

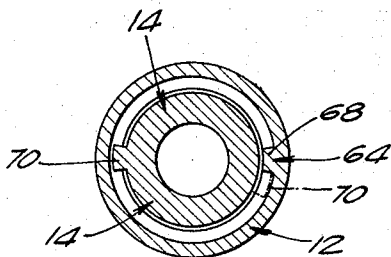
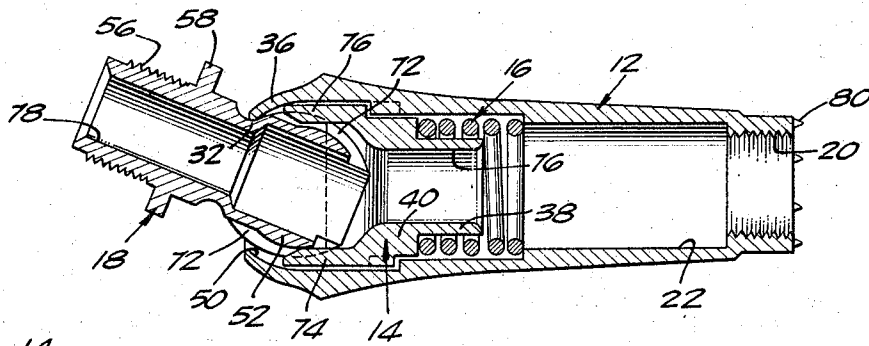
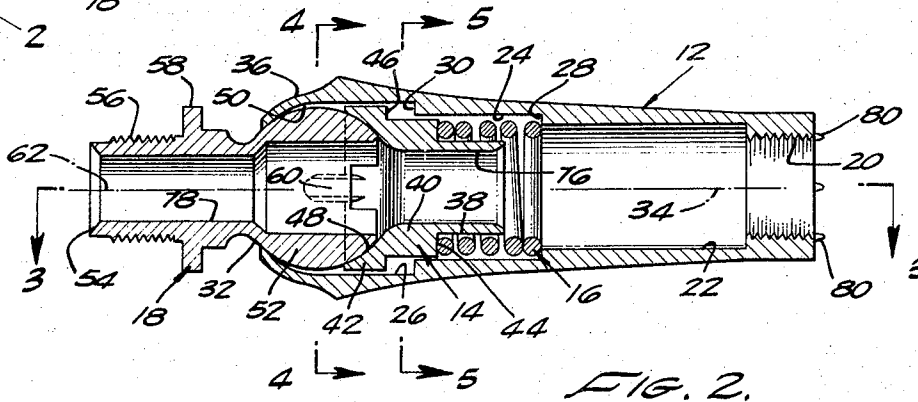
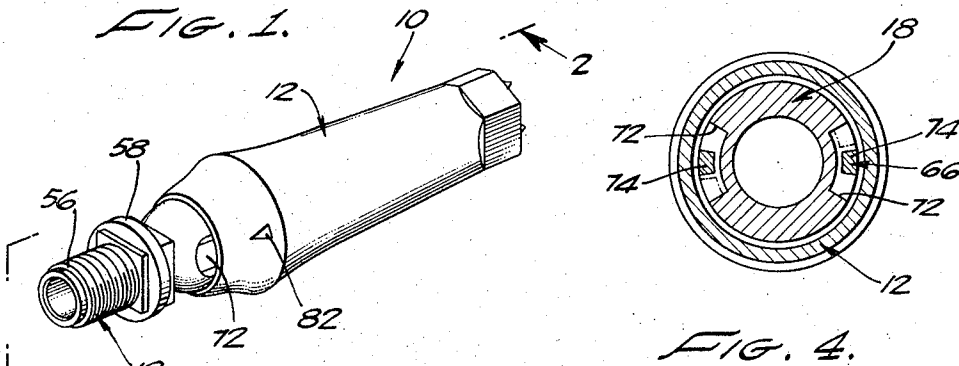
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R. A. BARRETT ET AL

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SWIVEL ASSEMBLY ROTATABLE THROUGH MORE THAN ONE REVOLUTION

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RICHARD A. BARRETT
DANIEL A. POLESKY
INVENTORS

BY *Buehler & Auer*

ATTORNEYS

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SWIVEL ASSEMBLY ROTATABLE THROUGH MORE THAN ONE REVOLUTION

Richard A. Barrett, Arcadia, and Daniel A. Polesky, Los Angeles, Calif., assignors to International Commodities, Inc., Pasadena, Calif., a corporation of California

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This invention relates generally to an articulated coupling and has more particular reference to an improved swivel assembly of unique construction.

In its broader aspects, the invention provides an improved swivel assembly which may be used for a variety of purposes. One particularly useful application of the swivel assembly, however, is in an electrical lighting fixture for attaching a lamp housing to a lamp support, thereby to permit the position of the lamp housing relative to the support to be adjusted. By way of example, one specific type of electrical lighting fixture in which the present swivel assembly may be used to advantage is a so-called pole lamp. As is well known in the art, such a pole lamp comprises a long supporting standard, or pole, which is normally installed in an upright position between the floor and ceiling of a room. Mounted on this pole, at positions spaced therealong, are a number of lamp housings each of which is commonly attached to the pole by means of a swivel assembly.

Generally speaking, an electrical swivel assembly of the kind under discussion comprises a housing having means for attachment to the lamp support and a swivel member mounted in the housing and having means for attachment to a lamp housing. The swivel assembly has a central opening extending through the swivel housing and the swivel member for receiving the electrical conductors which carry electrical current to a lamp within the lamp housing. In some of the existing electrical swivel assemblies of this kind, the swivel member has only one degree of adjustment relative to the swivel housing, to wit, pivotal adjustment about an axis generally normal to the longitudinal axis of the swivel housing. In many cases, this type of swivel assembly is undesirable for the reason that it unduly limits the adjustment of the lamp housing relative to the lamp support. Accordingly, an improved type of electrical swivel assembly has been devised wherein the swivel member has two degrees of adjustment relative to the swivel housing, to wit, pivotal adjustment about an axis generally normal to the longitudinal axis of the swivel housing and rotational adjustment about the latter axis.

While this improved electrical swivel assembly is quite satisfactory for use in many lamps, it has two inherent deficiencies which this invention seeks to cure. One of the deficiencies referred to results from the fact that it is necessary to positively limit the angle of rotational adjustment of the swivel member in order to prevent excessive twisting of the electrical conductors which extend through the swivel assembly when the latter is installed on a lighting fixture. In the existing swivel assembly under discussion, the maximum angle of rotational adjustment of the swivel member is somewhat less than 360°. In many cases, this limitation of the maximum angle of rotational adjustment of the swivel member to less than 360° is undesirable. The second deficiency, referred to above, of the existing improved electrical swivel assembly resides in the fact that the pivotal adjustment of the swivel member is restricted to one plane. In other words, the swivel member is incapable of universal swivel movement relative to the swivel housing. This latter limitation of the existing swivel assembly is undesirable in many cases.

At this point, therefore, it is apparent that there is a

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need for an improved electrical swivel assembly which is not subject to the two limitations of adjustment discussed above. This invention provides such an improved electrical swivel assembly. As mentioned earlier and as will become apparent from the ensuing description, however, the improved swivel assembly of the invention is not limited in usefulness to electrical fixtures.

Accordingly, it is a general object of this invention to provide an improved swivel assembly wherein the adjustment of the swivel member relative to the swivel housing is limited in a unique way which affords the swivel member with a greater degree of freedom of adjustment than are the swivel members of the existing swivel assemblies.

A more specific object of the invention is to provide an improved swivel assembly wherein the swivel member is rotatably adjustable relative to the swivel housing through an angle of 360° or more, and wherein further the swivel member is capable of universal swivel adjustment relative to the swivel housing.

Another object of the invention is to provide an improved swivel assembly of the character described which is particularly well suited for use as an electrical swivel assembly.

A further object of the invention is to provide an improved swivel assembly of the character described which is relatively simple in construction, economical to manufacture, and otherwise ideally suited to its intended purposes.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the invention, whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims, and illustrated in the accompanying drawings, wherein:

FIGURE 1 is a perspective view of the present improved swivel assembly;

FIGURE 2 is an enlarged longitudinal section through the swivel assembly, taken on line 2—2 in FIGURE 1;

FIGURE 3 is a longitudinal section through the swivel assembly taken on line 3—3 in FIGURE 2 and illustrating the swivel member in one of its limiting positions of pivotal adjustment relative to the swivel housing;

FIGURE 4 is a transverse section through the swivel assembly taken on line 4—4 in FIGURE 2; and

FIGURE 5 is a transverse section through the swivel assembly taken on line 5—5 in FIGURE 2.

The swivel assembly of this invention, as it is represented in the drawings, is indicated in its entirety by the reference numeral 10. Generally speaking, the illustrated swivel assembly comprises four components, to wit, an outer, generally tubular housing 12, a cup member 14, a spring 16, and a swivel member 18. Extending through the housing 12 is a bore which is threaded at 20, adjacent one end of the housing, and which is counter-bored at 22, 24 and 26 to the progressively larger diameters illustrated. The counterbores 22 and 24 define therebetween an annular shoulder 28 on the swivel housing 12. The counterbores 24 and 26 define therebetween an annular shoulder 30 on the housing. In the end of the swivel housing 12, removed from its threaded end 20, is a circular opening 32 which is centered on the longitudinal axis 34 of the housing. Opening 32 is surrounded by a generally spherically curved end wall 36 of the housing.

The cup member 14 includes a relatively thin walled, terminal sleeve portion 38, an intermediate enlarged external shoulder portion 40, and a further enlarged, external shoulder portion 42. The sleeve portion 38 and the intermediate shoulder portion 40 of the cup member define therebetween an external annular shoulder 44 of the cup member which faces the internal housing shoulder 28. The intermediate shoulder portion 40 and the terminal

shoulder portion 42 define therebetween an external annular shoulder 46 on the cup member which faces the internal housing shoulder 30. Spring 16 seats at one end against the internal housing shoulder 28 and at the opposite end against the external shoulder 44 on the cup member 14. This spring is compressed when the cup member occupies the position in the swivel housing 12, shown in FIGURES 2 and 3, whereby the spring is effective to urge the cup member toward the spherically curved end wall 36 on the housing. Extending axially into the end of the cup member 14 adjacent the housing end wall 36 is a generally spherically curved recess 48. This recess and the end wall 36 define therebetween a generally spherically curved socket 50.

The swivel member 18 includes a generally spherically curved ball-like end 52 which is rotatably and swivelly contained within the socket 50 and a reduced diameter extension 54 which extends from the spherical end 52 through the opening 32 in the swivel housing 12. The external end of the extension 54 is externally threaded at 56 and is formed with an external annular shoulder 58. The diameter of the extension 54 of the swivel member 18, where the extension joins to the spherical end 52 of the swivel member, is substantially smaller than the diameter of the opening 32 in the swivel housing 12, whereby the swivel member can pivot relative to the swivel housing, to the limiting position illustrated in FIGURE 3.

The swivel assembly 10, as it is thus far described, is generally conventional. It is apparent from the description to this point that the cup member 14 is capable of rotation relative to the swivel housing 12 about the longitudinal axis 34 of the housing. It is further apparent that the swivel member 18 is capable of universal swivel movement in the socket 50, about its center 60 of curvature, and of rotation about the longitudinal axis 62 of the swivel member, relative to the swivel housing 12 and the cup member 14.

According to the present invention, this generally conventional, basic swivel assembly is improved by the provision of first co-acting stop means 64 on the swivel housing 12 and the cup member 14 and second co-acting stop means 66 on the cup member 14 and the swivel member 18 for limiting rotation of the swivel member on its longitudinal axis 62, relative to the swivel housing, in such manner that the swivel member is permitted to rotate relative to the swivel housing through an angle at least equal to 360° and to undergo limited universal swivel movement relative to the housing. In this regard, it will be recalled that in the existing swivel assembly which permits rotation of the swivel member relative to the swivel housing, the maximum angle of rotation of the swivel member relative to the swivel housing is somewhat less than 360°.

The co-acting stop means 64 of the present improved swivel assembly comprises an internal stop shoulder 68 on the swivel housing 12 and an external stop shoulder 70 on the cup member 14. The housing stop shoulder 68 projects axially from the internal housing shoulder 30 toward the external shoulder 46 on the cup member. The stop shoulder 70 on the cup member, in turn, projects axially from the external shoulder 46 on the cup member toward the internal shoulder 30 on the swivel housing. It is apparent, therefore, that the stop shoulder 70 on the cup member is engageable with the stop shoulder 68 on the swivel housing during relative rotation of the cup member in the housing, thereby to limit the maximum angle of rotation of the cup member relative to the housing. These stop shoulders are made as narrow as is possible consistent with the required structural strength of the stop shoulders, thus to provide the cup member with the greatest angle of relative rotation relative to the swivel housing. It is apparent from FIGURE 5, however, that the stop shoulders 68 and 70, regardless of their width, limit the angle of relative rotation of the cup member to less than 360°.

The co-acting stop means 66 on the cup member 14 and the swivel member 18 comprise a pair of diametrically opposed, axially extending grooves 72 in the external, spherically curved surface of the spherical end 52 of the swivel member and a pair of projecting tongues 74 which extend axially from the adjacent end of the cup member into the grooves 72, to limit relative rotation of the swivel member relative to the cup member. Referring to FIGURE 4, it will be noted that the circumferential width of each groove 72 on the swivel member is substantially greater than the circumferential width of its respective tongue 74, whereby the swivel member is permitted to rotate through a substantial angle relative to the cup member. According to the present invention, the maximum angle through which the swivel member 18 may rotate relative to the cup member 14 is at least equal to, and is preferably greater than, the difference between 360° and the maximum angle through which the cup member may rotate relative to the swivel housing 12. It is apparent, therefore, that the co-acting stop means 64 and 66 in the present improved swivel assembly 10 limit relative rotation of the swivel member 18 relative to the swivel housing 12 in such manner that the swivel member is permitted to rotate relative to the housing through an angle which is at least equal to 360° and which, if desired, may be made greater than 360°. It is further apparent that the width the grooves 72 in the swivel member 18 relative to the width of the tongues 74 on the cup member 14 is such as to permit limited universal swivel movement of the swivel member relative to the swivel housing 12. In this regard, it will be recalled that one deficiency of the existing swivel assemblies resides in the fact that the swivel movement of the swivel member of each assembly, relative to its swivel housing, is restricted to pivotal movement in one plane containing the longitudinal axis of the housing. In other words, the swivel member in the existing swivel assemblies is incapable of limited universal swivel movement, as is the swivel member 18 of the present improved swivel assembly.

As noted earlier, the present improved swivel assembly is particularly useful as an electrical swivel assembly for attaching a lamp housing to a lamp support, such as the standard or pole of a pole lamp. When the swivel assembly is to be employed in such electrical applications, it is necessary to insert electrical conductors through the assembly for connection to the lamp socket in the lamp housing. To this end, the cup member 14 and the swivel member 18 in the illustrated swivel assembly are shown to have central openings 76 and 78, respectively, which communicate with one another and with the central bore through the swivel housing 12, thereby to define the central opening in the swivel assembly through which electrical conductors may be inserted. When mounting the swivel assembly on the pole of a pole lamp, the threaded end 20 of the swivel housing 12 is connected to a threaded fastener on the lamp pole. The lamp housing is connected to the threaded end 56 of the swivel member 18. Preferably, the end of the swivel housing 12 which seats against the lamp pole is provided with projecting prongs 80 which are adapted to indent themselves into the metal of the lamp pole, thereby to restrain the swivel housing against rotation relative to the pole. When installing the present swivel assembly on the pole of a pole lamp, it is necessary to locate the internal stop shoulder 68 on the swivel housing 12 in a predetermined angular position relative to the pole. To this end, the housing has an arrow 82 engraved in its outer surface in line with the housing stop shoulder, whereby the manufacturer may tell at a glance the position of the stop shoulder in the housing. According to the preferred practice of the invention, all of the internal edges of the swivel assembly are broken or beveled, as shown, to prevent these edges from cutting into the electrical conductors which extend through

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the swivel assembly when the latter is mounted on a lighting fixture.

In manufacture of the present swivel assembly, the swivel housing 12, cup member 14, and swivel member 18 are separately fabricated after which the cup member and swivel member, together with the spring 16, are assembled in the swivel housing. The end wall 36 of the housing is thereafter swaged over the spherically curved end 52 of the swivel member to retain the parts in assembled relation.

While the invention has herein been shown and described in what is presently conceived to be its most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described the invention, what is claimed as new in support of Letters Patent is:

1. A swivel assembly comprising: a housing having a central axis and an opening in one end on said axis and surrounded by a generally spherically curved end wall of the housing, a cup member longitudinally disposed within said housing for axial movement along and rotation about said axis, resilient means acting between said housing and said cup member for yieldably urging the latter member axially toward said opening, said cup member having a generally spherically curved recess presented toward said opening and defining with said end wall a generally spherical socket, a generally spherical swivel member rotatably and swivelly disposed in said socket and including an extension protruding through said opening, the portion of said extension within said opening being substantially smaller in transverse cross-section than the opening to permit limited swivel movement of said swivel member in said socket, first co-acting stop means

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on said housing and cup member including an internal projecting stop shoulder on said housing and an external projecting stop shoulder on said cup member engageable with said housing stop shoulder for limiting relative rotation of said cup member relative to said housing in such manner that said cup member is rotatable relative to said housing through a given angle approaching 360°, and second co-acting stop means on said cup member and swivel member including a pair of diametrically opposed, axially extending grooves in the external spherically curved surface of said swivel member and a pair of diametrically opposed, axially extending tongues on said cup member engaging in and substantially narrower than said grooves, respectively, for limiting relative rotation of said swivel member relative to said cup member in such manner that said swivel member is rotatable relative to said cup member through an angle at least equal to the difference between said given angle and 360°, whereby said swivel member is rotatable through a full 360° relative to said housing.

2. A swivel assembly according to claim 1 wherein: said swivel assembly has an opening extending through said housing, cup member and swivel member through which electrical wires are adapted to be inserted.

References Cited by the Examiner

UNITED STATES PATENTS

1,778,658	10/1930	Baker	285—264
2,684,259	7/1954	Schwartz	285—282 X
3,012,798	12/1961	Berger	285—264
3,034,809	5/1962	Greenberg	285—267
3,104,897	9/1963	Berger	285—166

CARL W. TOMLIN, *Primary Examiner.*

D. W. AROLA, *Assistant Examiner.*