Dec. 16, 1947. R. B. COTTON 2,432,509

GLIDER PICK-UP DEVICE

Original Filed Oct. 28, 1943

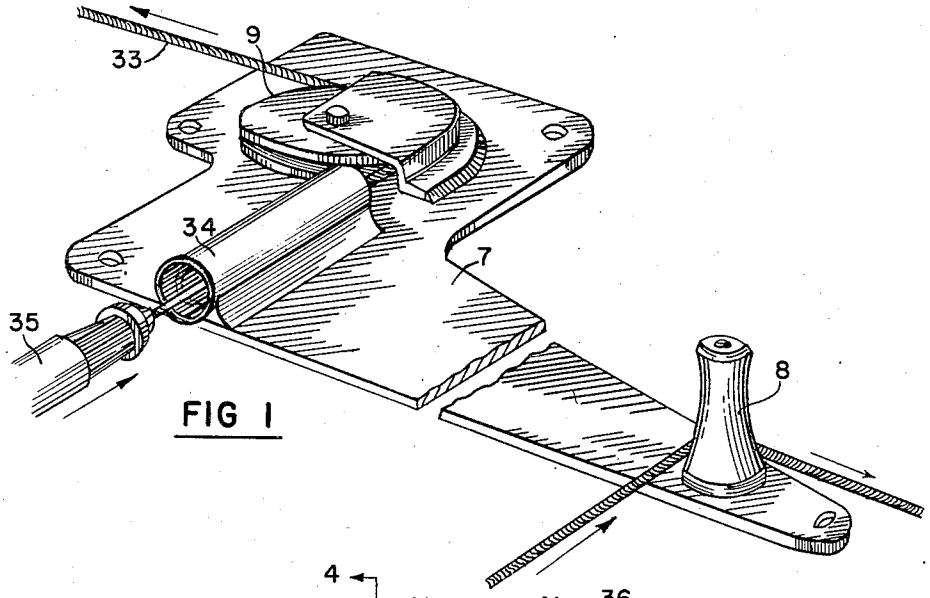


FIG 1

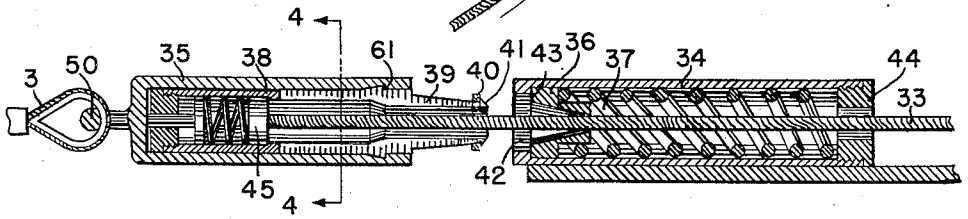


FIG 2

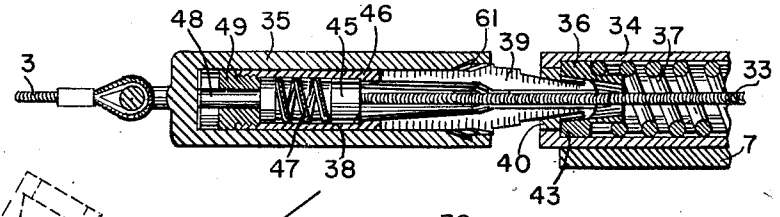
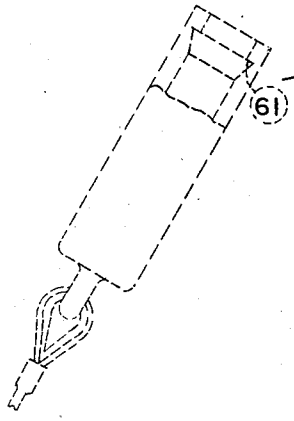


FIG 3



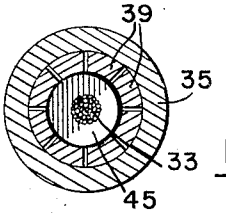


FIG 4

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GLIDER PICKUP DEVICE

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Original application October 28, 1943, Serial No. 507,931. Divided and this application October 21, 1944, Serial No. 559,720

5 Claims. (Cl. 244—63)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

1

The invention herein disclosed relates to glider pick-up apparatus of the type in which the glider which is at rest to begin with, is given a steady acceleration by energy obtained from a plane in flight until it reaches the speed of the plane, at which time a towline which has been picked up by the plane and which is connected to the apparatus, is released therefrom, and is gripped by a device on the glider for the subsequent towing of the glider by the plane.

The present application is a division of application Serial No. 507,931, filed October 28, 1943, and is for the release means referred to above.

In the apparatus, which is the subject of the parent application, the energy necessary for accelerating the glider with a steady and reasonable acceleration is transferred from the plane in flight until the glider attains the speed of the plane, and then the towline is fixed for the subsequent towing of the glider by the plane. This is accomplished without the necessity of carrying any of the apparatus in the glider or the plane, except for a very light pulley on the glider comprising a part of the gripping means and a light pick-up hook on the plane.

A hydraulic mechanism is used in the operation of this apparatus against a pressure accumulator to provide a continuous steady pull on one end of the towline which is passed around the pulley at the nose of the glider while the other end of the towline is being pulled by the plane, thus storing a part of the energy during the first part of the accelerating operation above referred to while the glider's velocity is low, and returning it during the latter part thereof, thereby continuously providing only half of the steady accelerating force to the glider, the other half being in the meantime supplied to the glider directly from the plane through the other portion of the towline passed around the pulley.

The apparatus thus includes a take-up line connected between the hydraulic means and the towline which is passed around the pulley on the glider.

The object of the present invention is to provide means to release the towline from the take-up line when the glider reaches the speed of the plane.

A further object is to provide a coupling between the towline and the take-up line which will break the connection upon impact or pressure of the coupling against a buffer sleeve through which the take-up line is passed.

These and other more specific objects will become apparent as the details of the subject releasable coupling means are described, having reference to the accompanying drawings, wherein:

2

Fig. 1 is a perspective view of the deck sheave post and buffer assembly used in the above referred to apparatus,

Fig. 2 is a cross-sectional view of the buffer and the releasable coupling between the towline and take-up line prior to release.

Fig. 3 is the same view with the parts in position immediately after release, the broken line figure showing the towline end fitting broken away from the rest of the coupling an instant later,

Fig. 4 is a cross-section taken at 4—4 of Fig. 2.

Referring more specifically to the several figures wherein the corresponding parts are designated by like numerals, the buffer sleeve 34 has an inner shoulder 43 against which the slidable collar member 36 is normally resiliently held by spring 37, the other end of which is biased against the fixed collar member 44. Take-up line 33 passes through this buffer and is attached to the coupling plug 45 fitted against an inner shoulder in sleeve 38 and supporting one end of spring 47 therein, the other end of which biases a pin member 48 which extends through a collar fixed in the end of the sleeve 38. The other end of sleeve 38 has a series of resilient prongs 39 extending therefrom around its periphery. These prongs have a collar 40 mounted around their wedge formed ends so that when the collar is pushed over the wedged portions it brings the prongs radially toward the axis of the coupling. A peripheral shoulder formed by projections on the prongs is thereby moved radially within the circumference of the sleeve, while normally it has a greater diameter and is adaptable to hook over an internal shoulder 61 formed in a groove on the inside of the cylinder 35 comprising the other part of the coupling which is attached at 50 to the towline 3. The closed end of this cylinder forces the pin member 48 in against the pressure of spring 47 when the coupling is locked. When the coupling is pulled in against the buffer collar 36 by movement of the take-up line 33, the collar 36 strikes the collar 40 which normally rests against the shoulder formed at the nose 41 of the prong assembly. Movement of the prong ends into the hollow of the sleeve 34 and collar 36 where they are further wedged by the conical shape of the hollow in this collar, moves the collar 40 over the wedge portions of the prongs to draw the shoulder formed by the prongs inwardly out of the groove 61, and the pin member 48 assists in releasing the outer sleeve so as to break the connection and separate the coupling.

Although a specific application of the releasable coupling is shown in this disclosure, it is obvious that the device is applicable to other uses wherever an automatic break in a moving line is desired upon it reaching a predetermined axial position in its movement.

Likewise, various modifications in design in the several parts of the coupling and buffer sleeve may be made without departing from the spirit and scope of this invention, as defined in the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

1. A coupling connecting two lines, a buffer through which one of the lines passes comprising a collar resiliently held against axial displacement, and means on said coupling to release it when the line is moved through the buffer so as to cause the coupling to strike said collar in an axial direction tending to displace it, including slidable means on said coupling, and resilient ejecting means for separating said coupling upon its release.

2. A releasable two-part coupling having each part connected to one portion of an automatically breakable line, a buffer element having a resiliently urged member, one portion of the line passing through said member, a releasing means on the part of the coupling nearest the buffer, so that as the line moves through the buffer the releasing means strikes the resiliently urged member in the buffer and the reaction releases the two parts of the coupling, and resilient means in one of said coupling parts for urging them apart.

3. A releasable coupling connecting two portions of an automatically breakable line, comprising a cylinder having a closed end connected to one of said portions, a coupling plug connected to said other portion, a sleeve for said plug with a closed end and an inwardly projecting shoulder near its open end for retaining said plug and having a bored opening in its closed end, a pin member in said sleeve with its pin extending through said bored opening and resilient means between said pin member and said plug, said cylinder having an internal circumferential groove with a square shoulder near its open end, said sleeve being slidable in said cylinder and having resiliently spreading prongs extending axially from its open end with square shoulders fitting against the square shoulder in said circumferential groove when said sleeve is pressed into said cylinder until said pin abuts the closed end of said cylinder and said resilient means is slightly compressed.

4. A releasable coupling connecting two portions of an automatically breakable line, comprising a cylinder having a closed end connected to one of said portions, a plug connected to said other portion, a sleeve for said plunger with a closed end and an inwardly projecting shoulder near its open end for retaining said plug and having a bored opening in said closed end, a pin member in said sleeve with its pin extending through said bored opening, resilient means between said plug and said pin member, said cylinder having an internal circumferential groove with a square shoulder near its open end, said sleeve being slidable in said cylinder and having resiliently spreading prongs extending axially from its open end with square shoulders fitting against the square shoulder in said sleeve groove when the sleeve is pressed into said cylinder until said pin abuts the closed end of said cylinder and said resilient means is slightly compressed, said prongs having projections converging axially, a collar around said projections adapted for withdrawing the prong shoulders out of said groove when the collar is pushed back over said converging projections, and retaining means on the end of said projections for said collar.

5. A releasable coupling connecting two portions of an automatically breakable line, comprising a cylinder having a closed end connected to one of said portions, a plug connected to said other portion, a sleeve for said plug with a closed end and an inwardly projecting shoulder near its open end for retaining said plug and having a bored opening in said closed end, a pin member with its pin extending through said bored opening, resilient means between said plug and pin member, said cylinder having an internal circumferential groove with a square shoulder near its open end, said sleeve member being slidable in said cylinder and having resiliently spreading prongs extending axially from its open end with square shoulders fitting against the square shoulder in said circumferential groove when the sleeve member is pressed into said cylinder until said pin abuts the closed end of said cylinder and said resilient means is slightly compressed, said prongs having projections converging axially, a collar around said projections adapted for withdrawing the prong shoulders out of said groove when the collar is pushed back over said converging projections, retaining means on the end of said projections for said collar, and resilient buffer means around the plug portion of the line for pushing said collar back over said converging projections as the line is pulled through said buffer means.

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