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CARTRIDGE FEEDING MECHANISM

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2 Sheets-Sheet 1

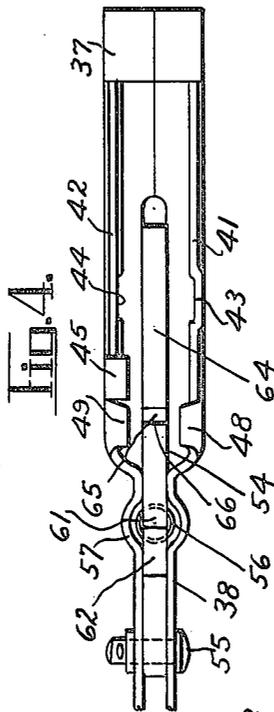
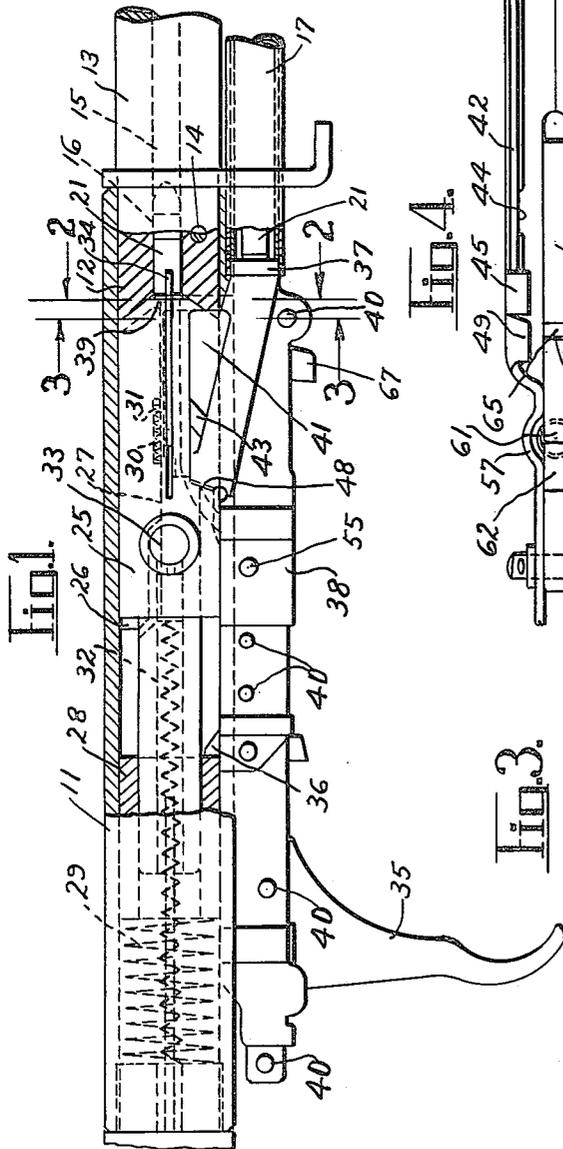
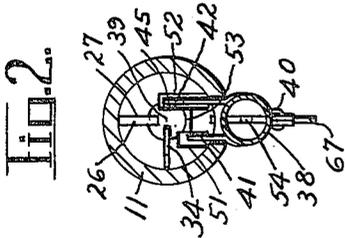
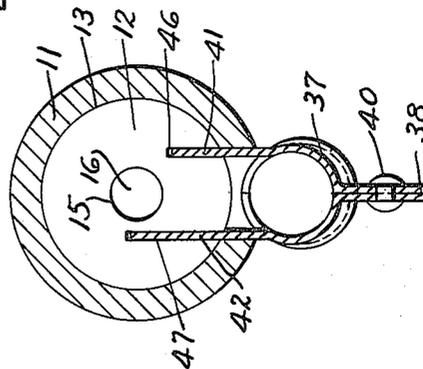


Fig. 3.



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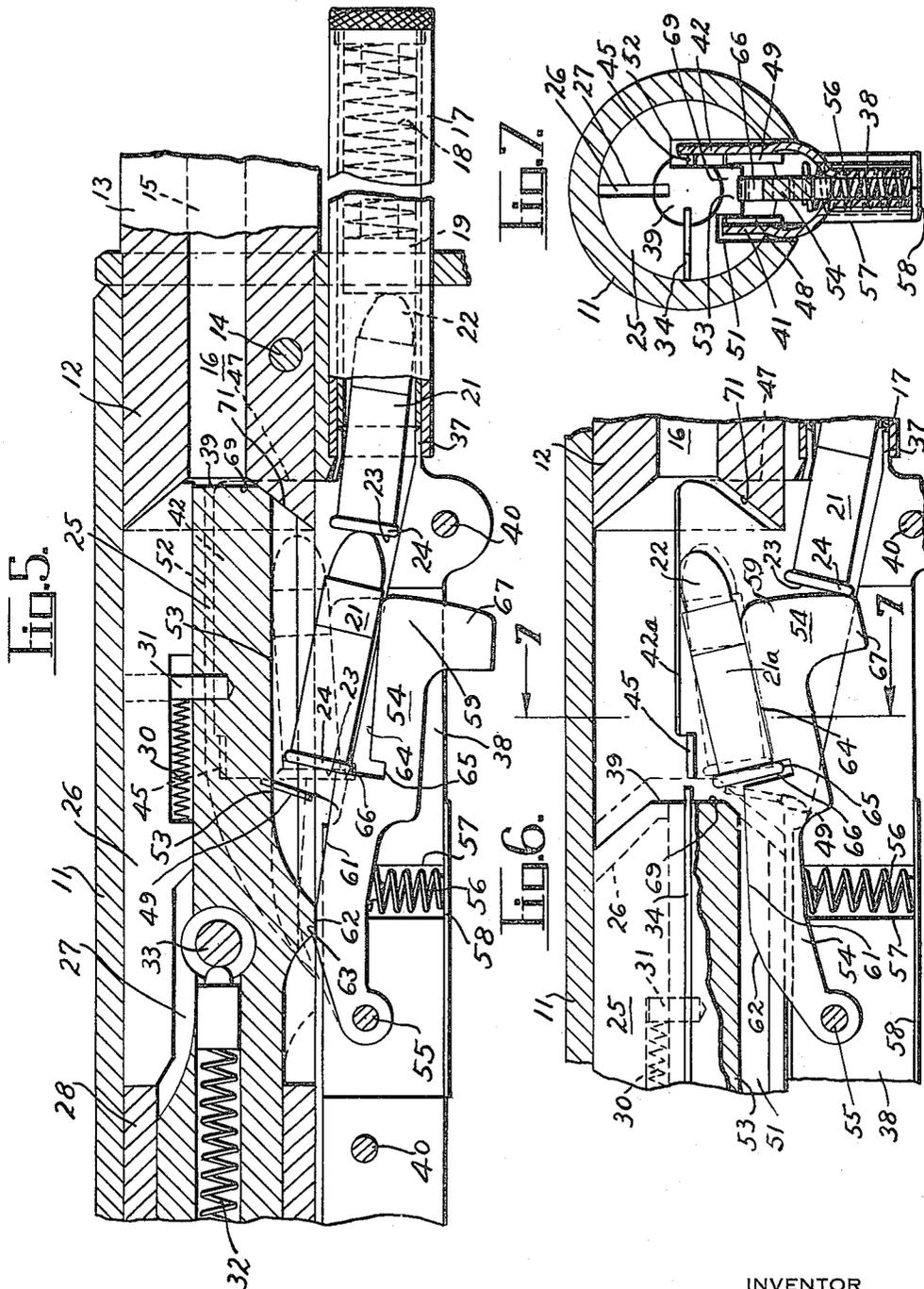
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CARTRIDGE FEEDING MECHANISM

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2 Claims. (Cl. 42-17)

This invention relates to firearms and more particularly to improvements thereof constituted by new and useful cartridge feeding means especially adapted for use in repeating firearms. The present improvements facilitate the feeding of cartridges from a tubular magazine through a throat and into alignment with the chamber in the breech end of a barrel in a particularly smooth and efficient manner and without any appreciable binding, or possible jamming, action.

One object of this invention is to provide in a firearm an improved form cartridge feeding mechanism.

Another object is to provide in a firearm of the repeating type a cartridge feeding mechanism having an improved form of cartridge carrier operatively associated with an improved form of cartridge guiding throat whereby the cartridge being fed into the firearm action will be smoothly and efficiently moved into alignment with the chamber in the breech end of a barrel.

Still another object is to provide in a firearm of the repeating type an improved form of cartridge feeding mechanism comprising cooperating new and useful features and elements in the structure of a bolt, throat and carrier whereby a cartridge may be smoothly and efficiently fed from a tubular magazine into the chamber of a barrel.

A further object is to provide in a firearm an improved cartridge feeding mechanism which will be relatively inexpensive to manufacture, simple in construction, compact, and very efficient and durable in use.

With these and other objects in view, which will appear as the description proceeds, there has been illustrated in the drawings one form in which the novel features, elements, and principles of this invention may be conveniently and practically embodied.

In the drawings:

Figure 1 shows a longitudinal section of a firearm with certain parts being broken away, the usual stock and forearm being omitted for the sake of clearness;

Figure 2 is a cross-sectional view taken on the line 2-2 of Figure 1 and, by the omission of the breech end of the barrel showing an end view of the cartridge feeding mechanism of this invention;

Figure 3 is an enlarged cross-sectional view taken on the line 3-3 of Figure 1;

Figure 4 is an enlarged broken top plan view of the improved cartridge guiding throat and cartridge carrier elements of this invention;

Figure 5 is an enlarged longitudinal sectional view showing the elements of the improved cartridge feeding mechanism of this invention in assembled relation when the firearm action is in closed position;

Figure 6 is a view similar to Figure 5, but wherein the elements of the improved cartridge feeding mechanism are shown in another position of their operative movements and, in dotted lines, the cooperating action whereby a cartridge is smoothly and efficiently disposed in alignment with the chamber of the barrel; and

Figure 7 is a cross-sectional view taken on the line 7-7 of Figure 6.

Referring now to the drawings wherein like reference numerals designate like parts, or elements, throughout the several views, the reference numeral 11 denotes a receiver, generally tubular in form, the front end of which may be secured, in any desirable manner, to the breech end 12 of a barrel 13. In the illustrated form, the receiver 11 is pinned to the breech end 12 of the barrel 13 by a cross pin 14. The barrel 13 has the usual bore 15 and cartridge receiving chamber 16. A tubular magazine 17 is disposed below and extends forwardly along the barrel 13. A cartridge feeding spring 18 acting on a slide 19 constantly urges cartridges disposed in the magazine rearwardly and out of the open rear end of the magazine 17. Cartridges 21, herein shown as being of the rim fire type are urged rearwardly, the nose 22 of each being engaged by the head 23 of a succeeding one, the nose 22 of the last one being engaged by the slide 19. The head 23 of each of the usual rim fire cartridge has a circumferential rim 24 extending outwardly thereabout.

A bolt 25 is provided and is slidable lengthwise in the receiver 11 toward and away from the breech end 12 of the barrel 13 to seat a cartridge 21 in the chamber 16 and to retain it therein until the cartridge is fired by action thereon of a firing pin 26. The firing pin 26 is slidable in a groove 27 in the upper surface of the bolt 25 and is actuated forwardly by a striker 28 urged forwardly by a spring 29 in a well-known manner. The firing pin 26 is retracted by a spring 30, reacting between the firing pin and a pin 31 secured in the bolt 25. The bolt 25 is urged forwardly by a spring 32 in a common and well-known manner, and is moved rearwardly either manually, by the use of a knob (not shown) on the outer end of a pin 33, or automatically, due to the back pressure developed when the cartridge is fired. A cartridge shell extractor 34 is carried by the bolt 25 and operates in a well-known manner when the bolt is retracted. A trigger 35 connected to a sear 36 releases the striker 28 from the retaining action of the sear 36. The cartridges 21 are fed into the receiver 11 from the magazine 17, through a tubular portion 37 at the forward end of a casing 38, one at a time, to be engaged by the forward end 39 of the bolt 25 to be pressed toward and seated in the chamber 16 in a manner to be described hereinafter.

In this instance, the casing 38 is formed of two substantially similar sheet metal plates riveted together at intervals by rivets 40. At the front of the casing, the plates are formed to provide the tubular portion 37 which enters the rear end of the magazine 17. The plates are then extended upwardly to provide laterally spaced apart side flanges 41 and 42 forming a cartridge throat therebetween. Diagonal opposing grooves may be struck outwardly of flanges 41 and 42, respectively, as at 43 and 44, to permit the rim of a cartridge to move upwardly therein when the cartridge is engaged and moved forwardly by the bolt 25 in a manner to be described hereinafter. The flange 42 extends upwardly farther than the flange 41 and has an upper edge 42^a turned inwardly at the rear portion thereof to form an ejector 45. The breech end 12 of the barrel 13 is slotted as at 46 and 47 to receive the forward ends of the flanges 41 and 42, respectively, and retain them against possible flaring apart at this point. The rear edges of the flanges 41 and 42 are inclined forwardly and upwardly and opposing lips 48 and 49 are formed thereat and provide rear cartridge guides. The under surface of the forward end of the bolt 25 is slotted lengthwise at 51 and 52 to permit the bolt to slide over the flanges 41 and 42, the ejector 45, and the lips 48 and 49, respectively. A rib 53 extends lengthwise of the bolt 25 between the slots 51 and 52, and a boss 63 is formed

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on the underside of the bolt 25 at the rear end of the rib 53 for a purpose to be hereinafter disclosed.

The plates constituting the casing 38 are spaced apart to the rear of the tubular portion 37 and beneath the flanges 41 and 42 to provide a space for a cartridge carrier or lifter 54 to swing. The carrier 54 is pivoted to the casing 38 on a pin 55 and is constantly urged upwardly by a spring 56 disposed in opposing vertical grooves 57 formed in the plates of the casing 38; the spring 56 reacting between the underside of the carrier 54 forward of its pivot 55 and opposing lower flanges 58 provided on the plates of the casing 38.

When the bolt 25 is in the fully retracted position shown in Fig. 6, and the cartridge carrier or lifter 54 is inoperative or empty, the forward portion 59 of the carrier is elevated in the cartridge throat by the spring 56, and a forwardly inclined upper edge 61 of the carrier 54 is engaged by the rib 53 at the forward end of the bolt preventing further upward movement of the carrier. Thus, when the carrier 54 is empty and the bolt is moved forwardly from the retracted position shown in Fig. 6 to the closed position shown in Fig. 5, the rib 53 of the bolt engaging the inclined upper edge 61 of the carrier 54 depresses the same to a slight extent, and the boss 63 of the bolt engages an upper cam surface 62 provided on the carrier to further depress the carrier and move the latter to the position shown in Fig. 5.

The carrier 54 is provided with a substantially planar platform surface 64 extending rearwardly from its forward end to receive a cartridge 21 from the tubular portion 37 of the casing when the bolt is closed and the carrier is in the lower position shown in Fig. 5. A cross slot 65 is formed in the rear end of the platform 64, the rear wall of the slot 65 extending upwardly above the platform 64 to provide a stop shoulder 66 engaging the head 23 of the cartridge 21 fed out of the portion 37 of the casing by the slide 19 and the spring 18, as shown in Fig. 5. As the bolt is moved rearwardly from the position shown in Fig. 5, the boss 63 disengages the cam 62 of the carrier, allowing the carrier to rise in the cartridge throat, lifting the cartridge 21 until the latter strikes the under surface of the rib 53 of the bolt. This position of the cartridge is shown in dotted lines in Fig. 5. Further upward movement of the carrier and cartridge is prevented until the rib 53 of the bolt clears the cartridge as the withdrawal movement of the bolt continues. As the bolt 25 is withdrawn, the forward end of the carrier is permitted to swing upwardly, seating the body 21^a of the cartridge 21 upon the platform 64, the slot 65 providing clearance for the rim 24 of the cartridge so that the body 21^a of the cartridge lies substantially flush with the platform 64.

As the carrier or lifter 54 rises, a depending lug 67 provided on the carrier at the forward end thereof engages the next following cartridge to prevent the latter from moving rearwardly out of the portion 37 of the casing until the platform 64 is again lowered to receive the following cartridge. When the rib 53 of the bolt clears the cartridge 21, as explained above, the upward movement of the carrier or lifter and the cartridge is resumed, and the cartridge is moved upwardly until the cartridge reaches the position shown in full lines in Fig. 6. In this position, the upper portion of the head of the cartridge is engaged by the aforementioned rear cartridge guides 48 and 49. As previously stated, the rear cartridge guides 48 and 49 are inclined forwardly and upwardly. Therefore, it will be understood that, as the cartridge is lifted by carrier or lifter and the cartridge head engages the rear guides 48 and 49, the cartridge is moved forwardly. As the cartridge is guided forwardly by the rear guides 48 and 49, the forward edge of the rim 24 of the cartridge, or, in other words, the portion of the cartridge between the body 21^a and the periphery of the rim 24, is firmly engaged by the forward wall of the slot 65 in the carrier, the position of the cartridge being

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shown in full lines in Fig. 6. From the foregoing, it will be understood that the cartridge is firmly held in this position and accidental displacement of the same inhibited. Owing to the relationship of the cartridge with respect to the carrier and the rear cartridge guides 48 and 49, dislocation of the cartridge, likely to cause the bolt to jam upon forward movement thereof, is inhibited in a very satisfactory manner.

Forward movement of the bolt 25 from the fully retracted position shown in Fig. 6 causes engagement of the front end 69 of the rib 53 with the cartridge head. Owing to the engagement between the forward edge of the cartridge rim and the forward wall of the slot 65 in the carrier, further forward movement of the bolt 25 causes the carrier 54 to be slightly depressed, thereby releasing the forward edge of the cartridge rim, the position of the cartridge being shown in Fig. 6 in dotted lines. The cartridge is substantially horizontally disposed in this position.

To facilitate entrance of the cartridge nose 22 into the chamber 16, the breech end of the barrel may be countersunk as at 71, the forward end 39 of the bolt being formed to enter the countersink 71. As the bolt 25 is carried forwardly from the dotted-line position indicated in Fig. 6, the cartridge is moved forwardly by the bolt and the cartridge nose 22 is moved into the chamber 16, the cartridge head being guided upwardly to the proper elevation for insertion into the breech end of the barrel by the diagonal opposing grooves 43 and 44 formed in the flanges 41 and 42, respectively. Thus it will be understood that when the bolt 25 is in the fully closed position, the cartridge is properly seated in the chamber 16 and the firearm is in battery.

When the bolt is in the closed position, the carrier 54 is once again in lower position to receive the next following cartridge from the portion 37 of the casing, and the cartridge feed cycle may be repeated by the aforementioned previously described sliding action of the bolt.

While there has been shown and described herein one form of improved cartridge feeding mechanism for firearms, it is to be understood that the features and principles of this invention may be embodied in other forms without departing from the spirit and essential attributes thereof and it is therefore desired that the form shown be considered in all respects as illustrative and not restrictive, reference being had to the claims rather than to the foregoing description to indicate the scope of the invention.

Having thus fully disclosed the invention, what is claimed as new and for which it is desired to obtain Letters Patent, is:

1. In a firearm, a receiver having a forwardly extending barrel, a tubular magazine below the barrel and extending forwardly therefrom, a bolt slidable in the receiver, an elongated throat-forming member disposed longitudinally in said receiver and having substantially parallel side portions, said side portions being provided with upwardly and forwardly inclined opposing lips at the rear of the throat, and an elongated cartridge lifter extending forwardly into the throat intermediate said side portions and pivoted to said receiver rearwardly of said lips, said lifter being spring biased to swing upwardly and rearwardly for lifting a cartridge in the throat, said lifter being provided with a planar cartridge platform and being provided with a rearwardly facing shoulder disposed at the rear of said platform, said shoulder extending below said platform and being disposed at right angles thereto, said platform being adapted to receive a cartridge thereon from said magazine to be lifted in said throat, and said platform receiving the cartridge so that the cartridge head is disposed rearwardly of said shoulder, said lifter at one point in the lifting movement thereof moving the upper portion of the cartridge head against said lips of the throat-forming member to cam the cartridge forwardly on said platform so that the lower portion of the cartridge

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head engages said shoulder, whereby raising of the cartridge nose relatively to the lifter is inhibited.

2. In a firearm, a receiver having a forwardly extending barrel, a tubular magazine below the barrel and extending forwardly from the receiver, a bolt slidable in the receiver, an elongated throat-forming member disposed longitudinally in said receiver and having substantially parallel side portions, said side portions being provided with opposing upwardly and forwardly inclined lips at the rear of the throat, and an elongated upwardly spring-biased cartridge lifter extending intermediate said side portions longitudinally of said throat-forming member, said lifter being pivoted in said receiver rearwardly of said lips to swing upwardly and rearwardly for lifting a cartridge in said throat, said lifter being provided with a forward planar platform and being slotted at the rear of said platform to provide a rearwardly facing shoulder, said shoulder extending below said platform and being disposed at right angles thereto, said platform being adapted to receive a cartridge thereon from said magazine to be lifted in said throat, the slot in the lifter receiving the cartridge head during lifting movement of the cartridge,

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said lifter at one point in the lifting movement thereof moving the upper portion of the cartridge head against said lips of the throat-forming member to cam the cartridge forwardly on said platform so that the lower portion of the cartridge head engages said shoulder, whereby raising of the cartridge nose relatively to the lifter is inhibited.

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