Dec. 22, 1953 J. A. CARR ET AL 2,663,748

SWIVEL CONNECTOR

Filed Dec. 6, 1950 2 Sheets-Sheet 1

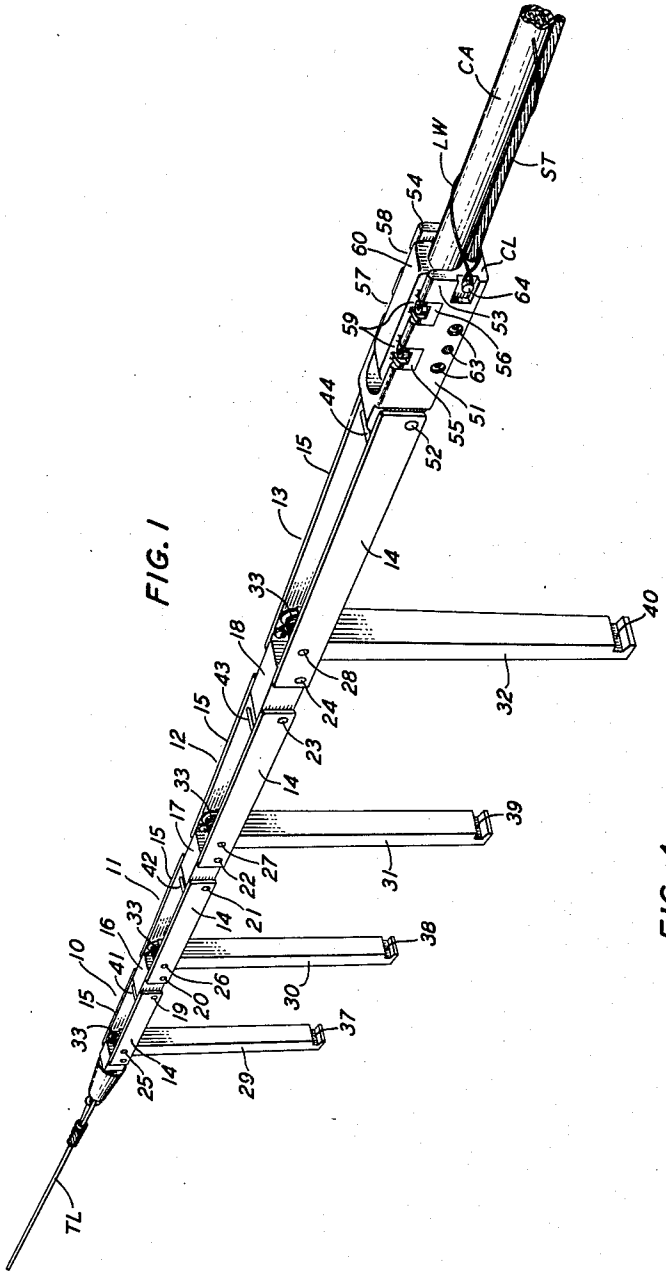

FIG. 1

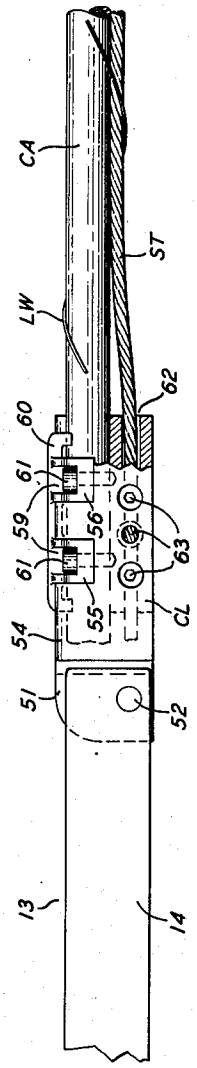

FIG. 4

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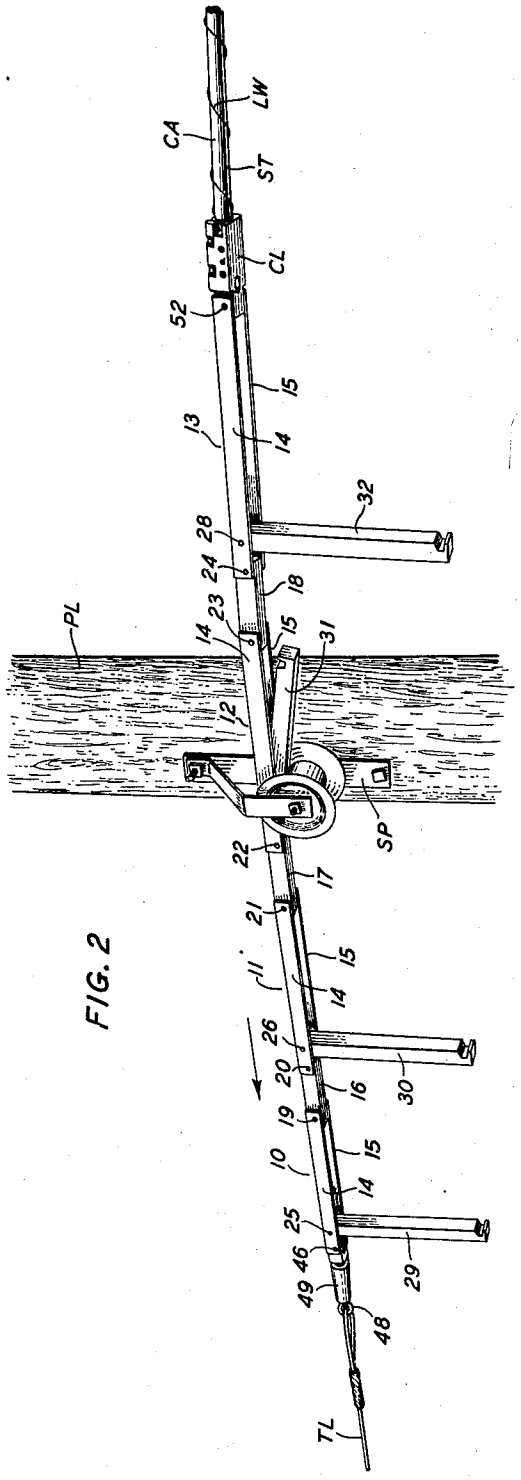

FIG. 2

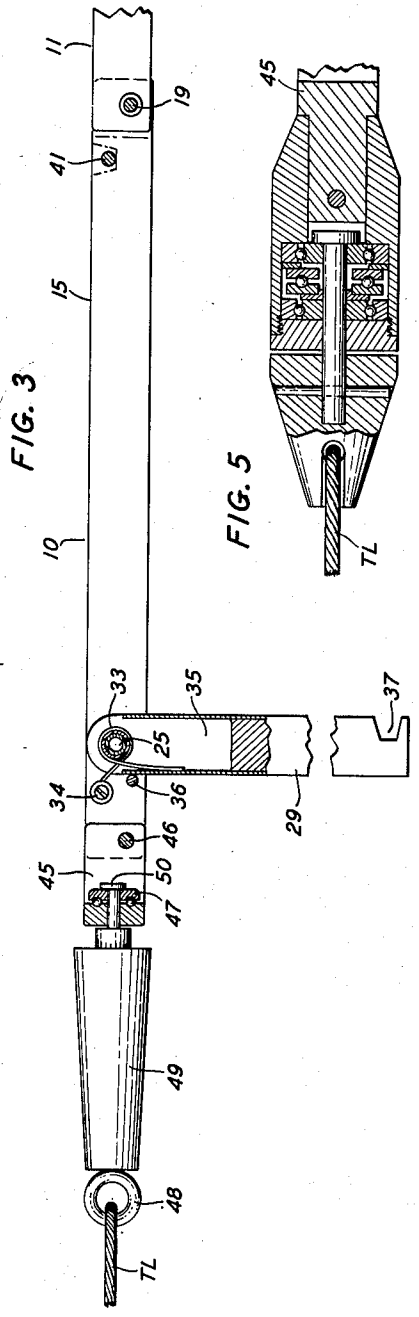

FIG. 3

FIG. 5

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SWIVEL CONNECTOR

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Application December 6, 1950, Serial No. 199,492

3 Claims. (Cl. 254—134.3)

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This invention relates to swivel connectors and more particularly to an intermediate connecting device intended to be interposed between a tow line and a cable being towed to prevent the twisting of the cable.

One object of this invention is to provide a connecting device which will permit the winch or tow line to twist without imparting the twisting action to the cable and/or strand being towed.

A further object of the invention is the provision of a connecting device which due to its novel construction has, at its draft end, means for rotatably securing a winch or tow line thereto and at its other end means for securing a cable and/or strand thereto.

In the installation of aerial cable wherein the cable is prelashed to the supporting strand prior to its being installed on the pole line, as disclosed in the application 199,491, filed December 6, 1950, in the name of F. V. Haskell, S. M. Sutton and O. L. Walter, which discloses a method and apparatus for installing aerial cable by prelashing the cable to the supporting strand, wherein both the strand and cable are pulled through a machine for lashing a wire around the strand and cable by means of a tow or winch line secured thereto which at the same time pulls the cable up into supporting devices on the supporting poles, it is essential that the cable and strand do not twist during the pulling-in operation.

It is a well-known fact that when a winch or tow line is wound on a drum, it has a tendency to twist when and after being removed and that this tendency varies with the pulling-in load. In the pulling-in of aerial cable by a winch or tow line secured to a power winch, using prior art methods and apparatus, it has been found that such twisting and untwisting of the tow line are imparted to the cable and/or strand with detrimental effects. Since it is essential that the cable and/or strand should be free of the twisting influence of the tow line, we have devised a device, intended to be interposed between the end of the tow line and the draft end of the cable and/or strand, which prevents the twisting of the tow line from affecting the cable and/or strand and permits a prelashed cable to be pulled in with a minimum amount of effort and with the assurance that the cable will not be damaged by a twisting action being applied thereto.

In accordance with our invention, we have provided a plurality of link members hinged together and having downwardly depending spring biased arms, which when moved upwardly, as when passing through a support and against the tension of springs, nest in recesses in the link members.

Secured to the draft end of the device is a rotatable pulling eye, which is journaled in a suitable thrust bearing. The opposite end of the device is provided with suitable means for clamping the cable and strand therein.

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The invention will be more clearly understood from the following detailed description when read in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of a connecting device illustrative of this invention with a tow line secured to the draft end and the cable supporting strand and lashing wire secured to the other end;

Fig. 2 is a perspective view of the device shown in Fig. 1 and illustrates the action of the downwardly depending arms as they pass through the cable support;

Fig. 3 is a fragmentary view, partly in section, and shows details of the thrust bearing on the draft end of the device and the spring for biasing the downwardly depending arms;

Fig. 4 is a fragmentary view, partly in section, and shows in detail the clamping means for securing the cable, the supporting strand and the lashing wire to the rear end of the connecting device; and

Fig. 5 illustrates an alternative form of thrust bearing for the draft end of the device.

Referring now to the drawings and in particular to Figs. 1 and 2, we have provided as shown a plurality of link members 10, 11, 12, and 13, each of which comprises a pair of spaced apart parallel longitudinally extending side members 14, and 15. The members 14 and 15 are held in spaced relation and joined together by means of the blocks 16, 17, and 18 and are pivotally connected thereto by means of pins 19, 20, 21, 22, 23, and 24.

As shown in Figs. 1 and 2, and in greater detail in Fig. 3, there is pivotally supported between each of the members 14 and 15 adjacent the blocks 16, 17 and 18, by means of the pins 25, 26, 27 and 28 the downwardly depending arms 29, 30, 31 and 32 which are maintained or biased in their downward position, as shown in Fig. 3, by means of the coil springs 33. The coil springs 33 are mounted on the pivot pins 25, 26, 27, and 28 and have one end secured by means of screws 34 to the side members 15 and have their other end bearing against the inner wall of the recesses 35 in the arms 29, 30, 31, and 32. A stop pin 36 is located adjacent the top of each of the arms 29, 30, 31 and 32, to limit the movement thereof.

There is located at the lower end of each of the arms 29, 30, 31, and 32, the notches 37, 38, 39 and 40, which are adapted to engage the stop pins 41, 42, 43, and 44, located at the rear of each link member 10, 11, 12, and 13, between the members 14 and 15, to prevent the arms from projecting upwardly beyond the top edges of the link members as they pass through the support SP on the pole PL.

As shown in detail in Fig. 3, there is located on the draft end of the device a member 45, to which there is pivotally secured by means of the pin 46 the forward link member 10. Rotatably secured to the member 45 by means of the ball bearing 47, is the pulling eye 48, the shank portion of which extends through the member 49 and terminates in the large head portion 50. As shown in the various figures a winch or tow line TL is secured to the pulling eye 48 and is free to rotate on the bearing 47.

As shown in Figs. 1, 2, and 4 and more in detail in Fig. 4 there is provided at the rear end of the connecting device, a clamping means for securing the cable, strand and lashing wire to the rear link member 14. The clamping means CL comprises a casing member 51, having a trough shaped recess therein which is open to its rear for the reception of the cable CA. The opposite end of the casing 51 is pivotally secured to the link member 14 by means of the pivot pin 52. The casing 51 is provided on its upper edges 53 and 54 with recesses 55, 56, 57 and 58, which are adapted to receive the extending ear portions 59 of the shoe member 60, which as shown, is in engagement with upper surface of the cable CA and bears firmly against the cable to grip it securely in the casing 51 when the bolts 61, which pass through the ears 59 and into the recesses, are tightened down.

As shown, the strand ST is positioned in the longitudinal bore or hole 62 and held therein by means of the screws 63, and the lashing wire LW is secured around the stud 64.

In the operation of the device of our invention, the cable CA, the strand ST and the lashing wire LW are secured in the clamp CL as heretofore described. The tow line TL is then secured to the pulling eye 48.

When the tow line TL moves forward, as it is wound on the drum of the winch (not shown) to pull the prelashed cable CA into position on the support SP, the connecting device will approach the support with the arms 29, 30, 31 and 32, hanging downwardly as shown in Fig. 1, due to their weight. As the device reaches the support the arms will successively engage the support and will be moved upwardly as shown by the arm 31 in Fig. 2. Since the arms are spring biased they will assume their normal position as soon as they pass through the support, as shown by the arms 29 and 30 in Fig. 2. The action of the arms is repeated at each support as they pass therethrough and since the arms are of substantial weight the varying torque in the tow line TL will have no effect on the connecting device or the cable CA, since the tow line TL will be free to rotate on the swivel located on the forward end of the device and the connecting device will not twist nor rotate due to the downwardly depending arms 29, 30, 31 and 32, the weight of which has been calculated to oppose the twisting action of the tow line TL.

While we have shown and described a preferred embodiment of our invention, it is to be understood that various changes and modifications may be made therein without departing from the scope and spirit of the invention.

What is claimed is:

1. An antitwisting device to be interposed between the end of a tow line and the draft end of a prelashed cable assembly, said assembly including a sheathed multiconductor cable, a supporting strand and a longitudinally extending wire lashed thereabout, comprising a plurality of links hingedly secured together in tandem, each of said links comprising a pair of spaced apart parallel members and having downwardly depending arms pivotedly supported therebetween adjacent one end thereof, each of said arms having a spring connected thereto for normally maintaining said arms in their extended positions, said arms arranged, when meeting an obstruction, to move upwardly against the tension of the springs and nest in the link members, means on the forward end of the device for securing a tow line thereto, and adjustable clamping means on the rear end of the device for securing the sheathed cable, the supporting strand and the lashing wire.

2. An antitwisting device to be interposed between the end of a tow line and the draft end of a prelashed cable assembly, said assembly including a non-metallic sheathed multiconductor cable, a supporting strand and a longitudinally extending wire lashed thereabout, comprising a plurality of links hingedly secured together in tandem, each of said links comprising a pair of spaced apart parallel members and having downwardly depending arms pivotedly supported therebetween adjacent one end thereof, each of said arms having a spring connected thereto for normally maintaining said arms in their extended positions, said arms arranged, when meeting an obstruction, to move upwardly against the tension of the springs and next in the link members, rotatable means on the forward end of the device for securing a tow line thereto, and adjustable clamping means on the rear end of the device for independently securing the sheathed cable, the supporting strand and the lashing wire.

3. An antitwisting device to be interposed between the end of a tow line and the draft end of a prelashed cable assembly, said assembly including a non-metallic sheathed multiconductor cable, a supporting strand and a longitudinally extending wire lashed thereabout, comprising a plurality of links hingedly secured together in tandem, each of said links comprising a pair of spaced apart parallel members and having downwardly depending arms pivotedly supported therebetween adjacent one end thereof, each of said arms having a spring connected thereto for normally maintaining said arms in their extended positions, said arms arranged, when meeting an obstruction, to move upwardly against the tension of the springs and nest in the link members, rotatable means on the forward end of the device for securing a tow line thereto, and adjustable clamping means comprising a sheath engaging member, a strand securing means and a wire fastening means on the rear end of said device for securing the prelashed cable assembly.

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