

Iverson

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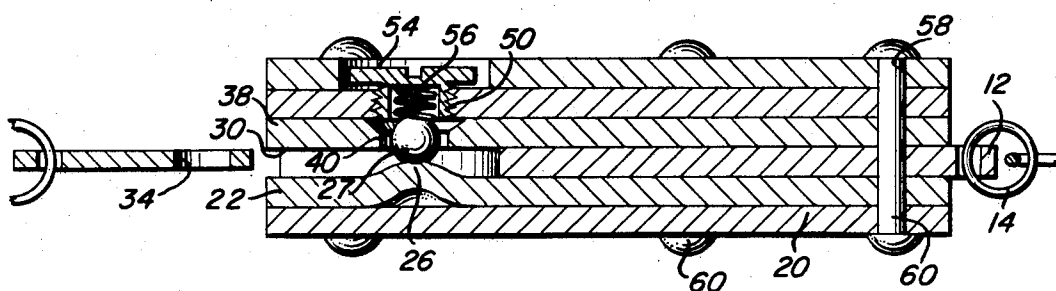


Fig. 1

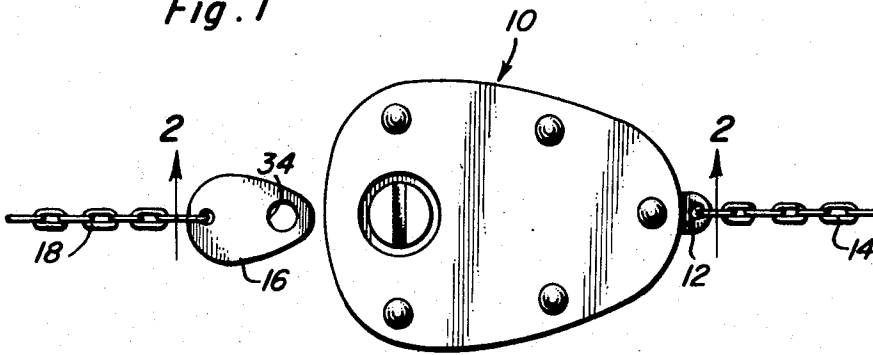
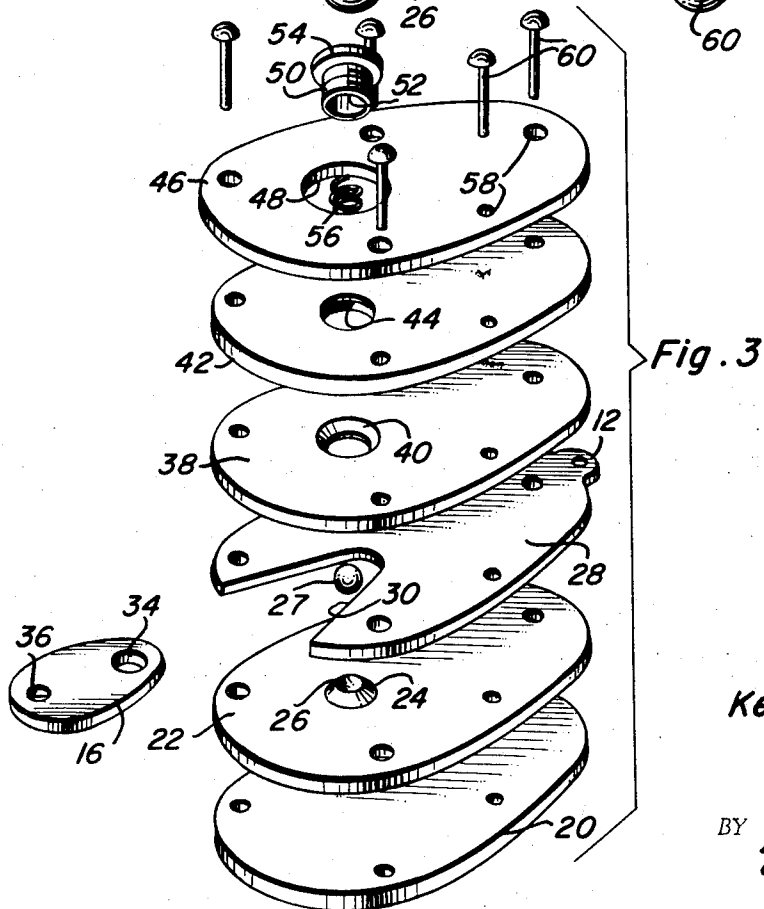
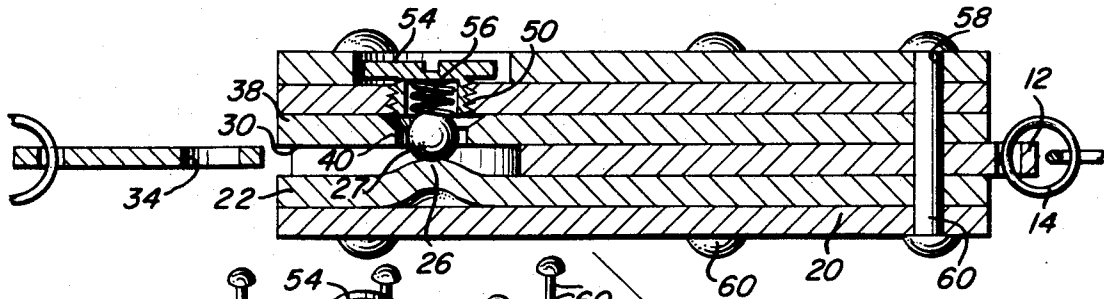


Fig. 2



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TENSION MEMBER OVERLOAD RELEASE MECHANISM

FIELD OF THE INVENTION

This invention relates to a quick release restraining device and in particular to a quick release assembly for dog leashes whereby a dog may be quickly and completely released from restraint by the application of a force which exceeds that for which the tension member has been set to retain. Such force may be applied by a lurching animal or its attendant.

BACKGROUND OF THE INVENTION

A wide variety of releasable connectors have been designed for connection between a dog leash and a dog collar. Generally, these previous designs suffer from two principal disadvantages. The first disadvantage resides in the relative complexity of the release mechanism. Frequently, multiple spring members are employed to achieve releasable latching. As will be appreciated, as a number of movable components increases, the desired releasing action at a predetermined minimum tension on the leash decreases in reliability. A second disadvantage of prior art devices becomes apparent due to the open design of many previous constructions that allow entry of dirt and debris which eventually clogs the moving parts of the mechanism thereby altering its ability to operate.

SUMMARY OF THE INVENTION

The present invention is an improvement over the previously designed quick release mechanisms of the type described. The present invention employs a minimum of moving parts which insures a high degree of reliability. Further, the simply fabricated device affords adequate shelter for the interior components so as to resist entry of dirt and foreign matter.

A further advantage of the present invention resides in a simple adjusting screw that varies the amount of tension required to achieve release.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a plan view illustrating the disposition of a latch when released from a corresponding keeper.

FIG. 2 is a sectional view taken upon a plane passing along section line 2—2 of FIG. 1.

FIG. 3 is an exploded view illustrating the components that make up the present invention.

DESCRIPTION OF THE INVENTION

Referring to FIG. 1, reference numeral 10 generally indicates a keeper component of the present invention which has an eye fastener portion 12 extending outwardly to connect a first end of the chain or leash 14. Slidably removable latch member 16 is held in the keeper 10 by detent action as hereinafter explained. The latch 16 is connected to a second chain 18 that has its free end connected to a dog's collar (not shown). It should be emphasized at this point that although the preferred embodiment of the present invention is being explained in terms of its use as a releasable connector between a dog leash and collar, the present connector assembly has general utility wherever a releasable connector is desired.

Referring to FIGS. 2 and 3, the assembly of parts for the invention is seen to include a plurality of overlying juxtaposed oblong shaped plates that are held together by rivets to form a laminated structure. A base plate 20 serves to underlie the remaining plates of the keeper 10. A second plate 22 abuts the base plate 20. The plate 22 has a frusto-conical projection 24 extending upwardly therefrom, the upper surface of the projection 24 having a semi-spherical depression 26 for seating a spherical member or ball 27 therein. The spherical member 27 forms a part of the detent when the latch 16 is removed. The spherical member 27 forms a part of the detent means which retains the latch 16 in the keeper 10.

The latch member 16 is generally tear-shaped and has a narrowed portion which is adapted for insertion in the keeper 10. The insertion is effected by the formation of a generally sector shaped slot 30 extending inwardly from the edge of plate 28. The shape of slot 30 coincides with the periphery of the narrowed portion of latch 16. As will become apparent from FIG. 2, the spherical member 27 partially resides in the slot 30 when the spherical member is seated on the projection 24.

As indicated in the figures, an aperture 34 is formed in the narrowed apex portion of latch 16. The aperture 34 receives the spherical member 27 after the latch 16 has been inserted in slot 30. The engagement of latch 16 between the spherical member 27 and the frusto-conical projection 24 within aperture 34 of the latch 16 constitutes detent action which releasably retains the latch 16 in the keeper 10. The aperture 36 positioned oppositely from the aperture 34 serves to retain the chain 18 in FIGS. 1 and 2.

A fourth plate 38 is disposed in juxtaposition with the plate 28. The plate 38 includes a countersunk opening 40 therein which restricts the lateral movement of the spherical member 27. Thus, the spherical member 27 will not stray from its proper position wherein detent action occurs.

A fifth plate 42 is juxtaposed atop the plate 38. A threaded aperture 44 is formed in the plate 42, the threaded aperture 44 being in axial alignment with the countersunk aperture 40 in plate 38. The threaded aperture 44 serves to receive a threaded member 50 that constitutes part of a release adjustment mechanism, as hereinafter explained.

A final cover plate 46 is juxtaposed on the plate 42. A large opening 48 is formed in the plate 46, this opening being in axial alignment with the apertures 44 and 40. The openings 44 and 48 must have sufficiently large diameters to allow admittance of the spherical member 27 in addition to a coil spring 56 that has its lower end abutting the spherical member 27 thereby biasing the spherical member into engagement with the projection 24. The opposite end of spring 56 is received within a hollow cylindrical chamber 52 in the threaded member 50. On the external surface of the hollow chamber 52 are threads that engage mating threads in aperture 44 of plate 42. As clearly indicated in FIG. 2, the opening 48 must be large enough to allow passage of the threaded portion of member 50 therethrough so as to allow threading engagement between the member and the threaded aperture 44.

The threaded member 50 has an enlarged head 54 which receives the driving end of a screwdriver for causing adjustment of the threaded member. By adjusting the head, which is disposed in concentric relation with the opening 48, the compression of spring 56 is adjusted so as to vary the force that the spring 56 exerts against the spherical member 27. As a result of this adjustment, the amount of tension required to break detent action between the spherical member 27 and the frusto-conical projection 24 within the aperture 34 in latch 16 can be varied.

As shown in the figures, the plurality of juxtaposed plates described have coinciding peripheral edges and are clamped together to form a laminated structure by a number of peripherally disposed rivets 60 that pass through aligned apertures 58 in each of the juxtaposed plates.

In operation of the device, the spherical member 27 is seated in the depression 26 of projection 24. When the latch 16 enters the slot 30, the leading peripheral edge of the latch 16 forces the spherical member 27 upwardly into the chamber 52 of the threaded member 50. As the spherical member 27 and the projection 24 separate, the latch is forced into more intimate engagement with the mating slot 30 formed in the plate 28. When the latch 16 is firmly seated in the slot 30, the spherical member 27 passes through the aperture 34 in the latch 16 and by so doing, detent securement between the latch 16 and the keeper 10 is effected. This of course connects the chain 14 and the chain 18. When a preselected tension is applied to the latch 16, such as by a lurching animal whose collar is connected to chain 18, the latch 16 is urged outwardly thereby causing the spherical member 27 to withdraw into the chamber 52 of the threaded member 50. As this withdrawal increases, the latch 16 is free from engagement with the keeper 10 thereby freeing the animal.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A releasable dual part connector assembly comprising a keeper component having a slot therein for receiving a latch member, detent means positioned in the keeper component and extending into the slot for engagement with the latch member, the detent means being designed to release the latch member upon the exertion of a preselected minimum tension applied to

the latch means, said detent means comprising a projection formed in a first plate component, the slot being formed inwardly of the edge of a second plate component which is juxtaposed with the first plate component, the projection projecting into the slot for engaging the latch member, a spherical member positioned in aligned relation to the projection, the spherical member residing in an aperture formed in a third plate component juxtaposed with the second plate component, and means for biasing the spherical member into engagement with the latch member whereby the latch member is clamped between the spherical member and the projection.

2. The structure of claim 1 wherein the biasing means comprises a coil spring received in an aperture formed in a fourth plate component juxtaposed with the third plate component, the spring having one end thereof contacting the spherical member while the opposite spring end engages a stationary abutment.

3. The structure set forth in claim 2 wherein the abutment comprises a threaded member adjustably disposed in the fourth plate component and having a shoulder for contacting the spring, adjustment of the threaded member causing variation of spring compression thereby permitting variation of the preselected tension required to release the latch member.

4. A releasable connector assembly comprising first and second bodies, said first body including opposite end portions, one of said end portions having an aperture formed transversely therethrough, the other of said bodies having a first recess formed therein opening outwardly of one marginal portion of said other body and in which said one end portion of said first body is telescopingly receivable with said aperture opening outwardly, at its opposite ends toward opposite sides of said first recess, one side of said recess including a frusto-conical projection extending toward, but spaced from the opposite side of said first recess and projecting at least into and partially through said aperture when said one end of said first body is telescoped in said first recess, the minor diameter end of said projection including a generally centered second semi-spherical recess opening toward said other side of said recess, said second body including a passage including a first end opening endwise into said first recess through the other side thereof registered with said projection, and a spherical detent member disposed at least partially within said passage for shifting axially thereof and spring urged toward said projection with said spherical detent member seated in said second semi-spherical recess and projecting less than one-half its diameter into said first recess.

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