May 8, 1945. G. WEBB 2,375,453

FEEDING DEVICE FOR AUTOMATIC FIREARM

Filed Feb. 25, 1941 2 Sheets-Sheet 1

Fig. 1

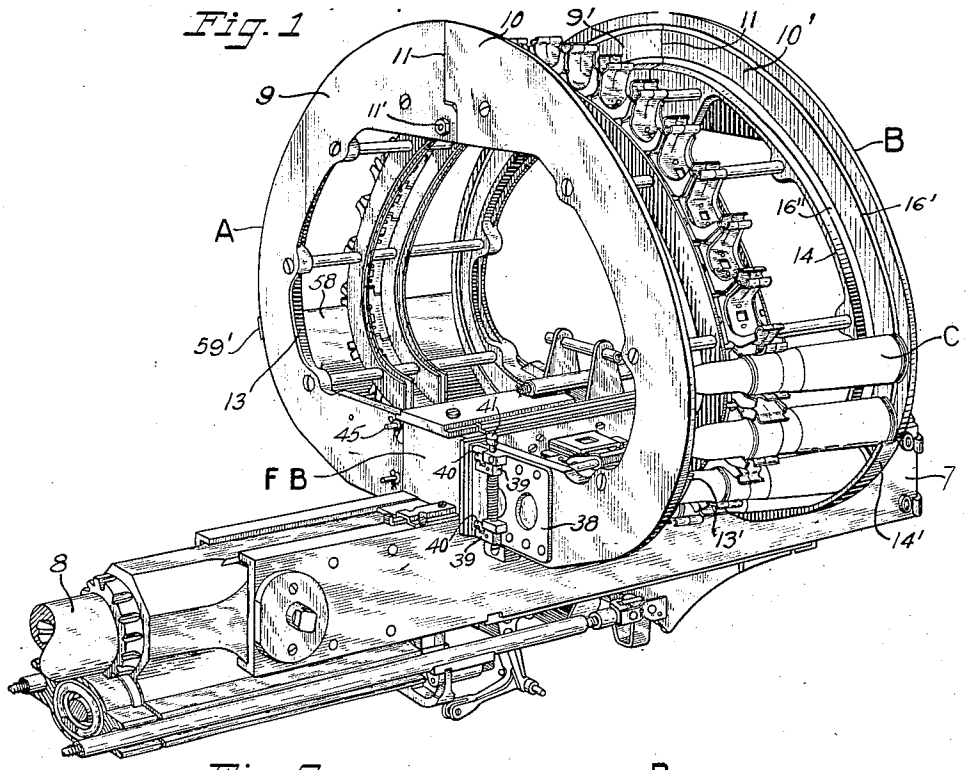
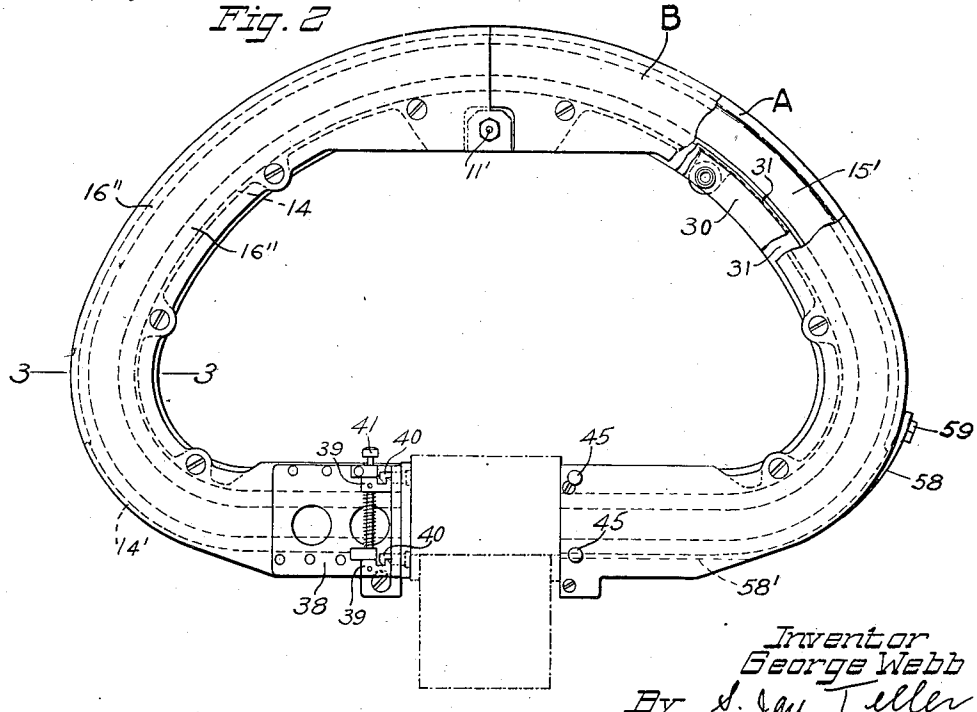


Fig. 2



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Fig. 3

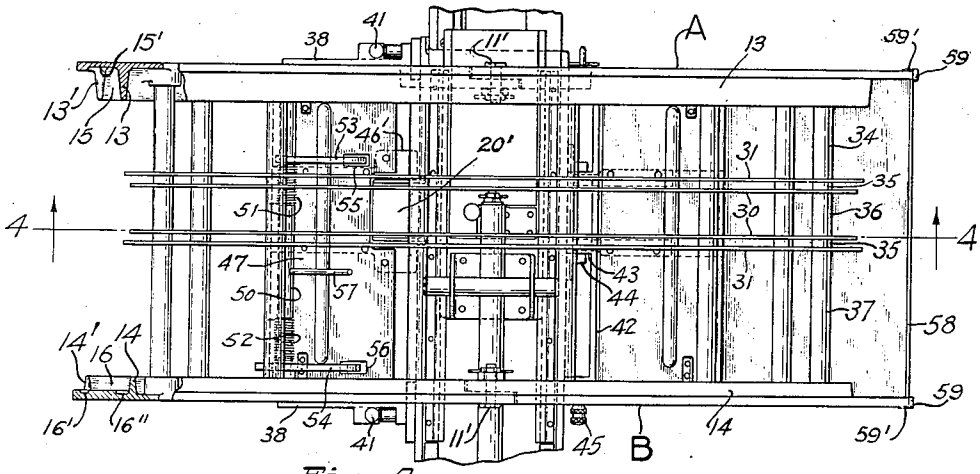


Fig. 4

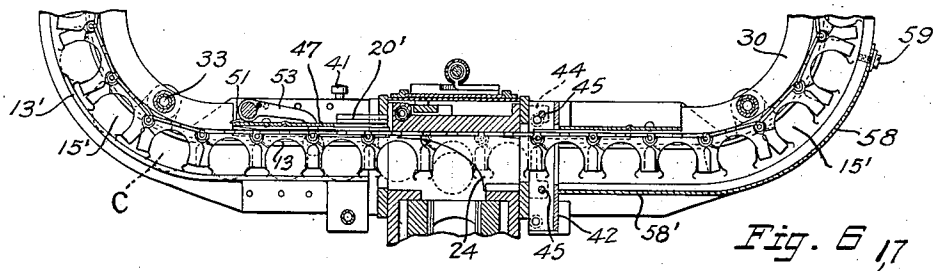


Fig. 6

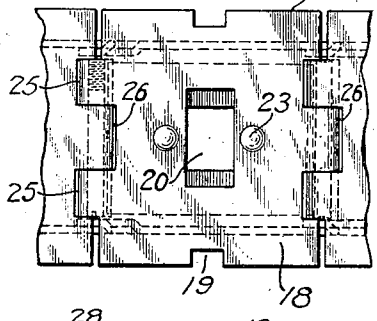
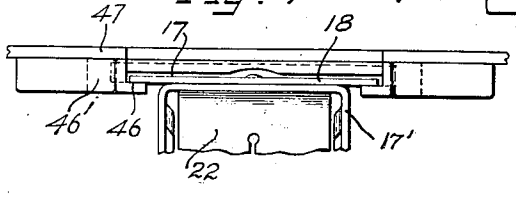


Fig. 5

Fig. 7



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UNITED STATES PATENT OFFICE

2,375,453

FEEDING DEVICE FOR AUTOMATIC FIREARMS

George Webb, Hartford, Conn., assignor to Colt's Patent Fire Arms Manufacturing Company, Hartford, Conn., a corporation of Connecticut

Application February 25, 1941, Serial No. 380,437

18 Claims. (Cl. 89—33)

My present invention relates to feeding devices or cartridge magazines for automatic firearms, and includes a method of feeding cartridges to automatic firearms.

Prior to my present invention, cartridges of relatively large caliber, such as 37 mm. or over, have been fed to automatic firearms of the recoil type either by rigid feeder strips or flexible feeder strips supported upon a tray located at the feeding side of the gun adjacent the feed box, or by articulated link feeder strips inserted in helical form in a box-like magazine. Such forms of feeders are shown and described in my copending application Serial No. 325,405, filed March 22, 1940, and are entirely satisfactory so far as the functioning of the firearm is concerned; but such forms of feeders necessarily impose a limitation as to the number of cartridges which can be used for individual rounds.

While I have mentioned the invention in connection with cartridges such as 37 mm. or over, I wish it to be understood that the invention is not to be construed as necessarily limited to use in connection with such relatively large cartridges; but I do point out that the present invention is particularly well-adapted for use in connection with such relatively large caliber cartridges as will become hereinafter more apparent.

Generally stated as to structure, the object of my present invention is to provide a cartridge feeding device or magazine which greatly increases the capacity of automatic firearms of relatively large caliber to receive at one loading or for individual rounds a large number of cartridges, while at the same time meeting the requirements or limitations imposed by relatively small space at the feeding sides of the firearms.

Generally stated as to method, the invention resides in the provision of an endless cartridge conveyor or carrier in the nature of an articulated link belt which carries the cartridges through the feed channel of the feed box and around a portion of the feed box so that the cartridges are successively delivered into the feed box for charging into the gun from one side thereof to the other by traveling a circuitous path.

The invention is well-adapted for use on aircraft, tanks, and field mounts of either fixed or flexible type, since it provides assurance against accidental displacement or improper feeding of the cartridges which might result in jamming during maneuvers or operation of the firearm.

As will become hereinafter more apparent and will be pointed out in detail, I provide a frame or support to receive the cartridges and around which the cartridges are fed successively by an endless articulated link belt to the feed box for charging into the gun. The invention also provides, as mentioned generally above, against accidental displacement of the cartridges from the frame or support longitudinally of the gun, as well as laterally and vertically with respect thereto during battle or other maneuvers.

Another and more specific feature of the invention resides in the provision of a feeding mechanism or cartridge support with an endless articulated link belt structure wherein the links are hingedly connected in such a manner that a great many of the cartridge holding clips carried by the links are normally, that is when the gun is in horizontal or substantially horizontal position, in upright position so that the cartridges located above the gun are not subject to displacement; and the provision of means for preventing accidental displacement of the cartridges in the other clips which are in inverted or substantially inverted position.

Still another feature of the invention resides in the provision of means for affording interchangeability of different types of cartridge feeders, such as the one disclosed in my present application with those disclosed in my said copending application, Serial No. 325,405.

The most important feature of the invention is the increase in the number of cartridges for a load, especially cartridges of relatively large caliber.

The foregoing and other objects and advantages of the invention will become more apparent and will be pointed out in detail during the course of the following description of the accompanying drawings.

In the accompanying drawings, I have shown the now preferred embodiment of the invention, but it will be understood that the drawings are intended for illustrative purposes only and are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

In the drawings:

Fig. 1 is a perspective view of a feeding device or magazine embodying the present invention illustrated as applied to an automatic firearm, a portion of the firearm being shown as viewed from the feeding side;

Fig. 2 is a rear elevation of the feeding de-

vice or magazine of Fig. 1, with parts broken away;

Fig. 3 is a top plan view with a portion shown in section taken on the line 3—3 of Fig. 2;

Fig. 4 is a view taken on the line 4—4 of Fig. 3;

Fig. 5 is a fragmentary enlarged view of links of the endless conveyor or cartridge carrier illustrating the manner of flexing;

Fig. 6 is a top plan view on the same scale as Fig. 5 illustrating the connection between the links; and

Fig. 7 is a fragmentary view illustrating the supporting means for the cartridge carrier disposed in the exit end of the magazine.

Referring to the drawings, the numeral 7 designates the breech casing and the numeral 8 the barrel of the gun. For a detailed description of the construction and operation of the charging and firing mechanism, reference may be had to Patent 1,525,065, granted to J. M. Browning on February 23, 1925, and to my co-pending application, Ser. No. 325,405, filed March 22, 1940. It need only be stated for the purpose of comprehensive understanding of the present invention that the breech end of the barrel 8 recoils and counter-recoils within the casing 7 in accordance with the mechanism and principles set forth in the above identified patent and my said co-pending application; and that such recoil and counter-recoil actuates the feeding mechanism, to successively strip the cartridges from the endless conveyor or carrier and charge them into the gun after initially manually inserting the first cartridge into the gun and firing to effect the automatic functioning.

With the foregoing in mind and reference to the said patent and my co-pending application, if necessary, and referring to the drawings in detail, numerals 9 and 10 designate complementary parts of one side of a C-shaped support or frame and numerals 9' and 10' designate similar parts or sections of the other side of the support around which the cartridges are guided and fed by an endless conveyor or carrier to be stripped successively therefrom and charged into the gun for firing. It is within the scope of the invention to have the sections or parts 9—10 and 9'—10' respectively, made as integral units, but in actual practice I have found it convenient to make the said parts or sections separately and provide said parts at their tops with connectible portions which are interfitted and other portions which abut as at joint 11, the interfitting connectible portions being detachably connected by a bolt 11'. For the purpose of convenience, the said sections 9—10 will be hereinafter referred to generally by the reference character A, and the sections or parts 9'—10' will be hereinafter referred to generally by the reference character B. The parts A and B constitute a track or guideway for the ends of the cartridges and are spaced apart longitudinally of the gun a distance sufficient to accommodate the cartridges of the caliber to be fired by the gun. The spacing of parts or plates A and B is not made with meticulous exactitude relative to the lengths of the cartridges but just sufficient to prevent accidental displacement of the cartridges longitudinally of the gun during maneuvers or manipulation of the airplanes, tanks, or other equipment on which the guns are mounted.

The plates A and B which constitute the two sides of the frame which forms the track or guideway for the cartridges are provided on their confronting or inner surfaces with radial curved ribs or flanges 13 and 14 respectively. The flange or rib 13 is adapted to support the noses or projectiles of the cartridges and is preferably wider than the flange or rib 14 which supports the heads of the cartridges. As shown particularly in Figs. 2 and 3, the plate A is provided with a curved shallow groove 15' which is concentric with and adjacent flange 13. The path of the noses of the cartridges in passing around the magazine coincides with groove 15', the groove primarily being for the purpose of preventing frictional contact between the noses of the cartridges and the plate A during the movement of the cartridges. Curved friction-reducing grooves are also provided in plate B as shown at 16' and 16''. The heads of the shells or shell casings slidably contact plate B during their travel around the magazine and the concentric grooves 16', 16'' reduce the area of frictional contact between the heads of the cartridge cases and said plate. The latter grooves are best shown in Figs. 1 and 3, the groove 16'' being adjacent flange 14. Adjacent the lower end of each of the plates similar flanges 13' and 14' are provided in spaced relation to flanges or ribs 13 and 14 to form channels 15 and 16 in which the noses and heads of the cartridges are disposed as they approach the feed box FB. The purpose of this construction will be hereinafter set forth in detail in connection with the operation of the feed mechanism.

An endless conveyor, herein illustrated as an articulated link belt, is provided to carry a succession of cartridges upwardly of, over, and downwardly of the feed box and therethrough for charging into the gun by the mechanism such as shown and described in my said co-pending application and in Patent 1,525,065. In actual practice, I have accomplished the successive firing of 30 cartridges in one load on a 37 mm. automatic gun, but, of course, this number may be increased by increasing the size of the plates A and B and the length of the endless conveyor. In other words, the invention is not limited to the ellipsoidal shape of the feeding mechanism or magazine nor to any particular size or capacity. For instance, the plates A and B could be made semi-circular, or could be extended further upwardly of the gun or outwardly therefrom according to the conditions or requirements of particular usage.

The details of construction of the flexible feeder or articulated link belt are shown best in Figs. 5 and 6 wherein the links are designated generally by the numeral 17. Each link comprises a sheet metal strip or plate 17' bent to inverted U-shape and is fixedly secured as by rivets 23 to a flat top or base plate 18 which is notched at opposite edges as indicated at 19 to cooperate with the feeder stops in the same manner as shown and described in my said co-pending application, Serial No. 325,405. The tops 18 of the links are also provided with centrally located openings 20 for engagement by a pawl on the feed slide 20', which pawl is shown and described in detail in my said co-pending application. The sides of the links are each cut away to provide arcuate openings or notches 21 of a size to accommodate the cartridges to be received therein, and spring clips 22 are riveted as indicated at 23 to the under sides of the tops of the links to grip the cartridges extending transversely of the links and through the notches 21. It will be observed that the notches 21, being provided in the spaced flanges of plate 17', will

serve to position the cartridges substantially parallel to each other when the cartridges are mounted in the feeder. The cartridges will also be positioned substantially parallel to the axis of the barrel of the gun. Of course, the tension or strength of the arms of the clips 22 is only sufficient to hold the cartridges during their movement or travel into the feed box and permit stripping of the cartridges therefrom by the cam plates 24 (Fig. 4) as in my said co-pending application. The uppermost, flat surfaces of the cam plates 24 (Fig. 4) serve as guide means within the feed channel of the feed box for guiding the base plates 18 of the feeder as the feeder passes through the feed channel. Furthermore, said surfaces hold the feeder from downward movement while the cam plates successively strip the cartridges from the feeder as the loaded feeder passes into the feed channel. The ends of the tops of the links are provided with interfitting loops provided by extensions of the tops 18. One end of each link is provided with a pair of loops 25 and the other end with a relatively wide loop 26, the latter being adapted to fit between the former on another link so that a rivet or pintle 27 may be inserted therethrough to afford the hinge connection of the links and endless belt structure. In Fig. 5, the numeral 28 designates a screw which connects the ends of the link strips to form the endless articulated link belt.

I wish to call particular attention to the fact that whereas in my said co-pending application, Serial No. 325,405, the articulated link belt is composed of a plurality or series of links generally similar to those forming the endless conveyor of my present application, an important difference resides in hingedly connecting the links at their tops rather than at the lower ends or extremities of the arms of the links whereby the structure flexes reversely in the present case to that in my said co-pending application. So far as I am aware, cartridge feeding link belts of the articulated link type have never before been made to flex in the manner shown in my present application, that is, with the open ends or cartridge receiving portions of the links having relative opening movement. It should be apparent that the interfitting or overlapping arms of the adjacent links are offset so that the arms at one end of one link embrace the arms of the succeeding link, while the other arms of said first link are embraced by the arms of the preceding link. For purposes of convenience, a feeder loaded with cartridges may hereinafter be referred to as a feeder assembly.

It is important to have the articulated link belt so arranged and supported relative to the flanges 13 and 14 and the channels 15 and 16 that the cartridges when located and held in the links will have their heads and projectiles located on the flanges 13 and 14 and in alignment with the channels 15 and 16. To this end I provide a track for the endless conveyor comprising curved substantially planar plates 30 on which the top plates 18 of the links 17 rest and along which the links move when actuated by functioning of the gun, as hereinafter described. Similar curved substantially planar plates 31 are arranged in transversely spaced relation to the plates 30 and extend thereabove or therebeyond for engagement by the longitudinal edges of the links 17 to prevent shifting movement of the articulated link belt when in position for operation on the magazine. The position of the cartridges when in the magazine is illustrated in Fig. 1 by four cartridges C; and the feeding of the cartridges into and through the feed box is illustrated in Fig. 4, wherein one of the cartridges is shown in dotted lines engaging the cam plates 24 and being stripped from the clips 22 of the articulated link belt.

The plates A and B and plates 30 and 31 may be held in fixed spaced relation by any suitable means, but I have found it convenient for the purposes of assembly and formation of a substantially rigid and sturdy structure to provide rods or struts 33 which extend through the said plates and which may be in the nature of elongated bolts or screws. Over the said rods, I provide sleeves 34 between plates A and 31, shorter sleeves or fillers 35 between plates 30 and 31, similar sleeves 36 between plates 30, and sleeves 37 between plates 31 and B. Of course, the relative lengths of the sleeves or fillers which serve to space the said plates is determined by the size of the cartridges to be fed.

From the foregoing description, it should be apparent that an endless conveyor feeding device or magazine including supports for the ends of the cartridges extending above and from one side of the gun to the other, an endless articulated link belt and a track or support therefor conforming the conveyor to the curvature of the supports for the ends of the cartridges, is provided as a unitary structure capable of being quickly attached to and detached from automatic firearms. It may be desirable at times to remove the endless conveyor feeding mechanism and substitute a rigid type of feeder or the usual type of magazine feeder. I, therefore, prefer to utilize the same type of attaching and detaching mechanism as shown in my said co-pending application, Serial No. 325,405, so that the different types of feeding mechanisms may be interchanged without difficulty. To this end, a plate 38 is attached by suitable means to each of the plates A and B at corresponding ends thereof. These plates carry spring latches 39 which engage fixed latches 40 rigidly secured to the feed box. By depressing the plunger 41, the latches 39 and 40 may be readily disengaged. A plate 42 is connected between the plates A and B adjacent the ends thereof opposite the ends carrying the latches 39. This plate has arms 43 which fit between brackets 44, and openings are provided through the plates A and B, the ends of the plate 42, and the arms 43 and brackets 44, to receive pins 45 serving to further detachably secure the feeding mechanism to the firearm in a manner similar to that shown and described in my said co-pending application.

As the links of the belt or feeder pass from the magazine to the feed channel of the gun, their longitudinal edges are guided in grooves 46 on plate 46' of the magazine (see Fig. 7).

In the magazine illustrated in my said co-pending application, Serial No. 325,405, I have provided a device which assures the flexible feeder being accurately positioned in the magazine. I have illustrated in the accompanying drawings a similar device consisting of a pivot pin 50 mounted between and supported by plates A and B. Springs 51 and 52 serve to bias the pivot pin and the fingers 53 and 54 attached thereto in a clockwise direction. The fingers 53 and 54 extend down through openings 55 and 56 in plate 47 and successively engage between two of the cartridges, as shown in Fig. 4. As in my said co-pending application, the purpose of this arrangement is to

accurately position the feeder assembly relative to the charging mechanism by assuring that the foremost cartridge in the direction of feeding will be located in proper position to be charged into the gun, and the foremost link of the feeder will be definitely and properly located with respect to the feed actuating mechanism of the gun. It has been found that, due to the weight of the feeder assembly while passing around the magazine, when the feeder is momentarily halted after stripping a cartridge from the same incident to each successive reloading of the breech of the gun, a certain amount of backlash is introduced into the feeder resulting in a tendency for the portion of the feeder assembly adjacent the entrance of the feed channel to move in a direction reverse to the normal feeding direction. The provision of the fingers **53** and **54** prevents the occurrence of detrimental backlash of this nature. A handle **57** is attached to the pin **50** so that the fingers **53** and **54** may be raised from engagement between the cartridges to permit movement of the endless cartridge belt from right to left, if desired.

As has been previously mentioned, the channels **15** and **16** retain the cartridges against accidental displacement as the links and the clips carried thereby move into inverted position, that is, as they approach the feed channel of the feed box. I preferably provide at the other side of the frame or support a detachable plate **58** having a straight portion extending substantially to the feed channel and fitting into a groove or slot **58'** suitably provided in the inner side of each plate A and B. The curved portion of the plate conforms to the curvature of the lower parts of the plates A and B and is suitably secured thereto by any detachable fastening elements such as screws **59** which pass through ears **59'** formed on plate **58**. Obviously this plate **58** provides the same assurance against accidental displacement of the cartridges at the right-hand side of the feed channel, and although the clips at this point are shown empty since the cartridges which they contained have been fired, when the belt is completely filled there are cartridges located at this point where the clips are in partly inverted position. Thus provision is made against accidental displacement of the cartridges at both sides of the gun, and, of course, it is obvious that the clips above the channels **15** and **16** and the plate **58** are either in upright or substantially upright position. Furthermore, the endless belt is loaded from the right-hand side and the plate **58** may be removed readily and quickly replaced in accomplishing complete loading of the feeder.

It should be apparent from the foregoing that the invention affords a very valuable contribution in connection with the efficiency of automatic firearms, especially, although not necessarily, automatic firearms of relatively large caliber since it greatly increases the number of cartridges to a load. Furthermore, the feeding device or magazine can be safely and easily operated either on airplanes, tanks, or flexible field mounts since the cartridges are held against accidental displacement during maneuvers.

What I claim is:

1. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members connected to said firearm, a plurality of struts extending between and connected to said members to maintain them in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means disposed between and respectively associated with said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the same and define a path of movement therefor, said supporting means extending around a portion of the firearm approximately from one end of the feed channel of the firearm to the other, a flexible articulated-link endless feeder, means on the feeder adapted to detachably hold a plurality of cartridges in substantially parallel relationship, and feeder guide means supported by said struts between said supporting means in spaced relationship thereto but substantially coextensive in length therewith in the direction of movement of the cartridges in the magazine, said feeder guide means being provided with surfaces adapted to be slidably engaged by said feeder to support and maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine.

2. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members approximately C-shaped and connected adjacent their free ends to said firearm, a plurality of struts extending between and connected to said members to maintain them in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means disposed between and respectively associated with said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the same and define a path of movement therefor, said supporting means extending around a portion of the firearm approximately from one end of the feed channel of the firearm to the other, a flexible articulated-link endless feeder, means on the feeder adapted to detachably hold a plurality of cartridges in substantially parallel relationship, and feeder guide means supported by said struts between said supporting means in spaced relationship thereto but substantially coextensive in length therewith in the direction of movement of the cartridges in the magazine, said feeder guide means being provided with surfaces adapted to be slidably engaged by said feeder to support and maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine.

3. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members approximately C-shaped and connected adjacent their free ends to said firearm, a plurality of

struts extending between and connected to said members to maintain them in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means disposed between and respectively associated with said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the same and define a path of movement therefor, said supporting means extending around a portion of the firearm approximately from one end of the feed channel of the firearm to the other, a flexible articulated-link endless feeder, means on the feeder adapted to detachably hold a plurality of cartridges in substantially parallel relationship, and feeder supporting and guide means supported by said struts between said cartridge supporting means in spaced relationship thereto, said feeder guide means comprising spaced substantially planar C-shaped members coextensive in length with the major portion of said cartridge supporting means in the direction of movement of the cartridges in the magazine and respectively presenting opposed surfaces adapted to be slidably engaged by said feeder to maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine.

4. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members connected to said firearm and also comprising means maintaining said members in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means disposed between and respectively associated with said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the same and prevent appreciable movement of the cartridges in a direction normal to said surfaces and also define a path of movement for the cartridges, said supporting means extending approximately from one end to the other of the path of movement of the cartridges in the magazine, a flexible articulated-link feeder provided with spaced substantially parallel aligned flanges extending from said links and defining a channel, the flanges of each link being respectively provided with a notch extending inward from the free edge thereof and in transverse alignment with the notch of the opposed flange to provide means in each link adapted to receive a cartridge, cartridge retaining means carried by each link and adapted to detachably hold a cartridge in said notches in parallel relationship with cartridges in adjoining links, whereby cartridges may be inserted in the notches of said feeder from the exterior of the magazine, and feeder guide means mounted between said supporting means in spaced relationship thereto but substantially coextensive in length therewith in the direction of movement of the cartridges in the magazine, said feeder guide means being provided with surfaces adapted to be slidably engaged by said feeder to support it and also to maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine.

5. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members approximately C-shaped and connected adjacent their free ends to said firearm, the intermediate portions of said members projecting upward from said firearm, means connected to said members to maintain them in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means disposed between and respectively associated with said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the same and also define a path of movement for the cartridges, said supporting means extending around the upper portion of the firearm approximately from one end of the feed channel of the firearm to the other, a flexible articulated-link endless feeder provided with spaced substantially parallel aligned flanges extending from said links and defining a channel in the feeder opening outward toward the perimeter of said magazine, the flanges on each link being respectively provided with a notch extending inward from the free edge thereof and in transverse alignment with the notch of the opposite flange to provide means in each link adapted to receive a cartridge, cartridge retaining means carried by each link and adapted to detachably hold a cartridge in said notches in parallel relationship with cartridges in adjoining links, whereby cartridges may be inserted in the notches of said feeder from the exterior of the upper portion of said magazine, and feeder guide means mounted between said supporting means in spaced relationship thereto but substantially coextensive in length therewith in the direction of movement of the cartridges in the magazine, said feeder guide means being provided with surfaces adapted to be slidably engaged by said feeder to support and maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine.

6. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members approximately C-shaped and connected adjacent their free ends to said firearm, the intermediate portions of said members projecting upward from said firearm, means connected to said members to maintain them in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means disposed between and respectively associated with said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the same and also define a path of movement for the cartridges, said supporting means extending around the upper portion of the firearm approximately from one end of the feed channel of the firearm to the other, a flexible articulated-link endless feeder provided with spaced substantially

parallel aligned flanges extending from said links and defining a channel in the feeder opening outward toward the perimeter of said magazine, the flanges on each link being respectively provided with a notch extending inward from the free edge thereof and in transverse alignment with the notch of the opposite flange to provide means in each link adapted to receive a cartridge, cartridge retaining means carried by each link and adapted to detachably hold a cartridge in said notches in parallel relationship with cartridges in adjoining links, whereby cartridges may be inserted in the notches of said feeder from the exterior of the upper portion of said magazine, feeder guide means mounted between said supporting means in spaced relationship thereto but substantially coextensive in length therewith in the direction of movement of the cartridges in the magazine, said feeder guide means being provided with surfaces adapted to be slidably engaged by said feeder to support and maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine, and supplementary cartridge supporting and guide means carried by the lower portions of said plate-like members and cooperating with said first mentioned cartridge supporting means to define opposed guide chanels adapted to respectively accommodate the opposite ends of cartridges to prevent accidental removal of said cartridges from the notches of said feeder while said cartridges are moving through the lower portion of said magazine.

7. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members approximately C-shaped and connected adjacent their free ends to said firearm, the intermediate portions of said members projecting upward from said firearm, means connected to said members to maintain them in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means comprising similar flanges respectively carried by and extending inward from said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the same and also define a path of movement for the cartridges, said flanges extending around the upper portion of the firearm approximately from one end of the feed channel of the firearm to the other, a flexible articulated-link endless feeder provided with spaced substantially parallel aligned flanges extending from said links and defining a channel in the feeder opening outward toward the perimeter of said magazine, the flanges on each link being respectively provided with a notch extending inward from the free edge thereof and in transverse alignment with the notch of the opposite flange to provide means in each link adapted to receive a cartridge, cartridge retaining means carried by each link and adapted to detachably hold a cartridge in said notches in parallel relationship with cartridges in adjoining links, whereby cartridges may be inserted in the notches of said feeder from the exterior of the upper portion of said magazine, feeder guide means mounted between said supporting means in spaced relationship thereto but substantially coextensive in length therewith in the direction of movement of the cartridges in the magazine, said feeder guide means being provided with surfaces adapted to be slidably engaged by said feeder to support and maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine, and supplementary cartridge supporting and guide means carried by the lower portions of said plate-like members in substantially evenly spaced relationship to and normally below said supporting flanges to define opposed guide channels at opposite sides of said firearm adapted to respectively accommodate the opposite ends of cartridges to prevent accidental removal of said cartridges from the notches of said feeder while said cartridges are moving through the lower portion of the magazine.

8. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism to feed a loaded cartridge feeder through said channel, a magazine comprising substantially C-shaped parallel front and rear plates spaced longitudinally of the firearm and connected at their respective ends to opposite sides of the firearm adjacent the feed channel, the intermediate portion of each of said plates being disposed above the firearm, a cartridge guide flange projecting laterally from the inner face of each plate, said flanges extending around a portion of the firearm approximately from one side of the firearm to the other side and adapted to respectively engage the opposite ends of cartridges to support the same, an endless flexible feeder mounted for movement between said plates around a portion of said firearm and through said feed channel, a plurality of substantially U-shaped cartridge holding clips secured to said feeder and opening outward thereof as it passes around said portion of the firearm and through said feed channel, and means extending between said plates and spaced substantially evenly from and normally below said first-mentioned flanges, said last mentioned means being partially co-extensive with said guide flanges and removably secured to said plates adjacent the lowermost edges thereof at the exit end of the feed channel of the firearm to form a channel and prevent removal of cartridges from the U-shaped recesses while the cartridges are moving through said channel and permit complete loading of the magazine when said last mentioned means is removed.

9. Cartridge feeding mechanism comprising in combination, an automatic firearm having a transverse feed channel therein and mechanism operable upon the functioning of the firearm to feed a loaded cartridge feeder through said feed channel, a magazine comprising substantially parallel front and rear plate-like members approximately C-shaped and connected adjacent their free ends to said firearm, the intermediate portions of said members projecting upward from said firearm, means connected to said members to maintain them in fixed spaced relationship longitudinally of said firearm, relatively spaced cartridge supporting means comprising similar flanges respectively carried by and extending inward from said members to provide surfaces respectively adapted to slidably engage the opposite ends of cartridges to support the

same and also define a path of movement for the cartridges, said flanges extending around the upper portion of the firearm approximately from one end of the feed channel of the firearm to the other, a flexible articulated-link endless feeder provided with spaced substantially parallel aligned flanges extending from said links and defining a channel in the feeder opening outward toward the perimeter of said magazine, the flanges on each link being respectively provided with a notch extending inward from the free edge thereof and in transverse alignment with the notch of the opposite flange to provide means in each link adapted to receive a cartridge, cartridge retaining means carried by each link and adapted to detachably hold a cartridge in said notches in parallel relationship with cartridges in adjoining links, whereby cartridges may be inserted in the notches of said feeder from the exterior of the upper portion of said magazine, feeder guide means mounted between said supporting means in spaced relationship thereto but substantially coextensive in length therewith in the direction of movement of the cartridges in the magazine, said feeder guide means being provided with surfaces adapted to be slidably engaged by said feeder to support and maintain the links of said feeder in proper alignment whereby cartridges when mounted in said links are maintained in parallel relationship and with their axes substantially at right angles to their path of movement in the magazine, and supplementary cartridge supporting and guide means carried by and extending between the lower portions of said plate-like members in substantially evenly spaced relationship to and normally below said supporting flanges to define opposed guide channels at opposite sides of the firearm adapted to respectively accommodate the opposite ends of cartridges to prevent accidental removal of said cartridges from the notches of said feeder while said cartridges are moving through the lower portion of the magazine, said supplementary means adjacent the exit end of the feed channel of the firearm being readily removable to permit loading of the feeder with its full complement of cartridges.

10. A cartridge magazine adapted to be mounted on an automatic firearm adjacent the feed channel thereof and contain a plurality of cartridges for successive feeding to said firearm, said magazine comprising in combination, a frame-like structure comprising substantially parallel spaced plates adapted to be mounted on said firearm, a cartridge support comprising a curved flange extending inward from each plate and adapted to extend around a portion of said firearm from one end of said feed channel to the other, said flanges being spaced from each other in a direction normal to said plates and adapted to be respectively engaged by the opposite ends of cartridges to be contained in the magazine, means connecting said plates to maintain them in fixed spaced relationship, the space between the adjacent surfaces of said plates amounting at least to the length of the cartridges to be contained in said magazine, and a curved guide adapted to receive and support a flexible articulated-link cartridge feeder and mounted between said plates in spaced relationship to and between said curved flanges and adapted to extend around said portion of said firearm substantially from one end of said feed channel to the other, said feeder guide and support comprising a plurality of spaced curved substantially flat and parallel plates defining the sides of an open-faced channel-like way and providing opposed surfaces adapted to respectively slidably engage opposite surfaces of said cartridge feeder links when mounted in said way to maintain the links of said feeder in proper alignment therein.

11. A cartridge magazine adapted to be mounted on an automatic firearm adjacent the feed channel thereof and contain a plurality of cartridges for successive feeding to said firearm, said magazine comprising in combination, a frame-like structure comprising substantially parallel spaced plates adapted to be mounted on said firearm, a cartridge support comprising a curved flange extending inward from each plate and adapted to extend around a portion of said firearm from one end of said feed channel to the other, said flanges being spaced from each other in a direction normal to said plates and adapted to be respectively engaged by the opposite ends of cartridges to be contained in the magazine, means connecting said plates and maintaining them in fixed spaced relationship, the space between the adjacent surfaces of said plates amounting at least to the length of the cartridges to be contained in said magazine, and a curved guide and support for a cartridge feeder mounted between said plates in spaced relationship to and between said curved flanges and comprising a plurality of spaced curved substantially flat and parallel plates adapted to extend around said portion of said firearm substantially from one end of said feed channel to the other, certain of said curved plates being adapted to directly engage and support the feeder and certain other of said curved plates extending outward beyond the outer edges of said first-mentioned curved plates and adapted to engage the respective outer edges of a cartridge feeder to limit movement of said feeder in a direction substantially normal to the plane of said curved plates.

12. A cartridge magazine adapted to be mounted on an automatic firearm adjacent the feed channel thereof and contain a plurality of cartridges for successive feeding to said firearm, said magazine comprising in combination, a frame-like structure comprising substantially parallel spaced plates adapted to be mounted on said firearm, a cartridge support comprising a curved flange extending inward from each plate and adapted to extend around a portion of said firearm from one end of said feed channel to the other, said flanges being spaced from each other in a direction normal to said plates and adapted to be respectively engaged by the opposite ends of cartridges to be contained in the magazine, means connecting said plates and maintaining them in fixed spaced relationship, the space between the adjacent surfaces of said plates amounting at least to the length of the cartridges to be contained in said magazine, and a curved guide and support for a cartridge feeder mounted between said plates in spaced relationship to and between said curved flanges and comprising a plurality of spaced curved substantially flat and parallel plates connected for support to said first mentioned plate connecting means and adapted to extend around said portion of said firearm substantially from one end of said feed channel to the other, certain of said curved plates being adapted to directly engage and support the feeder and certain other of said curved plates extending outward beyond the outer edges of said first-mentioned curved plates and adapted to engage the outer edges of a car-

tridge feeder to limit movement of said feeder in a direction substantially normal to the plane of said curved plates.

13. A cartridge magazine adapted to be mounted on an automatic firearm adjacent the feed channel thereof and contain a plurality of cartridges for successive feeding to said firearm, said magazine comprising in combination, a frame-like structure comprising substantially parallel spaced plates adapted to be mounted on said firearm, a cartridge support comprising a curved flange extending inward from each plate and adapted to extend around a portion of said firearm from one end of the said feed channel to the other, said flanges being spaced from each other in a direction normal to said plates and adapted to be respectively engaged by the opposite ends of cartridges to support the same when contained in the magazine, means connecting said plates and maintaining them in fixed spaced relationship, a guide and support for a cartridge feeder mounted between said plates in spaced relationship to said curved flanges, a supplementary flange extending inward from each plate adjacent the normally lower edge thereof in substantially evenly spaced relationship to and partially co-extensive with and normally below said first-mentioned flanges to form guide channels adapted to be disposed adjacent one end of the feed channel of the firearm for preventing removal of cartridges from the magazine in a direction normal to the plane of the path of movement of cartridges through said channels when the cartridges are disposed therein, and removable plate-like means disposed between said plates adjacent the normally lower edges thereof and in substantially evenly spaced relationship to and normally below said first-mentioned flanges to form a supplementary guide channel adapted to be disposed adjacent the other end of said feed channel, said plate-like means being partially co-extensive with said first-mentioned flanges and normally preventing removal of cartridges from said supplementary guide channel in a direction normal to the plane thereof when cartridges are passing therethrough but said plate-like means when removed from said plates permitting full loading of the magazine with cartridges.

14. A cartridge magazine adapted to be mounted on an automatic firearm adjacent the feed channel thereof and contain a plurality of cartridges for successive feeding to said firearm, said magazine comprising in combination, a frame-like structure comprising substantially parallel spaced plates adapted to be mounted on said firearm, a cartridge support comprising a curved flange extending inward from each plate and adapted to extend around a portion of said firearm from one end of the said feed channel to the other, said flanges being spaced from each other in a direction normal to said plates and adapted to be respectively engaged by the opposite ends of cartridges to be contained in the magazine, means connecting said plates and maintaining them in fixed spaced relationship, a guide and support for a cartridge feeder mounted between said plates in spaced relationship to said curved flanges, removable plate-like means disposed between said plates adjacent the normally lower edge thereof in substantially evenly spaced relationship to and partially co-extensive with and normally below said flanges to form a guide channel adapted to be disposed adjacent the exit end of said feed channel of said firearm to prevent removal of cartridges from said guide channel in a direction normal to the plane thereof when cartridges are passing therethrough, and means on the inner side of each of said plates adapted to releasably maintain said plate-like means in operative position in the magazine and permit ready removal of the plate-like means, whereby the portion of the magazine normally adjacent the exit end of the feed channel may be fully loaded with cartridges.

15. An articulated-link cartridge feeder adapted to pass around a guideway of a magazine and thorugh the feed channel of an automatic firearm and also adapted to be joined at its ends to form an endless feeder, said feeder comprising in combination, a plurality of similar substantially U-shaped link members hingedly connected adjacent the base of each U-shaped member whereby the legs of the U-shaped members comprise spaced flanges defining a substantially continuous flexible channel opening outward when the ends of the feeder are joined, a cartridge receiving notch formed in the free outer edge of each flange of each U-shaped member, the notches in the opposed flanges of each member being in alignment transversely of the longitudinal axis of the feeder, and means fixed to each member and adapted to releasably hold a cartridge positioned in the notches of the flanges of each member, said means being disposed in each member between said flanges.

16. An articulated-link cartridge feeder adapted to pass around a guideway of a magazine and through the feed channel of an automatic firearm and also adapted to be joined at its ends to form an endless feeder, said feeder comprising in combination, a plurality of similar substantially U-shaped link members hingedly connected together adjacent the base of each U-shaped member whereby the legs of the U-shaped members comprise spaced flanges defining a substantially continuous flexible channel opening outward when the ends of the feeder are joined, the adjacent edge portions of the legs of each of the U-shaped members being formed and adapted to overlie each other when the feeder is disposed in a substantially straight line, a cartridge receiving notch formed in the free outer edge of each flange of each U-shaped member, and means fixed to each U-shaped member and adapted to releasably hold a cartridge positioned in the notches of the flanges of each member.

17. An articulated-link cartridge feeder adapted to pass around a guideway of a magazine and through the feed channel of an automatic firearm and also adapted to be joined at its ends to form an endless feeder, said feeder comprising in combination, a plurality of hingedly connected plates forming an endless flexible band of substantially uniform width, each of said plates having means adapted to cooperate with feeder supporting and guide means in the feed channel of the firearm, a substantially U-shaped member joined at its base to each plate and the legs of each U-shaped member respectively comprising a flange disposed substantially parallel to the free edge of the plate adjacent thereto, the outer edge of each flange being provided with a cartridge receiving notch opening outward of the feeder when the ends of the feeder are joined, and means carried by each member and adapted to releasably hold a cartridge positioned in the notches of each member.

18. An articulated-link cartridge feeder adapted to pass around a guideway of a magazine and through the feed channel of an automatic firearm

and also adapted to be joined at its ends to form an endless feeder, said feeder comprising in combination, a plurality of hingedly connected plates forming an endless flexible band of substantially uniform width, a substantially U-shaped member joined at its base to each plate and the legs of each U-shaped member respectively comprising a flange disposed substantially parallel to and spaced inward from the free edge of the plate adjacent thereto, the outer edge of each flange being provided with a cartridge receiving notch opening outward of the feeder when the ends of the feeder are joined, and means connected to each U-shaped member and adapted to releasably engage a cartridge to hold said cartridge positioned in the notches of the flanges of said U-shaped member.

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