Dec. 27, 1955 T. B. FARRINGTON ET AL 2,728,848

MOUNTING FOR LIGHTING FIXTURES

Filed May 20, 1952 4 Sheets-Sheet 1

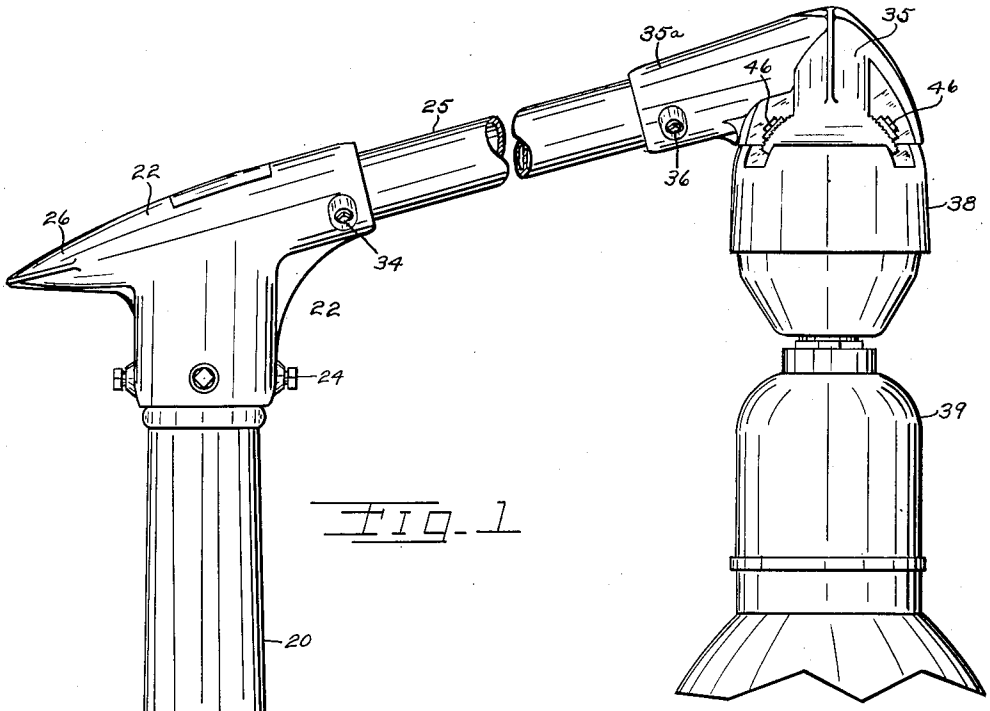
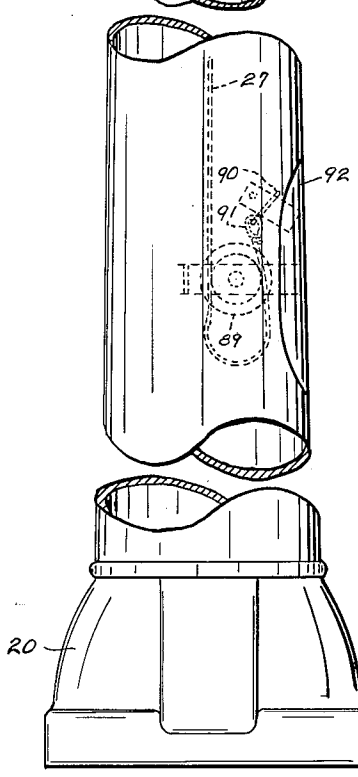


FIG. 1



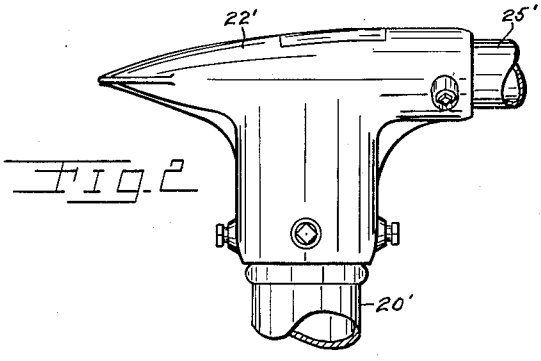


FIG. 2

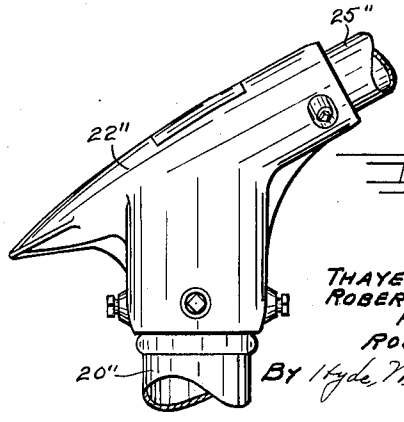


FIG. 3

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MOUNTING FOR LIGHTING FIXTURES

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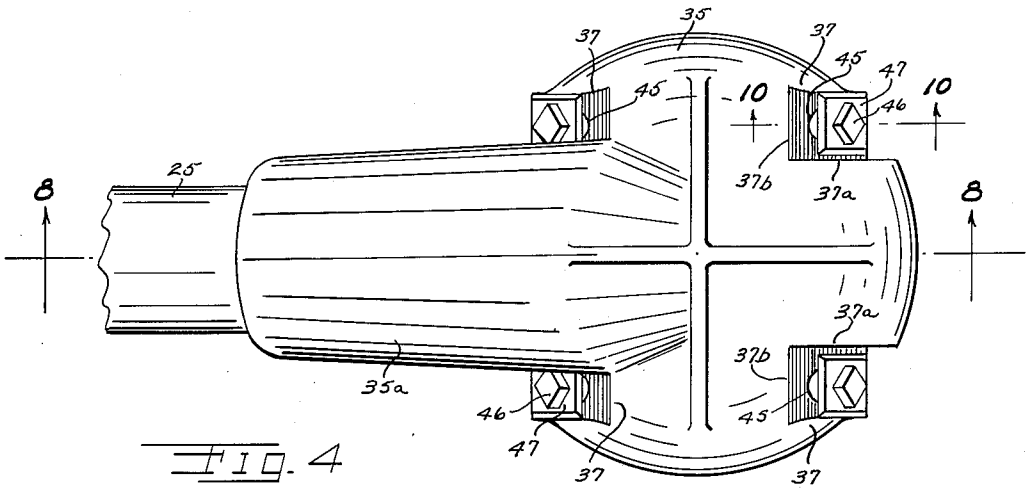


FIG. 4

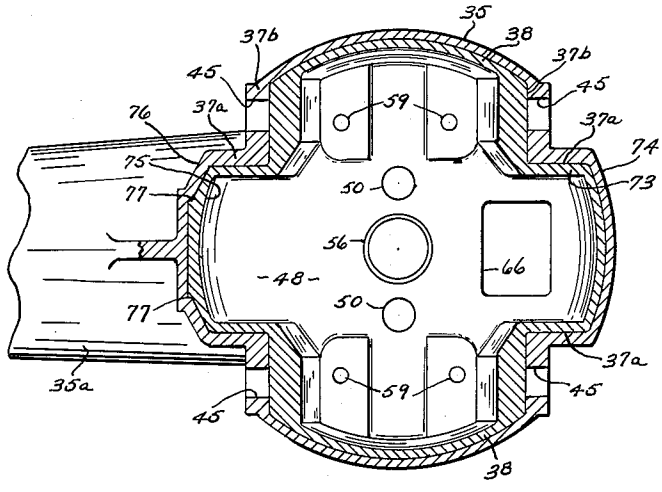


FIG. 11

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MOUNTING FOR LIGHTING FIXTURES

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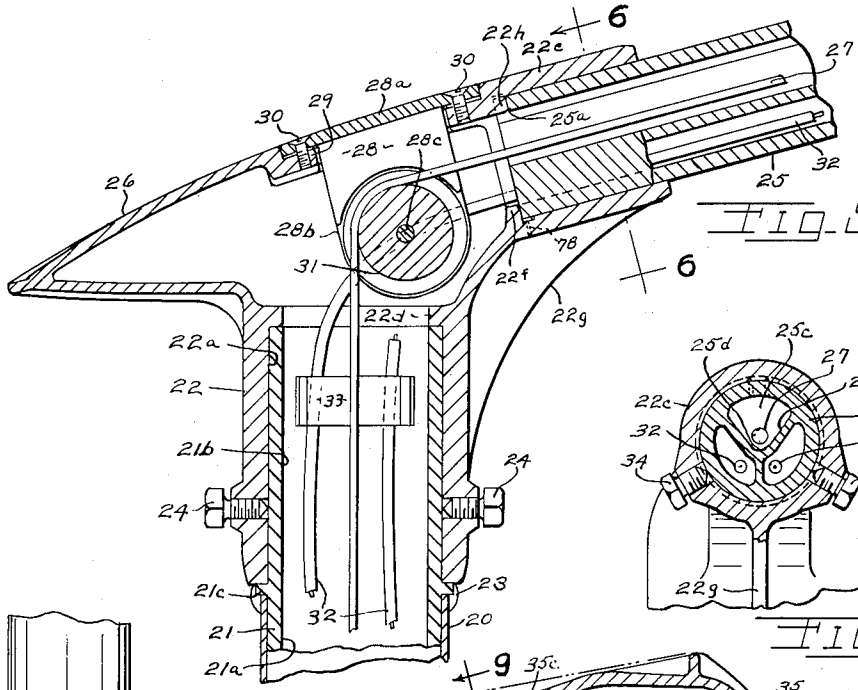


FIG. 5

FIG. 6

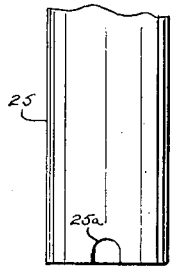


FIG. 7

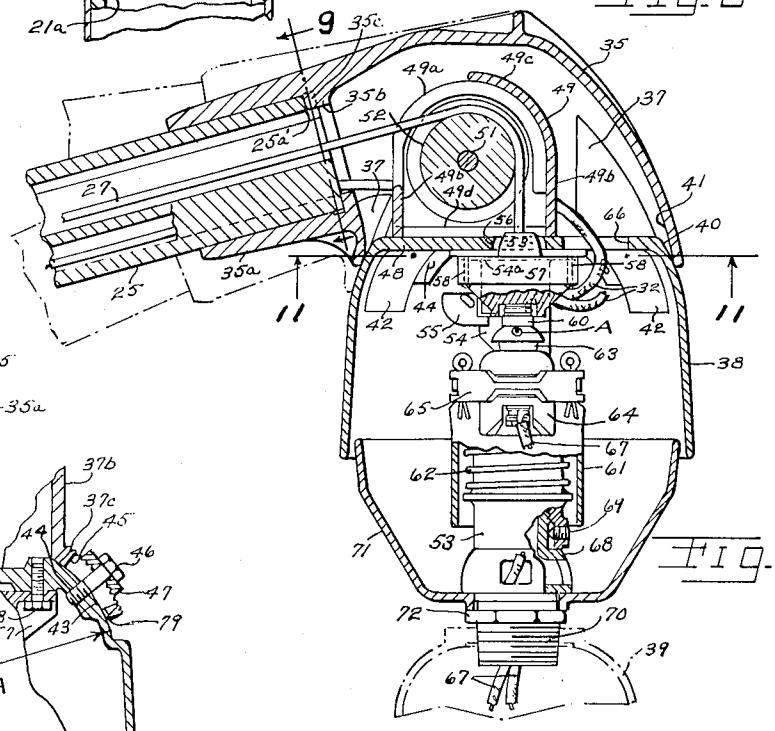


FIG. 8

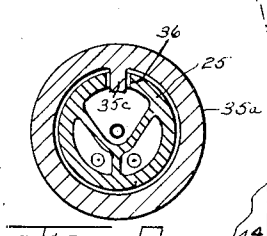


FIG. 9

FIG. 10

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MOUNTING FOR LIGHTING FIXTURES

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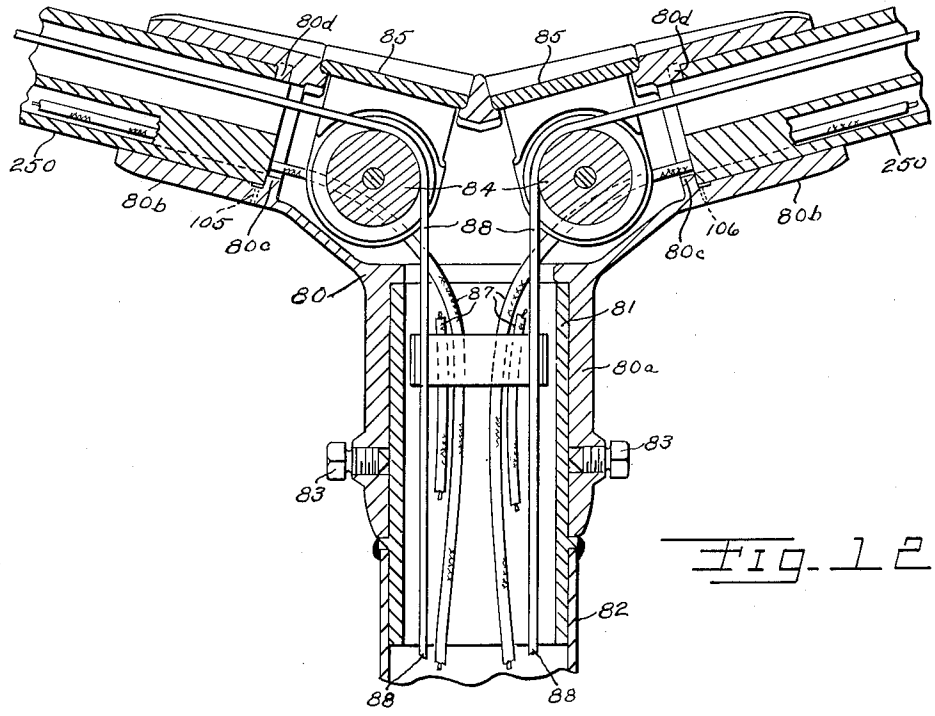


Fig. 12

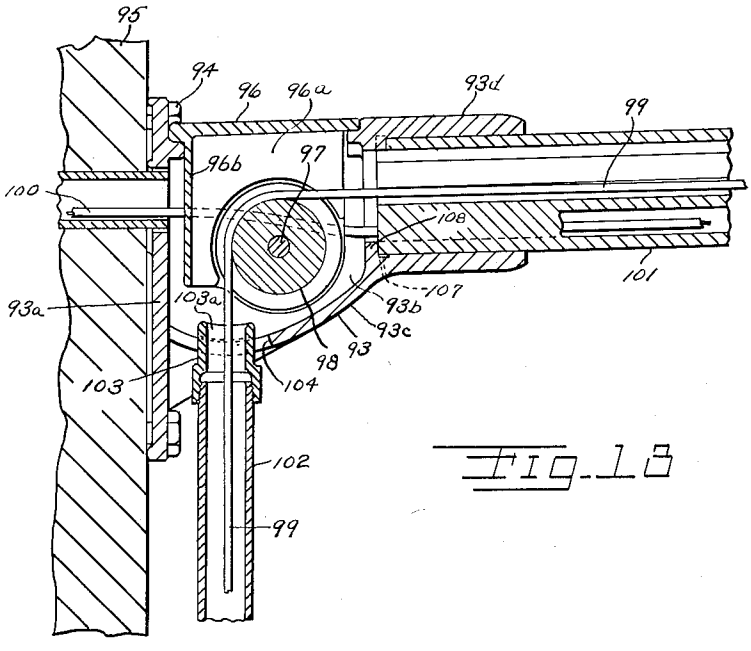


Fig. 13

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MOUNTING FOR LIGHTING FIXTURES

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Application May 20, 1952, Serial No. 288,842

10 Claims. (Cl. 240—64)

This invention relates to improvement in a mast arm for lighting fixtures.

One of the objects of the present invention is to provide a mast arm for lighting fixtures which is pleasing to the eye, consists of a relatively small number of parts, but one which is adaptable to many different uses and applications.

Another object of the present invention is to provide in a mast arm, a hollow arm which may be made of varying lengths and, either from standard or extruded tubing, one end of said arm being readily fixed into a pole fixture and the other end of said arm being readily attached to a hood and canopy arrangement for supporting a lowering hanger fixture.

Another object of the present invention is to provide a novel supporting structure above a lowering lamp hanger whereby a plumbizer arrangement is provided so that the lamp may always be hung plumb to compensate for the supporting pole being out of plumb, for sagging of the mast arm, or for other misalignments due to manufacture or assembly of the lamp supporting equipment.

Our invention provides for adjustment of the lamp to provide a plumbizing oscillation of the supporting fixture generally in the plane of the mast arm, and may also include an oscillating adjustment in a plane generally at right angles to the mast arm so that the lamp fixture may be hung absolutely plumb in spite of other variations in the supporting structure tending to misalign the lighting fixture in either of two planes at right angles to each other.

Our invention also provides a novel fixture for the top of a supporting pole in which case the mast may be oriented through 360 degrees relative to the pole. Our invention also provides a support fixture for mounting upon a wall or similar surface, and providing novel means to accommodate a cable for lowering and raising the lamp itself, together with means for accommodating the electrical conduits for energizing the lamp.

Our invention also provides novel structure in the mast arm itself for maintaining a separation between the lamp raising and lowering cable and the electrical conductors for energizing the lamp, together with a novel arrangement of the parts whereby the guiding structures for the lamp raising and lowering cable at each end of the mast arm are maintained in proper alignment with the partition walls in the mast arm itself while permitting rotative adjustment of the mast arm about its axis, within limits.

Other features of our invention relate to the construction and arrangement of the parts for carrying out the above mentioned functions, together with the provision of parts of varying design so as to adapt our invention for use in various places in the lighting field.

Other objects and advantages of our invention will be apparent from the accompanying drawings and description and the essential features thereof will be set forth in the appended claims.

In the drawings,

Fig. 1 is a side elevational view of our invention in position mounted at the top of a vertical pole;

Figs. 2 and 3 are side elevational views of a pole top mounting as seen at the upper left-hand portion of Fig. 1 but showing different angular relationships between the mast arm and the vertical pole;

Fig. 4 is a top plan view enlarged of the hood shown at the upper right-hand corner of Fig. 1;

Fig. 5 is a central sectional view enlarged, through the upper left-hand portion of Fig. 1;

Fig. 6 is a fragmental sectional view taken along the line **6—6** of Fig. 5;

Fig. 7 is a fragmental top plan view of one end of the mast arm;

Fig. 8 is a fragmental sectional view taken along the line **8—8** of Fig. 4;

Fig. 9 is a sectional view taken along the line **9—9** of Fig. 8;

Fig. 10 is a fragmental sectional view taken along the line **10—10** of Fig. 4;

Fig. 11 is a sectional view taken along the line **11—11** of Fig. 8;

Fig. 12 is a central sectional view through a modified form of our invention showing two mast arms connected to a single pole top mounting; while

Fig. 13 is a central sectional view through a modified form of our invention showing a wall plate mounting.

In Fig. 1, our improved mast arm and lamp supporting fixture is shown mounted on the top of a vertical hollow metal pole **20**. Other uses of our invention will be later described. Preferably, but not necessarily, an adaptor **21** is provided for the attachment of the pole top mounting **22** to the pole itself. The purpose of such an adaptor is to provide a lower sleeve portion **21***a* adapted to fit inside of various diameter poles, with an upper sleeve portion **21***b* of an outside diameter to fit snugly within the downwardly extending collar **22***a* of the pole top mounting. An annular rib **21***c* projecting radially outwardly from the adaptor **21** between the portions **21***a* and **21***b* provides a stop means for positioning the adaptor in the top of the steel pole. It also provides means for securing the adaptor to the pole as by means of the welding shown at **23**. Set screws **24** are threaded through suitable bosses in the collar **22***a* and position the pole top mounting in any desired orientation radially with respect to the pole **20**. A shoulder **22***d* projects radially inwardly at the upper end of the collar **22***a* and rests upon the top of the adaptor **21**. Thus the entire load of the mast arm is firmly held by the bearing of the projection **22***d* on the adaptor **21** which in turn has the rib **21***c* resting firmly upon the top of the pole **20**.

The pole top mounting **22** has a laterally projecting sleeve or collar **22***e* having an inside diameter adapted to receive in a fairly snug fit a cylindrical mast arm **25**. Preferably, the internal diameter of the collar **22***e* is adapted to receive a piece of standard tubing and, in one form of our invention, we utilize two inch diameter standard tubing for the member **25**. A shoulder **22***f* at the inner end of the sleeve **22***e* provides an abutment for the inner end of the tubular mast arm **25** and firmly positions the mast arm with respect to the pole top mounting. A reinforcing rib **22***g* extends around the throat of the pole top mounting connecting the sleeves **22***a* and **22***e* and providing reinforcement at this point. Preferably, but not necessarily, the end of the pole top mounting opposite the mast arm **25** is given a streamlined appearance as indicated at **26**.

Means is provided for guiding a cable **27** through the pole top mounting for the purpose of raising and lowering a lamp fixture. This means comprises a pulley

supporting bracket and shrouding 28 having a substantially flat top member 28*a* which overlies the sides of a shouldered opening 29 in the pole top mounting 22 and screws 30 secure the member 28 to the member 22. Member 28 also has two parallel side walls 28*b* between which extends a shaft 28*c* upon which the pulley 31 is rotatably mounted. This pulley has a groove in which the cable 27 runs. The pulley 31 is so positioned that the cable 27 passing tangentially downwardly from the pulley extends approximately down the center of the cylindrical pole 20. Preferably, electrical conduits 32 extend upwardly through pole 20, through the pole top mounting 22, and through the mast arm 25 to energize the lighting fixture. To keep these electrical conduits 32 from contacting the moving cable 27, a clip 33 is provided clipping the conduits 32 to the side walls of the adaptor 21. Just above this point, the walls 28*b* provide a shrouding around the pulley 31 so that the electrical conduits 32 are held out of contact with the cable 27 until they enter the mast arm 25.

Referring to Fig. 6, preferably, but not necessarily, the mast arm 25 is provided with a Y-shape partition 25*a* so as to provide three channels in the mast arm 25. The moving cable 27 passes through the upper chamber as shown in Fig. 6 while the electrical conductors 32 pass through the two bottom chambers. Set screws 34 hold the tubular mast arm 25 firmly assembled in the sleeve portion 22*e* of the pole top mounting 22.

The pole top mounting 22 shown in Figs. 1 and 5 have the sleeve 22*e* arranged at approximately 14° 30′ above the horizontal. This provides a mast arm slope for the tube 25 closely equivalent to a rise of three inches per foot of mast arm. The pole top mounting 22′ shown in Fig. 2 is exactly like that described at 22 with the single exception that the mast arm 25′ is supported in a nominally horizontal position. A mast arm which is actually horizontal gives the impression of dipping downwardly and to overcome this optical illusion the pole top mounting 22′ has been arranged to give a rise of ¼ inch per foot of mast arm 25′.

The pole top mounting 22″ of Fig. 3 has an internal construction in every way like that described at 22 but here the mast arm 25″ is arranged at an angle of approximately 26° 30′ above the horizontal, which gives a rise of very close to 6 inches per foot of mast length. This fitting is useful for mounting upon shorter poles where the mast arm must rise rather steeply in order to put the lighting fixture at the proper heights. For instance, the device of Fig. 3 may be used upon a twenty-eight foot pole 20″ and with a mast arm 25″ six feet long the lamp fixture may be supported 30 feet above the base of pole 20″.

Referring now to Figs. 4 and 8, at the outer end of the mast arm tube 25, there is mounted a hood 35. This hood is generally conical in shape opening downwardly but with the walls of the cone slightly convex outwardly. At one side of the cone is provided a hollow sleeve 35*a*, the hollow of the sleeve communicating with the hollow of the cone. The axis of the cylindrical sleeve 35*a* has the same angle with the horizontal as the angle of sleeve 22*e* of the pole top mounting with respect to the horizontal. In other words, the sleeve 35*a* of Fig. 8 has an axis of 14° 30′ with respect to the horizontal so as to match the pole top mounting 22. Hoods, not shown, adapted for assembly with the pole top mounting 22′ of Fig. 2 would have a sleeve 35*a* approximately at the horizontal but forming the slight angle described in the mounting of the arm 25′ in the pole top mounting 22′. In like manner, the hood for cooperation with the pole top mounting 22″ of Fig. 3 would have a sleeve positioned like 35*a* except at an angle of 26° 30′ to the horizontal. This provision of identical angles with respect to the horizontal for the mast arm connecting sleeve of the hood and the mast arm connecting sleeve of the pole top mounting makes it possible to use a

straight tubular member at 25, 25′ and 25″. This avoids bends in the mast arm which would cause friction with the moving cable 27. The sleeve 35*a* is provided at its end toward the hood with an inturned shoulder 35*b* against which the tubular mast arm 25 seats firmly. Set screws 36 are threaded in suitable bosses on the sleeve 35*a* and engage against the end of tubular mast member 25 so as to hold the hood and mast arm firmly assembled.

At both its inner and outer ends, the tubular mast arm 25 is provided at the uppermost portion of its end edge with a notch 25*a*. At its inner end, the notch 25*a* engages a projection 22*h* on the sleeve portion 22*e* of the pole top mounting. At the outer end of the mast arm a similar notch 25*a*′ receives a projection 35*c* on the sleeve member 35*a*. This orients the mast arm so that the generally triangularly shaped chamber 25*c* is uppermost in position to receive the cable 27. There is provided in the bottom of this chamber 25*c* a curved surface 25*d* of approximately ¼ inch radius which, when projected at its opposite ends, is tangential to the guide pulleys for cable 27 opposite the two ends of the tubular member 25. The notches 25*a* and 25*a*′ have a slight clearance with respect to their coacting projection, as clearly shown at 36 in Fig. 9 so that a slight adjustment is available in a plane at right angles to arm 25 to place the lighting fixture absolutely vertical.

The walls of the hood 35 near the bottom of the conical shape thereof, are indented to provide generally triangular pockets 37, of which there are four, two on each side of a central vertical plane along the line 8—8 of Fig. 4. Each pocket has a generally vertical wall parallel to the center line of the hood as indicated at 37*a*. Each pocket also has a generally vertical wall 37*b* at right angles to the wall 37*a*. Each pocket also has an arcuate bottom wall 37c as best shown in Fig. 10. Each pair of pockets on the same side of the center line of the hood have the bottom walls 37*c* arcuate about a center A which is approximately at the level of mating contacts for energization of the light fixture as will later appear. These arcuate surfaces 37*c* coact with the similar surfaces on a canopy 38 so as to provide relative oscillation behind the hood 35 and the canopy 38 in the general plane of mast arm 25 so as to provide a plumbizing arrangement permitting the lamp fixture 39 to hang absolutely vertical even where the pole 20 is not vertical or where the mast arm has sagged for some reason or other. The relative motion between the hood 35 and the canopy 38 is represented by the dot-dash position of Fig. 8 on one side of the full line position and the dot-dot-dash position of the parts on the other side of the full line position. The canopy 38 may move relative to the hood 35 but it is less confusing in Fig. 8 to show the broken line positions of the parts as though the hood moved relative to the canopy 38. The reason for making the center A at about the level of the fixed electrical contacts 60 is that various angular adjustments of hood 35 and canopy 38 may be made about the arcuate surfaces without affecting a proper mating of contacts 60 and 63 in the latched position of the lowering hanger member.

This canopy 38 is generally cup-shape opening downwardly. It is generally slightly frusto-conical in shape with the upper portion slightly convex outwardly as shown at 40 in Fig. 8. This provides a partially spheroidal surface at the upper end of the canopy 38 except for four pockets about to be described. This partially spheroidal surface 40 coacts with a rather similar surface 41 on the interior of hood 35 near the bottom. At the normal zone of contact between hood 35 and canopy 38 as shown in full lines in Fig. 8, the hood and canopy meet on a generally circular line of contact. Within the relative movement between the hood and canopy as indicated by the broken line positions of Fig. 8, the parts 40 and 41 have generally a line contact so that there is very little room for dirt to enter between the hood and the canopy. At the upper end of the hood it is provided with four

pockets 42 in position to coact with the four pockets 37 of the hood. Each of these pockets 42 has an unbroken vertical side wall, a generally flat unbroken bottom wall and an arcuate wall 43 formed about the center A so as to fit snugly with the arcuate walls 37*c* of the hood. This is clearly shown in Fig. 10. A threaded opening 44 is provided at approximately the center of each of the arcuate walls 43 of each of the pockets 42. Each wall 37*c* of the hood has an elongated slot 45 extending in a plane generally parallel to the mast arm 25. A bolt 46 passes through the slot 45 and is threaded into the opening 44. A washer 47 spans the slot 45 beneath the head of the bolt 46 and this bolt and slot connection serves to provide the relative adjustment between the canopy 38 and the hood 35 as indicated by the broken line positions of Fig. 8. The total movement provided in one embodiment of our invention is approximately 16° of movement.

Preferably, but not necessarily, in order to hold the parts more firmly together, we provide an arcuate wall on the bottom of the washer 47 as shown in Fig. 8 to match the arcuate wall 37*c* of the hood. Preferably also, both the bottom of the washer 47 and the upper face of the wall 37*c* are serrated with serrations running crosswise relative to the slot 45. In one form of our invention, these serrations provide teeth about 1/32 inch deep and about 1° from center to center measured at the root of the teeth. These serrations are identical on mating surfaces and give a firm bearing of the washer 47 on the wall 37*c* on opposite sides of the slot 45 so that the parts are held very firmly in any adjusted position.

Mounted on the top wall 48 of the canopy 38, is a pulley supporting bracket and shrouding 49. This bracket is generally U-shape opening downwardly and having two side walls 49*a* connected by end walls 49*b* and a partial top wall 49*c*. Each of the side walls 49*a* has an outwardly extending flange 49*d* engaging with the upper surface of the wall 48 of the canopy and the member 49 is held in place by securing members which pass through suitable openings in these flanges and through openings 50 shown in Fig. 11 in the wall 48 of the member 38. Between the side walls 49*a* there is mounted a shaft 51 on which a pulley 52 is rotatably supported. The cable 27 extending parallel to the axis of the tubular mast arm 25 engages the groove of pulley 52 tangentially, thus pulleys 52 and 31 support cable 27 parallel to the axis of the mast arm 25 and with slight clearance above the curved surface 25*d* as shown in Fig. 6. This prevents dragging of the cable as it is operated to move the light fixture. The cable 27 extending tangentially downwardly from pulley 52 lies at approximately the vertical axis of canopy 38.

The lighting fixture 39 is mounted on the end of cable 27 by means in all respects similar to that shown in U. S. Patent No. 2,377,871 granted June 21, 1945, to Thayer B. Farrington et al. It is sufficient to state here that a hollow stem 53 has cable 27 extending through it with a securing member on the end of the cable so that it will always pull upwardly on the stem 53. The stem passes upwardly and downwardly through a guide 54 to which the stem 53 is latched by means of a dog 55 to hold the lighting fixture 39 in its raised and operative position, as taught in the above mentioned patent. An opening 56 is provided through wall 48 to accommodate the upper end of stem 53 in its raised position. Two insulator blocks 57 are mounted in fixed position on the underside of wall 48 by means of screws 58 which pass through openings 59 shown in Fig. 11. Upper electrical contacts 60 are mounted, one on each insulator block 57. On the lower end of stem 53 is mounted a lower contact assembly 61 yieldingly held by spring 62. This assembly 61 carries the lower electrical contact 63 in insulator block 64 in position to mate with the upper contact 60. A keeper bar 65 holds each insulator block 64 in position. All this is taught in the above mentioned patent. The electrical conduits or conductors 32, previously mentioned, extend through the hood 35 protected against cable 27 by the shrouding of the member 49. These electrical conductors pass through a suitable opening 66 in the wall 48 and are connected to the upper electrical contact 60. From the lower electrical contact 63 electrical conductors 67 extend downwardly to energize the lighting fixture 39.

An adaptor 68 is threaded into the lower end of stem 53 and is held in any oriented position by means of a set screw 69. This is useful if the rays of the lighting fixture 39 are to extend in any predetermined direction. The lower end of the adaptor 68 is threaded as indicated at 70 for securing the lighting fixture to it.

Preferably, but not necessarily, we provide an upwardly opening cup 71 mounted on the adaptor 68 and held in position by a nut 72. The upper edge of cup 71 is generally circular and slightly less in diameter than the lower end of the skirt of canopy 38 so that the cup fits reasonably snugly inside the lower end of canopy 38. This makes a more sightly fixture and also prevents insects and birds and a certain amount of dust and moisture from getting into the parts housed in the canopy 38.

The guide 54 and the pulley bracket and housing 49 are provided with a common securing means. Flange 54*a* at the upper end of guide 54 is provided with suitable openings which register with the openings 50 in the partition 48 which forms the top wall of the canopy 38. In like manner, the bracket 49 has a pair of bottom flanges 49*d*, each of which is provided with an opening adapted to register with the two openings 50 just mentioned. The openings in flanges 49*d* are threaded and screws (not shown) pass through the openings in flanges 54*a*, then upwardly through openings 50 and are threaded into the openings in flanges 49*d* to hold the parts 54 and 49 securely mounted on opposite side of the wall 48 of canopy 38.

Means is provided insuring that hook 35 and canopy 38 are assembled as shown in Figs. 4, 8 and 11 and not in the position 180° reversed therefrom. The means here shown is clearly understood from Fig. 11. It will be noted that the portion 73 of canopy 38 between the two pockets on the outside of the fixture fits snugly inside the portions 74 of the hood 35 between the two outermost pockets 37. On the inside, similar portion 75 of the canopy fits snugly within the portion 76 of the hood between the two innermost pockets 37. Thus, these interfitting portions 73, 74, 75 and 76 provide key means between the hood and canopy preventing any tendency toward relative rotation about their respective axes. In order to make these parts irreversible, it will be noted that the parts 75 and 76 are angular with interfitting shoulders 77 as contrasted to the generally arcuate smooth surfaces between the parts 73 and 74. The hood and canopy, therefore, fit together smoothly only in the position of the parts as shown in Fig. 11. This arrangement of the parts insures that the opening 66, through which electrical conductors 32 pass, is always on the outside of the fixture so that the electrical conductors 32 are carried around the shrouding of pulley 52 and cannot become entangled with cable 27.

Weep holes are provided at necessary points such as 78 in Fig. 5, 105 and 106 in Fig. 12, 107 in Fig. 13, to drain away any moisture which may collect on the upper side of the annular ribs or projections 22*f*, 80*c* and 108 respectively. Also see Fig. 10 at location 79 where the arcuate surfaces of the hood and canopy meet, and where weep grooves are provided to drain away any moisture collecting directly below the lower ends of the slots 45.

The operation of this form of my device should now be clearly understood. With the parts assembled in the position of Fig. 1, the bolts 46 are loosened and the lamp 39 is permitted to swing vertically acting as a plumb bob. When the lamp is hanging in a true vertical position, then the bolts 46 are tightened to hold the parts

in this position. This insures that the lamp hangs vertically in spite of inaccuracies or tendencies to get out of plumb of the parts 20, 22, 25 and 35.

Fig. 12 shows a pole top mounting unit providing two mast arms extending laterally in opposite directions from the top of the pole. This double arm unit would have considerable advantage in parking areas, divided highways and similar installations, in that a single pole equipped with two arms may be used for suspending two luminaires rather than requiring a pole and single arm for each luminaire. Here a single member 80 is provided with a downwardly extending sleeve-like collar 80*a* into which fits the upper end of an adaptor 81 which fits into the pole 82 in a manner similar to the adaptor 21 previously described. Set screws 83 hold the pole top mounting piece in position on the adaptor. The pole top unit 80 has two sleeve-like collars 80*b* extending laterally in opposite directions and each at an angle of 14° 30′ above the horizontal, which is the same angle mentioned in connection with Figs. 1 and 5. The angles illustrated in Figs. 2 and 3 might be used here also. Into each of the sleeve-like collars 80*b* fits the inner end of the tubular mast arm 250 in all respects like the mast arm 25 and having the Y-shape internal partition as illustrated in Figs. 6 and 9. Stop shoulders 80*c* are provided at the inner ends of each mast arm identical with those illustrated at 22*f*. Indexing means for the mast arm is shown at 80*d* like that described at 25*a* and 22*h*. Two pulleys 84 are mounted respeectively in brackets 85 which are like the bracket 28 previously described. A clip holds electrical conduits 87 against the side wall of adaptor 81 and out of contact with cables 88 which operate the lowering lamp hangers. It will be understood, that the parts mounted at the outer end of each of the mast arms 250 are exactly like those described in connection with Fig. 8. The operation of this double mast arm device is exactly like that described in connection with Figs. 1 to 11 inclusive.

In connection with both Figs. 1 and 12, the cable 27 of Fig. 1 or the cables 88 of Fig. 12 may be led downwardly inside of the hollow steel pole (where such a pole is used), passed around a rotatable pulley mounted in the interior of the pole and then secured to a retaining hook 90 mounted on the pole by means of a loop 91 fixed on the end of cable 27. A hand hole plate 92 is provided in the outer wall of the pole and when this is removed, an additional length of cable may be attached to the link 91. A slight pull on the cable will then release the latch dog 55 so that the lowering hanger may be lowered for cleaning or maintenance of the lamp. When the lamp is again raised to latch position, the parts are restored to the position shown in Fig. 1.

Fig. 13 shows a central sectional view through a wall or pole plate mounting assembly. This unit combines the features of a mast arm supporting wall plate with a self contained pulley assembly for the operating cables for use in place of the pole top mounting 22. The device of Fig. 13 would be particularly applicable to installations on building walls or on wooden poles which would not permit the use of the pole top unit 22. The mounting unit 93 comprises a vertical rear wall 93*a* having suitable openings to receive bolts 94 by which it may be attached to a supporting surface 95. The unit also includes two generally parallel side walls 93*b* and a curved bottom wall 93*c*. The top wall is largely open to receive a removable bracket 96 which carries a shaft 97 upon which a pulley 98 is rotatably mounted. Two parallel side walls 96*a* and a rear wall 96*b* of the bracket 96 provide a shrouding for the pulley so as to separate the lamp operating cable 99 from electrical conductors 100. Access for the electrical cables may be through the rear wall 93*a* as shown in Fig. 13 or it may also be provided through one of the side walls 93*b* if desired. The unit 93 has a laterally projecting sleevelike collar 93*d* which snugly receives a mast arm 101. The outer end of this mast arm 101 is supplied with parts exactly like those shown in Fig. 8.

The downwardly extending reach of cable 99 below pulley 98 is housed in a conduit 102. Threaded on the upper end of this conduit is a swivel flare end 103 having a central cylindrical opening and two laterally extending flanges 103*a* which overlie the curved wall 93*c* of the mounting unit. A slot 104 in the wall 93*c* is wide enough to receive the member 103 and to permit oscillation of the member 103 riding on the flanges 103*a*. This provides for delivery of the nominally vertical run of the operating cable 99 at an angle deviating from the true vertical, in order to compensate for the taper of a wooden pole or some other slope such as might be encountered in a tall stack or chimney. Providing this angular adjustment eliminates the need for offsets or sweeping bends in the conduit 102 which, in turn, avoid the possibility of chafing of the operating cable within this conduit during operation of the lowering hanger, which is most desirable. It will be understood that the sleevelike collar 93*d*, shown in Fig. 13 as extending approximately horizontal as described in connection with Fig. 2, might also be provided extending at 14° 30′ above the horizontal as in Fig. 1, or at 26° 30′ above the horizontal as in Fig. 3. Other parts would need practically no change because of this change in angle.

One embodiment of our invention utilizes tubing two inches in diameter for the various mast arms shown at 25, 25′, 25″, 250 and 101. We contemplate that this tubing may be furnished to the user in any desirable lengths, probably in two foot increments such as lengths of six foot, eight foot, ten foot etc. This feature of our invention together with the various angles possible in the pole top mountings and wall plate mountings as illustrated in Figs. 1, 2 and 3 gives a great flexibility to our invention.

Wherever herein in the specification or claims we have used the word "cable" we intend also to cover other flexible tension members capable of similar use such as a light chain.

What we claim is:

1. Light suspension apparatus comprising a mast arm for attachment to a support, a hood on the outer end of said arm and opening downwardly, a downwardly opening canopy fitting within the lower portion of said hood, a lamp suspended from said canopy, mutually engaging arcuate surfaces on said hood and canopy permitting oscillation of said canopy varying the angle of its axis relative to the vertical axis of said hood, said surfaces being arcuate about an axis in a plane approximately at right angles to said arm and below said hood, and means releasably holding said canopy in various adjusted positions relative to said hood.

2. The combination of claim 1 wherein said hood is generally frusto-conical in shape and the top of said canopy conforms closely to the inside surface of the lower portion of said hood.

3. The combination of claim 1 wherein said hood is generally frusto-conical in shape, the top of said canopy conforming closely to the inside surface of the lower portion of said hood, said arcuate surfaces being provided in four pockets recessed into said hood and canopy, and bolt and slot connections between the walls having said arcuate surfaces.

4. The combination of claim 3 including a washer between each of said bolts and slots, each washer and the wall it engages having mating arcuate surfaces, and said mating surfaces having interfitting indentations.

5. The combination of claim 3 wherein said four pockets are non-symmetrically arranged on the sides of said hood nearer and farther from said mast arm, whereby said hood and canopy can be assembled in one position only.

6. The combination of claim 5 wherein said lamp is suspended by a cable extending axially of said hood and canopy, said canopy having a top wall having a through

opening for said electrical conductors, and in said one assembled position said opening is on the side of said canopy away from said mast arm and radially outside of said cable, whereby said conductors are held away from said cable in said hood.

7. Light suspension apparatus comprising a mounting for attachment to a support, a hood from which a lamp may be suspended, said mounting and said hood having sleevelike collars extending toward each other, a straight tubular mast arm embraced by and secured to said collars, a longitudinally extending Y-shape partition through said mast arm, said partition having a lower vertical portion and two upper portions diverging from the top of said vertical portion and dividing the interior of said arm into one upper and two lower passages, a lowering lamp hanger suspended from said hood, electrical conductors passing through said lower passages for energizing a lamp, a flexible cable for connection with a lamp and passing through said hood and said upper passage of said mast arm and through said mounting, and coacting locating means on said collars and said mast arm for positioning said mast arm radially with respect to said collars so that said lower vertical portion of said partition always remains vertical.

8. The combination of claim 7 including pulleys rotatably mounted in said mounting and in said hood, and said pulleys having grooves positioned to hold said cable, when taut, clear of said partition.

9. The combination of claim 7 in which said mast arm is an extruded section of aluminum or the like and having an outside cylindrical wall and said Y-shape partition is integral with said cylindrical wall along its entire length, whereby said mast arm is stiffened to resist loads imposed by a lamp at its outer end.

10. Electrical suspension apparatus comprising a mounting for attachment to a support, a fixture from which electrical apparatus may be suspended, a straight tubular mast arm extending between and secured to said mounting at one end and to said fixture at the other end, said mast arm being an extruded section of aluminum or the like having an outside cylindrical wall and an integral Y-shape partition extending through said arm, said partition having a lower vertical portion and two upper portions diverging from the top of said vertical portion, whereby to provide a plurality of separate passages through said arm, and means holding said arm in oriented position so that said vertical portion of said partition always remains vertical, whereby said mast arm is stiffened to resist loads imposed by electrical apparatus mounted at its outer end.

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