

No. 738,140.

PATENTED SEPT. 1, 1903.

H. FRIBERG, DEC'D.

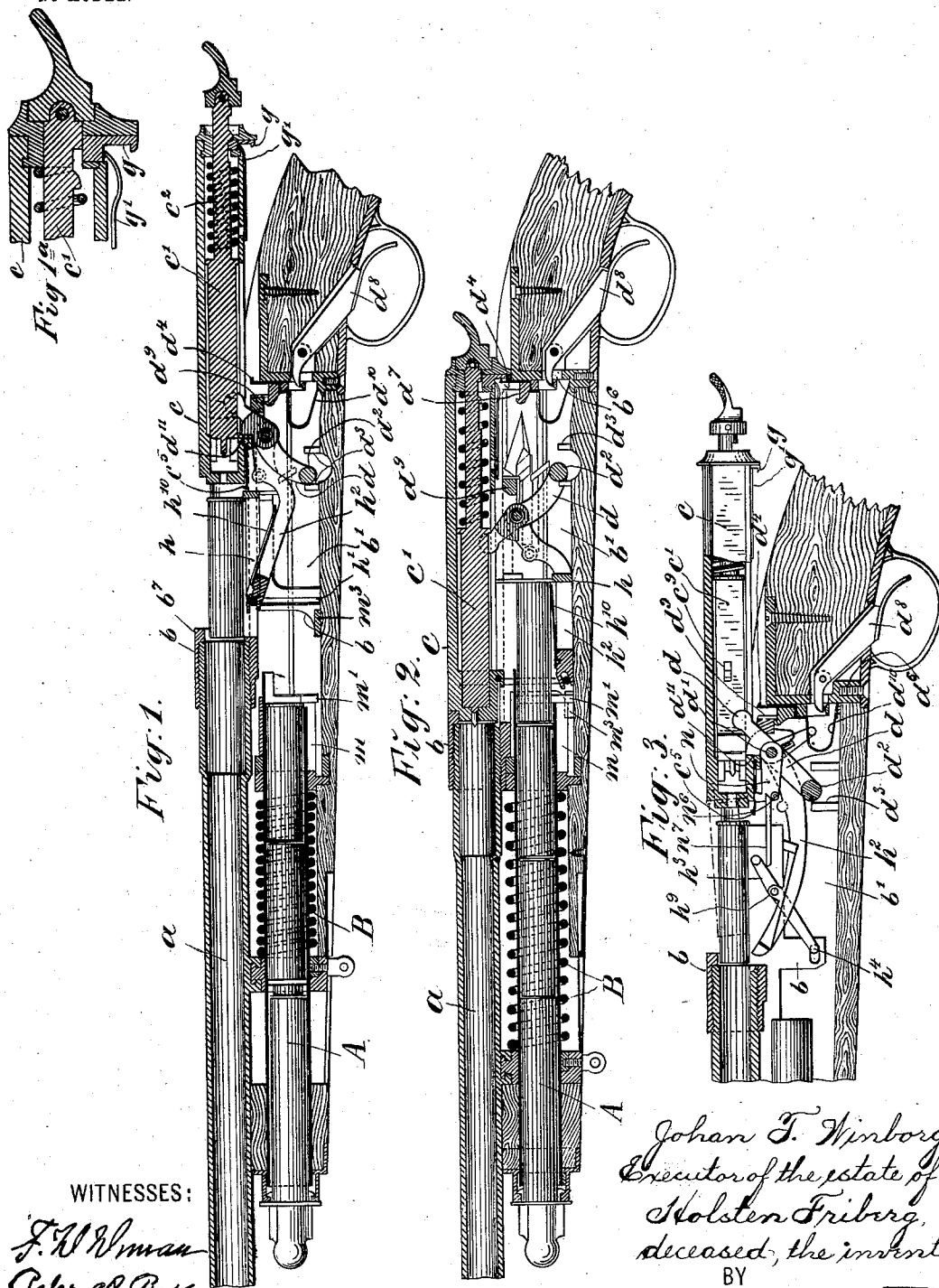
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AUTOMATIC FIREARM.

APPLICATION FILED APR. 20, 1898.

2 SHEETS—SHEET 1.

NO MODEL.



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JOHAN THEODOR WINBORG, OF STOCKHOLM, SWEDEN, EXECUTOR OF
HOLSTEN FRIBERG, DECEASED, ASSIGNOR TO AKTIEBOLAGET STOCK-
HOLMS VAPENFABRIK, OF STOCKHOLM, SWEDEN.

AUTOMATIC FIREARM.

SPECIFICATION forming part of Letters Patent No. 738,140, dated September 1, 1903.

Application filed April 20, 1898. Serial No. 678,224. (No model.)

To all whom it may concern:

Be it known that HOLSTEN FRIBERG, deceased, formerly a subject of the King of Sweden and Norway, and a resident of Stockholm, Sweden, did invent certain new and useful Improvements in Automatic Firearms, of which the following is a specification.

This invention relates to the class of small-arms or those to be carried by the person using them and to those which are or may be loaded and discharged by the force of the recoil, and in the construction which forms the object of the present application the magazine is stationary, while the barrel and barrel extension, which are connected together rigidly, reciprocate under the influences of the recoil and the recoil-spring. The barrel extension slides in keeper-bearings in the metal frame or casing set in the stock, the breech-bolt slides to and fro in the barrel extension, and the firing-pin slides to and fro in the breech-bolt. When the barrel extension moves back under the influence of the recoil, a lever fulcrumed therein acts to drive back the breech-bolt to a greater extent than the barrel extension and also to drive back and cock the firing-pin.

In the accompanying drawings, which serve to illustrate an embodiment of the invention, Figure 1 is a longitudinal vertical axial section of the gun, showing the breech open; and Fig. 1^a is an enlarged sectional view of the rear end of the breech-bolt and firing-pin, showing the cocking devices. Fig. 2 is a longitudinal vertical axial section of the gun, showing the breech closed. Figs. 3 and 4 are longitudinal vertical sections of the gun, taken in a different plane from the sections in Figs. 1 and 2. Fig. 3 shows the breech open, and Fig. 4 shows it closed. Fig. 5 is a fragmentary view of the inner face of one side of the fixed casing, showing the switch device for the cartridge-lifter. Fig. 6 includes an end view, a plan, and a section of the cartridge-lifter detached. Fig. 7 includes a side view and a plan of the lever of the cartridge-lifter detached. Fig. 8 includes a longitudinal section and two cross-sections of the breech-bolt detached. Fig. 9 is a cross-section taken at the fulcrum *d'* in Fig. 3. Fig. 10 includes an

end view, a side view, and a plan of the device for preventing the rebound of the breech-bolt detached. Fig. 11 includes a side view, a plan, and a cross-section of the firing-pin detached. Fig. 12 includes a longitudinal section, two cross-sections, and a plan of the barrel extension. Fig. 13 is a horizontal section of a part of the breech-bolt and firing-pin, showing the locking-levers of said bolt; and Fig. 14 shows one of the locking-levers detached. Fig. 15 includes a side view and a sectional view of the operating-lever carried by the barrel extension. Fig. 16 illustrates the stop device of the magazine, which will be hereinafter described.

In the ordinary wooden stock of the firearm or gun is fixed the metal casing *b'*, and in front of it, in the stock, is mounted the non-reciprocating magazine *A*. The barrel *a* of the gun is mounted slidably and is held normally in its advanced position by a recoil-spring *B*, herein shown as embracing the magazine, but the particular disposition of this spring is not important. The barrel *a* is open at its rear end, where the cartridge-chamber is situated, and secured rigidly to this rear end of the barrel is the barrel extension *b*, which reciprocates with the barrel and is guided at the points *b*², *b*³, and *b*⁴, Figs. 9 and 12, in the fixed casing. The barrel extension *b* is slotted or open at its top and has a lip *b*⁷, which overhangs the rear end of the barrel, Figs. 1 and 12, to serve as a limiting-stop for the cartridge in loading.

In the tubular barrel extension is slidably mounted the tubular breech-bolt *c*, which has a central aperture at its front end to permit of the passage of the tip of the firing-pin *c'*, which is slidably mounted in the tubular bolt *c* and backed by a spring *c*². The firing-pin has at its outer end a rotatable collar *c*¹³, which bears on the outer end of the breech-bolt, and on the firing-pin is a handle *c*¹¹, and said pin has also at its outer end two shoulders for full and half cock. These shoulders are adapted to be engaged in cocking by a catch or sear *g*, provided with a spring *g*¹.

When the recoil takes place, the barrel extension is driven back and carries with it an operating-lever *d*, Fig. 15, which is fulcrumed

at d' , Fig. 9, in the barrel extension. The lower end d^2 of this lever is loosely caged between two pins d^3 in the stock at the bottom of the casing, and as the barrel extension carries back the fulcrum d' the upper arm of the lever will move back at a greater speed and to a greater distance than the fulcrum. The upper end of the lever d is slotted to embrace the flattened firing-pin, which it reaches through a slot g^2 , Fig. 8, in the under side of the breech-bolt. The upper extremity of the lever d engages a shoulder on the firing-pin c' when the breech is closed, Figs. 2 and 4, and consequently at the moment of the recoil the said lever drives back the firing-pin and cocks it, compressing at the same time its spring c^2 . The breech-bolt is driven back together with the firing-pin, the lever d impinging upon a transverse bar d^9 thereon, Fig. 12, as seen in Figs. 1 and 3. When the breech-bolt shall have moved back to the position seen in Fig. 1, a shoulder c^{14} thereon, Fig. 8, will impinge on a shoulder or face d^{11} on the lever d , Fig. 15. While the reciprocating movements of the parts are taking place the cartridge-shell is extracted from the chamber in the barrel, and a fresh cartridge is taken from the magazine and supplied to the cartridge-chamber in the barrel.

The extractor c^5 is a simple spring-hook of a known kind secured to the front end of the breech-bolt c . The recess to receive and hold the extractor is shown in Fig. 8.

The cartridges in the magazine are expelled one by one at the open rear end of the same by the usual spring in the magazine. (Not shown.) In order to prevent the rear cartridge from being driven out at the wrong time, a stop device is employed, which is illustrated in Figs. 1, 2, 12, and 16. Under the rear end of the magazine-tube are secured two flat springs m , which will be held substantially parallel and near each other by their own resiliency. At their rear free ends these springs carry upright stop-pins m' . When the parts are driven back by the recoil, the upper ends m^4 of these two pins are close together and near the rear end of the magazine A, where they take behind and stop the expulsion of the cartridge from the magazine; but when the force of the recoil is spent and the spring B drives the parts forward the pins m' are spread or wedged apart laterally by their lower ends engaging diverging grooves m^2 , Fig. 16, in a lip m^3 on the barrel extension, thus displacing or moving apart the said stop-pins to an extent sufficient to allow the cartridge to pass out of the magazine between them—that is to say, the barrel extension carries at its front end a V-shaped wedge which enters between the lower ends of the two stop-pins and displaces them laterally in opposite directions. When the cartridge to be supplied moves rearwardly out of the magazine, Fig. 2, it rests on a lifter h , Fig. 6, which is guided slidably in grooves h' , Fig. 12, in the barrel extension. This lifter is actuated by

a lever h^2 , Fig. 7, the construction and operation of which will now be described.

The lever h^2 has a jaw at its front end or head, which engages a pin on the head of the lifter h , and it is or may be fulcrumed so as to turn about the fulcrum-pin d' . It carries a flat spring h^{10} , the free rear end of which is so disposed as to take in front of the rim-flange of the cartridge backed out onto the carrier h and thus compel the cartridge to remain in position when the recoil takes place.

The lever h^2 has an actuating-stud h^6 , which projects from it laterally, and in the reciprocating movements of the lever with the barrel extension this stud h^6 engages guideways in the inner side wall of the casing, as illustrated in Fig. 5, wherein the two dotted circles designate the two extreme positions of the stud h^6 . In moving to the rear along the lower guideway h^7 the stud h^6 encounters a spring-switch h^5 , which it elevates and passes under. In its forward movement the stud h^6 is thrown sharply upward by the abrupt incline of the switch into the upper guideway h^8 , along which it moves forward for a short distance and then descends again by an inclined way to the lower guideway h^7 . When thrown up by the switch h^5 , the lever h^2 elevates the lifter h and brings the cartridge thereon into line with the chamber in the barrel, and the advancing breech-bolt c drives it into said chamber. The slot in the top of the barrel extension is wide enough to permit the passage upward of the ejected cartridge-shell, and there are recesses in the sides of the slot at the proper points to permit the rim-flange of the shell to pass. These are clearly seen in Fig. 12. When the breech is closed by the bolt c , said bolt is locked in the barrel extension by means now to be described, with especial reference to Figs. 13 and 14.

Mounted in the breech-bolt with fulcrum at c^6 are two like locking-levers c^3 , which have locking-heads c^4 , that are adapted to be driven outward into engagement with locking-recesses c^8 , Fig. 12, in the barrel extension. The firing-pin c' has a wedge c' , which when said pin is driven forward spreads apart the front ends of said levers and drives their locking-heads c^4 into the recesses c^8 , thus locking the bolt against recoil at the moment of firing. When, however, the firing-pin is driven back by the lever d in the recoil, an enlargement c^9 on the pin wedges apart the tails c^{16} of the levers and thus withdraws the locking-heads c^4 and frees the bolt. The breech-bolt moves with great rapidity under the influence of the recoil and the recoil-spring, and in order to prevent its rebound a checking or locking device is employed, which will now be described.

In the lower part of the breech-bolt are formed two checking-shoulders n^3 and n^4 , (seen in Fig. 8,) and fulcrumed on the fulcrum-pin d' (by preference) is a checking-lever n . (Seen detached in Fig. 10.) This lever has a spring n' , which tends to keep it

free end or locking-head pressed upward toward the breech-bolt. On the side of the lever n is a laterally-projecting stud n^6 , which in the movements of the barrel extension to and fro plays under a guide-rib n^7 , Figs. 3 and 4, on the side wall of the casing b' . This rib, however, is of such length that at the extreme ends of the reciprocating movements of the stud n^6 the latter frees itself from said restraining-rib, and the spring $\bar{n}'$ is permitted to press the head n^2 of the lever n into engagement with one or the other of the recesses n^3 and n^4 of the breech-bolt. The ends of the rib n^7 are beveled, so as to cam the head n^2 out of locking engagement. This device, it will be noted, serves to check or lock the breech-bolt against rebound in its two extreme positions.

Mounted slidably on the rear wall b^6 of the fixed casing is a spring-catch d^4 , which is adapted to be drawn down by pressing the trigger d^8 . This catch d^4 engages a hook or shoulder on the sear g when the breech is closed and the firing-pin cocked, and when the trigger is pressed the firing-pin is set free and the gun fired. Fig. 1^a shows the sear g drawn down. There is another catch d^7 , connected with the same slide as the catch d^4 , and this catch d^7 is adapted to wipe into engagement, when the recoil takes place, with a shoulder on the transverse bar d^9 on the barrel extension, and thus hold the breech open. This may be used for hand-loading. In continuous firing the catch d^4 is kept pulled down by pressure on the trigger, and consequently the catch d^7 cannot engage and hold the barrel extension open and will form no impediment to the automatic or continuous firing of the gun.

It may be explained that in automatic or continuous firing the trigger is pressed and held pressed until the breech opens and closes. Then it is pressed again and held pressed until the breech opens and closes again. Thus the gun reloads and cocks itself by the recoil.

Figs. 3 and 4 illustrate the same gun as that of Figs. 1 and 2; but these views have been utilized, to avoid multiplicity in the drawings, to illustrate another form of the cartridge-lifting device. This modification of the invention will now be described. In this construction the lifting-lever h^2 takes at its free end under the front end of the cartridge, and another lever h^3 , coupled at h^9 to the lever h^2 , takes at its free end under the rear part of the cartridge and lifts it. The lever h^3 has a slotted connection at h^4 to the barrel extension b . The operation is the same as that of the lifter and lever shown in Figs. 6 and 7, so far as the cartridge is concerned. To keep the cartridge in position on the levers h^2 and h^3 and to perform the functions of the spring h^{10} of Fig. 7, there may be two side springs on the barrel extension, as indicated by dotted lines at h^{14} in Fig. 12. It may be stated that as a secondary function of the lever n when the breech is thrown open and

the head n^2 of this lever snaps upwardly behind the shoulder n^4 on the forward end of the breech-bolt the said head takes under the rim of the cartridge-shell and aids in ejecting the shell. The purpose of loosely caging the lower extremity or stud d^2 between the somewhat widely separated pins or shoulders d^3 , so that the barrel extension will have some movement to and fro before the lever is engaged by the pins, is to provide some lost motion to give time for ejecting the empty cartridge-shell and for raising the fresh cartridge to alinement with the barrel.

Having thus described the invention of the said HOLSTEN FRIBERG, what is claimed as new in said invention is—

1. In a firearm, the combination with the stock and fixed casing, of the barrel and barrel extension connected rigidly together and mounted slidably so that they may reciprocate on said casing, the recoil-spring, the tubular breech-bolt mounted slidably in the barrel extension so that it may reciprocate, the firing-pin mounted slidably in the breech-bolt, its spring, means actuated by the firing-pin for locking and unlocking the breech-bolt, and means for cocking and freeing the firing-pin, of means between the barrel extension and breech-bolt for driving back the latter in the barrel extension when the receiver moves back with the recoil.

2. In a firearm, the combination with the stock, the fixed casing, the rigidly-connected barrel and barrelextension, mounted slidably on the casing, the recoil-spring, the breech-bolt slidable in the receiver, the firing-pin mounted slidably in the breech-bolt, and the spring of said firing-pin, of the means for locking the breech-bolt in its closed position, and unlocking it, said means comprising the locking-levers fulcrumed in the breech-bolt and having heads to engage locking-recesses in the barrel extension, and means carried by the firing-pin in its movements which actuate said levers to lock when the pin is driven forward, and to unlock when the pin is driven backward.

3. In a firearm, the combination with the reciprocating barrelextension, and the breech-bolt, of a locking device for the breech-bolt comprising the locking-levers fulcrumed therein, the barrel extension having recesses to receive the locking-heads of said levers, and the firing-pin, mounted slidably in the bolt and provided with two wedging devices, one to wedge apart the front ends of said levers to effect the locking and the other to wedge apart the tails of said levers to effect the unlocking, and means for operating both the bolt and the firing-pin.

4. In a firearm, the combination with the stock, the fixed casing, the reciprocating barrel and barrel extension, these latter being connected rigidly together, the recoil-spring, the breech-bolt mounted slidably in the barrel extension, the firing-pin mounted slidably in the breech-bolt, and the spring of said pin,

of the operating-lever fulcrumed in the barrel-extension below the breech-bolt, the lower arm of said lever being caged between stops in the casing and the upper arm thereof engaging the firing-pin and breech-bolt, and the said stops, whereby the recoil, acting through said lever, serves to drive back and cock the firing-pin and also drive back the breech-bolt.

5. In a firearm, the combination with the stock, the fixed casing, the connected barrel and barrel extension mounted to reciprocate on said casing, the recoil-spring, the tubular breech-bolt mounted slidably in the barrel extension, the firing-pin mounted slidably in the breech-bolt, and its spring and cocking devices, of the operating-lever fulcrumed in the barrel extension below the breech-bolt and its upper end engaging said bolt and the firing-pin, and stops in the casing below, which loosely engage the lower end of said lever, whereby the barrel extension may move a predetermined distance in either direction without engagement of the lever with said stops.

6. In a firearm, the combination with the stock, the fixed casing therein, the reciprocating barrel and barrel extension, the recoil-spring, a reciprocating breech-bolt, and a firing-pin and its spring, of the trigger, a catch d^7 operated and controlled by the trigger, and a catch on the barrel extension adapted to engage the catch d^7 and hold the barrel extension against the action of the recoil-spring tending to advance the barrel extension.

7. In a firearm, the combination with the stock, the fixed casing therein, the connected and reciprocating barrel and barrel extension, and the breech-bolt slidable in the barrel extension, of the non-reciprocating magazine, the cartridge-lifter mounted in the barrel extension, and means for elevating the cartridge-lifter to bring the cartridge thereon into alignment with the barrel when the barrel extension is moved forward by the recoil-spring.

8. In a firearm, the combination with the stock, the casing, the connected reciprocating barrel and barrel extension, the breech-bolt mounted slidably in the receiver, the firing-pin mounted slidably in the breech-bolt, and the spring and cocking devices of said pin, of the lifter h , for the cartridge mounted to slide up and down in the barrel extension, the non-reciprocating magazine so disposed as to deliver a cartridge onto said barrel extension, the lifting-lever fulcrumed in the barrel extension and coupled to said lifter, said lifting-lever provided with a lateral stud h^6 , and a spring h^{10} to retain the cartridge, and the switch and guideway device on the casing engaged by the stud h^6 , for throwing up and lowering said lever.

9. In a firearm, the combination with the stock, the casing, the reciprocating barrel and barrel extension, the recoil-spring, the breech-bolt mounted slidably in the barrel extension and provided with two retaining-shoulders, the firing-pin and its spring in said bolt, and intermediate means whereby the barrel extension imparts accelerated movement to the breech-bolt, of means for checking the rebound of the breech-bolt, said means comprising a locking-lever n , fulcrumed in the barrel extension and adapted, when permitted, to engage the retaining-shoulders on said bolt, the spring of said lever, and means for disengaging and holding said lever at proper times out of engagement with said shoulders.

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

JOHAN THEODOR WINBORG,
Executor of the estate of Holsten Friberg, deceased.

Witnesses:

ERNST SVANGVIST,
H. B. OHLSSON.