted on the frame, an actuating lug from the casing projecting into said groove, a catch yieldingly mounted in the breech-bolt and having a cam surface to permit passage of said lug and a side to be engaged by said lug for operation of the breech-bolt, and means for releasing the catch from said lug.
15. A firearm including a frame having a breech-bolt chamber therein, a breech-bolt located in said chamber, means for rotating the breech-bolt in one direction, said bolt having a cam groove, a casing movably mounted on the frame, a lug projecting from the casing into said cam groove to rotate the breech-bolt in one direction, a yielding catch to be engaged by said lug to move the breech-bolt in one direction, said catch having a cam surface to permit passage of the lug thereover, and a releasing lug projecting from the frame in position to engage said cam surface and move the catch from engagement with said lug.
16. A firearm including a frame having a breech-bolt chamber, said chamber having a breech-bolt locking groove in the wall thereof, a breech-bolt rotatably mounted in said chamber and having a lug to engage said locking groove, said breech-bolt containing a chamber with a firing pin sleeve locking groove therein, a firing pin sleeve having a lug located in the locking groove in the breech-bolt, a spring located within the breech bolt and in engagement with said

sleeve for tensioning purposes, means for locking said sleeve to the breech-bolt with said spring under tension, means for releasing said locking means to permit turning movement of the breech-bolt, and means for stopping the turning movement of the breech-bolt with the locking lug on the firing pin sleeve located in the locking groove in the breech-bolt.

17. A breech-bolt for a firearm having a chamber therein, a spiral spring located within said chamber with one end thrusting against a shoulder therein, a firing pin sleeve projecting into the breech-bolt and having a shoulder to engage the opposite end of said spring to tension it by expansion, means for locking the sleeve within the breech-bolt when said spring is under tension, and means for locking the sleeve against turning movement when the spring is under tension.

18. A breech-bolt having an opening therein, a firing pin sleeve projecting into said opening, a firing pin projecting through said sleeve and through the breech-bolt, means for locking the sleeve to the breech-bolt, said bolt having a recess in its end, means upon the firing pin to engage said sleeve to hold the pin against turning movement with the breech bolt, and means for turning the breech-bolt during its forward movement to cause said recess to register with said holding means upon the firing pin.

19. A firearm including a frame having a breech-bolt chamber therein, a breech-bolt rotatably and longitudinally movable in said chamber, means for securing the breech-bolt in the chamber, said breech-bolt having an opening therein, a spring located in said opening, a firing pin sleeve projecting into the opening and engaged with said spring to tension it, a firing pin projecting through said sleeve and through the breech-bolt, the latter having a recess in its edge, a projection from the firing pin arranged to enter said recess, said projection engaging said sleeve to hold the firing pin against turning movement with the breech-bolt, and means for limiting the turning movement of the breech-bolt with said recess opposite the projection from the firing pin.

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