O. V. PAYNE.

FIREARM.

APPLICATION FILED MAY 15, 1919.

1,347,754. Patented July 27, 1920.

Fig. 1.

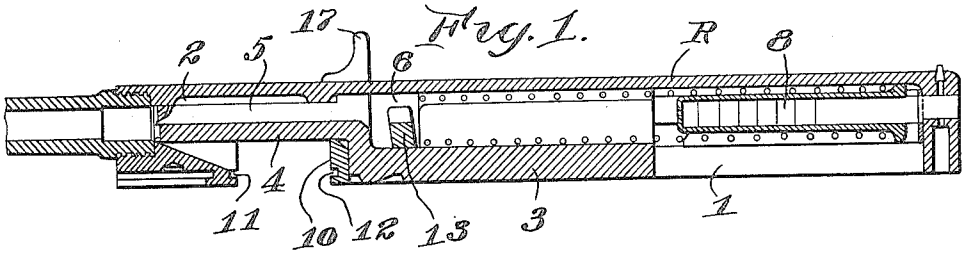

Fig. 2.

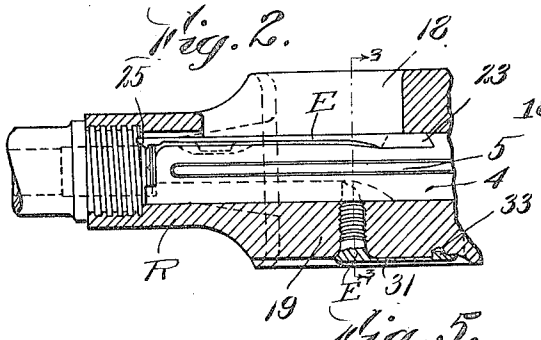

Fig. 3.

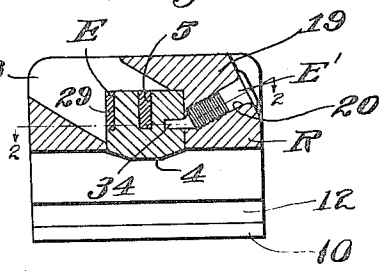

Fig. 5.

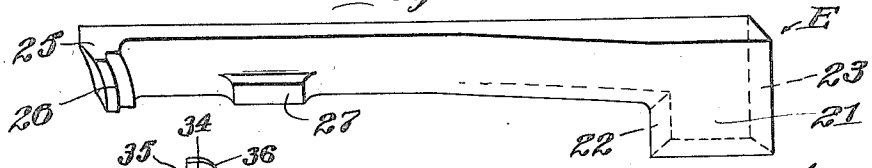

Fig. 6.

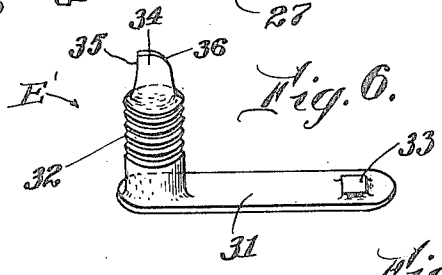

Fig. 4.

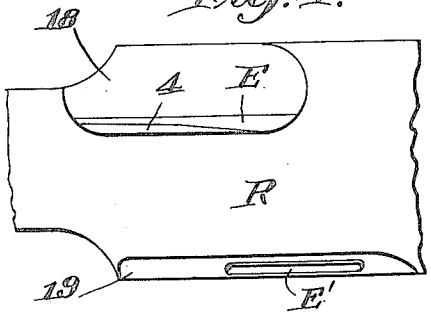

Fig. 7.

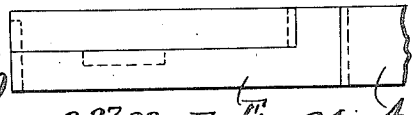

Fig. 10

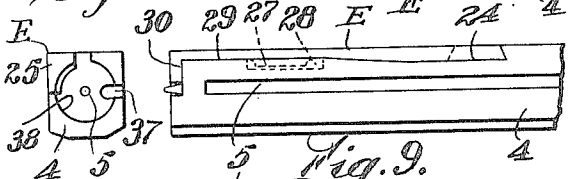

Fig. 9.

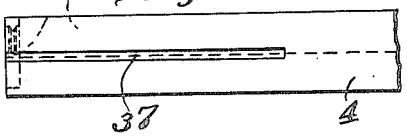

Fig. 8.

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UNITED STATES PATENT OFFICE.

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FIREARM.

1,347,754. Specification of Letters Patent. Patented July 27, 1920.

Application filed May 15, 1919. Serial No. 297,284.

To all whom it may concern:

Be it known that I, OSCAR V. PAYNE, a citizen of the United States of America, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Firearms, of which the following is a specification.

This invention relates to firearms and more particularly to the extractor and ejector and associated parts of hand firearms.

The object of the invention is to provide means for extracting and ejecting cartridges which is simple in construction, which can be manufactured at low cost, which involves a minimum number of parts, which may be readily attached or detached to or from a firearm without the use of tools, which is reliable and durable in use, and which is generally superior as will hereinafter appear.

One embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section of the receiver and breech mechanism, the other parts of the firearm being either removed or broken away;

Fig. 2 is a section on line 2—2 of Fig. 3, showing parts in elevation;

Fig. 3 is a vertical transverse section on line 3—3 of Fig. 2;

Fig. 4 is a top plan of the portion of the receiver shown in Fig. 2;

Fig. 5 is a perspective view of the extractor;

Fig. 6 is a perspective view of the ejector;

Fig. 7 is an elevational view of the right-hand side of the forward end of the bolt with the extractor attached thereto, showing the parts inverted;

Fig. 8 is a top plan of the parts shown in Fig. 7;

Fig. 9 is an elevational view of the left-hand side of the parts shown in Figs 7 and 8; and

Fig. 10 is a front end elevation of the parts shown in Figs. 7 to 9.

The particular firearm in which I have illustrated my improved extractor and ejector in the drawings is described and claimed in its various aspects in my co-pending applications Sr. No. 282,642, filed March 14, 1919; Sr. No. 297,282, and Sr. No. 297,283, the last two applications being filed on even date herewith; and inasmuch as the present application is concerned only with the extractor and ejector and associated parts I have illustrated only these parts in the drawings, it being understood that the subject matter of the present application may be applied to firearms of various types and kinds.

The firearm illustrated in part in the drawings comprises a receiver R having a bolt chamber including a rear portion 1 of large cross-section and a forward portion 2 of reduced cross section. Slidable longitudinally in this chamber is a bolt comprising a large rear portion 3 and a forward portion 4 of reduced cross-section, the portion 4 being adapted to extend into the reduced portion 2 of the bolt chamber when the bolt is in the firing position illustrated in Fig. 1. Slidably mounted in a groove in the upper central portion of the bolt is a firing member 5 having an enlarged body portion 6 sliding in an enlarged opening in the rear portion 3 of the bolt. A buffer 8 is provided in the rear end of the bolt chamber to absorb the recoil of the bolt and a spring 9 is provided to advance the bolt into firing position. A finger-piece 17 extends upwardly from the firing member through a slot in the top of the receiver by means of which the bolt may be manually retracted. A locking member 13 is associated with the firing member, bolt and receiver automatically to lock the bolt in firing position and to advance the firing member into position to fire a cartridge, the lock being arranged automatically to unlock the bolt and permit it to be retracted by the breech pressure after the breech pressure has decreased to a relatively low value. Extending transversely of the receiver R beneath the reduced portion 2 of the bolt chamber is a transverse opening 10 adapted to receive a cartridge magazine in position to feed cartridges to the breech mechanism. The opening 10 is provided with guideways 11 and 12 to receive guides on the magazine, thereby to position the magazine with respect to the receiver. All of this mechanism is described and claimed in the aforesaid applications and for the purpose of the present application it need not be further described.

Referring more particularly to the subject matter herein claimed, the receiver R is provided with an elongate opening 18

which slopes upwardly from the forward portion of the bolt chamber to the upper right-hand corner of the receiver, this opening being arranged to permit the fired cartridges to be ejected therethrough as will be described hereinafter. On the side opposite to the opening 18 the upper corner of the receiver is beveled as shown at 19 in Figs. 2 to 4 and extending inwardly through the receiver from this beveled surface to the side of the portion 2 of the bolt chamber is a threaded opening 20 adapted to receive the ejector pin hereinafter described.

As shown in Fig. 5 the extractor E comprises an elongate member of rectangular cross-section, this member being formed of such material and being of such thickness as to permit it to be sprung in the direction of its short dimension. The rear end of the extractor is provided with a downward extension 21 which is beveled on its opposite sides 22 and 23 so as to dovetail into a recessed groove 24 in the right-hand side of the bolt member. The forward end of the extractor E is provided with a lateral extension 25 adapted to extend inwardly along the forward end of the bolt as shown in Fig. 10, the lateral extension 25 being provided with a concave hook 26 adapted to hook over the flange at the rear end of the cartridge in the case of a flanged cartridge or to hook into the groove near the end of the cartridge in the case of a grooved cartridge. Near its forward end the extractor is provided on its inner side with a lug 27 adapted to fit into a recess 28 in the side of the bolt to hold the extractor in place on the bolt, as will hereinafter be described.

The forward end 4 of the bolt is in general rectangular in cross-section as shown in Figs. 3 and 10. However, portions of the bolt are cut away to form the vertical guideway 24, which extends the full depth of the bolt, and to form a longitudinal recess 29 adapted to receive the elongate body portion of the extractor E. The forward end of the bolt is cut away at the upper right-hand corner 30 to receive the lateral extension 25 of the extractor.

To apply the extractor to the bolt the rear end 21 of the extractor is slipped downwardly into the guideway 24, the forward end of the extractor being sprung outwardly to permit the lug 27 to clear the side of the bolt. After the extractor has reached its lowermost position, the forward end thereof is permitted to spring inwardly until the lug 27 seats in the recess 28 as shown in Fig. 8.

As shown in perspective in Fig. 6, the ejector E′ comprises an elongate plate 31, a threaded stud 32 extending laterally from one end of the plate 31, and a short lug 33 extending laterally from the same side of the plate at the other end. The stud 32 is adapted to be threaded into the opening 20, and when it is threaded all the way into this opening, as shown in Fig. 3, the lug 33 is adapted to seat in a recess in the face 19 of the receiver to hold the ejector against rotation, the plate 31 being sufficiently flexible to permit the end carrying lug 33 to be flexed outwardly while the stud 32 is being threaded into the opening 20. The inner end of the stud 32 is provided with a projection 34 having a forward face 35 substantially perpendicular to the axis of the bolt, a rear face 36 which is curved as shown in Fig. 6, and having upper and lower faces which are substantially flat, as shown in Fig. 3. The projection 34 is oblique to the axis of the stud 32 as shown in Fig. 3, so that it will extend into the slot 37 in the left-hand side of the bolt 4. However, the projection 34 is so formed on the end of the stud 32 that it will not engage the threads in the opening 20 while the stud 32 is being threaded into or out of the opening.

The operation of the mechanism is as follows: When a cartridge is fed from the magazine (not shown) into position in front of the bolt, the cartridge is engaged by the forward end of the bolt, in the forward movement of the bolt, and is pushed forwardly into the firing chamber. As the cartridge seats in the firing chamber and as the bolt reaches firing position the forward end 25 of the extractor E springs outwardly and hooks into the groove (or over the flange) of the cartridge. In this connection it is to be noted that the lug 27 is of such length and such depth that it does not leave the recess 28 when the forward end of the extractor springs over the rear end of the cartridge as described. When the bolt is retracted the cartridge is withdrawn from the firing chamber by the hook 26 of the extractor and is carried rearwardly on the bolt, the rear end of the cartridge fitting into the circular recesses 38 in the forward end of the bolt. When the bolt has been retracted to the position wherein the cartridge is in lateral alinement with the opening 18 the portion 34 of the ejector E′ engages the rear end of the cartridge and flips it outwardly through the opening 18.

From the foregoing description it will be evident that no tools are necessary to assemble or disassemble the extractor or ejector parts. The extractor may be detached merely by flexing the forward end outwardly until the lug 27 clears the recess 28 and then moving the extractor upwardly until the rear end 21 leaves the guideway 24. To detach the ejector E′ it is merely necessary to flex the rear end of the plate 31 outwardly until the lug 33 clears the surface 19 and then rotating the plate until the stud 32 has been threaded out of the opening 20.

I claim:

1. A firearm comprising a breech bolt having a longitudinal recess along one side thereof and a transverse recess communicating with the longitudinal recess, the transverse recess being dovetailed, and an extractor filling said longitudinal recess flush with the periphery of the bolt and having a dovetail gib fitting into said transverse recess.

2. A firearm comprising a breech bolt having an elongate recess extending from the forward end of the bolt longitudinally along one side thereof and having a dovetail groove extending transversely of said recess at a distance from the end of the bolt, and an elongate extractor adapted to lie in said recess and having a transverse dovetail gib adapted to slide into said dovetail groove, the bolt and extractor having shoulders arranged to prevent said gib from slipping out of said groove, and the extractor being sufficiently flexible to permit it to be sprung outwardly until said shoulders clear each other, thereby to permit said gib to be slipped out of said groove.

3. A firearm comprising a receiver, a breech bolt reciprocatable in said receiver, said bolt having a longitudinal groove along one side and an ejector pin threaded through an opening in said receiver and thence extending into said groove, said pin having an arm extending along the outside of the receiver and said arm and receiver having engaging shoulders arranged to prevent rotation of said pin, said arm being flexible to disengage said shoulders for the purpose of removing the ejector.

4. A firearm comprising a receiver having a bolt chamber therein and having a threaded opening extending into the chamber, an ejector pin threaded into said opening, a flat arm integrally attached to the outer end of said pin, said arm extending from the pin along the outside of said receiver, and a lug on the inside of said arm adapted to seat in a recess in the receiver to prevent rotation of said pin, said arm being sufficiently flexible to be sprung outwardly to disengage said lug from said recess to detach the ejector.

5. A firearm comprising a receiver having a bolt chamber therein and having a threaded opening in its wall communicating with said chamber, an ejector pin threaded through said opening, said pin having an arm extending along the outside of the receiver, and means for locking said arm to prevent rotation of said pin.

Signed by me at Cleveland, Ohio, this 29th day of April, 1919.

OSCAR V. PAYNE.