Nov. 20, 1928. 1,692,328

J. M. BROWNING

CARTRIDGE FEEDING DEVICE FOR AUTOMATIC FIREARMS

Original Filed Jan. 2, 1925

Fig. 1

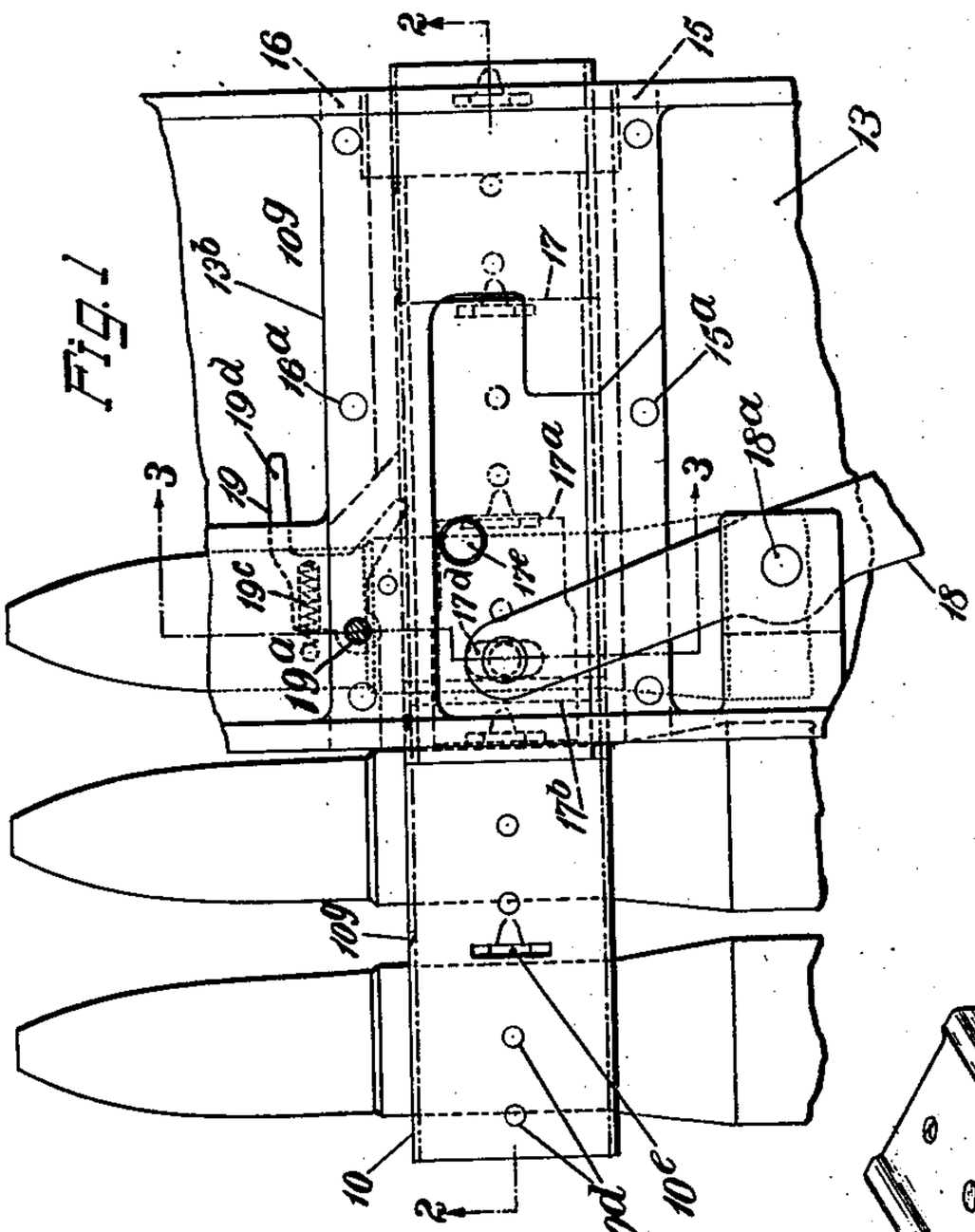


Fig. 2

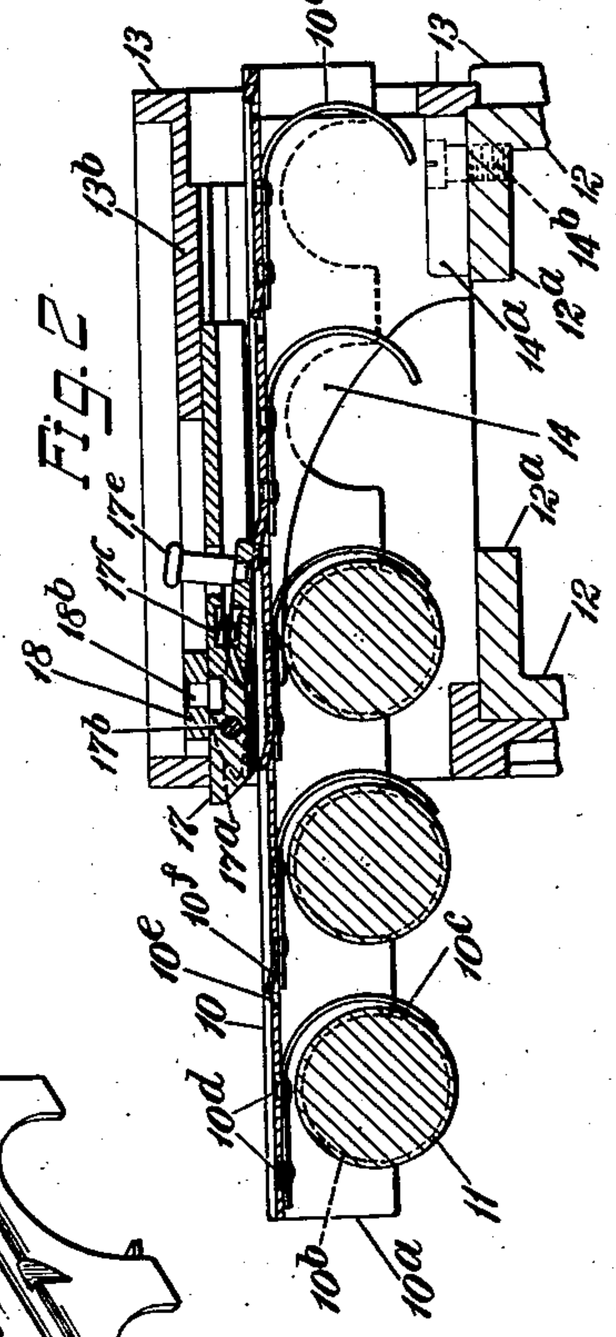


Fig. 4

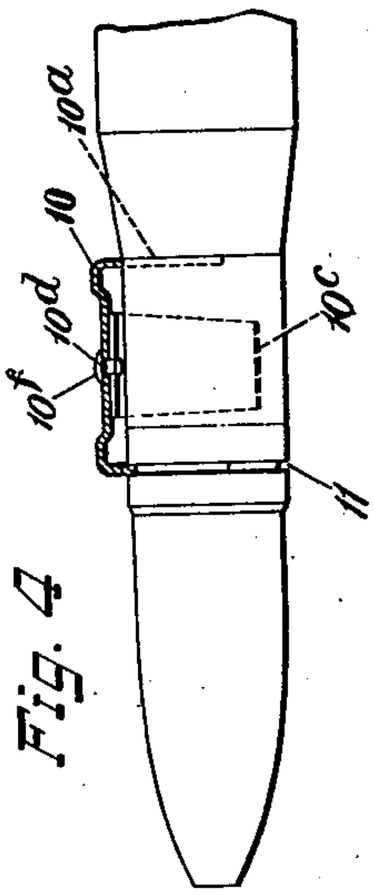


Fig. 3

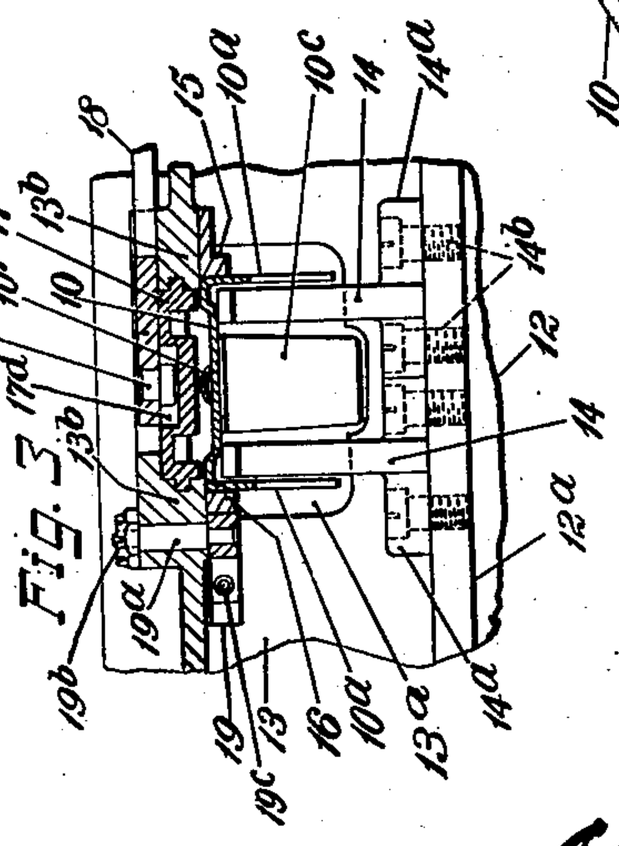
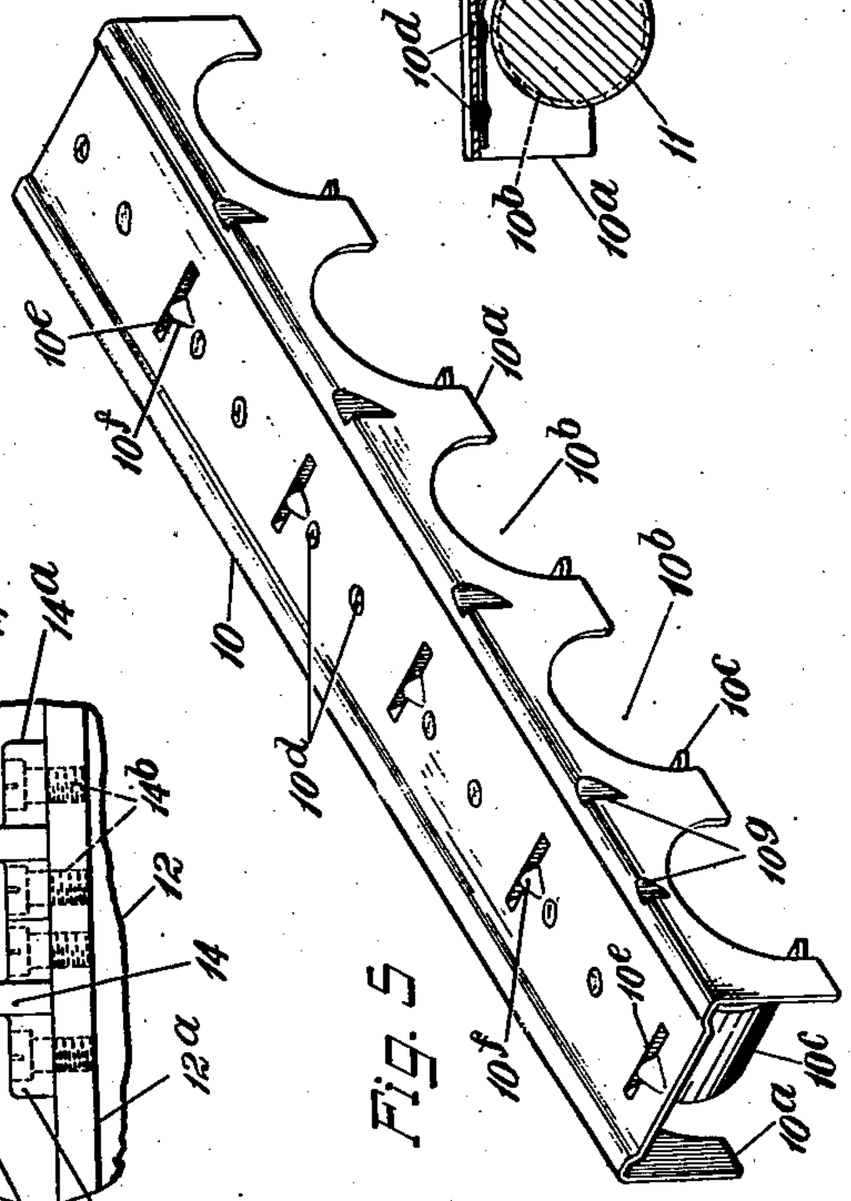


Fig. 5



Inventor

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UNITED STATES PATENT OFFICE.

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CARTRIDGE-FEEDING DEVICE FOR AUTOMATIC FIREARMS.

Application filed January 2, 1925, Serial No. 141. Renewed August 18, 1928.

The invention relates generally to cartridge feeding devices for automatic firearms, and more particularly to such devices in which a holder carrying a plurality of cartridges is moved transversely of the axis of the firearm and the cartridges are successively removed from the holder and transferred into the chamber of the barrel.

It is an object of the invention to provide an improved cartridge holder of this class which is simple in construction and easy of manufacture, light in weight and yet most durable, and which is particularly adapted to hold a number of cartridges of large caliber, say 37 m/m or over, in such manner that they are securely held therein in transport or when placing the holder in the firearm, but can be readily removed from the holder by the means provided for this purpose on the firearm.

Another object of the invention is to provide an improved cartridge unit consisting of a holder and a plurality of cartridges therein, the said holder and cartridges being held in the required relationship by improved and novel means.

A further object of the invention is to provide simple yet highly efficient means for moving the holder transversely of the firearm and for supporting and guiding the holder with the cartridges therein in such movement, and in combining said supporting and guiding means with means for removing the cartridges successively from the holder.

These and other and further objects, which will become more apparent with the following disclosure, are attained by the novel improved means illustrated in the accompanying drawings, described in detail in the specification and pointed out in the claims appended hereto.

In the drawings:

Fig. 1 represents in a plan view a portion of the feed box of the firearm to which the invention is shown applied, the top cover of the feed box being omitted.

Fig. 2 represents a vertical transverse section through the feed box and a portion of the breech casing of the firearm on the line 2—2 of Fig. 1 and as seen from the rear, the spring clips for yieldingly keeping the cartridges seated in the holder being shown in elevation.

Fig. 3 represents a vertical longitudinal section through a portion of the feed box of the firearm on the line 3—3 of Fig. 1 and as seen from the left.

Fig. 4 represents the cartridge holder in a vertical transverse section through a cartridge seat thereof and showing a portion of the cartridge seated therein.

Fig. 5 represents the novel improved cartridge holder in a perspective view.

The novel cartridge holder 10 embodying the invention preferably consists of an elongated piece of sheet metal of small width as compared with the length of the cartridges which it is adapted to hold and has depending flanges 10^a at the front and rear arranged substantially at right angles with the top of the holder, see Figs. 2, 4 and 5. The flanges 10^a are provided with cut-out recesses 10^b forming seats for the cartridges. These recesses are preferably of somewhat greater depth than the radius of the parts of the cartridges seated therein, as is clearly shown in Figs. 2 and 4, and conform to the curvature of the cartridges through a substantial arc, which may be, as in the preferred form of holder shown, an arc of approximately 180°. To permit the easy insertion and removal of the cartridges from their seats, the lower open ends of the recesses are preferably slightly outwardly flaring or rounded, see Figs. 2 and 5.

In order to yieldingly keep the cartridges seated in the holder, spring clips 10^c are provided, these clips being secured to the under side of the top portion of the holder in any suitable manner, as by the rivets 10^d. The clips are curved as shown in the drawings to bring their free ends to bear against the under sides of the cartridges seated in the recesses 10^b of the holder, thereby keeping the cartridges in the holder, see Fig. 2. It will be observed that each of the said elements or clips 10^c is positioned to engage the corresponding cartridge near one side thereof and below the level of the center thereof so that the cartridge is gripped between the said element or clip and the opposite portions of the corresponding seats 10^b formed in the flanges 10^a.

In order to produce a very compact construction, when the holder is filled with

cartridges of the long bottle neck type containing powerful charges of propellant, it is preferably applied to the cartridges at their forward reduced portions, as shown in the drawings, which causes the center of gravity of a cartridge to be located to the rear of the holder. This unbalanced arrangement of the cartridges in the holder has, moreover, an important advantage to be described later on.

In order to properly align the cartridges in the holder and keep them in alignment when seated therein, suitable means are provided which prevent placing the cartridges into the holder unless the cartridges are in the proper endwise relation thereto and, when the cartridges are seated in the holder, said means prevent endwise movement of the cartridges. Such means may comprise the edges of the recesses 10^b in one of the flanges 10^a of the holder, preferably the forward flange, which recesses are of somewhat less diameter than the diameters of the adjacent parts of the cartridges to be seated therein, and corresponding grooves 11 formed in these parts of the cartridges, said grooves being of a width to snugly receive the edges of the recesses therein when the cartridges are seated in the holder, see Figs. 2 and 4. These grooves may be conveniently formed in the usual rotating band on the projectiles, as shown in Fig. 4.

By this construction, it will be evident that the cartridges cannot be inserted in the holder except when in their proper endwise relation thereto, nor can they have any endwise movement to bring them out of alignment when seated therein.

This construction has the further important advantage of opposing the removal of the cartridges from the holder except by the means provided on the firearm with which the holder is adapted to be used. Because of the unbalanced arrangement of the cartridges in the holder, the rear ends thereof, because of their greater weight and inertia will tend to move down against the action of the spring clips more readily than the forward ends. But because of the engagement of the edges of the recesses in the forward flange of the holder in the grooves of the cartridges any such sagging or downward movement of the rear ends of the cartridges at once causes a binding action between the walls of the forward recesses 10^b and the forward and rear walls of the grooves 11 in the cartridges to prevent further downward movement of the rear ends of the cartridges and thus assist the spring clips in keeping the cartridges in their seats, and thereby permit the use of spring clips, of less strength than would otherwise be required.

The horizontal top portion of the holder 10 is preferably indented, as clearly shown in Figs. 3 and 5 for the greater portion of its width, for strengthening purposes and also for other purposes as will presently appear.

The holder is formed with suitable means for engagement with the feeding mechanism of the firearm with which it is adapted to be used. In the embodiment of the invention selected for illustration, transverse slots 10^e are cut at equally spaced points along the length of the holder through its top, and on the forward side of these cuts, the metal has been struck up to form shouldered feed lugs 10^f adapted to cooperate with the feed pawl of the firearm. These shouldered lugs 10^f are preferably made by striking up a relatively small portion of the metal of the holder whereby, while they are sufficiently strong for ordinary feeding purposes, they may, should unusual resistance to the feeding movement of the holder be encountered, give way and thus prevent possible injury to other parts of the feeding mechanism of the firearm. The damaged holder can be discarded and replaced with a whole one.

Since the lugs 10^f are formed in the indented portion of the top of the holder and do not project above the lateral raised portions of the holder, they are protected from injury in the careless handling of the loaded holders, or otherwise.

Notches 10^g are provided at the top edge of the forward part of the holder for co-operation with a stop pawl of the firearm to prevent rearward movement of the holder.

In Figs. 1, 2 and 3 are shown portions of a firearm with which the novel improved holder is adapted to be used although its use is not restricted to any particular type of firearm. The breech casing 12 of the firearm here shown and the mechanism generally (not shown) is similar in construction to that shown and described in my patent for an automatic firearm, No. 1,525,065 dated February 3, 1925. As in the said patent, the side plates of the breech casing are provided at the top with inturned flanges 12^a, between which is an opening through which the cartridges are adapted to be fed downwardly into position for insertion into the chamber of the barrel.

The feed box 13, which is of a modified construction from that shown in the said patent to adapt it to receive and cooperate with the novel improved holder, is mounted on the top of the breech casing 12 and secured thereto by any suitable means (not shown). In its left hand side wall the feed box is provided with an elongated opening adapted to permit the passage transversely thereinto of a loaded cartridge holder, and on its right hand side wall, an opening 13^a, see Fig. 3, is provided for the exit of the empty holder.

Novel improved means are provided to cooperate with the holder for supporting and guiding it in its passage through the feed box. In the embodiment of the invention selected for illustration, such means are com-

bined with the means for removing the cartridges from a holder and starting them downward into the breech casing, and comprise a pair of vertically arranged cam plates 14, see Figs. 2 and 3, extending transversely of the feed box 13, and having means, such as the laterally extending lugs 14^a, at the bottom of their right-hand ends through which the cam plates are secured to the inturned flanges 12^a of the right-hand side plate of the breech casing, as by screws 14^b.

These cam plates are vertically thin at their left-hand ends to permit these ends to enter the space between the cartridges and the top of the cartridge holder as the latter is moved from left to right through the feed box. The under sides of the cam plates, from a point some distance removed from the left hand ends, extend downwardly and toward the right on a gradually increasing curvature until they meet the horizontal lowest surfaces of the cam plates adjacent the inner edge of the inturned flange 12^a of the right hand side plate of the breech casing. The top surfaces of the cam plates are flat and are spaced vertically a distance below the bottom of a horizontal transverse web 13^b of the feed-box sufficient to receive therebetween the top of the cartridge holder 10, and guide the same through said box.

When the cartridge holder is applied to the firearm the cam plates are located, respectively, just inside the front and rear depending flanges 10^a, the space between the cam plates permitting the spring clips 10^c to pass, see Fig. 3. The top of the holder then rests upon the flat top surfaces of the cam plates and is thus supported and guided by said cam plates in its transverse feeding movement. To further guide the holder the transverse guiding brackets 15 and 16 are arranged, respectively, at the rear and at the front of the respective cam plates. These guiding brackets are secured to the under side of the transverse web 13^b by any suitable means, such as the rivets 15^a and 16^a, respectively, see Fig. 1.

By the foregoing construction it will be seen that, while the top surfaces of the cam plates 14 support the cartridge holder against downward movement in its passage through the feed box of the firearm, the camming action of the curved under sides of said plates upon the cartridges at points forward and rearward of the spring holding clips 10^c successively depresses said cartridges at the same rate of speed at their front portions as at their rear portions, thereby removing said cartridges downwardly from the recesses 10^b against the tension of the spring clips smoothly and without any tendency to bind.

The means for advancing the cartridge holder with a step by step motion may comprise a feed-slide 17 having transverse reciprocating movement in a suitable slide-way provided in the transverse web 13^b of the feed box. The feed slide 17 carries a feed pawl 17^a pivoted in the slide at 17^b and actuated to its operative position by a helical spring 17^c. The nose of the feed pawl is arranged to co-operate with the shouldered projections 10^f on the cartridge holder to move said holder one step to the right on each feeding stroke of the slide 17.

The slide is automatically reciprocated transversely in the operation of the firearm in any usual manner, being connected by suitable means, such as a system of levers similar to those shown in my said patent, to a recoiling part of the firearm, such as the barrel and barrel extension. In the drawings, the first lever 18 of such a system is shown pivoted in the feed box on the vertical pin 18^a, the forward arm of this lever being connected to the feed slide 17 in any suitable manner, as by a stud 18^b on the end of the lever arm projecting into a groove 17^d, see Fig. 3, in the top of the feed slide.

Rearward movement of the holder is prevented by a stop pawl 19 pivoted on the under side of the transverse web 13^b of the feed box by means of a vertically extending pivot stud 19^a rigidly connected to said pawl as by a riveted connection. Said stud is formed at its upper end with a reduced screw-threaded extension adapted to receive a nut 19^b, which is adapted to be turned against the shoulder formed by said reduced end and locked in place.

The forward guide bracket 16 is made in two parts to allow clearance for the stop pawl 19. The pawl 19 is moved to its operative position to co-operate with the shoulders formed by the notches 10^g on the holder 10 by a spring 19^c seated in a recess in the pawl and bearing at one end against an abutment in the feed box, see Fig. 1. The left hand part of the guide bracket 16 limits the movement of the pawl in one direction.

A finger or extension 19^d permits the pawl 19 to be manually moved to its inoperative position, if it is desired to withdraw a cartridge holder in which some cartridges still remain from the left-hand side of the feed box. The feed pawl 17 is also provided with a stud or projection 17^e having an enlarged head which passes through a hole in the feed slide and projects some distance above the same, see Fig. 2, where it can be readily grasped between the thumb and forefinger to lift the feed pawl to its inoperative position. By the arrangement shown and described, the operator can move both pawls to their inoperative position and hold them in such position with one hand, while he withdraws the cartridge holder toward the left with his other hand.

While I have hereinbefore described a specific embodiment of my invention, it is evi-

dent that various changes in the form and arrangement of parts may be made without departing from the spirit of the invention.

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

1. A cartridge holder for automatic firearms comprising a normally horizontal top plate, and cartridge engaging means depending from the top plate and adapted to engage a plurality of cartridges near the front ends thereof, the said means serving by such engagement to prevent relative endwise movements of the cartridges.

2. A cartridge holder for automatic firearms comprising a normally horizontal top plate, and cartridge engaging means depending from the top plate and including a flange extending longitudinally of the holder and having seats for receiving a plurality of cartridges, the portions of the flange at the edges of the seats being adapted to enter annular grooves in the cartridges to prevent relative endwise movements of the cartridges.

3. A cartridge holder for automatic firearms comprising an elongated body having front and rear downward directed flanges provided with downward opening cartridge seats adapted to receive cartridges, and means to prevent endwise movement of the cartridges in said holder.

4. A cartridge holder for automatic firearms comprising a normally horizontal top plate, and two spaced depending flanges extending longitudinally of the holder and each having seats for receiving a plurality of cartridges, the portions of one of the flanges at the edges of the seats therein being adapted to enter annular grooves in the cartridges to prevent relative endwise movements of the cartridges.

5. A cartridge holder for automatic firearms comprising an elongated body having front and rear downward directed flanges and provided with pairs of downward opening cartridge seats formed therein, and resilient elements corresponding in number to the pairs of seats for holding cartridges in the said seats, each of the said elements being positioned to engage the corresponding cartridge near one side thereof and below the level of the center thereof so that the cartridge is gripped between the said element and the portions of the corresponding seats at the opposite side of the cartridge.

6. A cartridge holder for automatic firearms comprising a normally horizontal top plate, two spaced depending flanges extending longitudinally of the holder and each having a plurality of pairs of seats for receiving a plurality of cartridges, and resilient elements corresponding in number to the pairs of seats secured to the plate between the flanges for holding cartridges in the said seats, each of the said elements being positioned to engage the corresponding cartridge near one side thereof and below the level of the center thereof so that the cartridge is gripped between the said element and the portions of the corresponding seats at the opposite side of the cartridge.

7. A cartridge holder for automatic firearms comprising a normally horizontal sheet metal top plate, and cartridge engaging means depending from the top plate and adapted to engage and hold a plurality of cartridges, the aforesaid top plate having transverse slots therein and also having feed lugs struck up from the body thereof adjacent the respective slots.

8. A cartridge holder for automatic firearms having an elongated sheet metal body provided with depending flanges having downward opening cartridge seats, the top of the said holder being formed with raised portions at the front and rear thereof respectively, means for holding cartridges in the said seats, and feed lugs projecting upward from the body between the said raised portions thereof, the said lugs lying below the said raised portions and being thus protected against injury.

9. A cartridge unit for automatic firearms including in combination, a cartridge holder having a plurality of seats open in the downward direction, and a plurality of cartridges in the respective seats and projecting at both sides of the holder, the said holder and the said cartridges having cooperating interfitting parts intermediate the ends of the latter for preventing endwise movement of the cartridges in the holder.

10. A cartridge unit for automatic firearms including in combination, a cartridge holder having a plurality of seats open in the downward direction, and a plurality of cartridges in the respective seats and projecting at both sides of the holder, the said holder and the said cartridges having cooperating interfitting parts intermediate the ends of the latter for preventing endwise movement of the cartridges in the holder and the said cartridges having their centers of gravity widely spaced from the center line of the holder so that the said interfitting parts also serve to oppose premature downward movements of the cartridges from their seats.

11. A cartridge unit for automatic firearms including in combination, a cartridge holder comprising an elongated member having downward extending recessed flanges at the front and rear thereof, and a plurality of cartridges positioned in the respective recesses and projecting at both sides of the holder, the said cartridges having annular grooves therein which receive portions of one of the flanges at the edges of the recesses therein to prevent relative endwise movement of the cartridges.

12. A cartridge unit for automatic firearms including in combination, a cartridge holder

comprising an elongated member having downward extending recessed flanges at the front and rear thereof, and a plurality of cartridges positioned in the respective recesses and projecting at both sides of the holder with the weight at one side much greater than at the other, the said cartridges having annular grooves therein which receive portions of one of the flanges at the edges of the recesses therein to prevent relative endwise movement of the cartridges and also by a binding action to prevent premature removal of the cartridges from the recesses.

13. A cartridge unit for automatic firearms including in combination, a cartridge holder comprising an elongated body having front and rear downward directed flanges with cartridge receiving seats formed therein, cartridges positioned with their forward portions engaging the said seats, resilient members for holding the cartridges in said seats, and co-operating means on said front flange and the cartridges tending to prevent premature downward removal of the cartridges from their seats.

14. A cartridge unit for automatic firearms including in combination, a cartridge holder comprising an elongated body having front and rear downward directed flanges with cartridge seats formed therein, and cartridges engaging the said seats with their weight forward and rearward of the holder unequally distributed, the cartridges being formed with recesses therein and the edges of the seats formed in one of said flanges being adapted to enter the corresponding recesses in the cartridges thereby holding the cartridges against endwise movement, the edges of said seats and the recesses in the cartridges co-operating also to prevent premature downward movement of the cartridges from their seats.

15. A cartridge unit for automatic firearms including in combination, a cartridge holder comprising an elongated sheet metal body having front and rear downward directed flanges with cartridge seats formed therein and cartridges engaging the said seats in an unbalanced relation and having recesses formed therein, the seats formed in the flanges adjacent the lighter ends of the cartridges being adapted to enter the corresponding recesses formed in the cartridges, whereby the tendency for the heavier ends of the cartridges to move downwardly from their seats in advance of the lighter ends causes a binding action which prevents premature downward movement of the cartridges from their seats.

16. A cartridge unit for automatic firearms including in combination, a cartridge holder comprising an elongated sheet metal body having front and rear downward directed flanges with cartridge seats formed therein, and cartridges engaging the said seats in an unbalanced relation and formed with annular grooves therein, the edges of the seats formed in one of said flanges being adapted to enter the corresponding grooves formed in the cartridges, whereby endwise movement of the cartridges is prevented and whereby the unbalanced relation of the cartridges tends to oppose their premature removal from the holder.

17. In an automatic firearm, the combination of a frame having a transverse feed channel therethrough, a cartridge holder adapted to be fed through the channel, the said holder comprising a normally horizontal top plate together with depending means for holding cartridges, means for feeding the holder through the channel, and common means providing the sole support for the under side of the holder as it is fed and for successively removing cartridges therefrom.

18. In an automatic firearm, the combination of a frame having a transverse feed channel therethrough, a cartridge holder adapted to be fed through the channel, the said holder comprising a normally horizontal top plate together with depending means at the sides thereof for maintaining cartridges in spaced relation and centrally located means for yieldingly holding the said cartridges against removal, means for feeding the holder through the channel, and two cams mounted in fixed relation to the frame for removing the cartridges successively from the holder as it is fed, the cams being positioned to engage the cartridges between the depending spacing means and at opposite sides of the centrally located means.

19. In an automatic firearm, the combination of a frame having a transverse feed channel, a holder comprising an elongated member having front and rear downward directed flanges provided with cartridge seats and means between said flanges for yieldingly holding cartridges in the said seats, means for feeding the holder through the said channel, and means extending between the respective flanges and the holding means in the passage of said holder through said channel, and serving as a support and guide for the holder, the said means also serving to remove the cartridges successively from the holder during the feeding movement thereof.

20. In an automatic firearm, the combination of a frame having a transverse feed channel, a holder comprising an elongated member having front and rear downward directed flanges provided with cartridge seats and means between said flanges for yieldingly holding cartridges in the said seats, means for moving the holder through said channel, and common means for guiding and supporting said holder in such movement and for remov-

ing the cartridges successively from said holder.

21. In an automatic firearm, the combination of a frame having a transverse feed channel therethrough, a cartridge holder adapted to be fed through the channel, the said holder comprising a normally horizontal top plate together with depending flanges at the sides thereof provided with cartridge receiving recesses, means in fixed relation to the frame for engaging the holder between the flanges to support it as it is fed and for successively removing the cartridges therefrom, and other means also in fixed relation to the frame for engaging the holder at the sides thereof to guide it.

22. In an automatic firearm, the combination of a frame having a transverse feed channel therethrough, a cartridge holder adapted to be fed through the channel, the said holder comprising a normally horizontal top plate together with depending means at the sides thereof for maintaining cartridges in spaced relation, feed lugs projecting upward from the top of the holder, a feed slide located above the feed channel and movable longitudinally thereof, a pawl projecting downward from the slide and adapted to engage the said lugs to feed the holder through the feed channel, and cam means in fixed relation to the frame for successively removing the cartridges from the holder as it is fed.

23. In an automatic firearm, the combination of a frame having a transverse feed channel therethrough, a cartridge holder adapted to be fed through the channel, the said holder comprising a normally horizontal top plate together with depending means at the sides thereof for maintaining cartridges in spaced relation, feed lugs projecting upward from the top of the holder, a feed slide located above the feed channel and movable longitudinally thereof, a pawl projecting downward from the slide and adapted to engage the said lugs to feed the holder through the feed channel, cam means in fixed relation to the frame for successively removing the cartridges from the holder as it is fed, and means carried by the pawl and projecting upward through the feed slide for withdrawing the pawl from operative relation with the holder.

24. In an automatic firearm, the combination of a frame having a transverse feed channel therethrough, a cartridge holder adapted to be fed through the channel, the said holder comprising a normally horizontal top plate together with depending means at the sides thereof for maintaining cartridges in spaced relation, feed lugs projecting upward from the top of the holder, a feed slide located above the feed channel and movable longitudinally thereof, a pawl projecting downward from the slide and adapted to engage the said lugs to feed the holder through the feed channel, a second pawl at one side of the feed channel for preventing backward movement of the holder, and means carried by the first said pawl and projecting upward through the feed slide for withdrawing the pawl from operative relation with the holder, the last said means and the second said pawl being so positioned that both pawls can be simultaneously moved to inoperative positions by one hand of the operator.

This specification signed and witnessed this 31st day of Dec., 1924.

JOHN M. BROWNING.