

April 28, 1970

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3,508,731

POLE TOP LUMINAIRE MOUNTING DEVICE

Filed Jan. 4, 1968

2 Sheets-Sheet 1

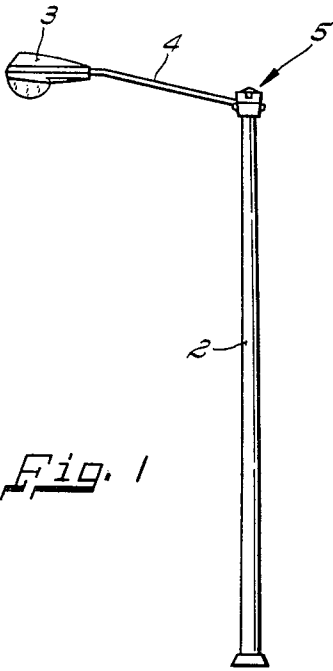


Fig. 1

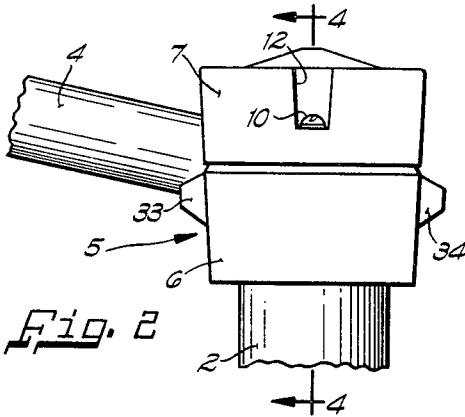


Fig. 2

Fig. 6

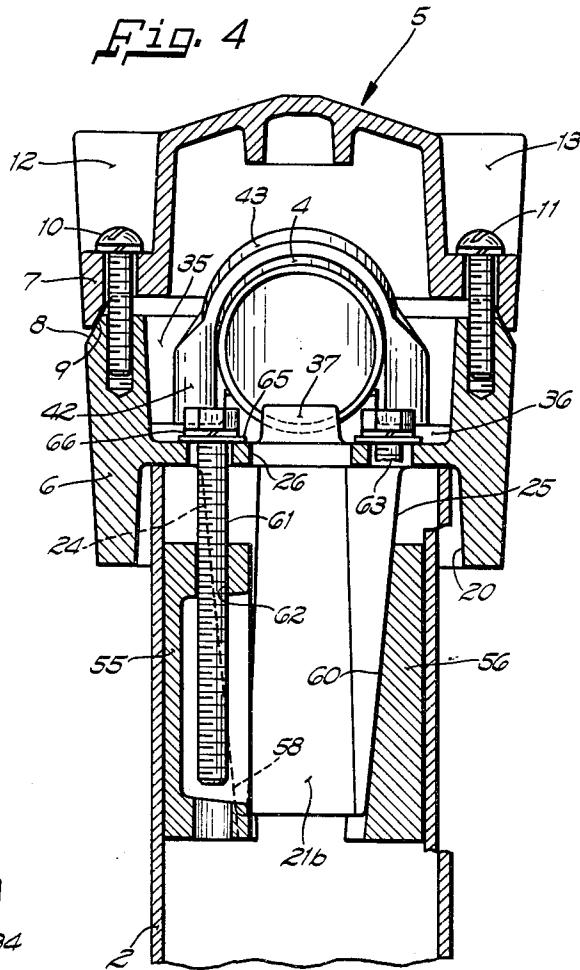
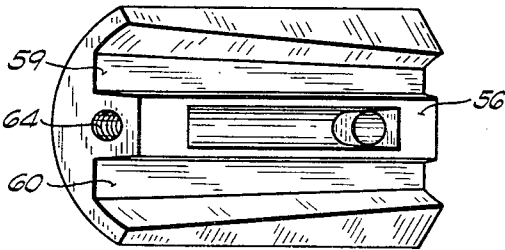


Fig. 4

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Fig. 3

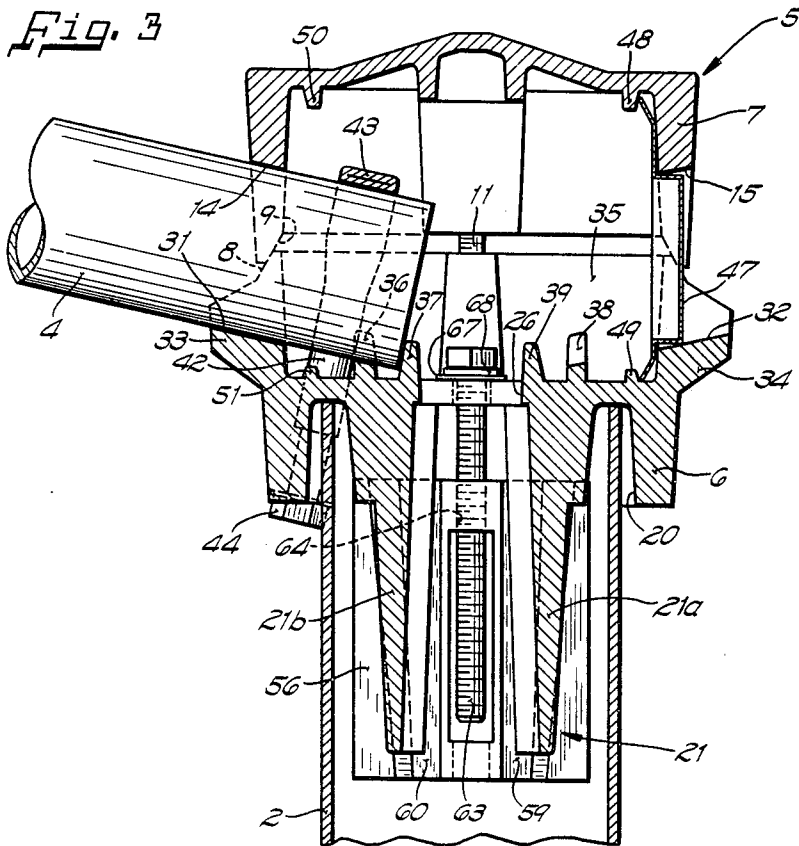
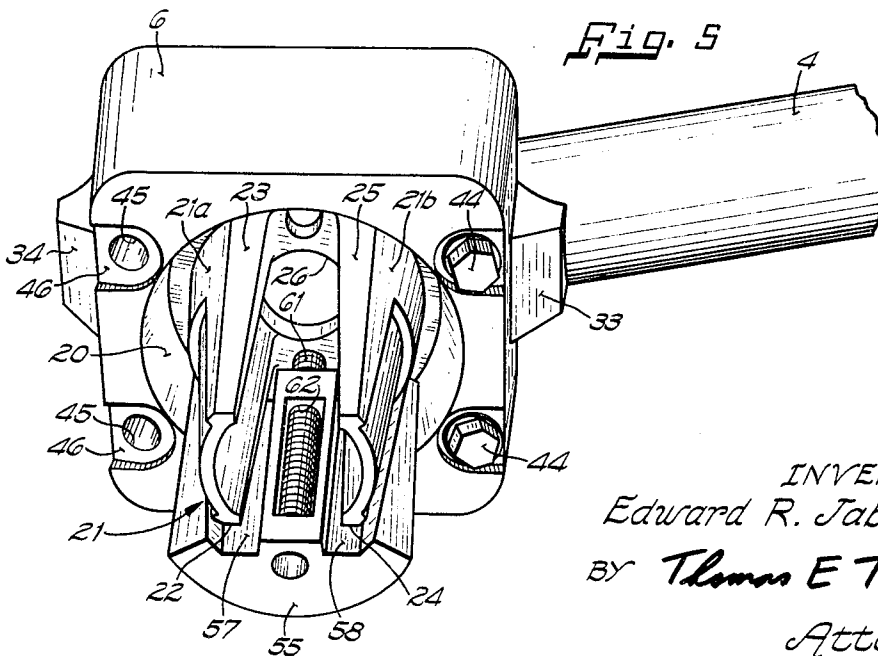


Fig. 5



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3,508,731

POLE TOP LUMINAIRE MOUNTING DEVICE
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10 Claims

ABSTRACT OF THE DISCLOSURE

A pole top luminaire mounting fitting having collet type means for engaging the interior of a round tubular upright pole and clamping means for holding the secured end of a cantilever luminaire support. The fitting further includes a removable cover and means for adapting the device for supporting either one or two luminaires.

BACKGROUND OF THE INVENTION

This invention relates to pole top luminaire mounting devices and, more particularly, to attachment assemblies for removably securing one or more luminaires to the top of a vertical pole.

In the field of pole top luminaire mounting devices, the prior art has included slipfitter devices secured to the pole by means of conventional fastening devices such as set screws. An improved approach is illustrated in Patent No. 3,156,418, issued Nov. 10, 1964 to Edward R. Jablonski and Harold A. Van Dusen, Jr. and assigned to the present assignee. This device consists of a collet type clamping device which slips over the top of a pole and has a series of sliding wedges which clamp about the periphery of the pole.

SUMMARY OF THE INVENTION

In the erection of pole supported lighting apparatus, tubular supporting poles and tubular cantilever arms are commonly used. It is highly desirable to distribute the stresses occurring at mechanical connecting points over as wide an area as possible in order to provide a rigid structure of maximum strength. The commonly used set screw devices give rise to high stress concentrations. The collet type slipfitter of the aforementioned Patent No. 3,156,418 was an improvement in this respect and is still highly satisfactory for many purposes. It is an object of this invention to provide an improved collet type attachment with easily adjusted and easily accessible collet tightening means.

It is another object of the invention to provide a mounting device of the aforescribed type with an enclosure with a pleasing appearance and with a removable cover to provide easy access to enclosed fastening means and wiring chamber.

It is a further object of the invention to provide a device of the aforescribed type with maximum adaptability in that one or a plurality of cantilever arms may be thereby supported.

Other objects and advantages of the invention will hereinafter appear.

These objects are accomplished by providing a luminaire mounting device having a body portion for being placed on top of the mounting pole and having a depending hub portion for being inserted within the top of the tubular pole. The hub has a plurality of upwardly and outwardly sloping surfaces upon which slide a series of peripherally positioned sliding wedge type collet segments. Adjusting means are provided for forceably drawing the collet segments toward the body portion and outwardly on the sloping surfaces to firmly engage the inner surface of the tubular mounting pole. Arm clamping

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means are provided for clamping the inner ends of the cantilever luminaire supporting arms to the body portion. One or more arms may be so accommodated. A removable cover to the body portion provides easy access to the collet adjusting means and forms a wiring chamber. The cover and body are also provided with means for holding removable plugs which cover unused arm accommodating apertures in the assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is an elevational view of a complete luminaire assembly mounted on a vertical supporting pole, which assembly embodies the present invention;

FIGURE 2 is a fragmentary enlarged view of the assembly shown in FIGURE 1;

FIGURE 3 is a view similar to FIGURE 2 but taken in section generally through the center of the device;

FIGURE 4 is a sectional view taken generally on line 4—4 of FIGURE 2;

FIGURE 5 is a perspective view of a pole top mounting assembly with one of the collet segments removed; and

FIGURE 6 is a perspective view of one of the collet segments.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, FIGURE 1 shows a tapered tubular aluminum pole 2 supporting a conventional luminaire 3. Luminaire 3 may be fastened in a conventional manner to the outer end of a cantilever tubular aluminum supporting arm 4. Electrical wiring (not shown) is normally enclosed within pole 2 and arm 4. A mounting assembly indicated generally by numeral 5 mechanically connects the inner end of arm 4 to the top of pole 2.

The mounting assembly comprises a body portion 6 and a cover portion 7. Body 6 and cover 7 have chamfered mating edges 8 and 9, respectively. Screws 10 and 11 removably fasten cover 7 to body 6. Access to the heads of screws 10 and 11 is provided by recesses 12 and 13 in cover 7. Cover 7 has semi-circular recesses 14 and 15 in the lower edges of opposite sides thereof to accommodate luminaire supporting arms, such as arm 4.

Body member 6 is provided with a generally cylindrical recess 20 into which the top of pole 2 loosely fits. The top edge of tubular pole 2 abuts body 6 at the end surface of recess 20. An axially split hub 21, comprising two similar projecting portions 21a and 21b, projects axially from the end surface of recess 20 to extend downwardly within the upper end of pole 2. Each of projections 21a and 21b is provided with upwardly and outwardly sloping camming surfaces on the opposite edges thereof. Projection 21a has camming surfaces 22 and 23, while projection 21b has camming surfaces 24 and 25. Camming surfaces 23 and 25 are substantially coplanar. Similarly, surfaces 22 and 24 are coplanar. The end surface of recess 20 contains a circular aperture 26 between the upper ends of projections 21a and 21b to accommodate electrical wiring (not shown).

Opposite upper edges of body 6 have recesses 31 and 32 which, together with the corresponding semi-circular recesses 14 and 15 in cover 7, form circular apertures in mounting assembly 5 to accommodate the inner ends of luminaire supporting arms, such as arm 4. Lips 33 and 34 extend outwardly below apertures 31 and 32, respectively, to provide additional support for arms, such as arm 4.

The body 6 encloses an open topped substantially rectangular cavity 35. A wall 36 is formed on the bottom of cavity 35 and extends from one side thereof to the other. Wall 36 has a rounded recess in its central portion to conform to the periphery of the inner end of arm 4 and to serve as a support therefor. A stop 37 is formed adjacent

aperture 26 and parallels wall 36 to properly position the end of arm 4. Similarly, a wall 38 and a stop 39 are formed on the opposite half of cavity 35 to accommodate an oppositely projecting arm (not shown).

Clamping means are provided for rigidly securing the inner end of arm 4 within mounting assembly 5. This clamping means comprises a U-nut 42 formed of tubular steel bent into a U-shape and having a flattened bight portion 43 to spread the force exerted on arm 4 over a wider area. This clamping device is of a type more completely described in U.S. Patent 3,400,436, issued Sept. 10, 1968, by Edward R. Jablonski and assigned to the present assignee. The cylindrical ends of U-nut 42 are internally threaded to accommodate a pair of screws 44. Screws 44 pass through apertures 45, and the heads thereof bear against relieved surfaces 46 in the lower surface of body 6. Screws 44 are turned to draw U-nut 42 tightly against arm 4 to rigidly secure the inner end of arm 4 within body 6. If desired, a similar U-nut and screws may be assembled on the other side of cavity 35 to provide clamping means for an arm similar to arm 4 extending from the opposite side of mounting assembly 5.

A plug 47 may be used to close an unused arm accommodating opening in mounting assembly 5. Plug 47 is formed of sheet aluminum with a cup-shaped center portion to fit closely within and fill the unused aperture in mounting assembly 5. The upper and lower inwardly bent edges of plug 47 are held by plug retaining ridges 48 and 49, respectively, formed on the inner surfaces of cover 7 and body 6, respectively. Plug 47 is thereby secured firmly in place when cover 7 is placed over body 6. A similar pair of plug retaining ridges 50 and 51 are formed on the opposite half of the interior of mounting assembly 5.

The collet type clamping means for attachment to the top of pole 2 comprises two very roughly semi-cylindrical wedge-type collet segments 55 and 56. The outer cylindrical surfaces of collet segments 55 and 56 approximately conform to the interior dimensions of the tubular top of pole 2. Collet segment 55 is provided on its inner side with movable wedging surfaces 57 and 58 which slidably engage the stationary wedging surfaces 22 and 24, respectively. Similarly, collet segment 56 has camming surfaces 59 and 60 which slidably engage the stationary camming surfaces 23 and 25, respectively. A screw 61 engages a threaded portion 62 in the upper end of collet segment 55, and a screw 63 engages a threaded portion 64 in collet segment 56. Screw 61 extends through an aperture in the bottom of body 6, and the head of screw 61 with a flat washer 65 and a lock washer 66 engages the lower surface of cavity 35. Similarly, screw 63 extends through an aperture where its head, together with a flat washer 67 and a lock washer 68, engages the lower surface of cavity 35. The threads at the lower ends of screws 61 and 63 are deformed slightly to prevent the inadvertent disassembly of collet segments 55 and 56 from screws 61 and 63.

With collet segments 55 and 56 in a relative low position with respect to hub 21, the collet type attachment device comprising hub 21 and collet segments 55 and 56 may be inserted within the upper end of pole 2. Screws 61 and 63 are then turned to draw wedges 55 and 56 upwardly. Collet segments 55 and 56 then slide upwardly and outwardly along the sloping camming surfaces 22, 23, 24 and 25. Collet segments 55 and 56 engage the inner surface of pole 2 and, as screws 61 and 63 are tightened, collet segments 55 and 56 are wedged tightly between hub 21 and the inner surface of pole 2 to firmly attach the mounting assembly 5 to the top of pole 2. There may be some deformation of pole 2 or the collet assembly so that the collet assembly may fit variously sized poles within limits.

Collet segments 55 and 56 may be loosened if it is desired to remove assembly 5 by loosening screws 61 and 63 and driving them forceably downward.

I claim:

1. A lighting device mounting assembly for attachment to the top of a tubular supporting pole comprising:
 - body means for being mounted on the top of said pole and including hub means depending from said body means for extending in the direction of the axis of said pole into the upper end of said pole, said hub means including first cam surfaces on the lateral surfaces of said hub means, said first cam surfaces being inclined with respect to said axis;
 - collet type wedge means including second cam surfaces slidably engaging said first cam surfaces and positioned laterally of said hub means to be between said hub means and the internal surface of said pole when said mounting device is placed on the top of said pole with said hub extending into the upper end of said pole;
 - means for forceably moving said collet type wedge means with respect to said hub means, whereby said first and second cam surfaces force said collet type wedge means laterally against said internal surface of said pole to firmly clamp said mounting device to said pole; said means for moving said collet type wedge means comprises screw means between said body means and said collet type wedge means, acting when turned to draw said collet type wedge means toward said body means; and
 - said hub means and said collet type wedge means are keyed together to prevent rotational movement of said collet type wedge means with respect to said axis of said pole.
2. A lighting device mounting assembly for attachment to the top of a tubular supporting pole comprising:
 - body means for being mounted on the top of said pole and including hub means depending from said body means for extending in the direction of the axis of said pole into the upper end of said pole, said hub means including first cam surfaces on the lateral surfaces of said hub means, said first cam surfaces being inclined with respect to said axis;
 - collet type wedge means including second cam surfaces slidably engaging said first cam surfaces and positioned laterally of said hub means to be between said hub means and the internal surface of said pole when said mounting device is placed on the top of said pole with said hub extending into the upper end of said pole;
 - means for forceably moving said collet type wedge means with respect to said hub means, whereby said first and second cam surfaces force said collet type wedge means laterally against said internal surface of said pole to firmly clamp said mounting device to said pole; said means for moving said collet type wedge means comprises screw means between said body means and said collet type wedge means, acting when turned to draw said collet type wedge means toward said body means;
 - said screw means engages said collet type wedge means below said body means and extends upwardly through an aperture in said body means and terminates in means for turning said screw means, said turning means being accessible for operation from above said body means; and
 - said hub means and said collet type wedge means are keyed together to prevent rotational movement of said collet type wedge means with respect to said axis of said pole.
3. A lighting device mounting assembly for attachment to the top of a tubular supporting pole comprising:
 - body means for being mounted on the top of said pole and including hub means depending from said body means for extending in the direction of the axis of said pole into the upper end of said pole, said hub means including first cam surfaces on the lateral sur-

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faces of said hub means, said first cam surfaces being inclined with respect to said axis;

collet type wedge means including second cam surfaces slidingly engaging said first cam surfaces and positioned laterally of said hub means to be between said hub means and the internal surface of said pole when said mounting device is placed on the top of said pole with said hub extending into the upper end of said pole;

means for forceably moving said collet type wedge means with respect to said hub means, whereby said first and second cam surfaces force said collet type wedge means laterally against said internal surface of said pole to firmly clamp said mounting device to said pole; said means for moving said collet type wedge means comprises screw means between said body means and said collet type wedge means, acting when turned to draw said collet type wedge means toward said body means;

said screw means engages said collet type wedge means below said body means and extends upwardly through an aperture in said body means and terminates in means for turning said screw means, said turning means being accessible for operation from above said body means, said body means includes a central open topped cavity in which said turning means is positioned;

cover means for covering said central cavity and for being removably secured to said body means; and said hub means and said collet type wedge means are keyed together to prevent rotational movement of said collet type wedge means with respect to said axis of said pole.

4. A lighting device mounting assembly for attachment to the top of a tubular supporting pole comprising: body means for being mounted on the top of said pole and including hub means depending from said body means for extending in the direction of the axis of said pole into the upper end of said pole, said hub means including first cam surfaces on the lateral surfaces of said hub means, said first cam surfaces being inclined with respect to said axis, said body means including a central open-topped cavity and extending portions for extending laterally beyond the outer diameter of said pole;

collet type wedge means including second cam surfaces slidingly engaging said first cam surfaces and positioned laterally of said hub means to be between said hub means and the internal surface of said pole when said mounting device is placed on the top of said pole with said hub extending into the upper end of said pole;

means for forceably moving said collet type wedge means with respect to said hub means, whereby said first and second cam surfaces force said collet type wedge means laterally against said internal surface of said pole to firmly clamp said mounting device to said pole;

clamping means at least partially within said cavity for clamping to said body means at least one laterally extending luminaire supporting arm, said clamping means comprising a clamping member with adjusting means extending through said extending portions, whereby said adjusting means is accessible to tighten said clamping means from the exterior of said body means; and

cover means for covering said cavity and said clamping means, said cover means being removably secured to said body means.

5. A lighting device mounting assembly for attachment to the top of a tubular supporting pole comprising: body means for being mounted on the top of said pole and including hub means depending from said body means for extending in the direction of the axis of said pole into the upper end of said pole, said

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hub means including first cam surfaces on the lateral surfaces of said hub means, said first cam surfaces being inclined with respect to said axis, said body means including a central open-topped cavity and extending portions for extending laterally beyond the outer diameter of said pole;

collet type wedge means including second cam surfaces slidingly engaging said first cam surfaces and positioned laterally of said hub means to be between said hub means and the internal surface of said pole when said mounting device is placed on the top of said pole with said hub extending into the upper end of said pole;

means for forceably moving said collet type wedge means with respect to said hub means, whereby said first and second cam surfaces force said collet type wedge means laterally against said internal surface of said pole to firmly clamp said mounting device to said pole;

clamping means at least partially within said cavity for clamping to said body means at least one laterally extending luminaire supporting arm, said clamping means comprising a clamping member with adjusting means extending through said extending portions, whereby said adjusting means is accessible to tighten said clamping means from the exterior of said body means;

said clamping means comprises a U-shaped member having a bight portion within said cavity for clampingly engaging the inner end of one of said arms, said U-shaped member having its legs extending through said body to terminate in threaded adjusting means; and

cover means for covering said cavity and said clamping means, said cover means being removably secured to said body means.

6. A lighting device mounting assembly for attachment to the top of a tubular supporting pole comprising: body means for being mounted on the top of said pole and including hub means, axially divided into at least two parts depending from said body means, extending in the direction of the axis of said pole into the upper end of said pole, said hub means including first cam surfaces on the lateral surfaces of said hub means, said first cam surfaces being inclined with respect to said axis, said body means including an aperture between said parts for providing a passageway from one side of said body means to the other;

collet type wedge means including second cam surfaces slidingly engaging said first cam surfaces and positioned laterally of said hub means to be between said hub means and the internal surface of said pole when said mounting device is placed on the top of said pole with said hub extending into the upper end of said pole; and

means for forceably moving said collet type wedge means with respect to said hub means, whereby said first and second cam surfaces force said collet type wedge means laterally against said internal surface of said pole to firmly clamp said mounting device to said pole.

7. The invention as defined in claim 1, together with clamping means for clamping to said body means at least one laterally extending luminaire supporting arm.

8. The invention as defined in claim 5 in which: said body means comprises extending portions for extending laterally beyond the outer diameter of said pole; and

said clamping means comprises a clamping member with adjusting means extending through said extending portions, whereby said adjusting means is accessible to tighten said clamping means from the exterior of said body means.

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9. An attachment assembly for interconnecting a tubular member to a tubular pole comprising:

body means mounted on said tubular pole including a hub means axially divided into at least two parts extending into the interior of said pole, said hub means having first surfaces that are tapered with respect to the axis of said pole, said body means includes an aperture between said parts for providing a passageway from one side of said body means to the other;

a tubular member for attachment to said body means; means for mounting said tubular member onto said body means;

collect type wedge means positioned within said tubular pole laterally of said hub means to be between said hub means and the internal surface of said tubular pole including second surfaces having a reverse taper to and contacting said first surfaces, said collet type wedge means having collet surfaces opposite said second surfaces; and

means for forceably moving said collet type wedge means with respect to said body means so that said first surfaces and said second surfaces force said collet surfaces into contact with said internal surface of said tubular pole.

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10. An attachment assembly as defined in claim 9 in which said collet type wedge means includes at least two collet type wedge elements with said collet surfaces thereon individually defining an arc of at least 45° on said interior surface of said tubular pole.

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25 52—40; 285—397; 240—64