This invention relates to an improved ammunition feeding link for cannon, and has special reference to the provision of greater flexibility between articulated links, and the automatic disintegration or uncoupling of empty links after the shell has been withdrawn therefrom by the gun mechanism.

The link of the present invention was designed to replace, and be interchangeable with, a present type wherein fifteen links are riveted together and can bend between the links only in one direction from a plane surface such as the link guideways within the gun breech. Such permanently assembled links offer problems of disposer thereof and of recharging the cannon in inaccessible places as in airplane installations, since at present the cannon must be reloaded by the insertion of another clip of fifteen rounds when the first clip has been expended. In practice this limits the use of such a gun in the smaller fighting planes, to the initial clip as loaded prior to take-off; since otherwise a gunner would have to be provided to reload the cannon with a fresh clip.

The articulated, disintegrating link chosen to illustrate an embodiment of the invention was designed to fit the existing breech and cartridge feeding mechanism of a M4, 37 mm., automatic cannon. The normal cartridge feeding arrangement for this cannon limit it to clips of fifteen cartridges carried in individual links articulated to bend in one direction only, so that the fifteen cartridges are colled into a removable magazine normally attached to the left side of the gun breech, and fed therein while suspended from the links, which latter slide in guideways extending across the gun breech in a plane above the bore of the barrel. The gun feeding mechanism forces one cartridge at a time from its link, and also feeds or advances the clip of articulated links to bring another link into position. When the fifteen rounds have been used the articulated links are discharged as a unit from the right side of the gun breech, and since they remain linked together and can only bend downwardly from the plane of the breech guideways therefor, the disposal and/or salvaging of the links becomes a serious problem in aircraft installations. In inaccessible or remotely controlled gun installations it thus becomes impossible to reload in flight and the gun is therefore limited to its initial loading of fifteen rounds.

The present invention consists of links for holding and feeding ammunition to a cannon, a series of these links being temporarily or releasably articulated together by the act of placing shells or cartridges in each link, each link being disconnected from the remainder thereof as the shells are removed therefrom during the normal operation of the gun or cannon. Thus any desired number of links can be assembled into a continuous articulated belt or clip which disintegrates as it passes through the gun breech. The individual links may therefore be guided away from the gun and either discharged overboard, or collected in a container, if space is available therefor.

It is accordingly an object of this invention to provide a disintegrating articulated ammunition feeding belt of unrestricted length and wherein the individual links can be separated and then gathered in a smaller space or a more convenient receptacle.

It is a further object of this invention to provide such a disintegrating link belt wherein the links are releasably locked directly together by the insertion of the ammunition in the individual links, and released from each other by the removal of the ammunition, as in the normal operation of the gun.

It is another object of this invention to provide an improved and simplified disintegrating articulated link belt which can be flexed in either direction to facilitate the placing of an increased supply of ammunition adjacent the feeding side of the gun.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention in its preferred form is illustrated in the drawing and hereinafter more fully described.

In the drawing:

Figure I is a side view of a pair of links embodying the features of this invention.

Figure II is a bottom view of the links of Figure I, a fragmentary portion of a cartridge or shell being shown in position in one link to thereby lock the links together.

Figure III is a section on the line III—III of Figure I.

Figure IV is a disassembled perspective view of one link, to clearly bring out the features thereof.

As shown:

Each link, of which there may be any number assembled together, consists of a channel shaped cartridge retaining member comprising a base 10 conveniently formed of sheet metal, and hav-
of. The legs 11 carry inwardly pointing pins 13, while the legs 12 are inwardly offset at 14 to fit inside the legs 11 of an adjacent link, and are notched at 15 to engage the pins of such adjacent link. The legs 11 and 12 on each side are preferably joined by an arcuate web 16, the curve of which fits and locates a shell or cartridge case 17, a portion of which is indicated in Figures 1 and II.

The base 10 of the link has ears 18 stamped therefrom and out-turned flush with the base, these ears sliding in guideways associated with the gun breech, and being notched at 19 to be engaged by centering pins in the gun feeding mechanism. A central opening 20 is also stamped out of the base 10 to be engaged by the feeding pawl of the gun mechanism.

A spring clip comprising a base 21 and side fingers 22 and 23 is secured, as by riveting or spot welding, in the link member, the fingers engaging the sides of the cartridge shell to retain the same seated against the arcuate web 16. Each finger has a small ear 24 struck inwardly from its outer corner, and an opposite pair of these ears engage in a groove or channel 25 formed in the shell or bullet, to properly locate the shell relative to the link. The right hand fingers 23 are deliberately weakened and over-bent compared to the opposite fingers 22, in order that most of the spring movement, upon insertion of the shell, will occur therein. The fingers 23 are shown considerably narrower than the fingers 22 to be more yielding, the space or slot between the fingers 23 being considerably wider than the slot between the fingers 22. These fingers 23 carry keepers or dogs 26 which are adapted to engage under the pins 13 of the next link when a cartridge or shell is forced into position in one link. When the shell is removed the fingers 23 spring back in and without the dogs 26 from under the pins 13 of the next link thus releasing said pins from the notches 15 of the legs 12.

As the ammunition and links feed through the gun and a shell is pushed out of the spring fingers 22 and 23 of one link the keepers or dogs 26 release the pins of the preceding link and allow it to fall free by gravity and separate from the links still in the gun. In this manner, the entire length of the belt may be broken up into separate links which can be conveniently disposed of without special guide provisions other than a chute.

In the use of this type of articulated link it is convenient but not essential to provide a leading link having a special entering guide as indicated at 27 by the dotted outline. This facilitates initial entry into the gun mechanism.

In practical use these links may be fed in either direction, as the shell may be inserted into the symmetrical link pointing either way. If inserted nose down in Figure II the feed would be to the right in Figures I and II, and an empty link would be released as a shell was pushed out of the next link. In either case, the shell would be inserted with its groove 25 on the nose side of the link in order to properly balance the shell suspended from the clip.

It will thus be seen that I have invented an improved and modified articulated ammunition link that is self-disintegrating, while entirely relieving the ammunition from feeding and other strains incident to a long belt.

Having thus described my invention and the present preferred embodiments thereof, I desire to emphasize the fact that many modifications and adaptations of the apparatus herein described may be resorted to in a manner limited only by a just interpretation of the following claims.

I claim as my invention:

1. A disintegrating ammunition belt including a first link and a second link, each adapted to carry a shell, each link comprising a base member having a pair of substantially rigid outstanding arms at each end formed to receive and position a shell in the link, pins rigidly attached to the arms at one end of said base member, the arms at the other end of said base member having notches, said links being related so that the pins on the second link engage in the notches in the arms of the first link to constitute a pivotal connection between the links, a spring element attached to the base member of each link, each spring element having outstanding fingers adjacent said arms of the respective base member adapted for receiving and releasably retaining a shell, and keepers formed on the fingers adjacent the notched arms of the base member of the respective link, the fingers of said first link which carry the keepers being constructed and arranged to flexibly extend and move their respective keepers under the pins in the notches of the first link to prevent disengagement of said pins from the notches as long as the shell is retained in the links, and to automatically spring back when the shell is removed from the link and thereby release the pins from the notches in the first link to allow the force of gravity to disengage said second link from said first link.

2. A disintegrating ammunition belt including a first link and a second link, each adapted to carry a shell, each link comprising a base member having a pair of substantially rigid outstanding arms at each end formed to receive and position a shell in the link, pins rigidly attached to the arms at one end of said base member, the arms at the other end of said base member having notches, said links being related so that the pins on the second link engage in the notches in the arms of the first link to constitute a pivotal connection between the links, a spring element attached to the base member of each link, each spring element having outstanding fingers adjacent said arms of the respective base member for receiving and releasably retaining a shell, and keepers formed on the fingers adjacent the notched arms of the base member of the respective link, the fingers which bear the keepers being of reduced cross section so that when a shell is inserted in the first link said fingers of that link are subjected to substantial flexure so as to flexibly extend and move the keepers and pins in the notches of that link to prevent disengagement of said pins from the notches as long as the shell is retained in the first link, said fingers of the first link being adapted to spring back when the shell is removed from the first link and thereby automatically release the pins from the notches in that link to allow the force of gravity to disengage said second link from said first link.

HORACE J. ALTER.