

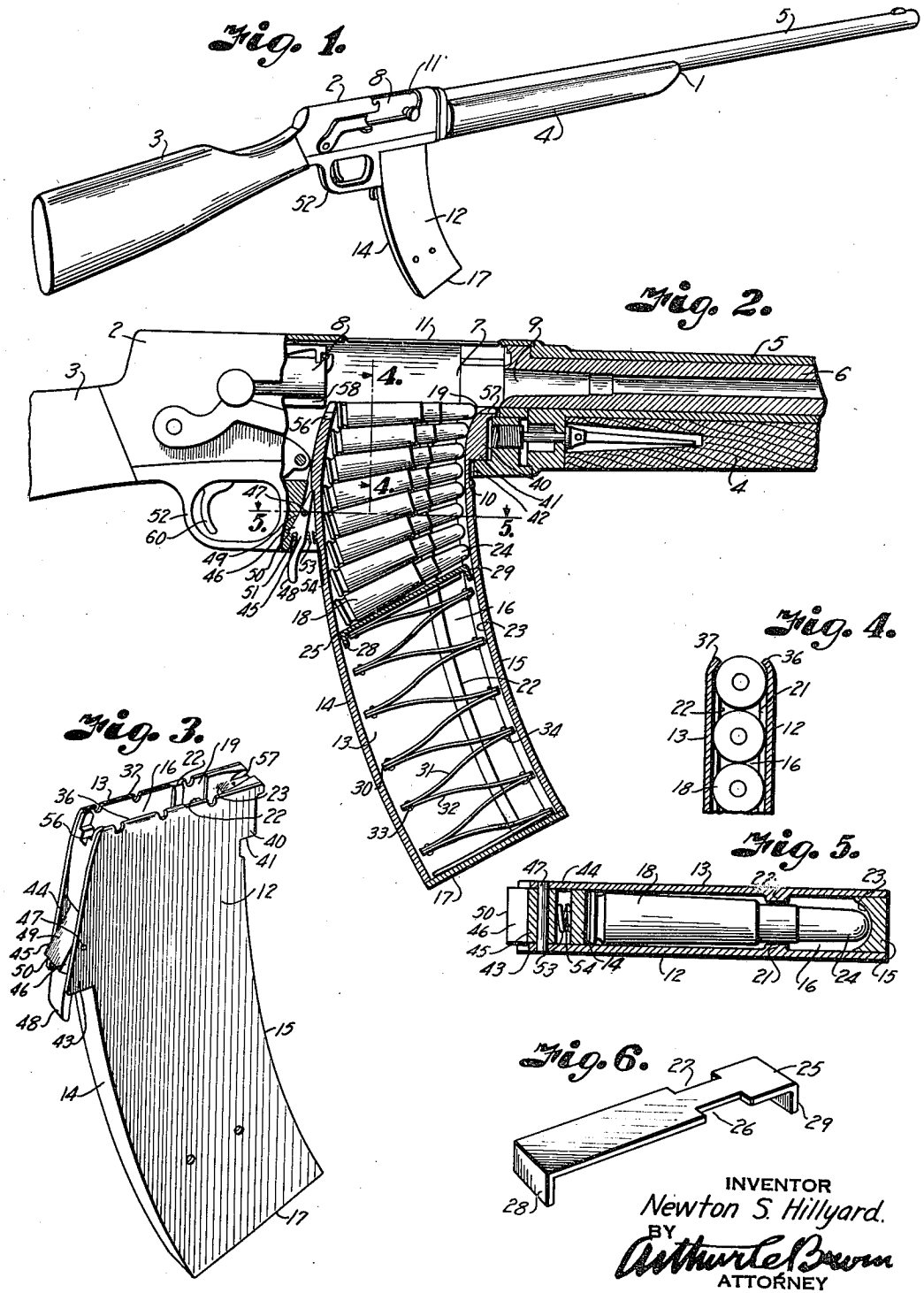
May 25, 1937.

N. S. HILLYARD

2,081,235

FIREARM

Filed Oct. 8, 1934



INVENTOR
Newton S. Hillyard.
BY
Arthur L. Brown
ATTORNEY

UNITED STATES PATENT OFFICE

2,081,235

FIREARM

Newton S. Hillyard, St. Joseph, Mo.

Application October 8, 1934, Serial No. 747,271

5 Claims. (Cl. 42—50)

This invention relates to firearms and more particularly to a cartridge magazine for use in automatic rifles of the type wherein the cartridge receptacle is located in the rear of and below the entrance to the gun chamber and which is ordinarily loaded with the aid of a charger or by inserting the cartridges one at a time through the shell discharge opening of the rifle.

Owing to the high velocity and shooting power of this type of rifle, together with ease of operation and manoeuvring ability, peace officers have found them more effective in present day bandit warfare than other types of firearms; however, due to the extremely slow method of loading, the rifles are practically useless after the cartridge receptacle has become emptied. Another disadvantage is that rifles of this character are ordinarily constructed to contain no more than five or six cartridges due to the fact that the cartridges are likely to jam when they are being swept out of the charger into the gun.

For these reasons rifles have given way to lower power type of firearms, such as machine, sub-machine and like guns which are adapted to contain greater amounts of ammunition.

The principal objects of the present invention are, therefore, to provide a cartridge magazine of greater capacity which may be substituted for the conventional cartridge receptacle and which may be readily removed when empty and replaced with a similar filled magazine so that the fire may be substantially continuous.

Another important object of the invention is to provide a magazine so shaped that the cartridges are automatically moved to firing position without danger of jamming.

In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of an automatic rifle equipped with a cartridge magazine constructed in accordance with the present invention.

Fig. 2 is a fragmentary view, partly in section, of the breech portion of the rifle and showing the cartridge magazine in position for feeding the cartridges into the firing chamber.

Fig. 3 is a detail perspective view of the cartridge magazine as it appears when removed from the rifle.

Fig. 4 is a cross section through the upper portion of the magazine on the line 4—4, Fig. 2.

Fig. 5 is a horizontal section through the magazine on the line 5—5, Fig. 2.

Fig. 6 is a detail perspective view of the elevator plate for supporting the cartridges.

Referring more in detail to the drawing:

1 designates an automatic rifle including a breech housing 2, shoulder and hand stocks 3 and 4, and a barrel jacket 5 in which is slidably mounted a gun barrel 6.

The breech housing 2 includes a firing chamber 7 in which is reciprocally mounted a breech block 8 movable to and from the breech end 9 of the barrel in firing of the rifle. Formed in the breech housing below the firing chamber 7 is a recess 10 which normally connects with a receptacle for containing cartridges which are inserted through the shell discharge opening 11 in the top of the firing chamber.

In the present invention, however, the cartridge receptacle is removed and replaced with a cartridge magazine embodying the features of the present invention. The magazine is best illustrated in Figs. 3 to 5, inclusive, and includes spaced arcuate side plates 12 and 13 having their side edges connected by arcuate shaped walls 14 and 15 to form a substantially arcuate shaped cartridge chamber 16 having its bottom closed by an end plate 17. The cartridge chamber 16 is of sufficient length and width to accommodate standard size cartridges 18 which are moved through the open top 19 of the magazine into the firing chamber upon actuation of the breech block as later described.

Owing to the fact that the cartridges 18 are of tapered formation, the side plates 12 and 13 are provided on their inner surfaces adjacent the neck portions of the cartridges with arcuate ribs 21 and 22 for cooperating with the rear inner faces of the plates 12 and 13 to retain the cartridges in central position in the chamber 16 as best illustrated in Fig. 5.

The arcuate wall 15 is preferably concave on its inner face as indicated at 23 to form a guide for the rounded nose of the cartridge bullet 24.

In order to support the cartridges for movement into the firing chamber, the magazine is provided with an elevator or follower plate 25 which conforms in shape to the interior of the chamber 16 and has notched portions 26 and 27 for slidably engaging the guide ribs 21 and 22 and flanged ends 28 and 29 for slidably engaging the inner face of the side walls 14 and 15 as best illustrated in Fig. 2. The elevator plate is normally urged into engagement with the cartridges by means of a spring element 30 composed of reversely curved flat spring leaves 31 and 32 riveted together at their ends as at

33 and 34 to the respective ends of adjacent leaves and thereby forming an accordion shaped spring of sufficient length to support the plate 25 at the open end of the magazine when empty of shells. To frictionally retain the cartridges within the chamber against tension of the spring element 36, while the magazine is being inserted in the rifle, the upper edges of the plate are curved inwardly as at 35 and 37 to yieldingly engage the side edges of the upper-most cartridge as best shown in Fig. 4.

In order to releasably secure the magazine within the breech housing, the upper end of the side wall 15 is provided with an outwardly extending lug portion 40 which forms a shoulder 41 adapted to engage or hook into a corresponding shoulder 42 that is provided on the breech housing, as shown in Fig. 2.

The upper rear portions of the side plates 12 and 13 project beyond the wall 14 to form ears 43 and 44 between which is pivotally mounted a latch member 45. The latch member 45 includes a triangular shaped head 46 that is pivoted between the ears on a pin 47 and carries a depending lever 48 offset from the rear face 49 of the head portion to form a detent 50 adapted to engage in a notch 51 that is located in the breech housing in alignment with the trigger guard 52. The latch is ordinarily retained in latched position by a coil spring 53 having one end bearing over a boss 54 formed on the arcuate wall 14 and its other end bearing against a similar boss on the latch 45, as best shown in Fig. 2.

The upper end of the arcuate walls 14 and 15 are notched, as at 56 and 57, so that a guide rib 58 on the breech block moves through the upper end of the magazine in propelling engagement with the rear end of the uppermost cartridge to move the cartridge through the firing chamber and into the breech of the gun barrel.

In using a magazine constructed as described, the magazines are filled with cartridges by inserting the cartridges through the open end thereof and pressing them past the intumed lip portions 36 and 37 to depress the elevator plate against tension of its spring 30.

When the magazine is filled, the upper end of the magazine is inserted through the opening in the recess 10 so that the shoulder 40 on the magazine engages over the shoulder 41 of the breech housing, after which the lower end of the magazine is moved toward the trigger guard to cause the latch 45 thereon to engage the shoulder 51 under influence of the coil spring 53. The magazine is then firmly anchored in position so that the uppermost cartridge is in position to be engaged by the guide rib on the breech block.

When the breech block is moved from cocked position toward the breech of the barrel, the upper cartridge is moved thereby so that the bullet end thereof moves upwardly over the curved portion of the barrel into the breech 9. When the end of the breech block engages the barrel it is automatically latched thereto and the rifle is ready for firing.

Upon gripping the trigger 60, the firing mechanism will be actuated to explode the cartridge for propelling the bullet 24 through the barrel. Upon recoil, the breech block is moved retractionally, carrying the barrel therewith, so that the next shell in the magazine is retained in depressed position. At the end of the recoil, the breech block is recocked for another operation and the

barrel is released for effecting throw-out of the empty shell and its return to normal position.

The next uppermost cartridge then moves into position for engagement with the breech block ready to be moved thereby into the breech of the barrel. The gun is then again in firing condition upon operation of the trigger 60.

When all of the cartridges have been fired, the magazine is quickly released by pushing forwardly on the lever 43 to release the detent from latched engagement with the shoulder 51. The lower end of the magazine is then moved forwardly with the shoulder 40 pivoting on the shoulder 41 until the upper end of the magazine has cleared the lower portion of the trigger guard. The shoulder 40 of the magazine may then be unhooked from the shoulder 41 completing the release of the magazine.

A filled magazine may then be readily inserted in place of the empty magazine so that the rifle is again in condition for firing with a minimum loss of time between the removal of the empty magazine and insertion of the filled magazine.

What I claim and desire to secure by Letters Patent is:

1. In a firearm including a barrel having a cartridge chamber, a breech housing having a recess through which cartridges are moved into the cartridge chamber and provided with shoulder portions on opposite sides of the recess, an arcuate shaped cartridge magazine having a shoulder portion at one arcuate side thereof adapted to interengage one of said shoulder portions of the breech housing, a pair of spaced ears on the opposite arcuate side of the magazine, a latch having its upper end pivoted between said ears, a tongue on the lower end of the latch for releasing the latch, and means for yieldingly retaining the latch in engagement with the other of said shoulder portions of the breech housing.

2. A cartridge magazine of the character described having means at one side thereof adapted to engage in a portion of a breech housing of a firearm, a pair of spaced ears on the opposite side of the magazine, a latch having its upper end pivoted between said ears, a tongue on the lower end of the latch for releasing the latch, and means for yieldingly retaining the latch in engagement with another portion of the breech housing of said firearm.

3. A cartridge magazine of the character described having means at one side thereof adapted to engage in a portion of a breech housing of a firearm, a pair of spaced ears on the opposite side of the magazine, a latch having its upper end pivoted between said ears, a tongue on the lower end of the latch for releasing the latch, means for yieldingly retaining the latch in engagement with another portion of the breech housing of said firearm, and means in the magazine for moving cartridges therein to the breech housing of said firearm.

4. In a firearm including a barrel having a cartridge chamber, a breech housing having a recess through which cartridges are moved into the cartridge chamber and provided with shoulder portions on opposite sides of the recess, a cartridge magazine having a shoulder portion at one side thereof adapted to interengage one of said shoulder portions of the breech housing, a pair of spaced ears on the opposite side of the magazine, a latch having its upper end pivoted between said ears, a tongue on the lower end of the latch for releasing the latch, and means

for yieldingly retaining the latch in engagement with the other of said shoulder portions of the breech housing.

5 In a firearm including a barrel having a cartridge chamber, a breech housing having a recess through which cartridges are moved into the cartridge chamber and provided with shoulder portions on opposite sides of the recess, an arcuate shaped cartridge magazine having a
10 shoulder portion at one arcuate side thereof adapted to interengage one of said shoulder por-

tions of the breech housing, means in said magazine for moving cartridges therein to said cartridge chamber, a pair of spaced ears on the opposite arcuate side of the magazine, a latch having its upper end pivoted between said ears, a
5 tongue on the lower end of the latch for releasing the latch, and means for yieldingly retaining the latch in engagement with the other of said shoulder portions of the breech housing.

NEWTON S. HILLYARD. 10