ARMORED CABLE-TYPE LOCK ASSEMBLY
WITH SPECIAL END FITTINGS FOR THE
ARMORED CABLE THEREOF

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ABSTRACT
An armored ball and socket-type cable having a first end fitting in the form of a lock housing which establishes a slip joint for the medial region of the cable and a second end fitting which establishes a lost motion take-up device for the cable. Novel anchor means are provided for permanently securing the two end fittings to the ends of the cable, a novel cylinder lock is associated with the lock housing (first end fitting) for removably projecting a locking bolt into locking engagement with selected armor sections, and two forms of armor sections are capable of being used in connection with the stranded cable proper.

13 Claims, 4 Drawing Figures
ARMORED CABLE-TYPE LOCK ASSEMBLY WITH SPECIAL END FITTINGS FOR THE ARMORED CABLE THEREOF

The present invention relates to an armored cable-type lock assembly of the general type which is shown and described in my U.S. Pat. No. 3,696,647, granted on Oct. 10, 1972, and entitled "CABLE-TYPE LOCK ASSEMBLY," the present lock assembly being an improvement over that which is disclosed in such patent.

The present lock assembly is designed primarily for use as a tie-down lock for a motorcycle, a go-cart, a mini-bike, a snowmobile, or any other wheeled sporting vehicle, as well as for a sail or a motor boat, and in this respect it does not differ from the lock assembly of my aforementioned patent. Structurally, insofar as the cable armor per se of the present invention is concerned, it is similar to that of the patented lock assembly in that it consists of ball and socket members which are threaded onto a flexible stranded steel cable. Two forms of cable armor are disclosed herein, each being similar to a corresponding form of armor disclosed in said patent but possessing certain inherent advantages, principal among which is the ability of the cable to make a relatively sharp bend or curve without binding of the armor sections (ball and socket members).

Functionally there is also a similarity between the patented and the present cable-type lock assemblies in that each includes a pair of end fittings, one of which is in the form of a lock housing which establishes a slip joint for the medial region of the armor sections and the other of which establishes a lost motion take-up device for said sections. Furthermore, each lock assembly is capable of being put to use for tie-down purposes by threading an end of the armored cable through a transverse bore in the lock housing in order to establish a variable size loop, and then locking such medial region of the armored cable in a fixed position when the desired loop size has been attained, a key-operated cylinder lock which is secured within the lock housing being provided for this purpose. Because of these similarities both of structure and function between the two cable-type lock assemblies, the general objects of the present invention are substantially the same as those set forth in my aforementioned Patent No.

The improvements which constitute the novel subject matter of the present invention reside mainly in a novel and more effective means for anchoring the opposite ends of the cable in the end fittings, i.e., the lock housing and the lost motion take-up device and, in addition, a novel key-operated lock housing and cylinder lock combination by means of which the lock housing may be caused to interlock with the cable armor at selected regions therealong.

Insofar as the anchoring means are concerned, whereas such means in the case of the patented lock assembly consist of captured tubular sheet metal ferrules which are either cramped or soldered to the ends of the cables after the latter are initially threaded through the respective end fittings, i.e., the lock housing and the lost motion take-up device, the present anchoring means consist of a machined anchor member in the form of metal collars which may be affixed to the ends of the cable prior to application of the lock housing and the take-up device to the cable. Thereafter, the anchor members are applied to the end fittings by a push-in-and-snap action, after which the assembly is a complete and permanent one which cannot be taken apart except by the use of a cutting torch or the like. This anchoring and assembly arrangement enables the cable and its armor to be fashioned and assembled for inventory purposes in predetermined lengths so that individual customer requirements may be attended to on a retail basis by selecting the desired armored cable length and then snapping the two end fittings in position on the armored cable to effect a permanent and self-contained lock assembly.

Insofar as the key-operated lock housing and cylinder lock combination is concerned, whereas the patented combination embodies a positive action, cam-operated withdrawal means for disengaging a locking flange from the cable armor sections in the vicinity of the slip joint, the present lock housing and cylinder lock combination employs a pop-up type of cylinder lock which, when it moves bodily from a seated and latched position to its popped-out position, withdraws the locking flange from engagement with the cable armor sections.

The cylinder lock is maintained in its seated position by means of a slidable latch bolt which, when withdrawn from a projected latching position under the influence of a key and tumbler arrangement, allows the entire cylinder lock to shift bodily to its popped-out position, thereby releasing the cable armor for sliding movement through the lock housing. The advantages of such a lock housing and cylinder arrangement will be set forth presently, the principal advantage being in the construction of a simpler and less costly combination of parts and one which may be inventoried separately from the lock housing and snapped permanently into position in such housing at the time of retail sales.

The provision of an armored cable-type lock assembly such as has briefly been outlined above, and possessing the stated advantages, constitutes the principal object of the present invention. Numerous other objects and advantages, not at this time enumerated, will become readily apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are described herein and are more specifically defined by the claims at the conclusion hereof.

In the accompanying single sheet of drawings forming a part of this specification, one illustrative embodiment of the invention, but with two forms of cable armor, is shown.

In these drawings:

FIG. 1 is a fragmentary sectional view, partly in elevation, taken centrally and longitudinally through the proximate or locking end region of an armored cable-type lock assembly embodying the present invention;

FIG. 2 is a transverse sectional view taken on the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary sectional view similar to FIG. 1 but taken on a central longitudinal plane which is at a right angle to the sectional plane of FIG. 1, and showing the armored cable, with a different form of cable armor, threaded through the lock housing and located in position therein;

FIG. 4 is a fragmentary sectional view, partly in elevation, taken centrally and longitudinally through the distal end region of the cable-type lock assembly.

Referring now to the drawings in detail and in particular to FIGS. 1 to 3, inclusive, the cable-type lock assembly of the present invention is comprised essentially of four separately manufactured and assembled components, namely, an armored cable, two forms of which
are designated by the reference numerals 210 and 10 in FIGS. 1 and 3, respectively, an end fitting in the form of a lock housing 12 at one end of the armored cable, a second or terminal end fitting in the form of a lock motion or slack take-up member 14 at the other end of the armored cable, and a cylinder lock 16 which is permanently received within the lock housing 12.

For descriptive purposes herein, the end of the armored cable to which the lock housing 12 is applied will be referred to as the "fixed" end, while the other end of the armored cable to which the terminal end fitting 14 is applied will be referred to as the "free" end.

Considering first the nature of the armored cable 10 which is illustrated in FIG. 3, the cable is comprised of a central length of flexible stranded steel cable 20 over which there is threaded series of tubular sheath-like armor sections including alternately arranged male ball members 22 and female socket members 24. All of the ball members 22 are identical in configuration and are in the form of spherical beads of relatively massive construction. Each ball member presents an outer spherical surface which is interrupted by a central bore 26. The latter extends diametrically through the member and receives the stranded cable 20. The opposite ends of the bore 26 in each ball member 22 communicate with frusto-conical recesses 28 which perform a function that will be set forth presently. The diameter of the bores 26 is slightly greater than the outside diameter of the stranded cable 20 with the result that the ball members 22 will slide easily along the cable during cable and ball member assembly operations and with the further result that after the assembly is complete the ball members 22 will not bind against the cable.

All of the socket members 24 are identical and each is in the form of a tubular bead having an axial bore 30 extending therethrough. At each end of the bore 30 there is formed a frusto-conical recess 32, the outer rim of which communicates with a semi-spherical socket 34 of annular configuration, the curvature of the socket being conformable to the curvature of the outer surface of the adjacent ball member 22 in the alternate arrangement of ball and socket members 22 and 24. The effective depth of each socket 34 is slightly less than the radius of a ball member 22 and, consequently, an intervening ball member 22 between two adjacent socket members 24, when seated within the opposed sockets 34, will present a limited exposed peripheral portion of the ball member and will maintain the adjacent socket members slightly spaced apart and thus establish a flexible ball and socket joint between such adjacent socket members. As shown in FIG. 4, the socket members 24 which extend inwardly an appreciable distance from the terminal end fitting or slack take-up member 14 are provided with medial circumferential locking grooves 36, the purpose of which is to establish a series of locking shoulders for cooperation with a locking flange which is associated with the cylinder lock 16 in a manner that will be described subsequently. It is to be noted at this point that the bores 26 in the ball members 22 and the bores 30 in the socket members 24 are of relatively short axial extent, specifically on the order of approximately twice the diameter of the bores. The slant angle of the frusto-conical recesses 28 at the ends of the bores in the ball members 22 and of the frusto-conical recesses 32 at the ends of the bores 30 in the socket members 24 is on the order of 30°, the various recesses constituting clearance areas which allow for relatively steep angular bends or curves in the assembled armored cable since there are no sharp rim edges that ordinarily would contact the stranded cable 20 in the absence of such frusto-conical recesses. Whereas, in the absence of such clearance recesses, an angular flexion of approximately 45° would be possible, albeit, not without some danger of cable cutting, when the frusto-conical recesses 28 and 32 are provided a flexion of as much as 55° can be effected with no danger of cable cutting, these figures being based on the illustrated form of armored cable 10 as shown in FIGS. 3 and 4 of the drawings. It will be understood that by varying the depth and angularity of the frusto-conical recesses 28 and 32 and of the semi-spherical sockets 34, the maximum curvature of which the armored cable 10 is capable will be varied accordingly.

It will be understood, of course, that the effective length of any given armored cable 10 will be a direct function of the number of ball members 22 and socket members 24 which are employed on the stranded steel cable 20. As previously stated, these members 22 and 24 are alternately threaded on the cable 20, there being one more ball member than there are socket members so that each end of the cable arm will present one of the ball members 22. After the requisite number of ball and socket members have been threaded on the stranded cable 20 so as substantially to cover the cable from end to end, each end of the cable will have applied thereto a tubular machined retaining collar. One of these retaining collars is designated by the reference numeral 40 in FIG. 3 and is operatively applied to the lock housing 12, and the other of the two collars is designated by the numeral 42 in FIG. 4 and is operatively applied to the slack take-up member 14.

The collar 40 is of cylindrical configuration and has formed therein a frusto-conical axial bore 44 of relatively small slant angle. The inner end of the collar 40 is formed with a semi-spherical socket 46 which is commensurate in diameter to the diameter of the adjacent ball member 22. The outer cylindrical surface of the collar 40 is provided with a medial external annular groove 48 which cooperates with a snap ring 50 in securing the collar 40 permanently within the confines of the lock housing 12 in a manner that will be made clear presently. The collar 40 is applied to the adjacent or fixed end of the stranded cable 20 by initially inserting such end of the cable into the semi-spherical socket 46 and then through the bore 44 until it becomes flush with the outer end face 52 of the collar, after which a plurality of tapered wedges 54 are driven endwise into the adjacent end of the cable in order to spread the steel strands thereof outwardly and against the tapered wall of the bore 44 much in the manner that a wedge is driven into the distal end of a wooden hammer handle in order fixedly to maintain the same in the eye of the head of the hammer. By this expedient, tension which may be applied to the cable 20 will enhance the wedging action of the wedges 54 and prevent withdrawal of the adjacent end of the cable 20 from the bore 44 in the retaining collar 40.

The collar 42 (see FIG. 4) is similar to the collar 40 except for the fact that it is of somewhat smaller diameter and is devoid of an external annular groove therearound, as well as of a semi-spherical socket in its inner end. It is applied to the adjacent or free end of the cable 20 in the same manner as the collar 40 is applied to the
fixed end of the cable, i.e., by means of tapered wedges which force the cable strands against the wall of a tapered or frusto-conical axial bore which is formed in and extends through the collar. Said collar 42 constitutes a reaction member for one end of a helical compression spring 60 which surrounds the free end of the stranded steel cable 20, the other end of the spring bearing against one end face 62 of a guide collar 64. The other end face of the guide collar is formed with a semi-spherical recess which bears against the adjacent ball member 22 of the armored cable. The guide collar 64 has formed therearound an external annular groove 68 within which the inner marginal portion of a snap ring 70 is seated, the groove and snap ring being designed for locking engagement with the terminal end member or slack take-up fitting 14 in a manner that will be set forth presently.

It is to be understood that at the time of assembly of the armored cable 10, the collar 42 is applied to the free end of the cable 20 in such a manner that the compression spring 60 is caused to exist under a slight degree of compression so that the guide collar 64 is forced yieldingly against the adjacent ball member 22 with a moderate degree of pressure, thus transmitting pressure successively from ball member to socket member and vice versa throughout the entire length of the armored cable, the two retaining collars 42 and 40 constituting terminal reaction members which assimilate or contain such pressure.

The thus completed or assembled armored cable 10 constitutes an individual or unitary cable lock component which may be inventoried by the retailer in predetermined lengths for subsequent application thereto of the two end fittings, i.e., the lock housing 12 and the slack take-up member 14, the former being applied to the collar 40 and the latter being applied to the guide collar 64.

The lock housing 12 is generally in the form of a pear-shaped body, the large end of which has formed therein a cylindrical lock-receiving socket 72, while the small end has formed therein a socket 74, the two sockets being coaxial with the lock housing 12. The socket 74 is designed for reception of the retaining collar 40 on the fixed end of the stranded cable 20. Said socket 74 is provided with a semi-spherical countersocket 76 in the rim or outer end region thereof, such countersocket being designed for mating cooperation with the adjacent ball member 22 of the armored cable 10. The socket 74 is provided with a medially disposed continuous annular groove 78 which registers with the external annular groove 48 in the collar 40 so that when the latter collar is inserted endwise in the socket 74 of the lock housing 12 the snap ring 50 will fall in place between the two grooves and thus permanently anchor the fixed end of the armored cable 10 to the lock housing 12.

The central portion of the lock housing 12 is provided with a transverse bore 80, the diameter of the bore being slightly greater than the external diameter of the various socket members 24. This transverse bore 80 is designed for reception therethrough of a medial region of the armored cable 10 in order that a variable size loop may be established for vehicle-locking purposes, as, for example, when the free end of the armored cable is passed through the frame or wheel of a motorcycle and then threaded through the bore 80 as shown in FIG. 3. After pulling the cable through the bore 80 until the desired size of loop is attained, the cylinder lock 16 is manipulated to lock the armored cable 10 to the lock housing 12.

It is to be noted that in connection with any given linearly straight length or span of the armored cable 10, the socket members 24, in combination with the intervening ball members 22, define a series of annular locking grooves 82 (see FIGS. 3 and 1) and are designed for selective cooperation with a locking flange 84 which is associated with the cylinder lock 16 and the nature of which will be set forth presently. When this locking flange is projected forwardly from the inner end of the cylinder lock 16, it is capable of entering a selected groove 82 or 36 in order securely to lock the lock housing 12 in a fixed axial position along the armored cable 10. When the locking flange 84 is withdrawn from the selected groove 82 or 36 and into the confines of the lock housing 12, the armored cable is released and the lock housing 12 may be slid therealong into a position wherein it is free with respect to the free end of the armored cable 10.

The cylinder lock 16 is of the "pop-up" axial tumbler type and involves in its general organization a composite lock cylinder embodying two telescopic cylinder parts. The latter consist of a front part 86 and a cup-shaped rear part 88, the former part being telescopically received within the latter part and being fixedly and permanently secured thereto by means of a pair of coaxial radially extending anchor or drive pins 90. The two lock cylinder parts 86 and 88 are formed with outwardly extending annular rim flanges 92 and 94 which define therebetween an annular recess 96. The latter has disposed therein the inner portion of a snap ring 98. The outer portion of said snap ring seats within an annular internal groove 100 which is formed in the wall of the cylindrical lock-receiving socket 72 in the large end of the lock housing 12. The entire lock cylinder 16 is shiftable bodily as a unit between a retracted position within the socket 72 wherein the snap ring 98 engages the rim flange 86 of the front part 86, and a projected position wherein the snap ring 98 engages the rim flange 94 of the rear part 88, such position being shown in dotted lines in FIG. 1. Two helical compression springs 102 are received in small sockets 104 in the rear or inner end face of the rear cylinder part 88 and bear at their inner ends against the bottom wall 106 of the socket 72, the purpose of such spring being yieldingly to urge the cylinder lock 16 into its projected position. The previously mentioned locking flange 84 is integrally formed on the rear end of the rear cylinder part 88 and is of sharp right-angle configuration in cross section in order that it will positively engage within a selected locking groove 82 or 36 with no danger of slipping under the influence of armored cable tension. Said locking flange 84 projects through a diametrically disposed slot 108 which is formed in the bottom wall 106 of the socket 72. The distal edge of the flange 84 is recessed on an arcuate bias as indicated at 110 in FIG. 1 so that when the lock cylinder 16 is in its retracted position within the confines of the socket 72, the locking flange will be projected into a selected locking groove 82 or 36 of the armored cable 10 and the arcuate edge or relief area of the locking flange will mate with the spherical outer surface of the adjacent ball member 22 of the bottom of the groove 36, depending on whether the flange in one of the grooves 86 on one of the grooves 36.
The cylinder lock 16 further includes a rotatable barrel part 112 which is disposed and rotatably mounted in the composite lock cylinder and has an outwardly extending annular flange 114. The latter, in combination with a fixed inner barrel part 115, establishes an interfacing plane 116 which is normally intersected by a series of split, spring-biased, axial tumblers 118 as is conventional in connection with an axial tumbler type lock. When all of the splits of the split tumblers 118 lie in the common interfacing plane 116, the outer barrel part 112 is capable of being rotated, otherwise not. The inner barrel part 115 is maintained in fixed relation with the front and rear parts 86 and 88 of the composite lock cylinder by the anchor or drive pins 90 (see FIG. 3). Rotation of said outer barrel part 112 is accomplished under the control of a key 120 having a tubular body portion 122 which is provided with tumbler-displacing shoulders 124 and a manipulating wing 126. The body portion 112 of the key 120 is telescopically receivable over the outer end of the outer barrel part 112 and, when so received, the shoulders 124 serve to bring the various tumblers 118 to their positions of lock release as is customary with a conventional axial tumbler type lock.

Means are provided for releasably latching the cylinder lock 16 in its retracted position within the socket 72, this position serving to project the locking flange 84 through the slot 108 for cable-locking purposes as previously described. This retracted position of the cylinder lock 16 may thus be regarded as the “locked” position of the lock housing 12, although it is not necessarily the locked condition of the lock cylinder 16. Similarly, the projected or “popped-out” position of the cylinder lock 16 may be regarded as the unlocked condition of the lock housing 12 although it does not necessarily represent the unlocked condition of the cylinder lock.

The means for releasably latching the cylinder lock 16 in its retracted position embodies a cylindrical latch bolt 130 which is longitudinally slidable in a cylindrical bore 132 in the inner end portion of the cup-shaped rear cylinder part 88. The bore 132 extends transversely of said rear cylinder part 88 and a portion of its wall intersects the bottom wall of the rear cylinder part 88 so that the upper or outer portion of the latch bolt 130, as viewed in FIG. 3, is exposed to the lower or inner end of the rotatable barrel part 112. A small eccentric pin 134 on the lower or inner end of the barrel part 112 projects into a circular recess 136 (see FIG. 2) which is formed in the flattened upper or outer portion of the latch bolt 130 and thus provides a lost motion interlock for translating rotational movement of the barrel part 112 into longitudinal sliding movement of the latch bolt 130. A helical compression spring 140 extends into a longitudinal socket 142 in the inner end of the latch bolt 130 and serves yieldingly to urge the bolt to a projected position wherein the outer or distal end thereof enters a recess 144 (see FIGS. 1 and 3) which is cut in the cylindrical wall of the bore 72 in the lock housing 12.

The end fitting or slack take-up member 14 is shown in FIG. 4 and it consists of an elongated thimble-like member which, in effect, constitutes a terminal arm section and defines a relatively deep socket 150. An enlarged counter-socket 152 in the lower or open end region of the thimble-like member defines with the socket 150 an annular shoulder 154 in the medial region of said thimble-like member. The countersocket 152 is formed with an annular snap ring-receiving groove 156, the function of which will become apparent presently. The rim region of the slack take-up member 14 is formed with semi-spherical recess 158 of annular configuration, this recess being designed for mating engagement with the adjacent ball member 22 of the armored cable 10.

The end fitting or slack take-up device 14 is adapted to be manufactured in quantity and stocked by a retailer who may apply one such fitting to each armored cable at the time the latter is sold to a customer. To assemble the end fitting 14 on the cable, the cable-attached collar 42 is pushed into the bore 52 until such time as the snap ring 70 which is disposed within the annular groove 68 in the guide collar 64 snaps into position within the groove 156. At this time, the assembly is complete and permanent and no disconnection is possible.

In the operation of the cylinder lock 16, assuming that the lock is in its retracted position within the confines of the bore 72, and that the latch bolt 130 is in its projected position so that it extends into the recess 44 in the wall of the bore 72, insertion of the key 120 into the cylinder lock will cause the various split tumblers to shift axially so that the splits defined thereby lie in the aforementioned interfacing plane 116 of the rotatable and fixed barrel parts 112 and 115, thereby permitting turning of the key and together with the rotatable barrel part 112. Such rotation of the barrel part 112 will shift the position of the small eccentric pin 134, and the latter will ride against the circular edge of the recess 136 and, by a camming action, withdraw the outer or distal end of the latch bolt 130 from the recess 144.

As soon as the latch bolt 130 clears the downwardly facing shoulder which is afforded by said recess 144, the two springs 102 will project the entire cylinder lock 16 upwardly to the dotted-line position in which it is shown in FIG. 1, thereby withdrawing the locking flange 84 from the particular locking groove 82 or 36 in which it may be seated and freeing the lock housing 12 from the medial region of the armored cable 10 for sliding therealong in either direction. It is to be noted that during rotation of the barrel part 112, the mating locking flange 84 and the elongated slot 108 through which it projects prevent turning of the composite cylinder 86, 88 in the bore 72.

It is also to be noted that when the cylinder lock 16 moves bodily toward its raised dotted-line position, the extreme distal end of the latch bolt rides on the smooth cylindrical wall of the socket 72, the bolt remaining in its retracted position against the yielding or biasing action of the compression spring 140. The key 120 may be withdrawn from the cylinder lock 16 at any time and ordinarily after the cylinder lock has moved to its raised or “popped-out” position, the key will be removed and the lock housing will thus remain in its unlocked condition until such time as it is again desired to engage the housing with the armored cable. At this time, it is necessary merely to adjust the cable 10 in the transverse bore 80 of the lock housing 12 until the locking flange 84 is brought into register with the desired locking groove 82 or 36, as the case may be, at which time the lock cylinder 16 will be pushed manually to its retracted position within the bore 72. As soon as this occurs, the latch bolt 130 will snap into its projected position and enter the recess 144 in order thus
to maintain the cylinder lock in such retracted position with the locking flange in interlocking engagement with the selected locking groove or 36. The above-described terminal end fittings 12 and 14, i.e., the lock housing and the slack take-up member, are useable without modification in connection with the alternate form of armored cable 210 which is illustrated in FIG. 1. When so used, the stranded cable proper 20 and the two end fittings remain precisely the same as heretofore described, the only difference in the lock assembly as a whole being in the use of a different form of armored cable. Instead of employing male ball members 22 and separate female socket members 24, all of the armor sections with the exception of the use of a single terminal ball member 22, are identical and each is in the form of a tubular body 212 which is of cylindrical design and presents male and female end regions. The male end region is in the form of an axially extended reduced post-like section 214 on the outer end of which there is formed semi-spherical ball fragment 216, while the female end region embodies a semi-spherical socket 218 which is conformable in shape to that of the ball fragment 216. A straight cylindrical bore 220 extends through the ball fragment 216 and the post-like section 214 and opens into the small end of a frusto-conical counterbore 222. The large end of such counterbore opens into the semi-spherical socket 218.

The tubular bodies 212 of the armored cable 210 are threaded onto the stranded steel cable 20 in end-to-end fashion so that each ball fragment 216 is received in a socket 218 in the next adjacent tubular body 212. When the cable is placed under tension by reason of assembly of the terminal end fitting (slack take-up member 14), a universal ball and socket joint is established between each pair of adjacent bodies 212. The frusto-conical counterbores 222 function in the manner of the frusto-conical recesses 32 of the ball members 22 of the armored cable 10.

Since the female end of one of the tubular bodies 212 opposes the lock housing 12, it is necessary to interpose one of the ball members 22 between such tubular body and the lock housing, such ball member mating with the adjacent spherical recess 76 of the lock housing 12 and the adjacent semi-spherical socket 218 of said one tubular body 212.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. Therefore, only insofar as the invention is particularly pointed out in the accompanying claims is the same to be limited.

Having thus described the invention what I claim as new and desire to secure by letters patent is:

1. A lock assembly comprising an elongated flexible armored cable having a fixed end and a free end and provided with a series of longitudinally spaced annular locking grooves therealong, a lock housing secured to said fixed end and having therein a transverse bore for sliding reception therethrough of said free end in order to produce a closed variable size loop, said housing being formed with a cylindrical lock-receiving socket having a bottom wall with an opening which communicates with said bore, a cylinder lock fixedly disposed in said socket, said cylinder lock including a lock cylinder slidable axially in said bore and provided with a locking member on its inner end, said cylinder being movable bodily between a retracted position wherein the locking member projects through said opening and into said bore for selective engagement with said annular locking grooves, and a projected position wherein the locking member is withdrawn from said bore, spring means yieldingly biased said cylinder to its projected position, releasable latch means effective between said lock cylinder and the wall of said bore for latching the cylinder in its retracted position, and key-actuated means disposed within said lock cylinder for releasing said latch means.

2. A lock assembly as set forth in claim 1 and wherein the opening in the bottom wall of said lock-receiving socket is in the form of a diametrically extending slot, and the locking member is in the form of a flat-sided flange which is slidable in said slot and thus prevents turning movement of the lock cylinder within said lock-receiving socket.

3. A lock assembly as set forth in claim 2 wherein said releasable latch means comprises a latch bolt mounted for diametric sliding movement in said lock cylinder between a retracted position wherein it is disposed within the cylindrical confines of the cylinder and a projected position wherein the forward end thereof is projected radially from the cylinder, and a recess is formed in the wall of said lock-receiving socket and into which the forward end of the latch bolt extends when the lock cylinder is in its retracted position.

4. A lock assembly as set forth in claim 2 wherein said lock cylinder is provided with spaced apart rim flanges which define therebetween an annular recess, and a snap ring is disposed within said recess and seats within an annular internal annular groove in the wall of said lock-receiving bore and serves to maintain the lock cylinder permanently in position within said latter bore.

5. A lock assembly as set forth in claim 2 and wherein said lock cylinder is of a composite nature and is comprised of inner rear and outer front cup-shaped telescopic sections which are maintained in their fixed telescopic relationship by means of radial drive pins which pass through the walls of such sections.

6. A lock assembly as set forth in claim 2 and wherein said key-actuated means comprises fixed and rotatable barrel parts within said lock cylinder, an eccentric pin which is connected to said rotatable barrel part and projects into a circular recess in the latch bolt, and a key-responsive split tumbler mechanism for releasably locking the rotatable barrel part to the fixed barrel part.

7. A lock assembly as set forth in claim 1 and wherein said flexible armored cable comprises a stranded steel cable having one end thereof fixedly secured to said lock housing, and a plurality of tubular sheath-like armor sections slidingly received over said cable and bridging the distance between said free end and said fixed end, said armor sections including alternately arranged ball members presenting convex frusto-spherical bearing surfaces at their opposite ends and cylindrical socket members presenting concave frusto-spherical bearing surfaces at their opposite ends, each ball member being provided with a cylindrical bore therethrough which communicates with frusto-conical recesses at its opposite ends, the steel cable passing through said bore and recesses and the recesses consti-
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tuting clearance areas for the cable to enhance the extent of angular flexing of the armored cable.

8. A lock assembly as set forth in claim 7 and wherein each socket member is formed with a cylindrical bore therethrough which communicates with frusto-conical recesses at its opposite ends, the steel cable passing through said latter bore and recesses and the recesses constituting clearance areas for the cable to enhance the extent of angular flexing of the armored cable.

9. A lock assembly as set forth in claim 7 and wherein said armor sections further include a terminal end section into which the end region of the steel cable which is remote from the lock housing extends, and a helical compression spring which encircles said end region, bears at one end against the cable and at its other end against said terminal end section so as to place the cable under tension and draw adjacent armor sections hard against each other.

10. A lock assembly comprising an elongated flexible stranded cable having a fixed end and a free end, a plurality of tubular armor sections telescopically and loosely received over said cable in end-to-end contiguity, thus establishing an armored cable assembly, adjacent armor sections defining therebetween ball and socket connections which collectively permit articulation of the armored cable assembly, said armor sections defining a series of longitudinally spaced external annular locking grooves, a lock housing on the fixed end of said cable, a terminal end fitting on the free end of the cable, said lock housing being provided with a transverse bore for sliding reception therethrough of said free end of the cable together with the associated armor sections to produce a closed variable size loop, key-actuated locking means in said lock housing and including a retractable locking flange designed for selective projection into said grooves to thus establish different size loops, said lock housing being formed with a cylindrical socket the wall of which is provided with an internal annular groove therearound, a cylindrical anchoring collar mounted on said free end of the cable and provided therearound with an external annular groove, said collar fitting snugly within said cylindrical socket with said internal and external grooves in circumferential register, and a split snap ring seated within the last-mentioned grooves and serving permanently to retain said collar within said socket.

11. A lock assembly as set forth in claim 10 and wherein said anchoring collar is formed with a frusto-conical bore into which said free end of the stranded cable projects, and a tapered wedge disposed within said frusto-conical bore and serving to spread the strands of said cable apart and against the wall of said frusto-conical bore in order thus fixedly to secure the collar on said free end of the cable.

12. A lock assembly comprising an elongated flexible stranded cable having a fixed end and a free end, a plurality of tubular armor sections telescopically and loosely received over said cable in end-to-end contiguity, thus establishing an armored cable assembly, adjacent armor sections defining therebetween ball and socket connections which collectively permit articulation of the armored cable assembly, said armor sections defining a series of longitudinally spaced external annular locking grooves, a lock housing on the fixed end of said cable, a terminal end fitting on the free end of the cable, said lock housing being provided with a transverse bore for sliding reception therethrough of said free end of the cable together with the associated armor sections to produce a closed variable size loop, key-actuated locking means in said lock housing and including a retractable locking flange designed for selective projection into said grooves to thus establish different size loops, said terminal end fitting being in the form of a cup-shaped member having a relatively deep socket therein and provided therearound with an internal annular groove into which the free end of said cable projects, a reaction collar on said free end of the cable and slidable within said socket, a guide collar surrounding the free end region of the cable and provided with an external annular groove therearound, said guide collar fitting snugly within said socket with said internal and external grooves in circumferential register, a split snap ring seated within said latter grooves and serving permanently to retain the guide collar within said socket, and a compression spring encircling the free end region of said cable and interposed between said reaction and guide collars and serving to take up lost motion between said guide collar and the adjacent armor sections.

13. A lock assembly as set forth in claim 12 and wherein said reaction collar is formed with a frusto-conical bore into which said free end of the stranded cable projects, and a tapered wedge disposed within said frusto-conical bore and serving to spread the strands of said cable apart and against the wall of said frusto-conical bore to thus fixedly secure the collar on said free end of the cable.

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