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AMMUNITION CHUTE CONNECTOR

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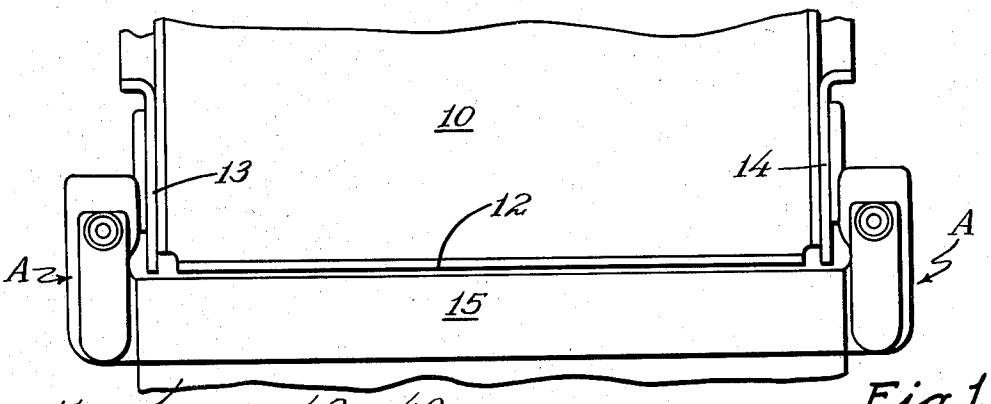


Fig. 1

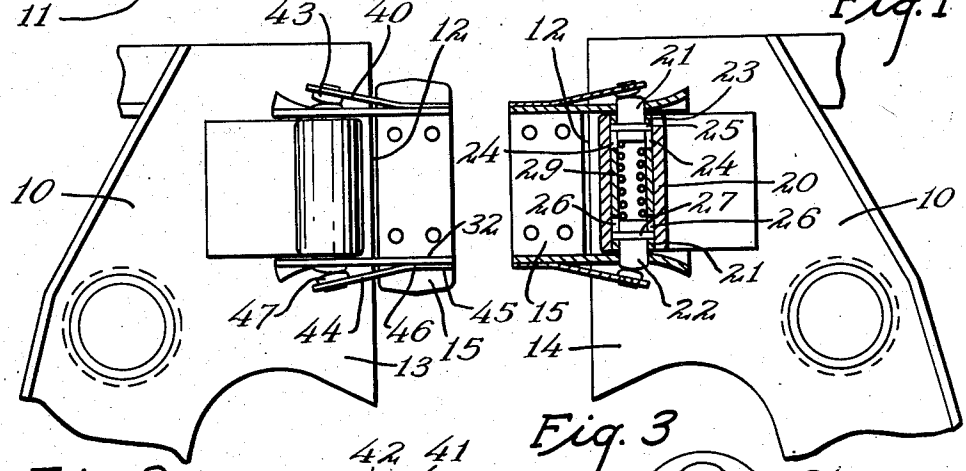


Fig. 2

Fig. 3

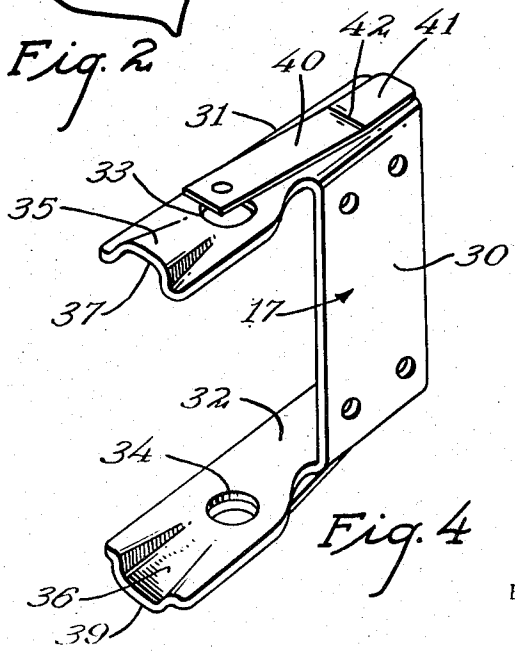


Fig. 4

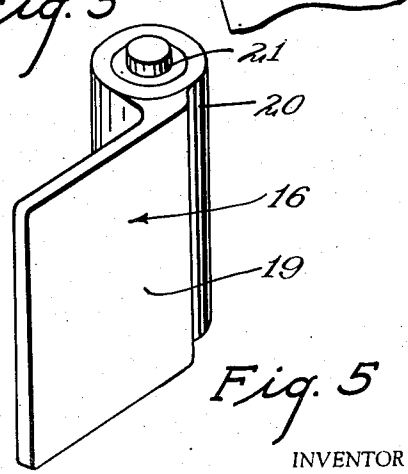


Fig. 5

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AMMUNITION CHUTE CONNECTOR

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4 Claims. (Cl. 24—265)

This invention relates to an improvement in ammunition chute connectors and deals particularly with a simple and effective means of connecting and disconnecting an ammunition chute with an ammunition box or gun using the ammunition.

In modern warfare flexible ammunition chutes are usually used to conduct a continuous series of shells from an ammunition storage box to the gun which fires the shells. Various means have been devised for connecting the chutes to the ammunition box. It is extremely desirable that the connector be simple in nature and quickly operated. The present invention deals with a connector of this type.

An object of the present invention resides in the provision of a connector including a pair of brackets which are mounted upon the ammunition box or on the gun and a cooperable member which is attached to the end of the chute. By moving the end of the chute toward the box bearing the brackets a chute may be automatically attached and locked in position. As a result the chute may be more easily locked in place than with connectors of previous types.

An object of the present invention resides in the provision of a connector having two cooperable parts. One of these parts is in the form of a barrel extending transversely to the direction of movement of the parts in connecting, or disconnecting, the connector. This barrel supports a pair of buttons, or plungers, which are urged resiliently in opposite directions. The other part of the connector includes a bracket provided with spaced guides. These guides are generally parallel and are spaced apart a distance substantially equal to the length of the barrel of the first mentioned connector part. The spaced guides are provided with cam surfaces which act against the ends of the buttons or plungers to force them inwardly against the compression of the springs. The guides are also provided with apertures or shoulders against which the buttons may engage. When the two parts of the connector are urged together the buttons move into registry with the openings and spring apart. This action locks the two parts of the connector together.

A further feature of the present invention resides in a simple and effective means of permitting the disconnection of the chute from the part to which it is secured. Resilient blades overlie the apertures into which the buttons or plungers extend when the two parts of the connector are connected. These spring blades include projections capable of extending into the apertures and retracting the plungers against the compression of their springs. As soon as the buttons or plungers have been retracted the two parts of the connector may be separated.

A feature of the present invention resides in the simple and effective manner in which the two parts of the connector may be attached or detached. The connecting of the two parts is effected merely by forcing the two parts of the connector together until they lock. Separation is effected by merely placing the hand over the spring blades and simultaneously forcing the ends of the blades together. This action acts to retract the locking plungers and the two parts of the connector may then be immediately separated.

These and other objects and novel features of the invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the present specification:

Figure 1 is a top plan view of a gun end adapter which is secured to the end of the flexible chute showing the manner in which this gun end adapter is attached to the feeder leading into the gun.

Figure 2 is a side elevational view of the structure shown in Figure 1.

Figure 3 is an elevational view of a portion of the structure shown in Figure 1, a part of the structure being shown in cross section.

Figure 4 is a perspective view of one portion of the connector removed from the remainder of the apparatus.

Figure 5 is a perspective view of the second portion of the connector removed from the remainder of the apparatus.

In the particular views illustrated the connector is shown connecting a gun end adapter to a feeder leading into the gun. The opposite end of the flexible chute is provided with an ammunition box adapter which is designed to connect the opposite end of the chute to the ammunition box. In view of the fact that the adapters are quite similar in nature and the connectors at each end of the chute are identical, the opposite end of the flexible chute has not been illustrated. Thus the adapter and the connectors may be considered to fit at either end of the flexible chute for the purpose of this description.

The feeder is indicated in general by the numeral **10**. This feeder is designed to receive a continuous chain of shells which are fed through the flexible chute. The end of the flexible chute is indicated by the numeral **11**. As the details of the feeder and the details of the chute form no part of the present invention they have not been illustrated in great detail. For the purpose of this description it is believed sufficient to state that the feeder **10** is provided with an inlet end **12** which is provided with spaced parallel side walls **13** and **14**. It is to these parallel side walls **13** and **14** that the connector is secured. The ammunition supply box is similarly provided with parallel side walls similar to **13** and **14** and the connector is connected in a similar manner to these side walls.

The adapter is indicated in general by the numeral **15**. This adapter **15** includes a generally rectangular frame to which the flexible chute **11** is secured. The chute **11** is also comprised of sections which are generally rectangular in sections or at least define a generally rectangular passage through which the shells pass.

The connectors are indicated in general by the letter A and include two main parts. The first of these parts is indicated in general by the numeral **16** and the other of the parts is indicated in general by the numeral **17**. Usually, the parts **16** are connected to the side walls **13** and **14** of the feeder **10** or of the ammunition box. The parts **17** are normally connected to either the gun end adapter or the ammunition box adapter, as the case may be.

The connector part **16** includes an anchoring flange **19** which is welded or otherwise secured to the side walls **13** or **14**. Connected to the anchoring plate **19** is a barrel **20** which extends transversely of the direction of movement of the connector in connecting or disconnecting the parts. In the particular arrangement illustrated the relative movement between the connected parts on connecting and disconnecting same is horizontal and the barrels are arranged with their axes extending vertically.

As best illustrated in Figure 3 of the drawings a pair of plungers **21** and **22** are mounted at opposite ends of a sleeve **23**. This sleeve **23** is provided with a first pair of diametrically opposed longitudinally extending slots **24** near one end of the barrel. These slots **24** are designed to accommodate a pin **25** which extends through the plunger **21** and terminate in the slots **24**. Thus the slots **24** limit the slidable movement of the plunger **21**.

A second pair of diametrically opposed longitudinally extending slots **26** are provided at the opposite end of the sleeve **23**. These slots are designed to accommodate a pin **27** which extends through a plunger **27** and terminates in the slots **26**. Thus the pins and slots limit the outward and inward movement of the plunger **22**. A spring **29** is provided in the sleeve **23** between the plungers **21** and **22** to normally urge these plungers apart.

In actual practice the mounting plates **19** are welded or otherwise secured to the parallel sides of the feeder **10** or of the ammunition storage box. The cooperable parts **17** of the fastener will now be described in detail.

Direction of movement is provided with an anchoring plate **30** which is designed for attachment at opposite ends of the generally rectangular adapter **15**. Along the upper and lower edges of the anchoring plate **30** we provide a generally right angular extending flange, the upper flange being identified by the numeral **31** and the lower flange being indicated by the numeral **32**. The term upper and lower flanges should not be construed as a limitation for the chutes are designed to extend virtually any direction and the terminology is employed only to simplify description.

The upper flange **31** is provided with an aperture **33** therein which is spaced from each end of the flange and which is the proper size to freely accommodate the plunger **21**. The lower flange is likewise provided with an aperture **34** which is aligned with the aperture **33** and which is designed to accommodate the plunger **22**. Both plungers **21** and **22** are normally of equal size and the structure is reversible. In order to simplify the operation of attaching the two parts of the connector the upper flange **33** is provided with a tapered or inclined groove **35** which is formed by pressing the center portion of the flange upwardly above the plane of the remainder of the flange and sloping the groove generally downwardly toward the aperture **33**. The flange **32** is likewise provided with a tapered channel or groove **36** which leads toward the aperture **33**. The ends **37** and **39** respectively of the channels or grooves **36** and **35** are apart far enough to accommodate the plungers **21** and **22** when these plungers are in their outermost position. Accordingly, the portion **17** of the connector may be placed adjoining the part **16** thereof and may be urged over the plungers **21** and **22**, the tapered or inclined grooves acting to gradually press the plungers **21** and **22** inwardly. In other words the channels or grooves act as cam tracks to depress the plungers **21** and **22** until they are in alignment with the apertures **33** and **34**. At this time the plungers snap outwardly being urged apart by the intermediate spring **29**. When the plungers **21** and **22** are extended through the apertures **33** and **34**, the two parts of the connector are latched together and cannot accidentally become separated.

In order to simplify the operation of removing the bracket portion **17** of the connector from the portion **16** thereof we provide flexible strips which overlie the plungers and assist in depressing the same when necessary. One such flexible strip **40** is anchored at one end **41** to the flange **31** and inclines slightly away from the flange **31**, being bent at **42** for this purpose. As best indicated in Figures 2 and 3 of the drawings the strip **40** is provided at its free end with a downwardly extending projection **43** which is of proper size to fit into the aperture **33** and of proper length to press the plunger **21** inwardly until the upper end thereof is entirely free of the aperture **33**.

The lower flange **32** is also provided with a flexible strip **44** which is anchored at one end at **45** to the undersurface flange **32** and which is bent at **46** to incline away from the flange **32**. This strip **44** is provided at its free end with an upwardly directed projection **47** which is of proper size to fit into the flange aperture **34** and which is of proper length to force the plunger **22** entirely out of the aperture **34**.

The operation of our device has been partially described in connection with the construction thereof. The chute **11** having the adapter **15** at one end thereof is brought into proximity with the gun feeder or with the ammunition box supporting the portions **16** of the connector. The adapter **15** is aligned with the entrance of the feeder or ammunition box at which time the plungers **22** and **21** of the two portions **16** are in alignment with the cam grooves **35** and **36** of the connector portions **17**. The adapter **15** is then urged toward the feeder **10** or ammunition box, the plungers entering their respective grooves and being cammed inwardly until they align with their corresponding apertures. At this time the plungers are forced outwardly by the spring **29** and the two connector parts are locked together.

When it is desired to detach the two elements one hand is placed at each end of the adapter **15** with the fingers extending across one of the flat spring strips while the thumbs engage over the opposite spring strips. The thumbs and fingers are then squeezed together, forcing the resilient strips toward surface contact with the various flanges to which they are secured. This action causes the projections on the spring strips to enter the apertures and press the various plungers inwardly. This retracts the plungers from the openings and permits the separation of the adapter from the portion to which it has been secured.

In accordance with the patent statutes, we have described the principles of construction and operation of ammunition chute connector, and while it has been endeavored to set forth the best embodiment thereof, it is desired to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of the invention.

We claim:

1. A detachable connector for attaching ammunition boxes and feeders to ammunition box adapters and gun end adapters including two separable parts, one part including a barrel, retractable plunger means retractable into said barrel and normally projecting therefrom, and means resiliently urging said plunger means into projecting position, the other part including spaced flanges provided with a pair of guides having an inlet open end, the end portions of said guides being spaced to admit the barrel and plunger means extending longitudinally therebetween, said guides including inclined cam means extending inwardly from said open end capable of retracting said plungers upon relative longitudinal movement of said guides, said guides having apertures therethrough into which said plunger means may project after they have been retracted by said cam means, said apertures holding said guides from reverse relative longitudinal movement, and flexible projection means engageable with said plungers to retract the same when engaged in said apertures.

2. A detachable connector for attaching ammunition boxes and feeders to ammunition box adapters and gun end adapters including two separable parts, one part including a barrel, retractable plunger means retractable into said barrel and normally projecting therefrom, and means resiliently urging said plunger means into projecting position, the other part including spaced flanges provided with a pair of guides having an inlet open end, the end portions of said guides being spaced to admit the barrel and plunger means extending longitudinally therebetween, said guides including inclined cam means extending inwardly from said open end capable of retracting said plungers upon relative longitudinal movement of said

guides, said guides having apertures therethrough into which said plunger means may project after they have been retracted by said cam means, said apertures holding said guides from reverse relative longitudinal movement, said cam means comprising tapered opposed U-shaped channels.

3. A detachable connector including two separable parts, one of said parts including a barrel having retractable plungers in opposite ends, and means normally urging said plungers apart, the other part including spaced flanges provided with a pair of spaced guides having cam grooves being spaced apart a distance sufficient to accommodate the barrel with its plungers projecting therebetween, said cam grooves acting to retract said plungers upon relative longitudinal movement of said guides, said guides having apertures therethrough in the path of movement of said plungers as the guides move relative thereto and into which said plungers project to lock the two parts from further relative movement, and means overlying said apertures and engageable therethrough to retract said plungers.

4. A detachable connector including two separable parts, one of said parts including a barrel having retract-

able plungers in opposite ends, and means normally urging said plungers apart, the other part including spaced flanges provided with a pair of spaced guides having cam grooves being spaced apart a distance sufficient to accommodate the barrel with its plungers projecting therebetween, said cam grooves acting to retract said plungers upon relative longitudinal movement of said guides, said guides having apertures therethrough in the path of movement of said plungers as the guides move relative thereto and into which said plungers project to lock the two parts from further relative movement, resilient strips disposed outwardly of said guides and extending over said apertures, and means on said guides movable into said apertures to retract said plungers as the strips are urged toward one another.

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