

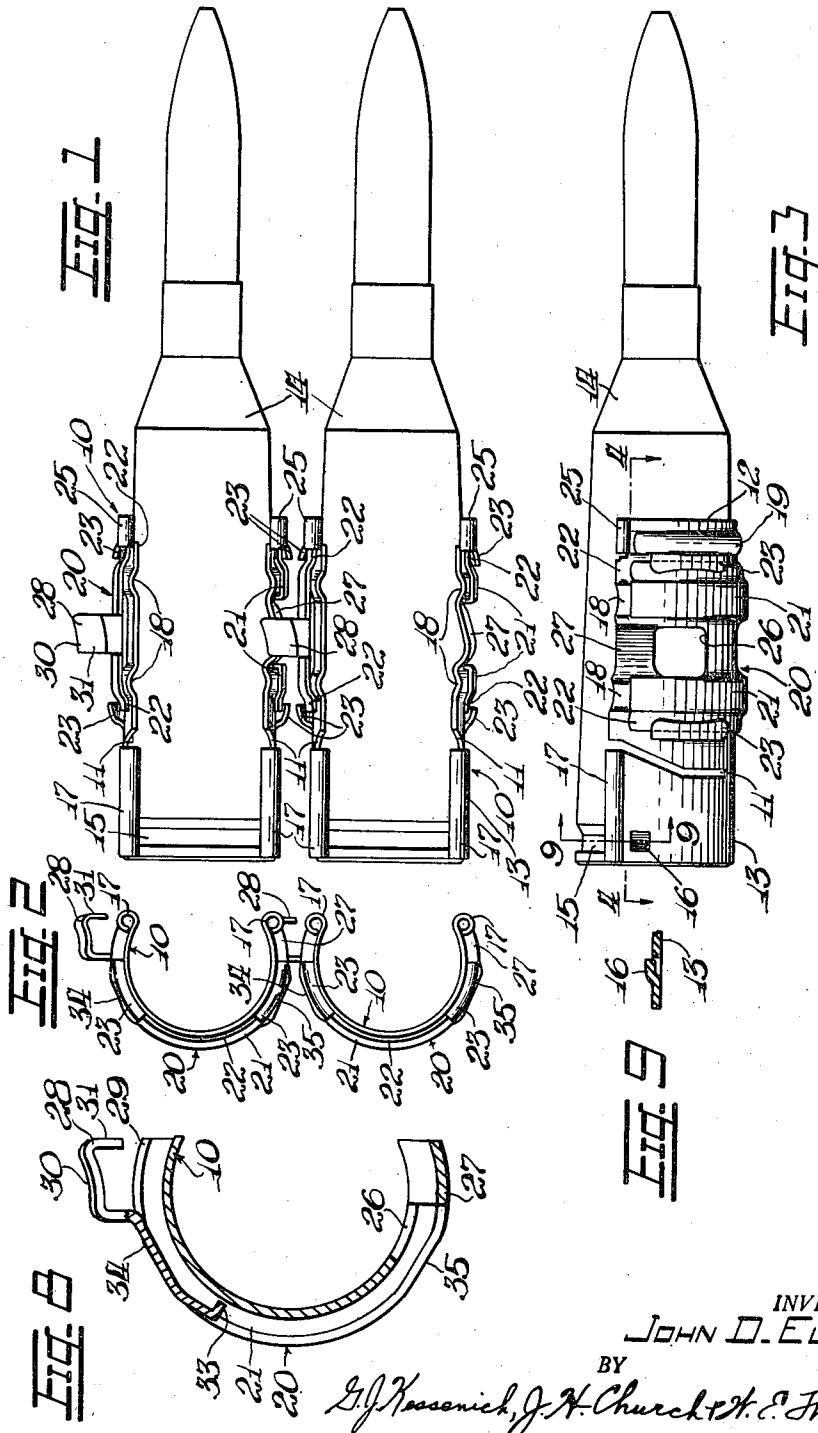
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CARTRIDGE BELT

2,475,380

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

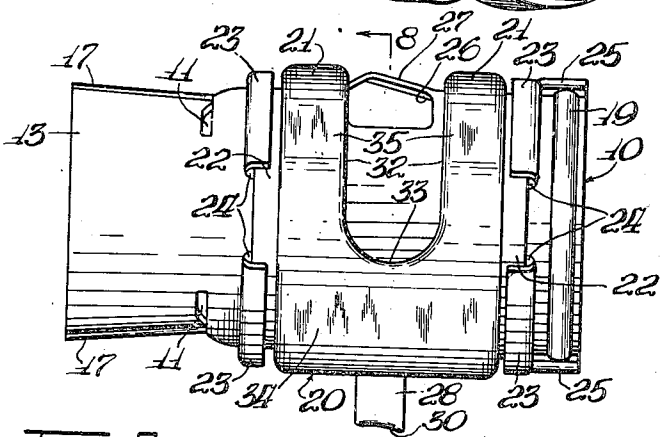
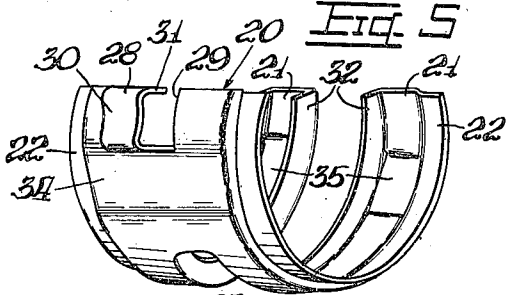
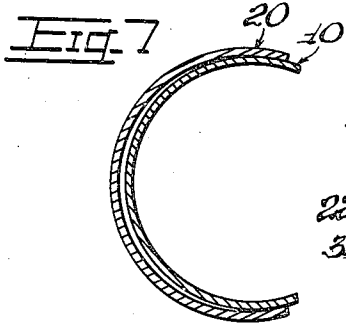
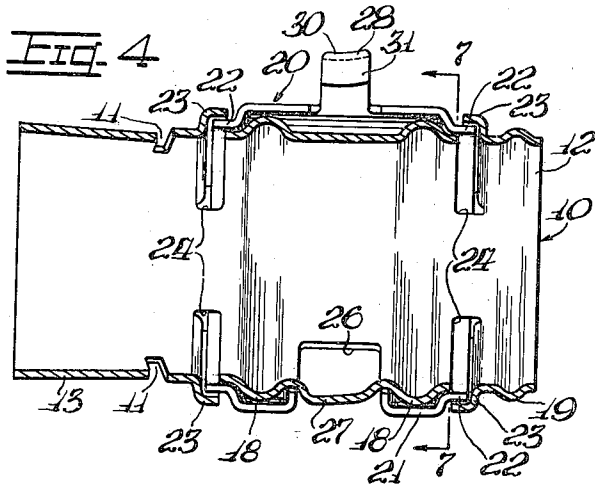


FIG. 6

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# UNITED STATES PATENT OFFICE

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## CARTRIDGE BELT

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5 Claims. (Cl. 89—35)

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This invention relates to a cartridge or ammunition belt and more particularly to a belt of the disintegrating type in which successive links of the belt become disconnected from the following links as the cartridges carried thereby are fired.

The development of ammunition belts for modern rapid-fire weapons such as machine guns involves the production of relatively inexpensive, highly expendable belt links. It is preferable that the belt be composed of a plurality of similar articulately connected links having means providing for separation of the links as the cartridges carried thereby are fired so that the belt will disintegrate in use. It is important in ammunition belts of this type that the links be constructed in such a manner that the cartridges are firmly held thereby in proper relationship to the feeding and firing mechanism of the weapon from which the ammunition is to be fired. Further, it is required that the cartridges be firmly held or gripped by the links while still permitting easy extraction of the ammunition for loading into the chamber of the weapon. In this respect there are at least two major types of extracting and feeding mechanisms: In one, the cartridge is extracted rearwardly or pulled from the link and then chambered; in the other, the cartridge is extracted forwardly or pushed through the link directly into the chamber of the gun. In belts adapted for either type of weapon, the primary object is to support the ammunition in the belt so that it is not subject to axial misalignment in storage, handling or use of the belt. One type of belt found to be fairly successful is that in which each link comprises a plurality of loops constructed and arranged so that one loop of one link interfits coaxially with a pair of spaced loops on another link to receive a cartridge which serves as a pintle for articulately interconnecting adjacent links. It has been found, however, that this type of belt is not well suited for the feeding and firing of ammunition of relatively heavy caliber, particularly ammunition in which the cartridge case has a diameter relatively greater than the caliber of the projectile.

It is accordingly a prime object of the present invention to provide an improved ammunition belt consisting of articulately interconnected links of the disintegrating type in which connection and disintegration is accomplished by means other than the cartridge itself.

An important object of the invention is to provide a cartridge belt link having a body portion formed to grip a cartridge and a carrier mem-

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ber relatively loosely embracing the body so as to be at least partly rotatable with respect thereto and to provide first means on the carrier for connecting the link to an adjacent link and to provide second means on the body for connecting the body to the carrier of another adjacent link.

The invention has for another object the provision of a link of the type in which extraction of the cartridge is accomplished by pushing the cartridge forwardly through the link.

Another object of the invention is to provide means on the body for locating and firmly gripping the cartridge.

It is another object of the invention to provide means for connecting adjacent links in such a manner that the cartridge carried by the link engages the connecting means and prevents disintegration of a pair of adjacent links until the cartridges have been fired or extracted therefrom.

The invention has for still another object the provision of a cartridge belt link and an embracing carrier in which the components are provided with cooperating means preventing both axial displacement and complete rotation of the carrier with respect to the body.

The foregoing and other important objects and features of the invention will become apparent as the disclosure is completely made in the following detailed description of a preferred embodiment of the invention as shown in the accompanying sheets of drawings in which:

Fig. 1 is a bottom plan view of a pair of connected links shown with cartridges therein;

Fig. 2 is an end elevation of a pair of connected links, shown without cartridges;

Fig. 3 is a side elevation of the structure shown in Fig. 1;

Fig. 4 is a longitudinal sectional view, on an enlarged scale, taken substantially on the line 4—4 of Fig. 3;

Fig. 5 is a perspective view of the carrier member per se;

Fig. 6 is a plan view of the complete link;

Fig. 7 is a diagrammatic sectional view taken on the line 7—7 of Fig. 4;

Fig. 8 is a transverse sectional view taken on the line 8—8 of Fig. 6; and

Fig. 9 is an enlarged fragmentary sectional view taken on the line 9—9 of Fig. 3.

The preferred form of link chosen for the purpose of illustration comprises a generally semi-cylindrical body 10 formed at its rear end with a pair of opposed generally peripheral slits 11. The slits 11 separate the body into a forward car-

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tridge-supporting portion 12 and a rearward cartridge-gripping portion 13. As best shown in Figs. 4 and 6, the cartridge-gripping portion 13 is slightly tapered and has an effective diameter slightly less than that of the forward portion 12. The body 10 is constructed of resilient or spring metal so that the cartridge-gripping portion 13 is expanded upon the insertion thereof of a cartridge 14. The cartridge is formed at its base with the usual extracting groove, herein indicated at 15, and the cartridge-gripping portion 13 of the body 10 is formed with a pair of generally diametrically opposed lugs 16 (Figs. 3 and 9) designed to engage this extracting groove. The free or terminal edges of the cartridge-gripping portion 13 are rolled as at 17 to provide means for positively positioning the cartridge in the body 10 and further to serve as means for positioning the link and cartridge in the feedway of the weapon.

The forward portion 12 of the body 10 is provided intermediate the slots 11 and its forward edge with a pair of longitudinally spaced peripheral ribs 18. The extreme forward end of the cartridge-supporting portion 12 is formed with a peripheral reinforcing rib 19. The ribs 18, in addition to strengthening the body 10, serve also as means for mounting on the body a semi-cylindrical carrier indicated generally by the numeral 20. As best shown in Figs. 4 and 5, the carrier relatively loosely embraces the body 10 and is rotatable within limits with respect thereto. The carrier includes a bifurcated portion formed with channels 21 which respectively cooperate with the peripheral ribs 18 on the body to guide the carrier on the body and to prevent relative axial displacement between the body and the carrier. Although the unbifurcated portion of the carrier does not include the channels 21, the arcuate shoulders continuing from one side of each channel cooperate with the ribs 18 on the body 10 in the same manner as do the channels. The carrier is provided at each of its opposite ends with a semicylindrical flange 22. The body 10 is provided with a plurality of retainer flanges or ears 23 (Figs. 4 and 6). The retainer flanges are formed as integral parts of the body and the formation thereof is accomplished by slitting the body, as at 24, and turning or bending the flanges 23 outwardly therefrom.

As best shown in Fig. 7, the carrier 20 is slightly eccentric with respect to the body 10 so that the carrier, although being rotatable with respect to the body, rather firmly grips the body. Relative rotation between the components is thus not undesirably loose. The carrier is installed on the body by springing the ends of the former apart and then guiding the same into position on the latter.

The terminal or free edges of that portion of the body including the reinforcing rib 19 are rolled at 25 for the same purpose as the rolled edges 17.

As best shown in Figs. 3, 4 and 6, the intermediate portion of the body 10 is cut out as at 26 to provide an opening bordered by an integral portion 27 that forms a connecting loop on the body. This loop is at an angle to the general semicylindrical surface of the body and is so provided for a purpose that will presently appear. The carrier 20 is provided at one side thereof with connecting means in the form of a hook 28. This hook is formed as an integral part of the carrier and the formation thereof is accomplished by cutting the carrier at 29 and bending the hook

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outwardly therefrom. When the links are assembled to form a complete cartridge belt, the hook 27 on the carrier of one link engages the loop on the body of an adjacent link (Fig. 1), the hook 28 and loop 27 being normally generally diametrically opposed so that the belt thus articulately connected may lie in a horizontal plane. However, since the carriers 20 are rotatable with respect to the bodies 10, the adjacent links may assume various angles with respect to one another. Furthermore, the connections between the hooks 28 and the loops 27 are relatively loose so that the belt has considerable flexibility and "fanning" thereof and other incidental twisting is not interfered with. The intermediate portion of the hook 28 is at an angle to the general semi-cylindrical surface of the carrier and is complementary to the angular disposition of the loop 27 on an adjacent link. Thus as the cartridge is withdrawn from the link, the adjacent empty link is more easily disconnected. In this respect it is to be understood that the presence of a cartridge in one link prevents disconnection of an adjacent link, inasmuch as the curved portion of the hook, indicated by the numeral 30, lies fairly close to the cylindrical surface of the cartridge case of the cartridge 14. The bent-over horizontal portion, indicated herein at 31, is sufficiently long to prevent twisting of the carrier on one link with respect to the loop on an adjacent link to such an extent that the links can be disconnected while containing cartridges. It is to be further understood that the belt passes through the feedway of the gun with the links uppermost, or in the position shown in Fig. 6, or in a position just the reverse of that shown in Figs. 1 and 3. Consequently, as the cartridge is extracted from the first link, that link will remain connected to the second link. When the cartridge is withdrawn from the second link, the hook 28 is free to escape from the loop 27 and, because of the angular disposition of the hook and loop, disconnection or disintegration is more readily accomplished. This result occurs because the heavier portion of the link is to the rear of the hook and the weight of the link causes pivoting or twisting of the link about an axis normal to the axis of the link. This twisting will be accompanied by a pivoting of the first link with respect to the second link about an axis generally through the loop 27 and parallel to the axis of the link. The angular disposition of the hooks and loops moreover serves as means tending to straighten the belt, or bring the links and rounds back into parallelism, after the belt has been twisted.

Formation of the longitudinally spaced channels 21 in the carrier 20 is accomplished by a bifurcation in the carrier and by a turning up of the edges 32 at the inner sides of the channels 21. The turned up edges 32 are continuous at an intermediate portion of the carrier 20 and form a continuous curved wall 33 (Figs. 6 and 8). It will be seen from an examination of Fig. 8 that rotation of the carrier 20 in a counterclockwise direction with respect to the body 10 will cause eventual engagement of the wall portion 33 with one side of the loop 27. Likewise, rotation of the carrier with respect to the body in a clockwise direction will effect eventual engagement between the wall portion 30 on the carrier and the other side of the loop 27. Cooperation between these components thus provides means preventing complete rotation of the carrier with respect to the body and the rotation permitted

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is sufficient for the purpose of feeding the cartridges and for storing the belts. In the latter instance, it is necessary only that the links be capable of rotation through approximately 90° in either direction so that the belt may be folded upon itself back and forth. On the other hand, the bifurcation permits maximum desired rotation of the carrier with respect to the body, since, if the carrier had been made solid throughout, it would be engaged by the loop 27 almost immediately and little relative rotation would be obtained.

As best shown in Figs. 5 and 6, the carrier 20 is provided with a flattened portion 34 on the solid portion thereof and similar portions 35 on the bifurcated portion thereof. These flat surfaces will be engaged by the feed and holding pawls of the weapon.

It will be noted that a predominant characteristic of the present belt is that, although it is of the disintegrating type and the links thereof are articulately interconnected, the connections between adjacent links are not accomplished directly by the cartridges. However, as previously stated, the cartridges do cooperate with the connecting means to prevent disintegration of the belt as long as cartridges are present. The free flexibility of the belt is accomplished entirely by the relationship between the carriers and body portions of the links and by connection between the carriers and bodies of adjacent links. Thus the cartridge, once firmly seated in the link and located by the locating lugs 16, is not affected by flexing of the belt, as is the case in belts of the type in which the cartridges serve as connecting pintles. Consequently, the present belt eliminates such undesirable characteristics as "walk off" wherein twisting of the belt works the cartridge endwise out of its proper position.

Certain other features of perhaps lesser importance will appear to those skilled in the art. It will be appreciated, of course, that the present disclosure pertains to only a preferred embodiment of the invention and that numerous modifications and alterations may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A cartridge belt link comprising a body including a generally semi-cylindrical body portion formed to carry a cartridge and having one

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end thereof formed to resiliently grip such cartridge, a carrier including a generally semi-cylindrical portion substantially concentric with and relatively loosely embracing said semi-cylindrical body portion so as to be attached thereto and at least partly rotatable with respect thereto, said body portion serving thereby as a bearing member for said carrier, means at one side of said carrier forming a hook constructed and arranged for connection to an adjacent similar link, and means on said body portion forming a loop at a point generally diametrically opposite said hook and constructed and arranged for connection to another adjacent link.

2. The invention recited in claim 1 wherein said hook is provided with a flattened portion so dimensioned that the presence of a cartridge within the semi-cylindrical body portion of the engaged adjacent link prevents the hook from being detached from said adjacent link.

3. The invention recited in claim 2 including guide means on said body portion positioned to prevent axial displacement of said carrier therealong, but not circumferential displacement.

4. The invention recited in claim 3 wherein said guide means comprise circumferential rib means on said body portion and circumferential groove means on said carrier portion loosely engaging said rib means.

5. The invention recited in claim 4 wherein said hook and loop means are dimensioned to permit limited angular and torsional play of adjacent engaged links.

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