

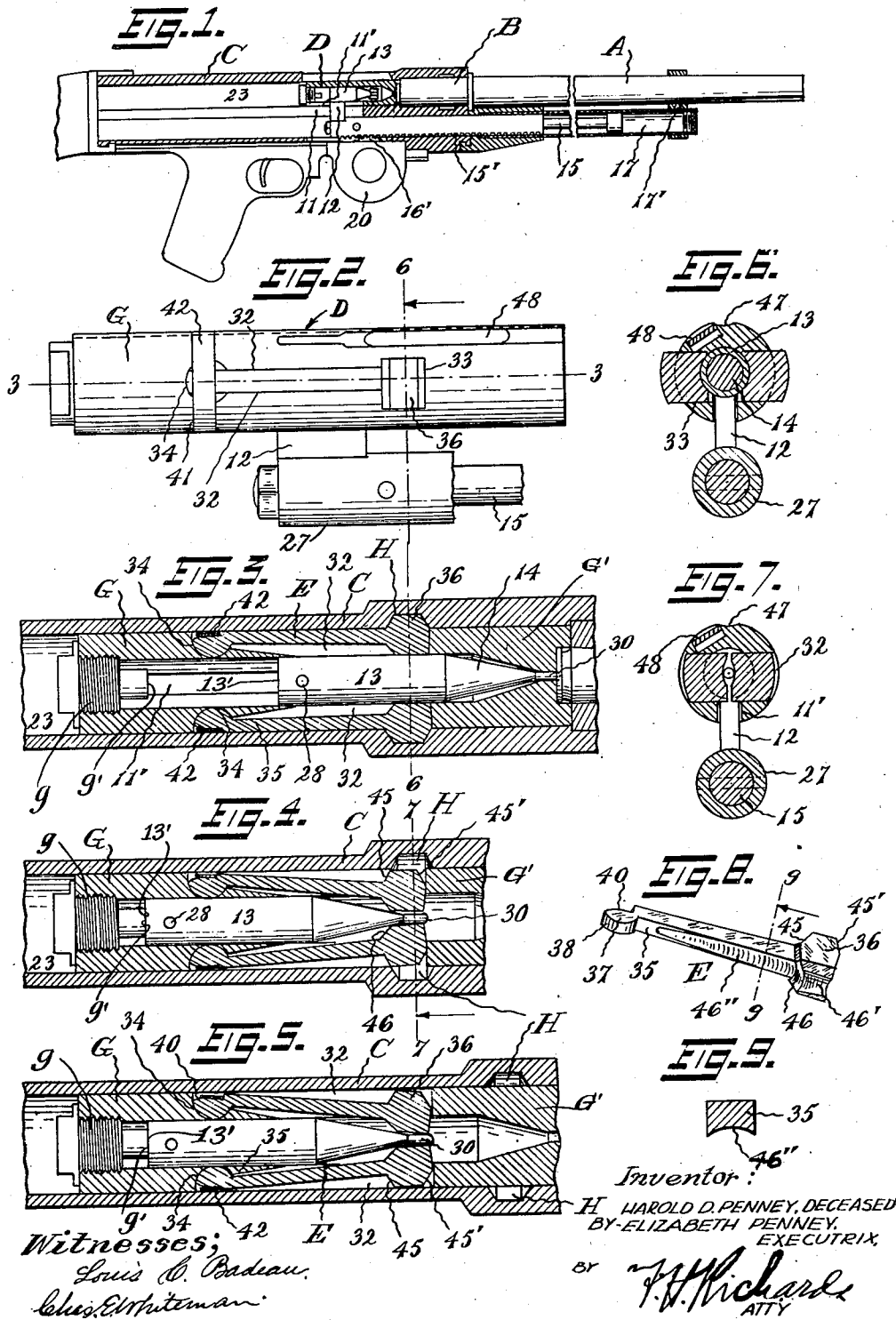
Feb. 27, 1945.

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2,370,189

BREECH MECHANISM FOR FIREARMS

Original Filed Dec. 24, 1917



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UNITED STATES PATENT OFFICE

2,370,189

BREECH MECHANISM FOR FIREARMS

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Substituted for abandoned application Serial No.
208,576, December 24, 1917. This application
September 9, 1941, Serial No. 410,182

7 Claims. (Cl. 42—3)

This invention relates broadly to firearms and particularly to those of the automatic gas operated type wherein the gases of one discharge store up power in a spring which by its retractive movement when released from the gas-pressure, sets into actuation the feeding and firing mechanism to bring about a succeeding feeding, firing and ejection of a cartridge shell, and so on ad infinitum.

The said invention applies primarily to an improvement in a sliding breech-block and firing-pin mechanism, and the frame or carrier therefor.

The main object of the invention is to provide a breech-block, frame, casing or carrier, and a reciprocating breech-bolt mechanism carried thereby, of an exceedingly simple and cheap form of construction, easily assembled and disassembled, (especially as to the several parts of the breech-block) of little liability to get out of order or clog for any reason; of little liability to wear, and consequently of long life; of great ease of operation when in action; and inevitably solidly locked in position to prevent retraction of the breech-block at the moment of firing.

While the improved breech-block as shown herein is especially designed and adapted for use with what is known as the Lewis type of automatic fire-arm, broadly the same may with little, if any mechanical change in the construction thereof, and without departing from the scope of the invention, be applied to any of such type of automatic fire-arms; and even in some cases to breech-blocks in non-automatic fire-arms; and the same is also especially adaptable for use with what is known as the Browning, Colt, or Colt-Browning type of automatic fire-arms, all without departing from the broad scope of the invention.

The said invention is fully shown and described in the following specification of which the accompanying drawing forms a part, wherein similar letters or numerals of reference designate like or equivalent parts wherever found throughout the several views, and in which:

Fig. 1 is a side view partially in section (and foreshortened by breaking in two) of a gun or automatic firearm of the Lewis type before referred to, showing the improved form of reciprocating breech-block and coacting mechanism in position therein, as it appears applied thereto;

Fig. 2 is a like side view on an enlarged scale, of the improved sliding breech-block taken in perspective, showing the firing-pin-post carrying

the firing-pin in position within the breech-block so as to reciprocate therein;

Fig. 3 is a top plan view of the mechanism shown in Fig. 2, taken in horizontal longitudinal section on the line 3—3 of Fig. 2, showing the positions assumed by the breech-block locking-levers, and other mechanism at the moment of firing;

Fig. 4 is a view of the mechanism shown in Fig. 3, in like section, showing the position assumed by the same at the moment when the firing-pin, its post, and the breech-block, are in a medial and central position with the lock-lugs of the lock-levers of the block about to be further retracted to the rear so that the breech-block carried along by the firing-pin-post, will upon its further movement, eject the spent cartridge-case;

Fig. 5 is a like view of the rear portion of the mechanism shown in Figs. 3 and 4, showing the breech-bolt and accompanying mechanism retracted and thrown into the extreme rearward position at the moment when the spent cartridge-case is being ejected;

Fig. 6 is an end view of the mechanism taken in section on the lines 6—6 of Figs. 2 and 3, when the parts are in the position indicated in Fig. 3, with the breech-block locked in the firing position;

Fig. 7 is a view similar to Fig. 6 looking toward the left in the same direction, taken on the section line 7—7 when the parts are in the position shown in Fig. 4;

Fig. 8 is a detail inner face top-view in perspective, of the improved form of breech-block lock-lug-lever removed from the breech-block; and

Fig. 9 is an end view thereof in section taken on the line 9—9 of Fig. 8, looking toward the left in the direction of the arrow.

Referring to the drawing:

Fig. 1 designates a side view partially in central vertical longitudinal section of the mechanical portion of an automatic firearm of the Lewis type, in which A designates the barrel proper; B, the cartridge chamber; and C, the breech-block frame or carrier, (which is securely attached to the barrel in any desired manner or in some cases may be formed integral therewith), in which breech-block-frame is reciprocatingly mounted the breech-block or bolt D, of the improved form. Passing through a slot 11 in the under side of the lower-wall of the breech-block-frame or carrier C, and also through a like slot 11' in the lower wall of the breech-block D, is the firing-

pin-post 12, carrying the body 13 of the firing-pin, reciprocating in the breech-block or bolt D), in which body is removably secured in any desired manner, the conical shaped firing-pin head 14 ending in the firing-pin proper 30, the firing-pin-post 12 being secured upon the rear end of a piston-rod 15, thrown to the rear against the tension of a spring (not shown), throwing the gear wheel 16', meshing with the rack-gear 15' carried by the piston rod 15, which piston is thrown against the tension of such spring by the gases from the gun passing through the orifice 17' in to the piston cylinder 17, which spring when released from such pressure, will drive the piston forward again. And while in Fig. 1, there is shown such piston-rod 15 connected with a rack-rod 15' integrally formed or secured thereto, coacting with a gear-wheel 16' contained in the housing 20, and normally thrown toward the front and against the pressure of the gases by a coil-spring (not shown); other means or mechanism than those shown for throwing such rod to the rear, and also to the front may be used with equal effect; and it is not intended to limit the invention to any particular form thereof, as none of the mechanisms so far described, form any part of the invention, which consists of a new and improved breech-mechanism adapted to be applied to any form of firearm, automatic or non-automatic, having a reciprocating breech-bolt or block, including the Lewis automatic type shown.

In the majority of the breech loading firearms of the reciprocating breech-bolt type in present use, whether automatic or non-automatic, it is usually essential that during the reciprocation of the breech-block or bolt at some point, and usually at the moment of locking the breech-block just before firing, such block shall be partially vibrated upon its axis into locking position, and that after firing, the lock must be vibrated in the reverse direction the same distance to bring about unlocking, reversal of the breech-block, and ejection of the spent cartridge-case. All of which is a detriment by reason of excessive cost, wear of mechanism, and lack of ease, facility, and rapidity of operation; and this especially in the case of automatic-gas actuated firearms of the general type known, all of which objections are overcome, and such difficulties removed, by the new and improved breech-bolt, and its locking mechanism, herein shown.

Referring to Figs. 1, 3, 4, and 5, the reference letter C designates the breech-bolt frame or carrier secured in any well-known manner to the breech of a barrel, within the rear cavity 23 of which reciprocates freely and easily, back and forth, the improved breech-block D, which comprises a cylindrical sleeve or hollow-barrel portion G, and a head block portion G', the barrel portion G being provided on one side, usually that which when in position will be, (especially in the Lewis type of automatic gun), the under side of such breech-block, with a firing-pin stud-slot 11', in which reciprocates the firing-pin post 12, secured to the gas actuated piston-rod 15, in any desired manner usually by being provided with a sleeve 27 formed integral therewith and mounted on and secured to the piston-rod 15.

The firing-pin body 13 fits the bore of the barrel portion G, so snugly as to just slide therein, and is secured to the firing-pin post 12 usually by a drive-pin 28.

A screw plug g is screwed into the rear end of the barrel portion G and is provided with a for-

wardly spaced impact part g' engageable by the rear end face 13' of the firing-pin body 13 when the latter moves to the rear.

Formed in and through the side walls of the breech-block and preferably on diametrically opposite sides thereof, with their common plane at a right angle to the slot 11' through which passes the firing-pin post 12, are formed lock-lever slots 32 having the enlarged front lock-lug openings 33 with inwardly flaring end walls, such lock-lever slots being each provided at the rearward end with rounded journal sockets 34, the forward upper surfaces of which merge gradually into the slots 32 over the top surfaces of the securing intermediate combined end and bottom walls of the slots 32.

The lock-levers E, are of the shape shown in detail in Figs. 8 and 9, comprising the shank 35, the head or lock-lug 36, and the rear securing lock-lug 37, having the inner segmental rock journal surface 38, rocking in the like shaped rock-journal-slot 34, in the wall of the breech-bolt, such lever being cut away opposite to 38, as indicated at 40, and registering with an annular peripheral securing ring chamber 41, to hold in place a securing-ring 42 of spring-steel or other resilient material, which holds both such lock-levers against accidental displacement.

The lock-lever lock-lugs or heads 36, are provided at front and rear on the outer side, with the inwardly rearwardly and forwardly slanting slide-faces 45 and 45', contoured to fit the lock-lug cavities H in the inner peripheral wall surface of the breech-block-carrier frame, and on the inner rear face with a concavely inwardly rounded slide-surface 46, merging at the front end into a concave firing-pin slot 46', and at the rear into a like-slot 46'', formed longitudinally of the inner face of the lever 35, (Fig. 8), all such grooves being so contoured and merged, that the firing-pin body 13, will move easily into the various positions shown in Figs. 3, 4, and 5, and vice versa, so as to actuate the lock-lug-levers into and out of locking position, upon the reciprocation of the firing-pin body 13 and the consequent reciprocation of the breech-block D. The breech-block is provided on the top surface with a cartridge feed groove 47, and a spring cartridge shell extractor 48, of any well-known form.

It is evident that many changes in the construction, combination and arrangement of the various parts of the improved breech-mechanism for firearms herein shown and described, may be made without departing from the scope of the invention, and it is not intended to limit the invention to the exact forms of construction of any of the several parts shown and described, nor to the exact manner of combining the same elements; and wherever herein, either in the description or claims, there are used the terms "breech-block" or "breech-bolt," the two phrases are to be considered synonymous in meaning, and covering broadly any reciprocating member of whatever form capable of being used as a breech-block or bolt.

The specification of this application is a copy of the specification of the prior application of Harold D. Penney, for Breech mechanism of firearms, Serial No. 208,576, filed December 24, 1917, and allowed September 15, 1924.

What is claimed is:

1. In combination, a barrel; a carrier at the rear of the barrel having a longitudinal bearing surface and at the forward end of the surface a cam face forming an obtuse angle with the sur-

face; a substantially tubular breech block slidably guided by the carrier against the barrel and having a forwardly faced impact part in its rear; a longitudinally reciprocatory firing pin guided substantially entirely within said block and rearwardly movable to engage said impact part and having a body part opposed to and substantially parallel to the plane of said surface and an inclined forward part forwardly inclined away from said plane; the block having a rearwardly faced wall near said cam face and body part when the latter is in forward position and forward of said inclined part and forward of and near said cam face when the pin is in rear position and the block is forward; a longitudinal locking lever having one end pivoted to the block and having at the other end a lock-lug of short front to rear dimensions, said lock-lug being disposable between said surface and inclined part when the pin and block are rearward and adapted when the block and pin are in forward position to have substantially snug engagement with said cam face, wall and body part, the lever holding the lug from turning when pressed upon simultaneously by said wall and face; and reciprocatory means for forcing the firing pin rearwardly to cause it to engage said impact part and withdraw the block to cause said lock lug to cam from said cam face, and for forcing the said pin forwardly.

2. In combination, a barrel; a carrier at the rear of the barrel having a longitudinal bearing surface and at the forward end of the surface a cam face forming an obtuse angle with the surface; a breech block slidably guided by the carrier against the barrel; a longitudinally reciprocatory firing pin guided by said block and rearwardly movable in said block and having a body part opposed to and substantially parallel to the plane of said surface and an inclined part forwardly inclined away from said plane; the block having a rearwardly faced wall near said cam face and body part when the latter is in forward position and forward of said inclined part and forward of and near said cam face when the pin is in rear position and the block is forward; a longitudinal locking lever having at the rear end pivotal connection with the block and having at the forward end a lock-lug of short front to rear dimensions disposable between said surface and inclined part when the pin and block are rearward and adapted when the the block and pin are in forward position to have substantially snug engagement with said cam face, wall and body part; means for forcing the firing pin rearwardly and for withdrawing the block to cause said pivoted connection to draw said lock lug rearwardly to cause the lock lug to cam from said cam face; and means for forcing the pin and said inclined part forwardly to force the block forward and to force the lock lug forwardly and outwardly against the cam face and then to fire the cartridge.

3. In combination, a barrel; a carrier at the rear of the barrel and having a longitudinal bearing surface and at the forward end of the surface a cam face forming an obtuse angle with the surface; a breech block slidably guided by the carrier and having a forwardly faced impact part; a longitudinally reciprocatory firing pin guided by said block and rearwardly movable to engage said impact part and having a body part opposed to and substantially parallel to said surface and an inclined part forwardly inclined away from the plane of said surface; the block having a rearwardly faced wall near said cam face

and near said body part when the latter is in forward position and just forward of said inclined part and said cam face when the pin is in rear position and the block is forward; a longitudinal locking lever having at its rear end pivotal connection with the block and having at its forward end a lock-lug of short front to rear dimension disposable between said surface and inclined part and adapted when the block and firing pin are in forward position to have substantially snug engagement with said cam face, wall and body part; and reciprocatory means for forcing the firing pin rearwardly to cause it to engage said impact part and withdraw the block to cause said pivotal connection and lever to draw said lock lug rearwardly to cause said lock lug to cam from said cam face, and for forcing said inclined part forwardly to force the lug forwardly and outwardly against the cam face and then to fire the cartridge.

4. In combination, a barrel; a carrier at the rear of the barrel and having lateral inner bearing surfaces and at the forward end of the surfaces lock cavities each having an inwardly rearwardly slanted rear cam face; a substantially tubular breech block slidable in the carrier and having a forwardly faced rear impact member therein, and a lower longitudinal slot; a reciprocating firing pin in said passage having a rear butt end engageable with said impact member and having non-tapered body and a tapered front end; the block having near its forward end lock openings opposite said body when the pin is in forward position and opposite said tapered end when the pin is in rear position, and registerable with said cavities when the block is forward; longitudinal locking levers having their rear ends pivoted to the block and each having at the forward end a lock-lug disposed in one of said openings and disposable between said surface and tapered end and adapted when the breech block and firing pin are in forward position to have snug engagement with said body, cam face and the front wall of said opening; a stud bolt in said lower slot and secured fast to the pin; and reciprocatory means for forcing the stud bolt and with it the firing pin rearwardly to cause the pin to engage said impact member and withdraw the block to cause said lock lugs to cam out of said cavities, and for forcing the stud bolt and with it the pin forwardly and outwardly to force the lock lugs forwardly and outwardly into said cavities and then to fire the cartridge.

5. In combination, a barrel; a carrier at the rear of the barrel and having lateral inner bearing surfaces and at the forward end of the surfaces lock cavities each having an inwardly rearwardly slanted rear cam face; a breech block slidable in the carrier and having a longitudinal passage therein, the passage having therein a forwardly faced impact member at its rear end; a reciprocating firing pin in said passage and having a non-tapered body and a tapered front end and a butt end engageable with said impact member; the block having lateral longitudinal slots, and at their forward ends and near its forward end lock openings opposite said body when the pin is in forward position and opposite said tapered end when the pin is in rear position, and registerable with said cavities when the block is forward against the barrel; longitudinal locking levers in said slots having their rear ends pivoted to the block and each having at the forward end a lock-lug in one of said openings and disposable between said surface and tapered end and adapted

when the breech block and firing pin are in forward position to have snug engagement with said body, cam face and the front wall of said opening; and explosion-operated reciprocatory means for forcing the firing pin rearwardly to cause it to engage said impact member and withdraw the block to cause said lock lugs to cam out of said cavities, and for forcing the pin forwardly to cause said tapered end to force the lock lugs forwardly and outwardly into said cavities and then to fire the cartridge.

6. In combination, a barrel; a carrier at the rear of the barrel having a longitudinal bearing surface and at the forward end of the surface a cam face forming an obtuse angle with the surface; a breech block slidably guided by the carrier against the barrel; a longitudinally reciprocatory firing-pin carrying member guided by said block and carrying a forward firing pin and having a body part opposed to and substantially parallel to the plane of said surface and an inclined forward part forwardly inclined away from said plane; the block having a rearwardly faced wall near said cam face and body part when the latter is in forward position and forward of said inclined part and forward of and near said cam face when the pin-carrying member is in rear position and the block is forward; a longitudinal locking lever having one end pivoted to the block and having at the other end a lock-lug of short front to rear dimensions, said lock-lug being disposable between said surface and inclined part when the pin-carrying member and block are rearward and adapted when the block and pin-carrying member are in forward position to have substantially snug engagement with said cam face, wall and body part, the lever holding the lug from turning when pressed upon simultaneously by said wall and face; and reciprocatory means for forcing the firing pin carrying member rearwardly and for withdrawing the block to

cause said lock lug to cam from said cam face, and for forcing the said pin-carrying member forwardly.

7. In combination, a barrel; a carrier at the rear of the barrel having a longitudinal bearing surface and at the forward end of the surface a cam face forming an obtuse angle with the surface; a breech block slidably guided by the carrier to the barrel; a longitudinally reciprocatory firing-pin-carrying member guided by said block and carrying a forward firing pin, and having a body part opposed to and substantially parallel to the plane of said surface and an inclined part forwardly inclined away from said plane; the block having a rearwardly faced wall near said cam face and body part when the latter is in forward position and forward of said inclined part and forward of and near said cam face when the pin-carrying member is in rear position and the block is forward; a longitudinal locking lever having at its rear end pivoted connection with the block and at the forward end a lock-lug of short front to rear dimensions said lock-lug being disposable between said surface and inclined part when the pin-carrying member and block are rearward and adapted when the block and pin-carrying member are in forward position to have substantially snug engagement with said cam face, wall and body part; means for forcing the firing-pin-carrying member rearwardly and for withdrawing the block to cause said pivoted connection to draw said lock lug rearwardly to cause the lock lug to cam from said cam face; and means for forcing the pin-carrying member and said inclined part forwardly to force the block forwardly and to force the lock lug forwardly and outwardly against the cam face and then to fire the cartridge.

ELIZABETH PENNEY.

40 *Executrix of the Last Will and Testament of Harold D. Penney, Deceased.*