AERIAL TARGET COUPLING

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5 Claims

ABSTRACT OF THE DISCLOSURE

A cable coupling having a main barrel containing a ball-bearing assembly to which a cable is attached extending out of one end of a barrel for rotation upon its longitudinal axis relative to the barrel. The barrel contains an aerial target attaching assembly extending from its other end. A cap member is provided over the barrel to optionally adapt the coupling for use with different types of target launchers.

STATEMENT OF GOVERNMENT INTEREST

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.

BACKGROUND OF THE INVENTION

The invention relates to cable couplings and, more particularly, to cable couplings for use in towing aerial targets which couplings can be adapted for use with different types of target launchers.

Description of the prior art

Presently both the Navy and the Air Force use targets which are towed behind an airplane for shooting practice. The target is towed at the end of a cable and is attached to the cable by a swivel, so that the cable is free to untwist as it is paid out from a reel without imposing a twist load on the target. In use the target is normally stowed under the wing of the towing airplane by a connecting mechanism which can be released from the inside of the airplane at the proper time to release the target for towing. The Navy target launcher (LAU—37/A) and the Air Force target launcher (RMU—8/A) differ in the means used to connect the target under the wing of the airplane. The Navy's launcher has a latch mechanism which latches onto a co-operating portion of the swivel in order to releasably retain the target under the wing. The Air Force launcher has releasable caliper-type arms which extend around the target to retain it in position. The swivel used with the Navy launcher, since it must have a portion to co-operate with the retaining latch, is substantially longer than the swivel used with the Air Force launcher. Although the swivel plays no part in retaining the target under the wing of the airplane in the Air Force Launcher, the longer Navy swivel cannot be used in the Air Force launcher because its extra length would interfere with the equipment (the extra length of the Navy's swivel would cover the passage from which the tow cable emerges from the airplane). With prior art swivels the Government has had to obtain, at a substantial expense, different types of swivels for each different type of target launcher.

In addition, prior art swivels are made up of many parts. Any reduction in the number of parts is obviously advantageous from the standpoint of reliability and expense. In prior art swivels, an expanding retaining ring is used to retain the ball-bearing assembly in place. Applying eliminates this retaining ring by modifying existing structure to perform its function.

SUMMARY OF THE INVENTION

In view of the inconvenience and expense of the prior art swivels, Applicant has devised a single swivel having fewer parts which can be adapted for use with different types of target launchers. This has been done by providing a basic relatively small swivel connection which could be used with the Air Force type launcher and further providing a detachable extension for the housing which can be used to adapt the swivel connection for use with the Navy type target launcher.

OBJECTS OF THE INVENTION

An object of the present invention is the provision of a swivel connector for use in towing aerial targets. Another object of the present invention is the provision of a swivel having a reduced number of parts over prior art swivels.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

The single figure is a side view of the swivel connector having a portion thereof cut away.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, there is shown a swivel connector, designated generally by the reference numeral 5, which includes a main barrel portion 6. Inside the main barrel portion is a ball-bearing assembly 8 which abuts against a shoulder portion 9 at the forward end of barrel 6. A plug member 10 fits against the rear side of ball-bearing assembly 8 and prevents a cable fitting 11 from being pulled through the center of the ball-bearing assembly by the tension in a cable 12 to the end of which it is swaged. An alternate construction would be to eliminate plug member 10 and enlarge the head of cable fitting 11 so that it would not fit through the center of ball-bearing assembly 8. A coupling rod 13 extends from the rear of main barrel 6 and is held in position by a pin 15 which is retained in place by O-ring 16. The forward end 14 of coupling rod 13 extends into the main barrel an amount sufficient to prevent ball-bearing assembly 8 from falling out of position. Thus, forward end 14 of the coupling rod 13 takes the place of the prior art retaining rings. The target is attached to coupling rod 13 between a pair of arms 19 and 20 by a pin 18. Pin 18 is held in place by conventional means such as a cotter pin 21. In order to adapt the swivel assembly for use with the Navy type target launcher, a cap member 22 is provided at the forward end of the main barrel 6. The cap member is threaded over the main barrel at 24 and is fixed firmly in place by a set screw 25. A passage 26 is provided in the forward end of cap 22 for cable 12. The forward end of cap 22 is shaped to co-operate with the latch mechanism on the Navy type target launcher. The releasable latch member, not shown, fits into an annular depression 28 of generally V-shaped cross-section.

The swivel assemblies will be manufactured for the Government including cap member 22. They will be delivered to the various places at which they will be used as a unit, and depending upon the type of target launcher in use, cap member 22 will either be used on the main
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3 barrel member or discarded. In order to secure the swivel assembly with or without cap member 22 on cable 12, O-ring 16 and pin 15 are first removed and connecting rod 13 it withdrawn from main barrel member 6. Ball-bearing assembly 8, plug member 10, and cable fitting 11 are all loosely placed within the main barrel member for shipping and they are now taken out. The cable is inserted in the front end of the swivel (first through passage 26 if the cap is being used) and pushed through. Ball-bearing assembly and plug 10 are placed on cable 12 and cable fitting 11 is then swaged onto the end of the cable. The plug is inserted into ball-bearing member 8 and the whole assembly is pushed into the main barrel member until the ball-bearing assembly abuts shoulder 9. Coupling rod 13 is then reinserted into the main barrel 6 and fastened in place with pin 15 and O-ring 16. The swivel connection is then ready for connection to an aerial target.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. For example, cable fitting 11 could be attached to cable 12 by any known means and is not limited to a swaged connection. Similarly, the target could be attached to coupling rod 13 through any conventional means and is not limited to pin 18 and arms 19 and 20.

What is claimed is:

1. A swivel connector for attaching a target to a tow cable, said cable being supported for swivelling movement in said swivel connector and extending through a cable aperture in one end of said swivel connector, said swivel connector having means at its other end for attaching said swivel connector to a target and being adapted for use with a first known type of target launching apparatus, means for adapting said swivel connector for use with a second known type of target launching apparatus comprising:

a detachable housing portion having a cable aperture therethrough;

means at one end of said housing and at said one end of the swivel connector detachably securing said detachable housing to said one end of the swivel connector so that the cable aperture in said one end of the swivel connector is aligned with the cable aperture in said detachable housing, said cable extending through the cable aperture in said housing; and

means on the periphery of said housing for interlocking engagement with a latching mechanism of a second known type of target launching apparatus for releasably latching said connector to said second type of launching apparatus.

2. The device of claim 1 wherein the cable aperture in said housing portion terminates in an enlarged chamber for receiving said one end of the swivel connector therein.

3. The device of claim 2 wherein said interlocking engagement means comprises a depression in said housing portion.

4. The device of claim 3 wherein said housing is symmetrical about a longitudinal axis, and said depression is annular and of generally V-shaped cross-section.

5. The device of claim 2 wherein said securing means comprises threads on said housing and said connector, and wherein a set screw is provided to fix the housing portion in a threaded position on said swivel connector.

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