May 19, 1970 W. L. LIPSCOMB 3,512,743

ADJUSTABLE LIGHTING FIXTURE HANGER WITH WIRING PROTECTION MEANS

Filed Nov. 14, 1966 2 Sheets-Sheet 1

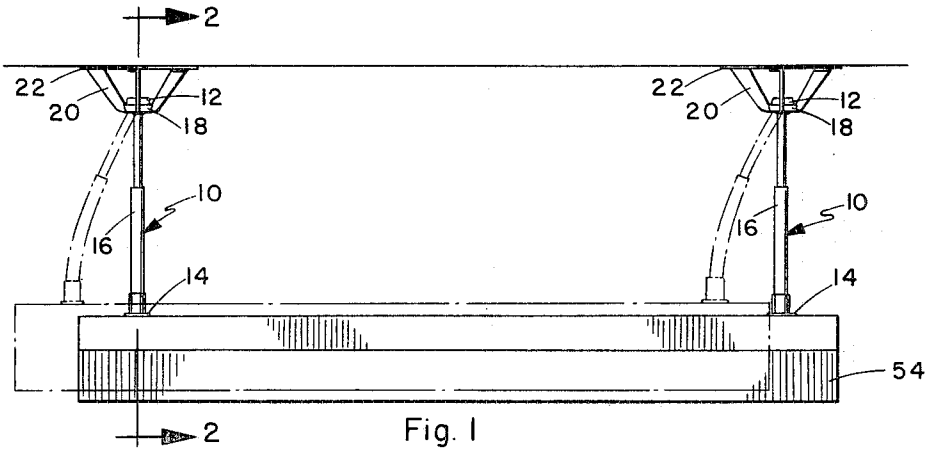


Fig. 1

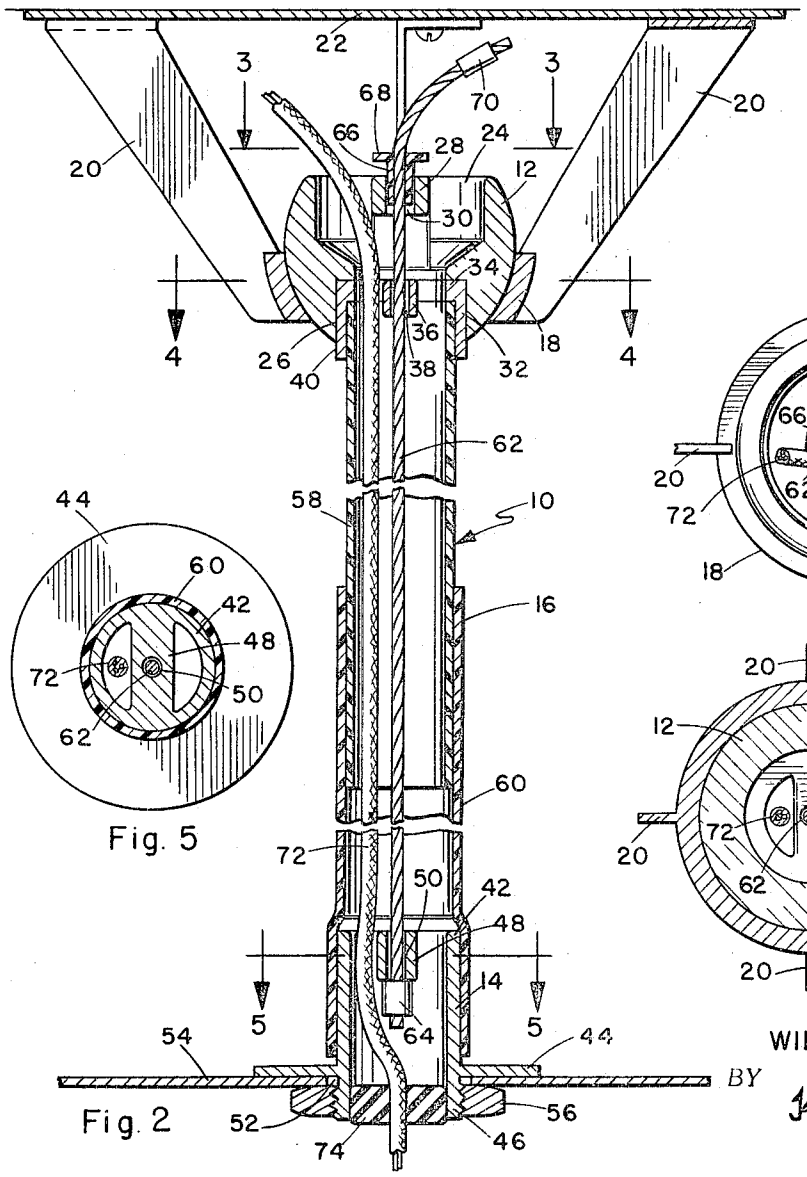


Fig. 2

Fig. 5

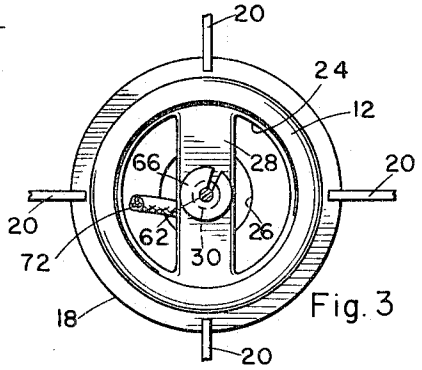


Fig. 3

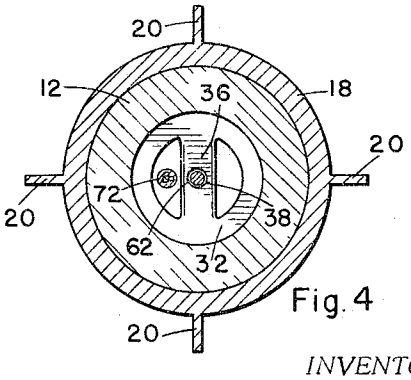


Fig. 4

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ADJUSTABLE LIGHTING FIXTURE HANGER WITH WIRING PROTECTION MEANS

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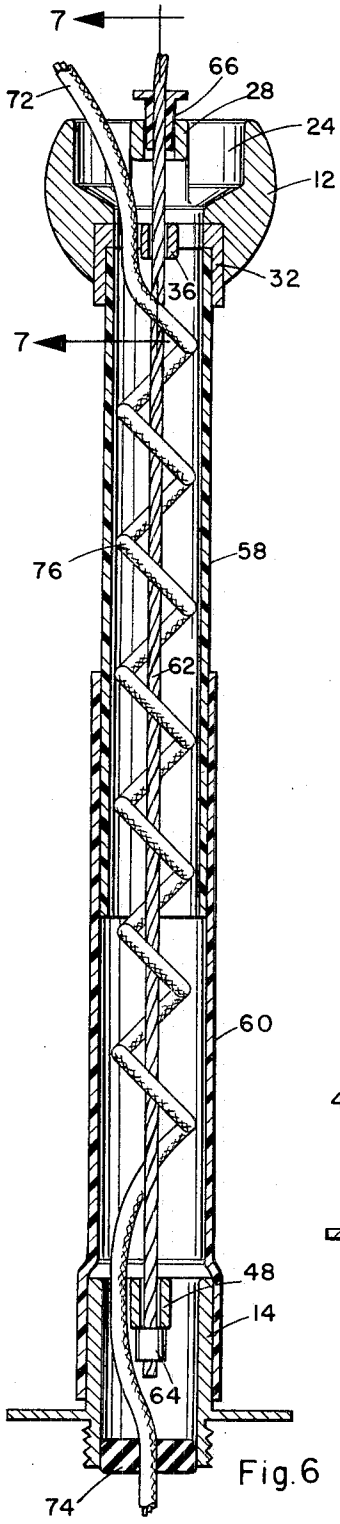


Fig. 6

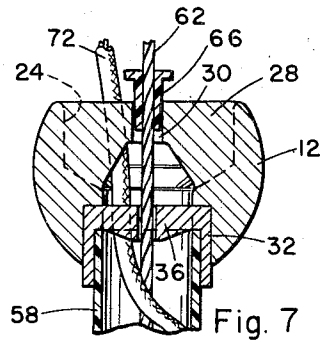


Fig. 7

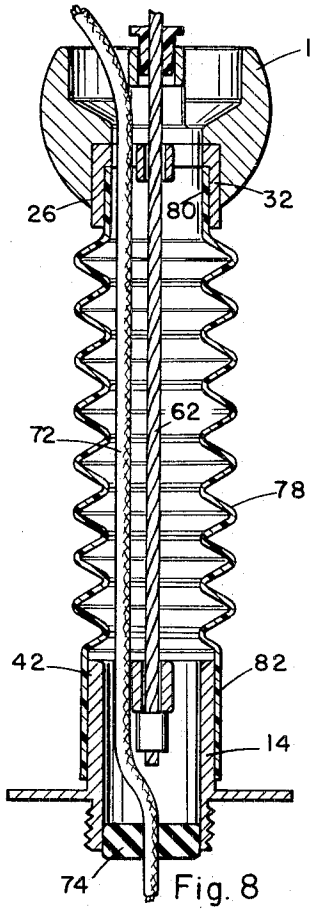


Fig. 8

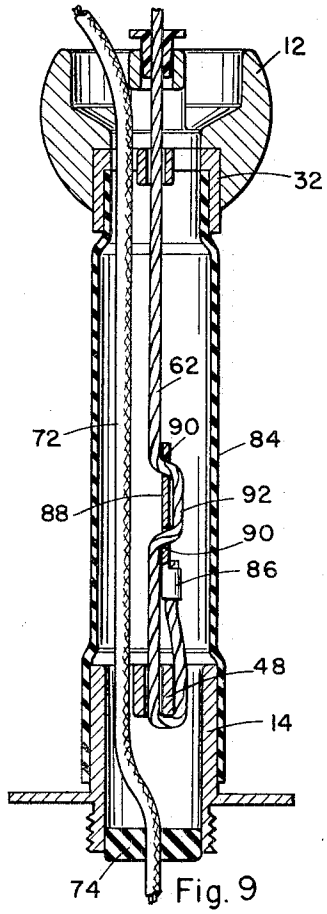


Fig. 9

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ADJUSTABLE LIGHTING FIXTURE HANGER WITH WIRING PROTECTION MEANS

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ABSTRACT OF THE DISCLOSURE

A lighting fixture hanger including a hollow flexible, longitudinally extensible tubular member, the upper end of said tubular member attached to a ceiling fixture, the lower end of said tubular member attached to a lighting fixture and a support cable connected to said ceiling fixture and said light fixture extending through said hollow tubular member.

The present invention relates to lighting fixtures and specifically to an adjustable lighting fixture hanger with wiring protection means.

Some types of lighting fixtures suspended from overhead structures are supported by stem-like hangers which have swivel or ball joints at the upper ends to permit swinging of the fixtures, as during installation and servicing, or as a result of an earthquake. Other types utilize flexible chains for suspension, which allows vertical adjustment in increments of length of each chain link. In these and other non-rigid types the wiring to the lighting fixture is usually unprotected, or is attached to or contained in the hangers in such a manner that motion of the fixture beyond a very limited amount can cause damage to or even breakage of the wires.

The hanger described herein fully encloses the wiring and is designed to move throughout a considerable range of displacement without any danger of damage to the wiring. In addition the hanger is adjustable in length to any desired position and is flexible throughout its length to withstand considerable displacement and deformation without permanent distortion of the hanger or fixture.

The hanger and its use are illustrated in the drawings, in which:

FIG. 1 is a side elevation view of a typical lighting fixture suspended by two hangers;

FIG. 2 is an enlarged sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a view taken on line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken on line 4—4 of FIG. 2;

FIG. 5 is a sectional view taken on line 5—5 of FIG. 2;

FIG. 6 is a sectional view similar to a portion of FIG. 2, showing the electrical wiring coiled within the hanger stem;

FIG. 7 is a sectional view taken on line 7—7 of FIG. 6;

FIG. 8 is a sectional view similar to FIG. 6, but showing an alternative stem structure; and

FIG. 9 is a similar sectional view showing a further alternative stem structure.

Similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing.

The basic hanger **10** comprises an upper end fitting **12** and a lower end fitting **14**, interconnected by a longitudinally extensible tubular sleeve **16**. Upper end fitting **12** is a truncated spheroidal ball element and is universally pivotally held in a correspondingly spherical ring or socket member **18** secured to supports **20**, which latter are suspended from a mounting plate **22**. Various configurations of supports and mountings may be used to suspend the socket member **18** below a ceiling or other overhead support, the exact structure not being critical to the present hanger.

The upper end fitting **12** has a large axial bore **24** in the upper end thereof, tapering to a smaller bore **26** in the lower end. Extending across the top of bore **24** is a diametrical cross bar **28**, in the center of which is an axial opening **30**. Fixed securely in bore **26** is a cylindrical collar **32** having an inwardly turned upper flange **34**, with a cross bar **36** extending diametrically across the flanged end, said cross bar having an axial opening **38**. The lower end of collar **32** projects below fitting **12** and provides a stop flange **40**, which limits the swing of the hanger by striking the lower edge of socket member **18**.

Lower end fitting **14** comprises a tubular collar **42** with an outwardly extending radial flange **44** near the lower end and an externally screw threaded portion **46** below the flange. Diametrically across the upper end of collar **42** is a cross bar **48** with an axial opening **50**. Threaded portion **46** passes through a suitable opening **52** in the upper frame portion of a light fixture **54** and is held by a nut **56**. Two or more hangers would be used for a large fixture, as in FIG. 1.

Sleeve **16**, in its basic form illustrated in FIGS. 1–7, comprises an upper portion **58** fitting slidably into a lower portion **60**. The upper end of upper portion **58** is secured inside collar **32**, by adhesive or other suitable means, while the lower end of lower portion **60** fits tightly over the outside of collar **42**. Both portions of the sleeve are of flexible and somewhat resilient material, such as plastic, to permit bending.

The weight of the light fixture **54** is supported by a cable **62**, preferably of stranded wire, which passes through openings **30**, **38** and **50** in the respective cross bars **28**, **36** and **48**. On the lower end of cable **62** is an enlarged stop **64**, such as a swaged sleeve pressed on the cable and on which the cross bar **48** rests. The upper end of cable **62** is held by a tapered slit clamp plug **66** which fits tightly into opening **28** and binds the cable securely. Clamp plug **66** is provided with a flange **68** to facilitate prying the plug loose to free the cable. For safety a further swaged stop **70** is secured to the upper end of cable **62** to limit the drop of the light fixture should the clamp plug fail or become loose for any reason. By sliding the cable **62** the height of the light fixture can be adjusted very accurately, then set by jamming the clamp plug **66** into opening **30**. Sleeve **16** is thus merely a covering and does not support any load, but adjusts telescopically to the required length as the cable **62** is set.

The electrical wiring, indicated at **72**, is brought in through upper end fitting **12** and passes on either side of cross bar **28** then on the same side of cross bar **36**, the wiring continuing through sleeve **16** and through the lower fitting **14** at one side of cross bar **48**. The wiring is thus separated and protected from cable **62** in the areas of the end fittings where rubbing or binding might occur during motion of the hanger. In the main length of sleeve **16** there is ample room for the wiring to avoid or slip clear of the cable. In the lower end of lower fitting **14** the wiring passes through a tight fitting sealing plug **74**, which acts as a draft stop for the hanger and specifically prevents the spread of fire through the sleeve if such an event should occur in the light fixture.

In an alternative arrangement, illustrated in FIG. 6, the electrical wiring **72** is coiled around cable **62**, as indicated at **76**. This is particularly useful if the wiring connections must be completed before the fixture is adjusted to its final position, since the coiled portion **76** will allow the wiring to adjust without binding or pulling to the variable length of the hanger.

A slightly modified form of the hanger, shown in FIG. 8, utilizes the same end fittings **12** and **14** but has a sleeve **78** of corrugated tubing, that is, substantially bellows-

like, instead of the two part telescopic sleeve. Sleeve **78** has a plain upper end **80** which fits into bore **26** and a plain lower end **82** which fits over collar **42**, so the method of attachment is unchanged.

A further configuration, shown in FIG. 9, includes a generally recti-cylindrical, unitary tubular sleeve **84** which is secured to end fittings **12** and **14** in the same manner as the other sleeves described. However, the main body of sleeve **84** is of elastic material, such as thin wall rubber tubing, which will stretch under load. This type of sleeve is suitable for use where a small range of adjustment is required and the weight of the light fixture will be sufficient to stretch the sleeve until the load is supported by cable **62**.

For added convenience adjusting means may be applied to the lower end of cable **62**. The lower end of the sleeve **16** can be raised from the collar **42** and adjustment of the effective length of the cable **62** altered to raise or to lower the fixture without disturbing the bracket **20** or upper end fitting **12**. One suitable arrangement to accomplish this is shown in FIG. 9, wherein the cable **62** is looped around cross bar **48**, or brought back through a second hole in the cross bar, and has a locking tag **86** clamped to the cable end. The locking tag **86** has a bar portion **88** with a pair of longitudinally spaced holes **90**. Cable **62** is threaded through one hole **90** to the opposite side of bar portion **88**, then back through the other hole to continue its path, leaving a locking loop **92** between the two holes. Under tension the cable is pulled tight and is frictionally locked in the locking tag, the principle being well known. By loosening loop **92** the locking tag can be slid along the cable for adjustment, then locked at the required position by pulling the cable tight.

The electrical wiring may extend alongside or be coiled around cable **62** in any form of the sleeve. In any configuration the weight of the light fixture is carried by the high strength cables, which are adjustable to any required length accurately and easily locked in place. The extensible sleeve fully encloses and protects the electrical wiring and the support cable. In the fittings at both ends of the hanger the cross bar structure separates the electrical wiring from the support cable and prevents damage to the wiring. Side loads on the light fixture in any direction will cause the hangers to swivel in the ball and socket connections of the upper end fittings, while the sleeves, in any of the disclosed forms, will bend to accommodate the offset, as in the broken line position in FIG. 1. This bending of the sleeves prevents any undue offset loads on the lower end fittings and avoids damage or distortion of the light fixture frame structure.

It is understood that minor variation from the form of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawings are to be considered as merely illustrative rather than limiting.

I claim:

1. A lighting fixture hanger, comprising:

a hollow, tubular, longitudinally extensible sleeve of resiliently flexible material;

an upper end fitting secured to the upper end of said sleeve;

a lower end fitting secured to the lower end of said sleeve and having means for attachment to a light fixture;

a supporting cable linking said upper and lower end fittings and extending through said sleeve and supporting the entire load carried by said lower fitting;

retaining means in said upper and lower end fittings to hold said cable substantially axially therein and defining open bore portions through which electrical wiring can pass separated from the cable;

clamp means on said cable making said cable adjustable as to the effective length thereof between said upper and lower end fittings:

and socket means in which said upper end fitting is pivotally held, said socket means having means for suspension from an overhead support.

2. The structure according to claim **1**, wherein said sleeve has bellows-like corrugations to permit elongation and collapse.

3. The structure according to claim **1**, wherein said sleeve is a generally recti-cylindrical, unitary, longitudinally elastic tube.

4. The structure according to claim **1**, wherein said upper end fitting has a larger axial bore in the upper portion thereof and a smaller axial bore in the lower portion thereof, said retaining means comprising a cross bar substantially diametrical across said larger bore and having an opening through which said cable passes and whereto said cable is adjustably connected, a collar in said smaller bore, said collar having a stop flange portion extending down over the upper end of said sleeve and being engageable with an adjacent portion of said upper end fitting to limit the pivotal or swinging motion of the hanger.

5. The structure according to claim **1**, wherein said upper end fitting is substantially spheroidal and is universally pivotal in said socket means;

said upper end fitting having an axial bore and a collar fixed in the lower end of said bore, said collar having a stop flange extending below the upper end fitting to engage said socket means and limit the pivotal motion of the hanger;

said sleeve being secured in said collar;

cross bars in said upper end fitting and said socket through which said cable passes, with open bore portions at the sides of the cross bars for passage of electrical wiring separated from the cable;

said lower end fitting having a tubular portion to which said sleeve is secured, with a cross bar in said tubular portion to which said cable is attached, leaving open portions at the sides of said cross bar for passage of electrical wiring.

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U.S. Cl. X.R.

240—85; 248—327, 328, 333