May 1, 1923. 1,453,439

N. CEDILLO

RECOIL OPERATED FIREARM

Filed March 21, 1921 6 Sheets-Sheet 1

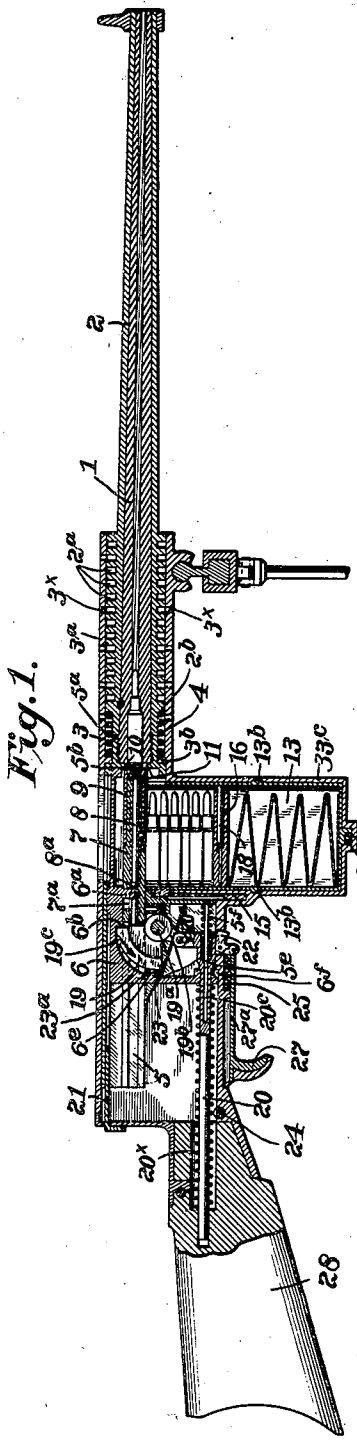

Fig. 1.

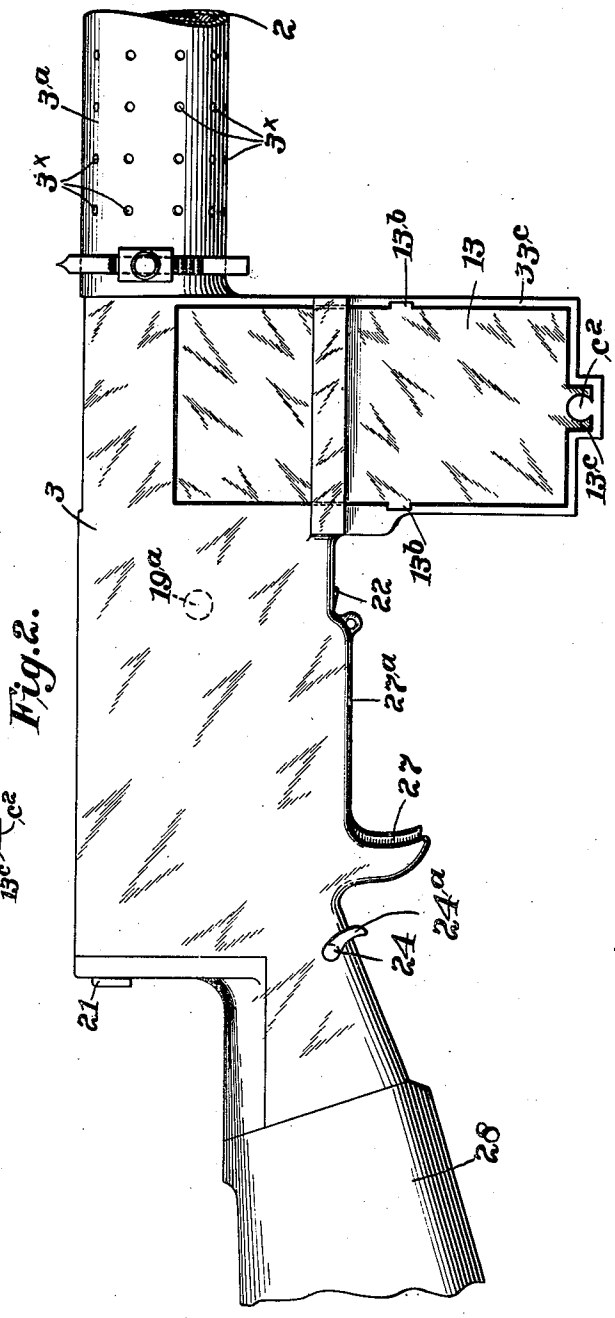

Fig. 2.

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by Spear Middleton Donaldson & Hall

Attys.

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N. CEDILLO

RECOIL OPERATED FIREARM

Filed March 21, 1921 6 Sheets-Sheet 2

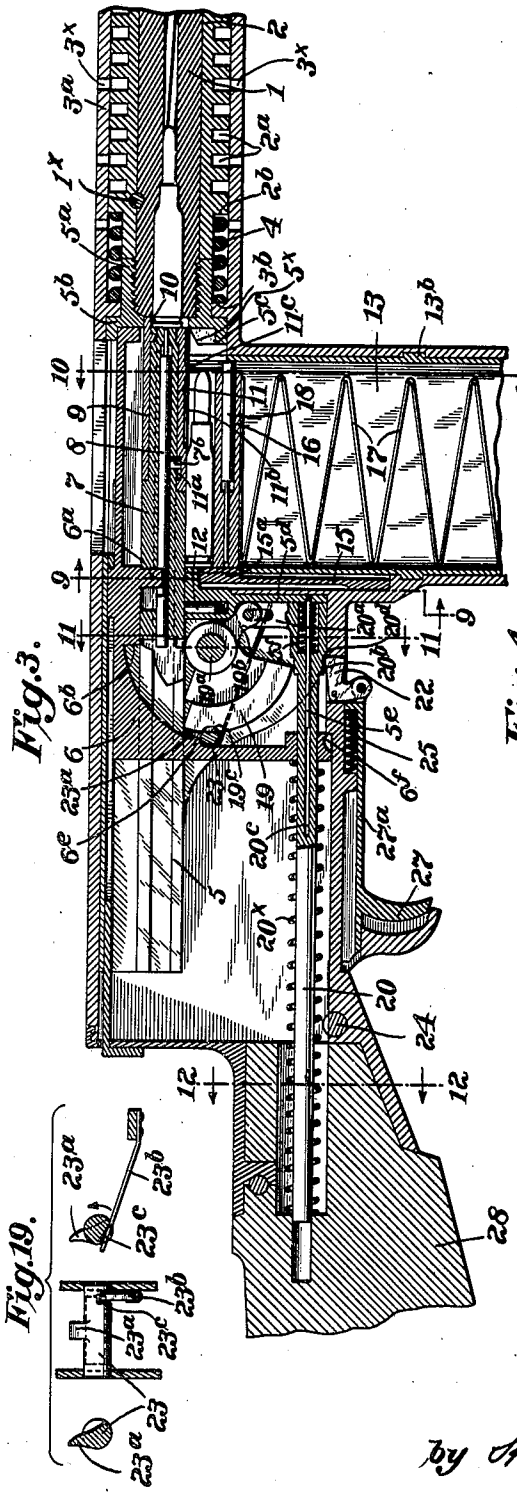

Fig. 3.

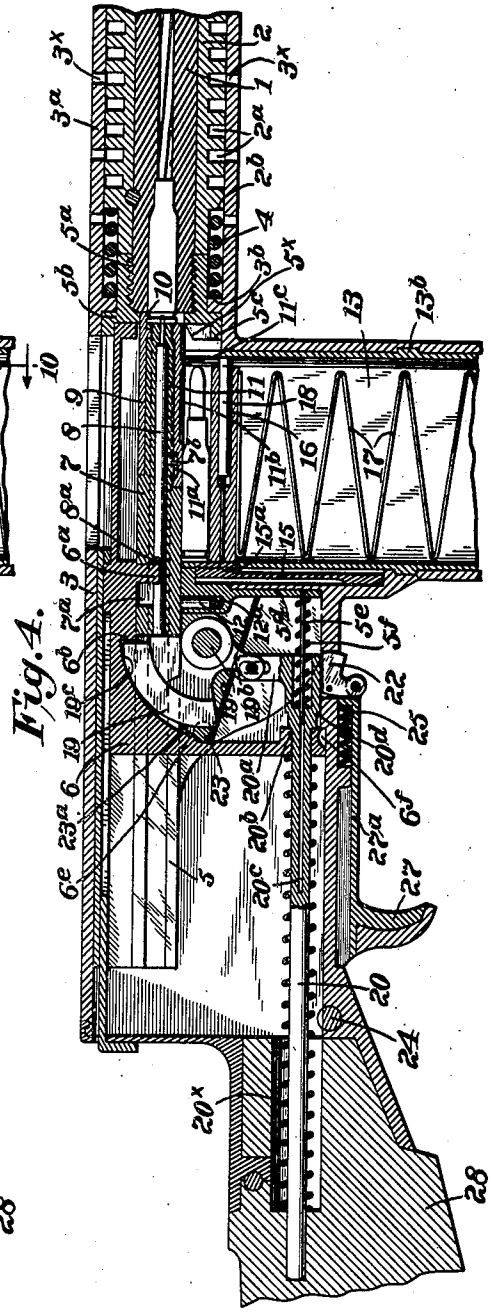

Fig. 4.

Fig. 19.

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N. CEDILLO

RECOIL OPERATED FIREARM

Filed March 21, 1921 6 Sheets-Sheet 3

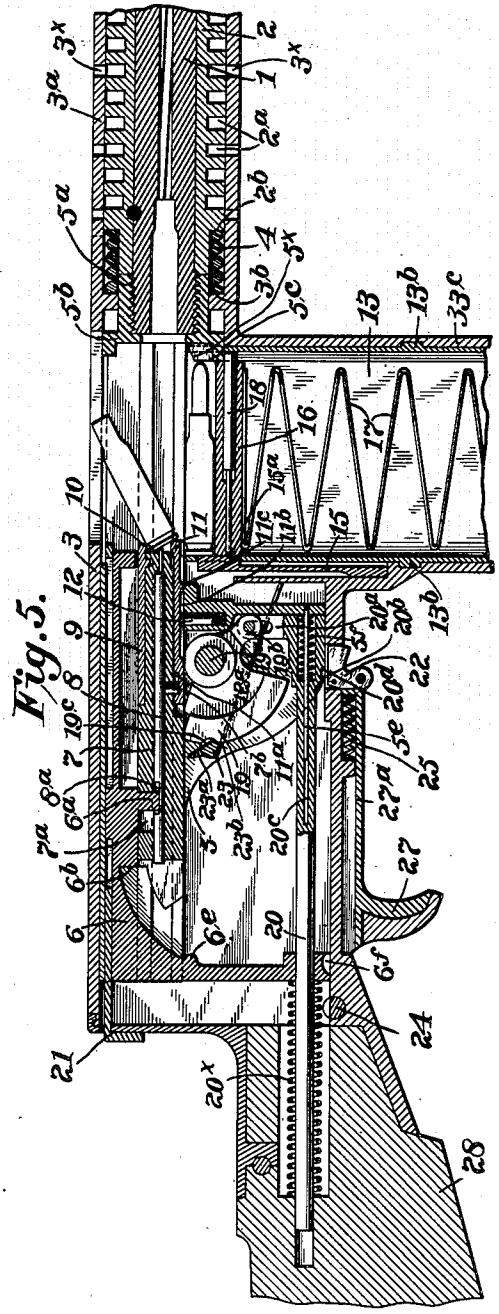

Fig. 5.

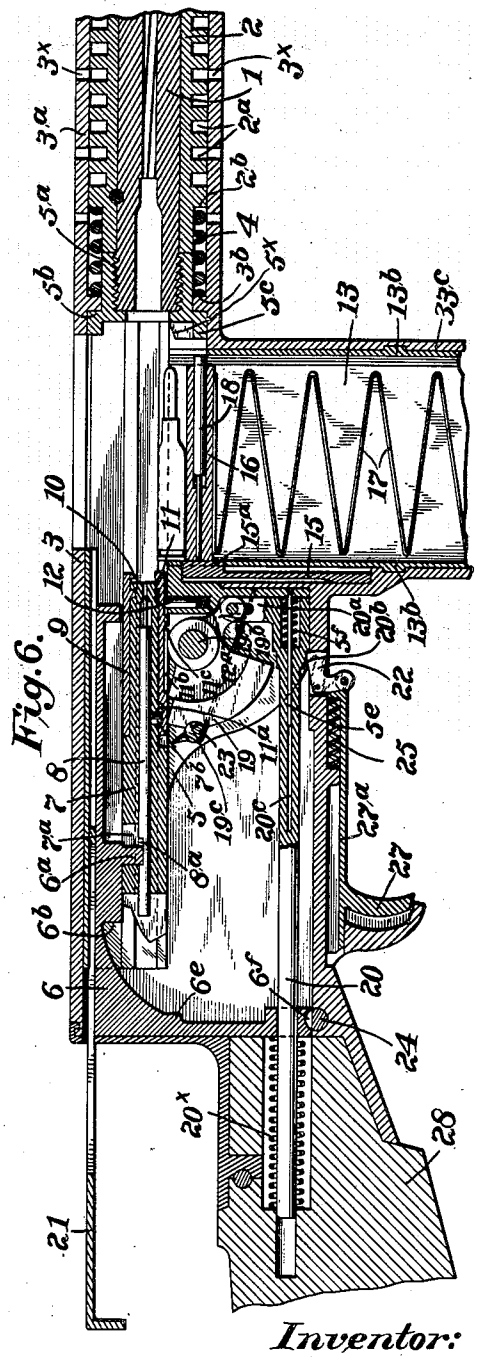

Fig. 6.

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May 1, 1923. 1,453,439

N. CEDILLO

RECOIL OPERATED FIREARM

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Fig. 7.

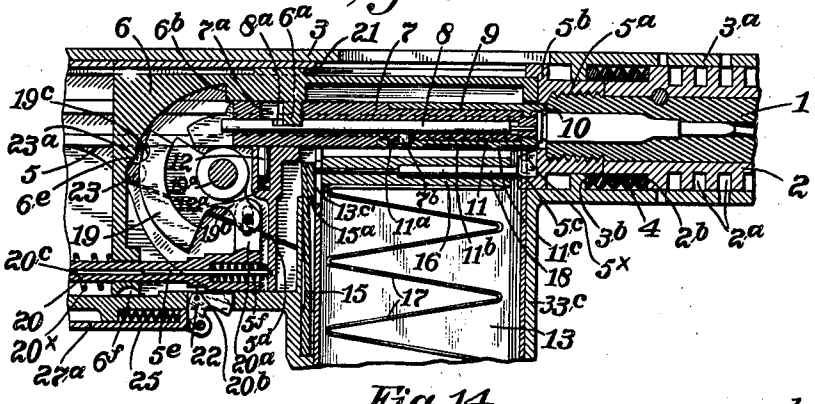


Fig. 14.

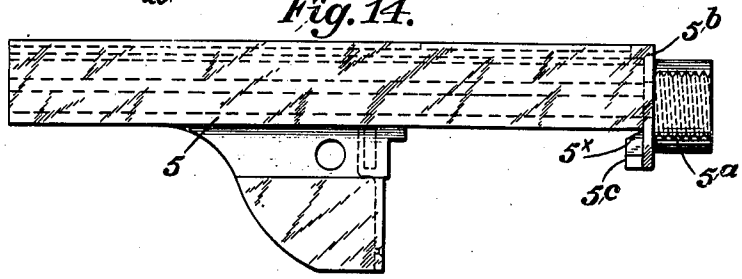


Fig. 16.

Fig. 15.

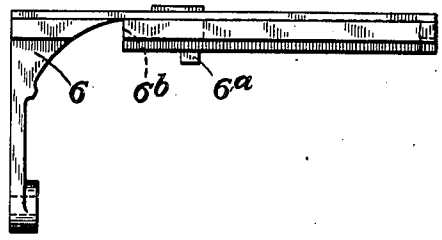


Fig. 17.

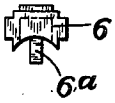
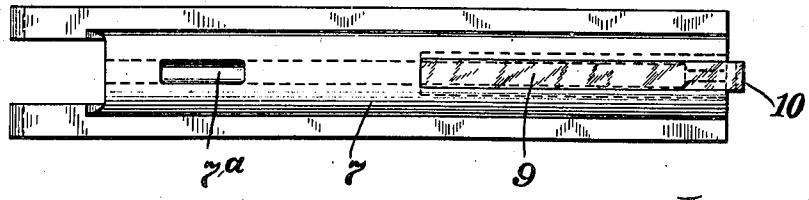


Fig. 18.



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May 1, 1923. 1,453,439

N. CEDILLO

RECOIL OPERATED FIREARM

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Fig.8.

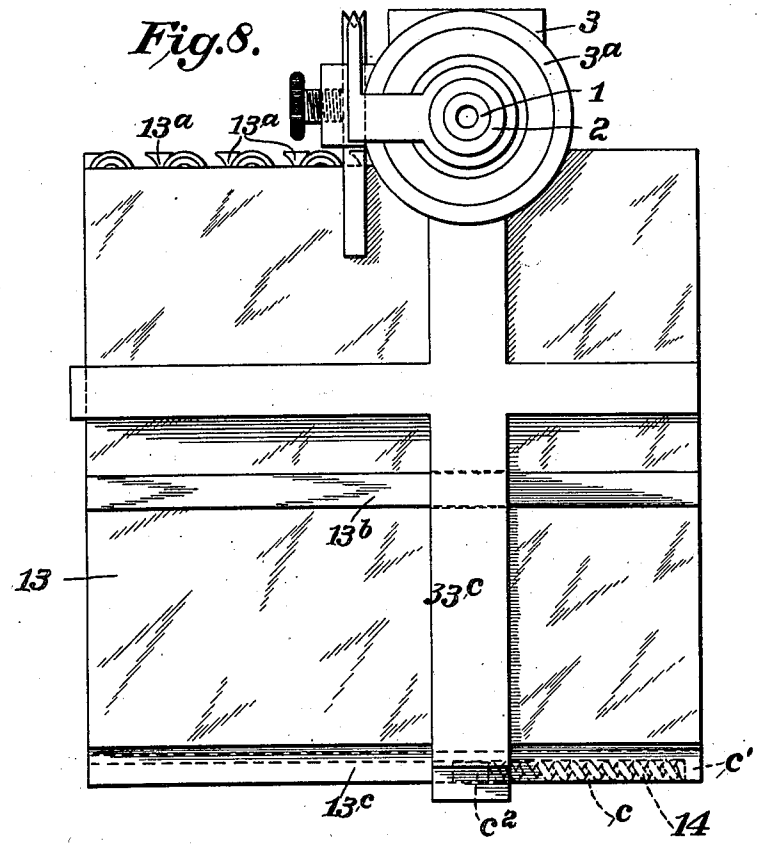
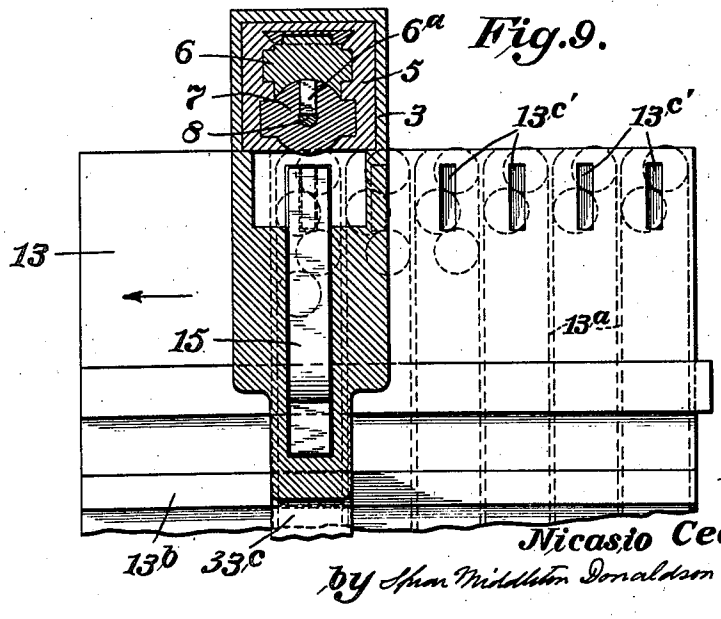


Fig.9.



Inventor:
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May 1, 1923. 1,453,439

N. CEDILLO

RECOIL OPERATED FIREARM

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Fig.10.

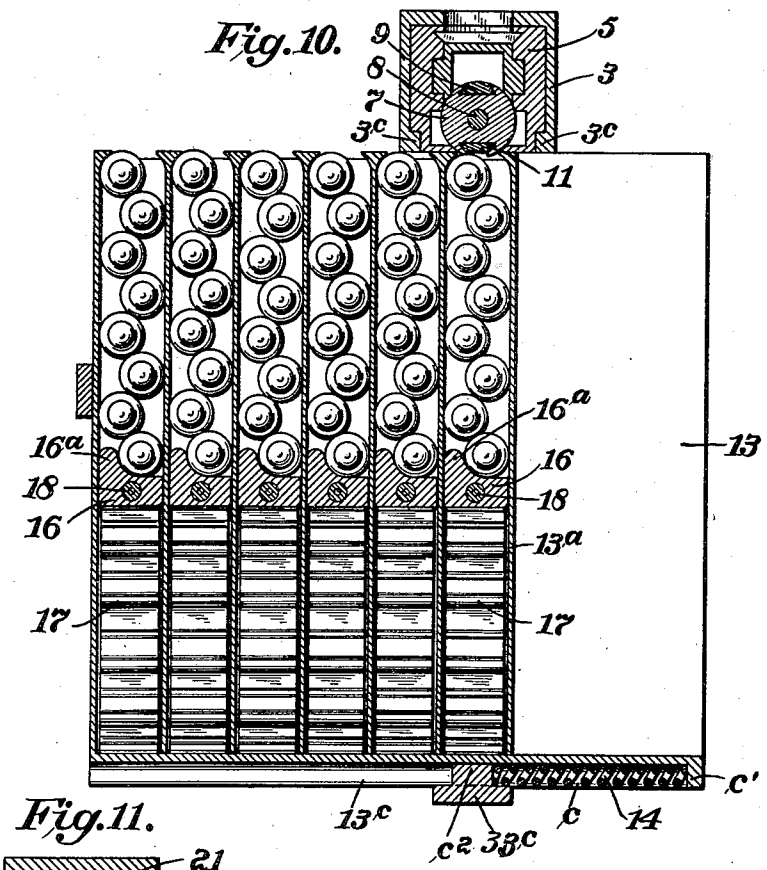


Fig.11.

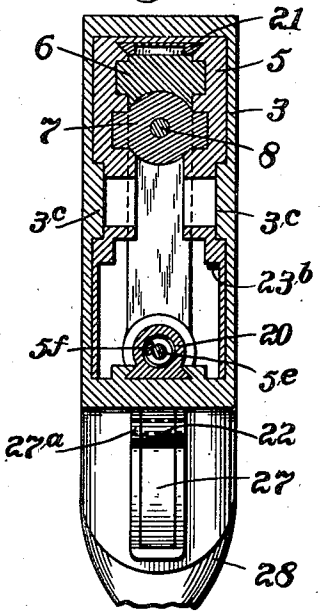


Fig.12.

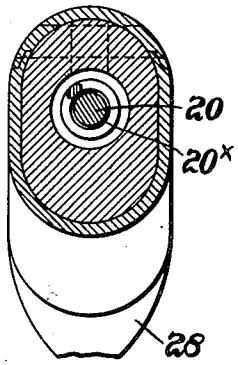
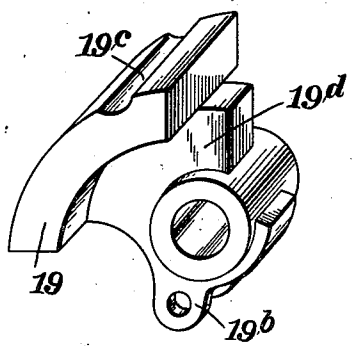


Fig.13.



Inventor:

Nicasio Cedillo,

by Upham Middleton Donaldson & Hall

Attys.

Patented May 1, 1923. 1,453,439

UNITED STATES PATENT OFFICE.

NICASIO CEDILLO, OF HOUSTON, TEXAS, ASSIGNOR TO C. E. REED, OF HOUSTON, TEXAS.

RECOIL-OPERATED FIREARM.

Application filed March 21, 1921. Serial No. 454,002.

To all whom it may concern:

Be it known that I, NICASIO CEDILLO, a citizen of Mexico, and a resident of Houston, Harris County, Texas, have invented certain new and useful Improvements in Recoil-Operated Firearms, of which the following is a specification.

My present invention relates to improvements in machine guns and aims to greatly reduce the number of parts and to provide a much more simple form of construction capable of being more economically manufactured and one which will be more durable and efficient in use.

With these and other objects in view the invention includes the novel feature of construction and arrangement and combination of parts hereinafter described, the nature and scope of my said invention being particularly defined by the appended claims.

An embodiment of my invention is illustrated in the accompanying drawings in which:

Figure 1 is a longitudinal sectional view through the complete gun except the stock which is shown partly in elevation, this view showing the parts in the position assumed after pulling the trigger but before recoil.

Fig. 2 is an enlarged side elevation of the main portion of the gun.

Fig. 3 is an enlarged sectional view, taken longitudinally of the gun, with the parts positioned ready for firing by pulling the trigger.

Fig. 4 is a similar view, but showing the parts positioned as at the instant of firing.

Fig. 5 is a similar view, with the breech-bolt retracted under the action of the recoil, and showing the ejector throwing the old shell out.

Fig. 6 is a similar view, with the parts fully retracted and ready to move forward and carry a fresh cartridge into the breech.

Fig. 7 is a similar view, illustrating the action of the magazine escapement, when one compartment has been emptied.

Fig. 8 is an enlarged front elevation of the gun.

Fig. 9 is a transverse section through the gun taken substantially on the line 9—9 of Fig. 3.

Fig. 10 is a similar view taken on the line 10—10 of Fig. 3.

Fig. 11 is a similar view taken on line 11—11 of Fig. 3, with parts omitted.

Fig. 12 is a similar view taken on line 12—12 of Fig. 3.

Fig. 13 is a perspective view of the hammer.

Fig. 14 is a side elevation showing in detail the barrel-carrier.

Figs. 15, 16 and 17 are details of the breech action slide, and Fig. 18 is an enlarged plan view of the breech bolt alone.

Fig. 19 is a detail view.

Referring by reference characters to these drawings, the numeral 1 designates the barrel, which is rifled in the usual or any desired manner, and which is firmly fitted into a reinforcing and carrying mantle or sleeve 2, and held therein by a dowel pin 1^x.

The sleeve 2 is preferably enlarged at its rear end and of cylindrical shape and provided with a plurality of annular grooves, as indicated at 2^a.

This enlarged cylindrical end is slidingly held in the cylindrical barrel receiving extension 3^a of the casing member 3 which contains or carries the working parts of the gun. Casing member 3^a is provided with numerous air passages 3^x to allow passage of air to the annular grooves for cooling purposes. The barrel is normally pressed outward in the firing direction to the limit of its movement by a helical spring 4 lying between the barrel receiving extension 3^a and the reduced end of the barrel sleeve, said spring bearing at its outer end against an annular shoulder 2^b of the barrel tube and at its other end against an internal annular shoulder 3^b of the barrel receiver. Outward movement of the barrel is limited by a shoulder 5^b of a sliding barrel carrier 5 contacting with the rear side of said shoulder 3^b of the barrel receiving extension 3^a.

The said barrel carrier 5 is slidably supported in the main frame or casing 3 and has at its forward end a tubular projection

which is rigidly connected with the rear ıd of the barrel, preferably by having said ıd extended in rear of the barrel sleeve and rovided with exterior screw-threads engag- ıg corresponding internal screw threads on ıe tubular extension 5^a.

The barrel carrier or receiver 5 is guided ı move in a rectilinear path in the casing y being provided on opposite sides with ıternal longitudinal grooves or channels hich are engaged by corresponding ribs or anges 3^c formed on the inner walls of the ısing.

Slidably mounted within the barrel car- er is a breech member or breech block 6 ıd a breech bolt 7 which have longitudinal bs on their side faces which slidingly en- age corresponding guide grooves in the ıner faces of the walls of the barrel carrier. he breech member is cut away to receive ıe hammer mechanism, hereinafter de- ribed into which cut away portions the ps of the breech bolt 7 and firing pin 8 roject, the firing pin being slidably ıounted in the central longitudinal bore or assage of the breech bolt.

A depending projection 6^a from the upper ortion of the breech member extends ırough an elongated opening or slot 7^a in ıe wall of the breech bolt and also engages ı elongated recess 8^a of a different length ı the firing pin (constituting a lost motion ınnection) so that backward movement of ıe breech member will carry with it the reech bolt and firing pin upon the projec- on encountering the rear ends of the slots r recesses in said parts.

Carried in a recess in the upper side of ıe breech bolt and projecting beyond the ıd thereof is an extractor 9 having its for- ard end shaped or hooked indicated at 10 ı engage the rim of the cartridge.

On its under side the breech bolt is simi- ırly recessed or grooved to receive the ector 11 which is mounted in said groove ı as to have a sliding movement therein mited by a projection 7^b on the breech ılt engaging a recess 11^a in the ejector, ıe forward end of the ejector normally earing against the heel of the cartridge.

The ejector is provided in its under face ith an elongated recessed portion 11^b hich terminates at its forward end in a ıoulder 11^c designed to cooperate with a op device which comprises a pin 12 seated ı a vertical recess in the transverse wall ı of the barrel receiver beneath the breech olt and normally forced upward by a pring 12^a. The upper end of the stop pin ears with a sliding contact on the under de of the breech bolt and ejector, and in ıe backward movement of these parts, ıters the recess or groove 11^b and travels ıerein until it contacts with the shoulder 11^c which causes the ejector to be held stationary while the breech bolt and extractor continue their rearward movement, resulting in the ejection of the empty cartridge shell.

Fresh cartridges are supplied from a cartridge container 13 which is in the form of a rectangular box open at its upper side and divided by partitions 13^a into a plurality of cartridge containing compartments of a width permitting the cartridges to lie therein in staggered relation as shown. This cartridge container is mounted to slide transversely in an open frame member 33^c which forms preferably an integral part of the casing 3. The container is properly guided in the frame and prevented from binding therein by guide ribs 13^b on its sides which engage corresponding grooves in the sides of the frame, and by the bottom rib 13^c which engages a similar groove in the bottom of the frame.

Rib 13^c is provided in its under side with a recess c of slightly more than semi-cylindrical form in cross-section within which is located a spring 14 which abuts at one end against and is secured to a stop c' carried by the container and at the other end against a circular projection c^2 on the frame. The spring 14 tends, when unrestrained, to move the cartridge container to the right, Fig. 10, so as to bring the cartridge containing compartments successively into loading position as soon as a preceding compartment has been emptied, the said container being normally held stationary by a spring dog 15 seated in a recess in the transverse wall of the frame or casing and having its locking end 15^a adapted to engage a series of recesses $13^{c'}$ in the rear wall of the container. The upper edges of the division walls 13^a of the container are provided with overhanging ledges which serve to retain the cartridges in position in the compartments due to the staggered relation hereinbefore referred to.

Located in each compartment beneath the cartridges therein, is a follower 16 which is pressed upwardly by a spring 17, preferably of zigzag leaf form as shown, which effects delivery of the cartridges from the compartment when in loading position, said follower having an elevated portion 16^a at one side which tends to crowd the lowermost cartridge towards or position it in proximity to the opposite wall of the compartment. Each follower has a longitudinal bore or passage within which is located a pin or transmitter 18 which normally and when any cartridges are in the compartment, lies with its ends in sliding contact with the walls of the container, but which, when the last cartridge has been ejected, comes into line at its front end with the

flange 5^c and at its rear end with the locking projection 15^a of the dog or detent 15, having a spring shank. Thereupon the backward movement of the barrel or recoil thereof forces the transmitter backward and by its pressure removes the locking projection 15^a from engagement with the corresponding recess in the container, which, under pressure of its spring 14, is moved to bring the next compartment into loading position, whereupon said locking projection 15^a automatically engages the next recess to hold the container against further movement. Flange 5^c has an incline 5^x to direct the nose of the bullet into the barrel chamber.

Within the barrel carrier 5 is located the hammer 19 mounted to oscillate on pivot pin 19^a and having a projection 19^b which engages by a pin and slot connection with a pojection 20^a carried by the main spring rod 20. The hammer has a reduced or web like portion 19^d, and the breech bolt, lips or projection 7^d, which overlap said web when the breech bolt is in locked position, (Fig. 4.)

The main spring rod passes through an opening in the rear wall of the breech block and has a shoulder 20^b cooperating with the front wall thereof, while the portion of the main spring rod which projects through the rear wall of the breech block is encircled by main spring 20^x which is secured in a recess in the stock and bears against the rear wall of the breech block. The main spring rod has a longitudinal bore 20^c extending backward from its front end, within which bore is slidingly fitted a rod 5^e fast at its front end to the transverse wall 5^d of the barrel receiver. Encircling this rod between said wall 5^d and the main spring rod is a helical compression spring 5^f, and the forward end of the main spring rod is preferably provided with a countersink or annular rebate to make provision for a longer spring than could otherwise be secured, this spring serving to actuate the hammer to fire the cartridge.

Backard movement imparted to the breech block, either under the impact of the barrel receiver in firing, or the hand action slide 21, effects the cocking of the hammer due to the action of the shoulder 6^b of the breech block and the rear end of the breech bolt on the forward and preferably stepped face of the hammer, which hammer is of segmental shape as shown.

This rocks the hammer on its pivot in the direction of the arrow, Fig. 1, and causes the arm 19^b to move rod 20 forward compressing hammer spring 5^f until the trigger 22 engages behind shoulder 20^d of rod 20 and locks the trigger in cocked position, in which position it is locked by automatic lock 23 which is in the shape of a rotary pin having a flat side 23^c designed to be pressed upon by spring 23^b, this pin engaging a curved recess 19^c in the outer surface of the hammer, this lock being automatically unlocked on forward movement of the breech block by a projection 6^e on the latter engaging a projection 23^a on the locking pin.

The breech block may be locked in its retracted position by rotary locking pin 24 cooperating with locking recess 6^f of the breech block, the said pin 24 being operated by hand, by the trigger end or handle 24^a.

The trigger is acted upon by spring 25 and is actuated by trigger ward 27 connected thereto by bar 27^a.

The usual stock is indicated at 28, and the gun in practice would be provided with customary front and rear sights and tripod connection.

It is believed that from the foregoing the construction and operation of my improved gun will be clear, it being of course, understood that the gun will continue to fire automatically as long as the finger is held pressed upon the trigger ward, but will stop instantly upon such release as is customary.

Having thus described my invention, what I claim is:

1. A machine gun comprising a casing, a barrel carrier carried thereby to be movable under recoil, a breech bolt slidably carried by said barrel carrier and having a central firing pin, an extractor carried by the upper part of said breech bolt, an ejector carried by the lower part to have limited sliding movement, and a contact device carried by the barrel carrier coacting with a lug on the ejector to project the latter beyond the breech bolt.

2. A machine gun comprising a casing, a barrel carrier carried thereby to be movable under recoil, a breech bolt slidably carried by said barrel carrier and having a central firing pin, an extractor carried by the upper part of said breech bolt, an ejector carried by the lower part to have limited sliding movement, said ejector having an elongated recess in its under surface terminating in an abrupt shoulder at its forward end, and a projectable contact device carried by the barrel carrier for coaction with said shoulder.

3. A machine gun comprising a casing, a barrel carrier carried thereby to be movable under recoil, a breech bolt slidably carried by said barrel carrier and having a central firing pin, an extractor carried by the upper part of said breech bolt, an ejector carried by the lower part to have limited sliding movement, said ejector having an elongated recess in its under face terminating in an abrupt shoulder, a slidable pin seated in a recess in the barrel carrier

d adapted to enter said recess and coopate with said shoulder, and a spring in id recess acting on said pin.

4. In a machine, a main casing, a barrier movable therein under recoil, a bar- rigidly connected to said barrel carrier, breech block and breech bolt supported by id barrel carrier, said breech bolt having central passage, a firing pin therein, said eech bolt and firing pin having aligning ngated slots or recesses, and said breech ck having a part projecting into both id slots or recesses.

5. In a machine gun, a main casing, a rrel carrier slidably guided therein, a eech bolt slidably guided in said carrier d carrying a firing pin, a breech block dably carried in said casing, said breech ck having a lost motion connection with th said breech bolt and firing pin and hav- also a shoulder adjacent the rear end of e breech bolt and a hammer having face rtions overlying said shoulder and the r end of the breech block.

6. In a machine gun, a main casing, a rrel carrier slidably guided therein, a eech bolt slidably guided in said carrier d carrying a firing pin, a breech block dably carried in said casing, said breech ck having a lost motion connection with th said breech bolt and firing pin and hav- also a shoulder offset in rear of the rear d of the breech bolt, and a hammer hav- a stepped face cooperating with said ulder and breech bolt end.

7. In a machine gun, a main casing, a rrel carrier slidably guided therein, a eech bolt slidably guided in said carrier d having a central longitudinal passage, iring pin located in said passage, a breech ck slidably guided in said carrier and ving a part overlying the breech bolt, said eech bolt and firing pin having aligning esses of different lengths and said overng part a projection extending into said esses, said breech block having a shoulder set in rear of the rear end of the breech lt, and a hammer having a stepped face perating with said shoulder and breech lt end.

8. In a machine gun, a main casing, a rrel carrier slidably guided in said cas- , a breech bolt and firing pin slidably ided by said carrier, a breech block hav- a lost motion connection with said breech lt and firing pin, a hammer pivotally car- d by said barrel carrier and having a part coacting with said breech bolt and fir- pin, and a spring acting on said ham- r.

9. In a machine gun, a main casing, a rrel carrier slidably guided therein, a eech bolt and firing pin slidably mounted said carrier, a breech block also slidably mounted in said carrier, a main spring exerting forward pressure on said breech block, a hammer articulated to said carrier, an arm or projection depending from the hammer, a slidable member having a part connected to said hammer arm, a spring exerting rearward pressure on said slidable member, and trigger mechanism cooperating with said slidable member.

10. In a machine gun, a main casing, a barrel carrier slidably guided therein, a breech bolt and firing pin slidably mounted in said carrier, a breech block also slidably mounted in said carrier, a main spring exerting forward pressure on said breech block, a hammer articulated to said carrier, manually operated locking means for holding said breech block in retracted position, an arm or projection depending from the hammer, a slidable member having a part connected to said hammer arm, a spring exerting rearward pressure on said slidable member, and trigger mechanism cooperating with said slidable member.

11. In a machine gun, a main casing, a barrel carrier slidably guided therein, a breech bolt and firing pin slidably mounted in said carrier, a breech block also slidably mounted in said carrier, a hammer articulated to said carrier, a slidable rod guided in the casing and extending through an opening in the breech block, the forward end of said rod having an actuating connection with said hammer, a spring interposed between the front end of said rod and a part of the barrel carrier, a trigger mechanism cooperating with a part carried by said rod, and a spring exerting forward pressure on said breech block.

12. In a machine gun, a main casing, a barrel carrier slidably guided therein, a breech bolt and firing pin slidably mounted in said carrier, a breech block also slidably mounted in said carrier, a hammer articulated to said carrier, a slidable rod guided in the casing and extending through an opening in the breech block, the forward end of said rod having an actuating connection with said hammer, a spring interposed between the front end of said rod and a part of the barrel carrier, a trigger mechanism cooperating with a part carried by said rod, and a helical spring encircling said rod and exerting forward pressure on the breech block.

13. In a machine gun, a main casing, a barrel carrier slidably guided therein, a breech bolt and firing pin slidably mounted in said carrier, a breech block also slidably mounted in said carrier, a hammer articulated to said carrier, a slidable rod guided in the casing and extending through an opening in the breech block, the forward end of said rod having an actuating con-

nection with said hammer, said rod having a tubular front end, a second rod connected to a part on the carrier and slidably engaging said recess, a compression spring encircling said second rod, and trigger mechanism coacting with said first named rod.

14. In a machine gun, a main casing, a barrel carrier slidably guided therein, a breech bolt and firing pin slidably carried by said carrier, a breech block slidably carried in said carrier, a hammer articulated to said carrier, an automatic lock for holding said hammer, and means on the breech block for automatically unlocking said hammer.

In testimony whereof, I affix my signature.

NICASIO CEDILLO.