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STREET-LIGHTING FIXTURE

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STREET-LIGHTING FIXTURE

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Fig. 12

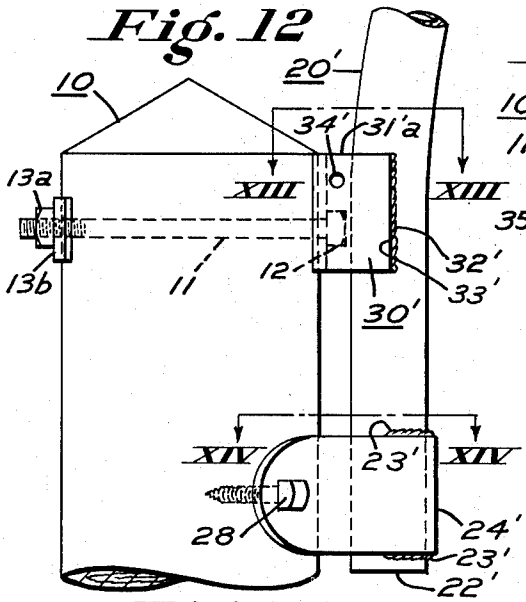


Fig. 13

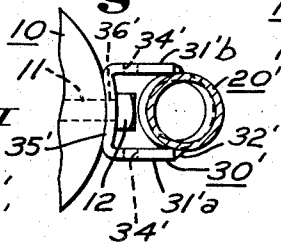


Fig. 14

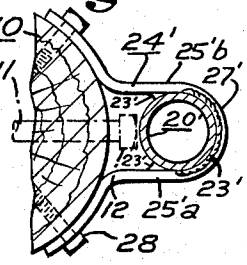


Fig. 16

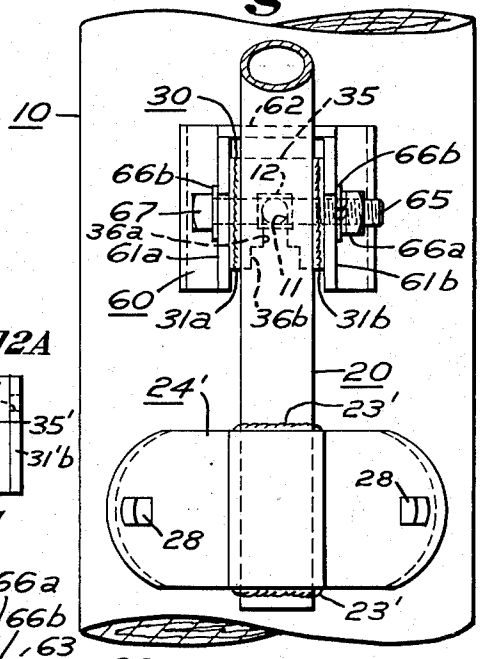


Fig. 15

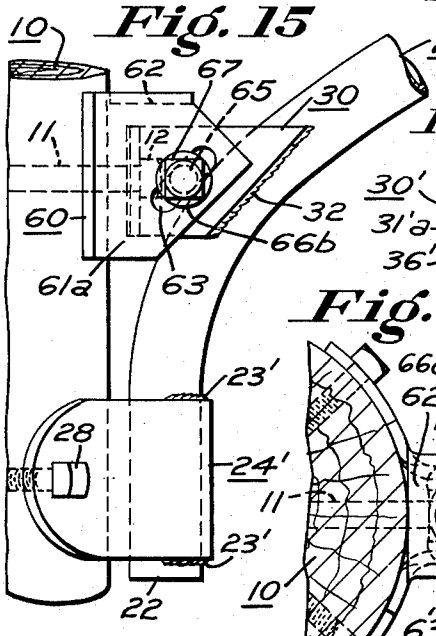


Fig. 12A

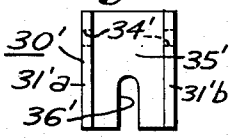


Fig. 17

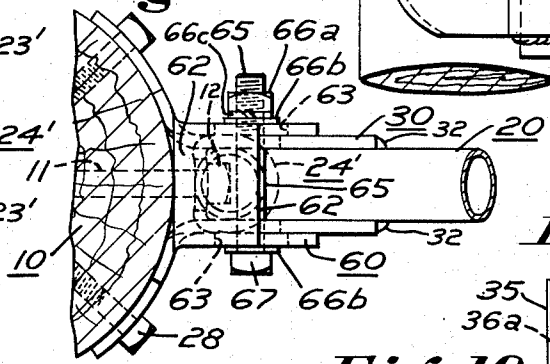


Fig. 19A

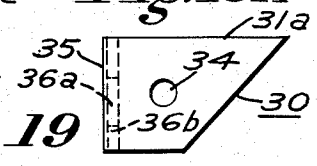


Fig. 18

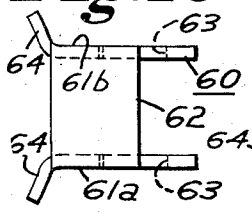


Fig. 18A

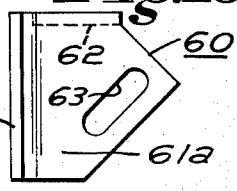
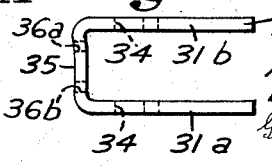


Fig. 19

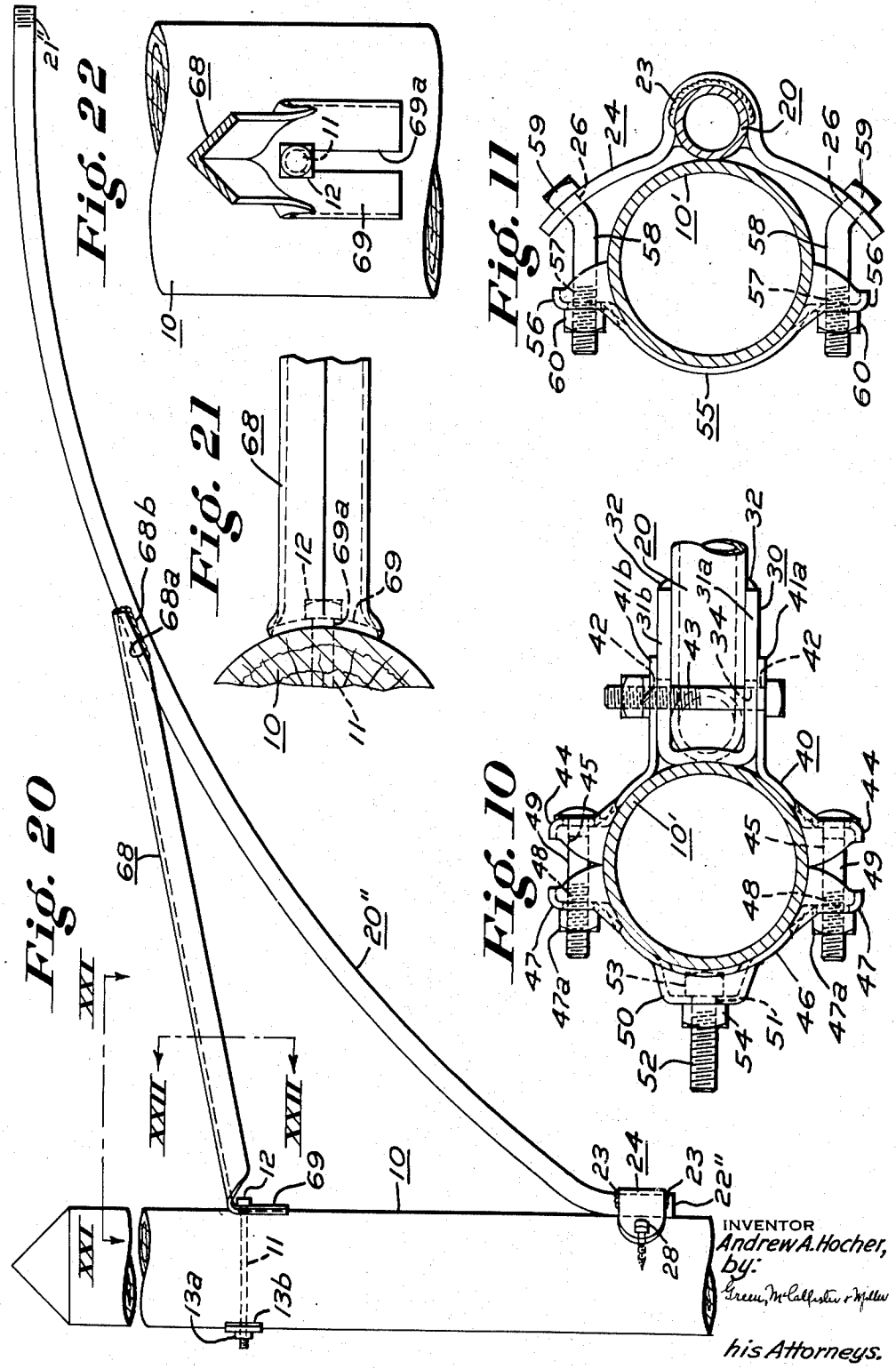


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STREET-LIGHTING FIXTURE

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Fig. 23

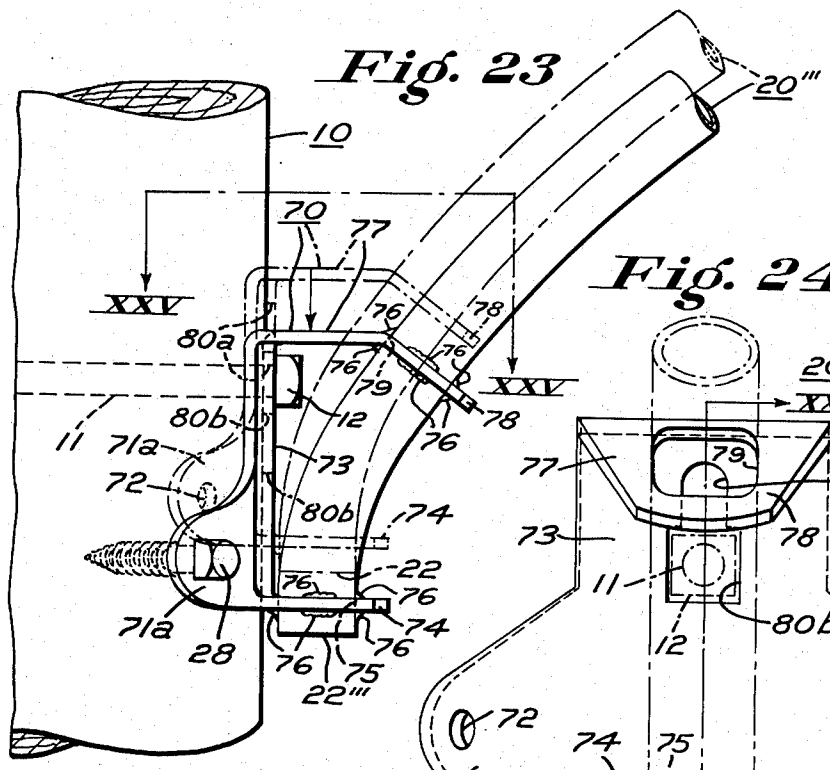


Fig. 24

Fig. 25

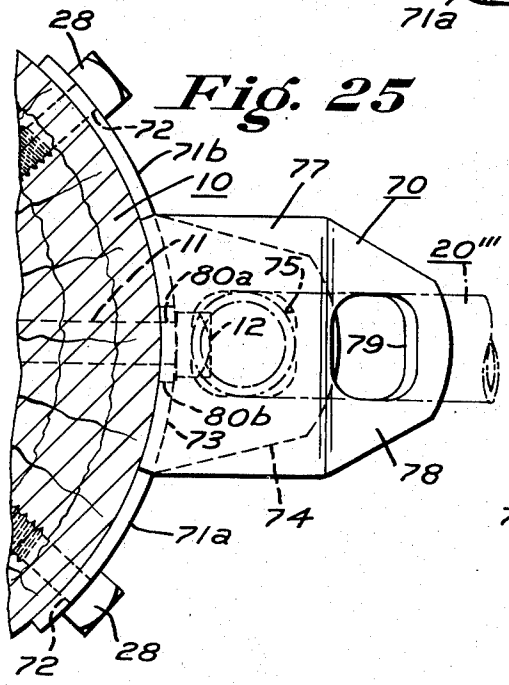
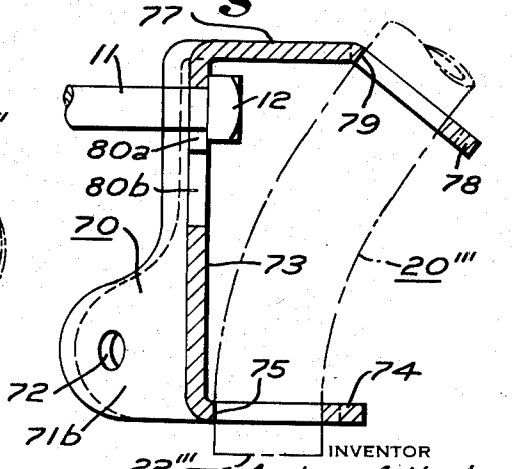


Fig. 26



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UNITED STATES PATENT OFFICE

2,608,369

STREET-LIGHTING FIXTURE

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Application June 23, 1948, Serial No. 34,680

6 Claims. (Cl. 248—221)

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This invention relates to overhead lighting brackets or heavy duty lighting fixtures of a type particularly suitable for outdoor and street lighting usage. A phase of my invention pertains to sweep arm mountings for such bracket or fixtures.

Previous to my present invention a number of difficulties have been encountered in connection with the provision of street-lighting fixtures. In the first place, a fixture of this type is generally employed to support rather heavy luminaires up to 75 pounds or more, and thus, has to be sufficiently strong to carry its own weight and the weight of a luminaire with a good factor of safety under adverse weather conditions.

In the second place, a street-lighting bracket or fixture must be suitable for mounting on a pole, vertical upright or support that may be loaded with other equipment near the upper end or top thereof. That is, it should be capable of being mounted at a lower or clearance level on a support and have sufficient sweep and a proper alignment to provide a proper and safe lighting level.

In addition, a luminaire requires rather heavy cables or wiring under present day conditions. Thus, the fixture should be capable of being easily provided or threaded with cables or wiring after it has been mounted in position on a pole or support. Also due to the fact that a fixture of this type, in itself, is somewhat heavy and due to its sweep is somewhat awkward to handle, the lineman or worker normally has considerable difficulty in properly aligning and mounting or attaching it on a pole or support.

Since the overhead lighting bracket is only as strong as its weakest point when in a mounted relationship on an upright or pole, heretofore the weakest point of such a bracket has been its point of connection to an upright. Heavy wiring cables such as required at the present time are relatively stiff and hard to bend and should be capable of insertion in a tubular arm or sweep member without damage to their insulation and without exposing their wires. Heretofore, it has been customary to use a pole plate or a cast socket that is a separate member and of a requisite size for one particular installation. Such plate or socket has been positioned to hold the horizontal end of the arm in position and has thus constituted the weak point of the structure and has raised a problem in cable or wire threading. In addition, it formed a collector for moisture.

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In view of the above considerations, it has been an object of my invention to provide a new and improved form of bracket or fixture and mounting therefor that will meet the above factors and will facilitate securing it in position on a suitable vertical support, such as a pole;

Another object has been to provide an inexpensive and practical form of street-lighting bracket or fixture having improved characteristics;

A further object has been to provide a fixture that may be easily slid into a preliminary position on a pole in such a manner that it will be somewhat loosely supported while being set and then finally secured in position;

Another object has been to provide a lighting fixture that will permit current carrying cables or wiring to be easily threaded therethrough after the bracket has been mounted in position on a suitable support or pole.

These and many other objects of my invention will appear to those skilled in the art from the illustrative embodiments thereof and the following description.

In the drawings:

Figure 1 is a fragmental side detail in elevation showing a preliminary step of loosely mounting a bolt or pin on a pole or vertical support to receive or hang a fixture constructed in accordance with my invention;

Figure 2 is a fragmental side detail view showing a fixture of my invention in a position above the bolt shown in Figure 1 and ready to be lowered upon it;

Figure 3 is a side view in elevation showing the fixture of Figure 2 after being set, aligned, and permanently or securely mounted in position on a pole or other vertical support; in this view, lag screws have been inserted and the bolt or pin has been drawn up tightly;

Figure 4 is an enlarged front view in elevation of an upper mounting yoke, support bracket, or element which is adapted to engage the bolt of Figure 1;

Figure 5 is an enlarged side in elevation of the bracket of Figure 4; and, Figure 6 is an enlarged top plan view thereof;

Figure 7 is an enlarged horizontal sectional detail taken along the line VII—VII of Figure 3 and illustrating a lower mounting yoke, support clamp or element;

Figure 8 is an enlarged side view in elevation; and, Figure 9 is an enlarged front view in elevation of the support clamp of Figure 7;

Figure 10 is a horizontal section, somewhat

enlarged, showing a clamping band that may be employed with the support bracket of Figures 4 and 13 for loosely or pivotally hanging a sweep arm on a vertical support as a substitute for the pin or bolt shown in Figure 1; this band is particularly suitable, for example, where a metal pole is being used;

Figure 11 is a horizontal section, somewhat enlarged, of a comparable lower clamping band for a support clamp such as shown in Figures 7 and 14;

Figure 12 is a view similar to Figure 3, but showing a modified form of fixture wherein clearance is provided between it and its support;

Figure 12A is a front view in elevation of the support bracket shown in Figures 12 and 13;

Figure 13 is a horizontal sectional detail taken along the line XIII—XIII of Figure 12;

Figure 14 is a horizontal sectional detail taken along the line XIV—XIV of Figure 12;

Figure 15 is a side view in elevation, Figure 16 is a front view in elevation, and Figure 17 is a plan view of Figure 15 showing a modified form of support bracket or an interfitting, adjustable portion that may be employed with an upper yoke or support bracket; this form will provide vertical and horizontal adjustment for the luminaire-carrying end of a sweep arm;

Figure 18 is a top plan view and Figure 18A is a side view in elevation of one interfitting bracket portion shown in an assembled relationship in embodiment of Figure 15;

Figure 19 is a top plan view and Figure 19A is a side view in elevation of the other interfitting support bracket portion of the embodiment of Figure 15;

Figure 20 is a vertical view in elevation of a fixture in which its support bracket has an increased span to provide a greater bracing action; this form is particularly suitable for fixtures carrying loads of more than 100 pounds or having a longer span;

Figure 21 is a top section taken along the line XXI—XXI of Figure 20;

Figure 22 is a front vertical sectional detail taken along the lines XXII—XXII of Figure 20;

Figure 23 is a side view in elevation and Figure 24 is a front view in elevation showing a fixture of my invention provided with a unitary support bracket and support clamp; the dot and dash lines of Figure 23 show the fixture in a preliminary position ready to be hung or pivotally supported on a pin or bolt and the full lines show it securely or rigidly mounted in its final position on the pole or vertical support;

Figure 25 is a horizontal section taken along the line XXV—XXV of Figure 23 and Figure 26 is a vertical section taken along the line XXVI—XXVI of Figure 24.

In order to simplify the description of illustrated embodiments of my invention, I have employed like numerals for similar parts in the various embodiments thereof and slightly modified parts have been indicated by prime suffixes.

In accordance with my invention, I provide an improved lighting bracket having an arm member 20 adapted to be mounted on and to project from a vertical upright or pole 10. The tubular arm member 20 has a bend providing a vertically extending mounting portion adjacent its lower end; and attaching means is secured on such mounting portion and extends transversely therefrom to fasten the mounting portion on the vertical upright. Such means comprises what may be termed an upper attaching

portion or support piece 30 and a lower attaching portion or clamp piece 24 which are in a vertically spaced-apart relationship on the mounting portion of the arm member 20 and are also spaced from the fully open vertical end 22 of the arm member. In this manner, I have been able to effectively balance the support of the arm member 20 on the vertical upright 10 and thus eliminate a weakening of the overall structure by reason of its method of mounting. In addition, the attaching means is secured to and has portions that constitute a part of the arm member 20; thus, the attaching means can be formed as a unitary part of the arm member in the shop, ready for mounting in position when taken to the field. This eliminates carrying a stock of different size attaching means for different size arm members and contributes in this sense to a less expensive construction and one in which the attaching parts do not have to be located and selected as to size in the field. The construction also permits the utilization of heavy cables, since such cables can be readily inserted through its lower vertical end 22 without sharp bends and without forming water pockets, such as inherent in prior constructions. Also, special bushings, sockets, etc. for the wiring have been eliminated.

Referring particularly to the embodiment of my invention shown in Figures 1 to 9, inclusive, 10 illustrates a pole or substantially vertical upright or support for the bracket or fixture and 11 is a bolt, pin or stud (headed projection or mounting pin) which is adapted to be positioned on the pole and to be mounted, at least preliminarily, in a relatively loose relationship thereon or with its head 12 projecting sufficiently to permit the attaching portion or support piece 30 of arm member 20 to be loosely pivoted or hung thereon, see Figure 1. The bolt 11 is shown provided with a suitable head 12 at one end thereof and with a threaded, opposite end portion 14 that is adapted to receive a washer 13*b* and a threaded, adjustable, take-up nut 13*a*.

Figure 1 shows that the bolt head portion 12 is in a spaced relationship with a front wall or face of the pole 10. Referring particularly to Figures 2 and 3, the fixture illustrated is provided with a hollow up-sweep member or arm member 20, of hollow or tubular construction. The upper end 21 of the sweep arm 20 may be threaded or provided with means for carrying and mounting a suitable conventional luminaire. A lower yoke element clamp piece, band, or lower attaching portion 24 is shown welded at 23 to a mounting portion, vertical section or lower end portion 22 of the sweep arm 20. As shown particularly in Figures 7, 8 and 9, the clamp or attaching portion 24 is provided with a pair of outwardly-extending leg or wing portions 25*a* and 25*b*, each of which has a mounting lag bolt or screw receiving hole 26 therethrough. The leg portions 25*a* and 25*b* are shown integrally connected by a curved or somewhat semicircular connecting, foot or back wall portion 27, adapted as shown particularly in Figure 7, to correspond substantially in curvature to the curvature of the portion 22 of the sweep arm 20. As shown particularly in Figure 3, lag screws 28 are adapted to be inserted through holes 26 into the pole or support 10 for the final mounting of the fixture thereon.

Referring particularly to Figures 4, 5, and 6, I have shown an upper attaching portion, support piece, yoke, or element 30 which is of sub-

stantially U-shape, see Figure 6. The upper attaching portion 30 is provided with a pair of outwardly-extending, parallel leg or wing portions 31a and 31b which are shown secured to a curved part of the mounting portion of the sweep arm 20 and at a spaced location above the clamp or lower attaching portion 24 by a suitable means, such as a weld 32.

As shown particularly in Figures 2, 3, and 5, the front edges 33 of the leg portions 31a and 31b slope backwardly to correspond substantially to the slope or curvature of an adjacent portion of the arm member 20 to which they are secured by weld metal 32. The arm portions 31a and 31b may be provided with holes 34 therethrough, in order that, if desired, the clamping band of Figure 10 may be used. The back ends of portions 31a and 31b are integrally connected by a foot or mounting portion 35 which, as shown particularly in Figure 4, is provided with an open slot extending from a bottom edge thereof upwardly therealong. This slot is shown enlarged at its lower portion 36b to correspond substantially in width to the width of a bolt head such as 12 of Figure 1. The upper portion 36a of the slot has a lesser width of slightly greater extent, but to approximately correspond to the diameter of the bolt or pin 11. The portion 35 preferably has a shape or curvature corresponding to the pole or support 10, see Figure 6.

To mount a bracket or fixture, such as shown in the above figures, the lineman may, as shown in Figure 1, first loosely mount the bolt 11. Next, the fixture may be pulled up by any suitable means to its approximate position and moved to a preliminary position with respect to the lower portion of the slot 36 in alignment with the bolt 11. Then, the weight of the fixture may be employed to permit it to slide downwardly along the pole 10 until the stem of the bolt 11 enters the upper slot portion 36a and abuts against the upper curved edge thereof, see Figures 3 and 4. Then, the lag bolts or screws 28 may be secured in position, and the nut 13a tightened up until the bolt head 12 tightly abuts against an outer face of the foot or mounting portion 35 of the attaching portion 30.

After the fixture has been thus securely mounted in position, cables or wires may be threaded upwardly through the lower open end 22 of the up-sweep arm 20 and carried out of the upper open end portion 21. At this point, any suitable form of luminaire or luminaire mounting may be secured on the end 21 and the cable suitably connected thereto.

In Figure 10, I have shown another way of mounting a support clamp piece or attaching portion such as 30 of Figure 3 or 30' of Figure 12. In this arrangement, the bolt 11 may be omitted and a support clamp or clamping band 40 used in place thereof. The band 40 may be said to constitute an interfitting portion of the attaching portion 30, and is provided with outwardly-projecting, spaced-apart wing or leg portions 41a and 41b that are adapted to rest upon or abut the leg portions 31a and 31b of the attaching portion 30. A pivot pin or bolt 43 extends through holes 42 in the leg portions 41a and 41b that are aligned with the holes 34 of the leg portions 31a and 31b, and thus, may be employed to hang the attaching portion 30 from the support or pole 10'.

The clamping band 40 is provided with two clamping halves; the front half is adapted to extend about a front half portion of the circumference of the pole 10' and the back half is adapted to extend about a back half portion thereof. The two semi-circular halves thus encircle the pole 10' and are secured in position by bolts 49 that extend through holes 48 in the projecting lug portions 44 and 47. Nuts 47a provide means for securely mounting the clamping halves of 40 on the support 10'. If desired, the back half of the band 40 may be provided with an offset portion 50 to receive an insulator-clevis-mounting bolt 52. The bolt 52 is shown provided with a head 53 and a nut 54 on opposite sides of the portion 50.

In Figure 11, I have shown a clamping band 55 for the lower attaching portion or clamp piece 24. In this arrangement, bolts 58 fit in the holes 26 in such a manner that their bent head portions 59 clamp or fasten the attaching portion 24 upon the pole or upright 10'. The clamping band 55 has a semi-circular back portion provided with bolt-receiving holes 57 in its projecting lugs 56 against which nuts 60 may be tightened down.

The construction of Figures 10 and 11 may be used where a hollow steel pole is being employed and where it is desirable to avoid the use of lag bolts 28 and pivot bolt 11. The transverse or cross-bolt 43 may be somewhat loosely mounted to preliminarily hang the fixture until it has been aligned, set, and rigidly secured in position by the attaching portion 24.

In Figures 12, 12A, 13, and 14, I have shown a modified form of lower mounting yoke, attaching portion, clamp piece or element 24' which is similar to piece 24 of Figure 7, except that it is provided with a pair of backwardly extending, bent-in or necked, wing or leg portions 25'a and 25'b. The greater backward extent of the portions 25'a and 25'b permits the arm member 20' to be mounted in a slightly spaced relationship with respect to the pole or vertical upright 10.

It will be apparent that the extending supporting leg portions 31'a and 31'b of the upper attaching portion 30' may be of any suitable extent, corresponding to a desired vertical positioning on the sweep arm 20. And, the upper attaching portion 30' can be mounted at any suitable spaced location with respect to the lower attaching portion 24' to provide requisite supporting strength for the structure. In Figure 13, the leg portions 31'a and 31'b of the attaching portion 30' provide additional clearance between the sweep arm member 20' and the upright member 10. This arrangement may be used where the upper attaching portion 30' is to be mounted closely adjacent to the lower attaching portion 24' or where, as shown, in Figure 12, the sweep arm has little, if any, curvature between the attaching portion or clamp piece 24' and the attaching portion or support piece 30', in that it provides sufficient clearance between the sweep arm member 20' and the head 12 of the loosely positioned bolt 11 to permit the upper piece 30' to be slid into position with respect to the bolt and its head. It will be apparent that the attaching portion or support piece 30' may be used with the lower attaching portion 24 of Figure 3, and that the lower attaching portion 24' may be used with the upper attaching portion 30 of Figure 3.

In the arrangement shown in Figures 20 to 22, inclusive, the sweep arm 20'' is provided with an attaching portion such as 24 or 24' at its lower end portion and with a modified form of attaching portion 68 which may be termed a brace member. The portion 68, as shown in Figures 21 and

22, is made up from an angle piece, whose upper end 68a may be slightly swaged out to receive the sweep arm 20'' to which it is secured by weld metal 68b. The other or lower end portion is flattened out and bent down to provide a mount or foot 69. The mount 69 is shown bifurcated to provide a slot 69a for slidably receiving the stem portion of the bolt 11 and against which the bolt head 12 is adapted to rest. As shown in Figure 21, the mount portion 69 is provided with a transverse curvature or shape substantially corresponding to that of the upright or pole 10.

In Figures 15 to 19A, inclusive, I have shown an interfitting aligning part or portion 60 which is adapted to provide means for facilitating the alignment, adjustment or setting of the fixture and to further insure against sway of the arm member 20. The adjustable aligning portion 60 is shown provided with a pair of spaced-apart, horizontally-extending, wing or leg portions 61a and 61b whose back ends 64 are turned out and sloped to substantially correspond to the shape or curvature of the vertical upright or pole 10. The back end portions 64 may also be made longer, so that they can be brought further around the pole or support 10 to give additional side sway strength. An integral top piece 62 extends transversely across the leg portions 61a and 61b to connect them. An inclined or diagonal slot 63 is provided in each leg portion. The slots 63 are adapted to adjustably receive a transverse bolt positioned to extend through holes 34 in the attaching portion 30, see Figures 19 and 19A. The bolt is threaded at 65 and is provided with a nut 66a, slide washers 66b, a lock washer 66c, and a head 67.

In the embodiment of Figure 15, the attaching bracket 30 is first hung or pivotally-loosely mounted on the bolt 11, and the portion 60 which is carried by the attaching portion 30 may then be moved along its slot 63 to accurately adjust the vertical-horizontal (diagonal) positioning of the sweep arm member 20. It will be noted that the slot 63 is sufficiently wide to permit some side adjustment as well as major diagonal adjustment. The ends 64 abut the support 10 and thus, the portion 60 acts as a spacer adjustment between the sweep arm member 20 and the support 10. The slot adjustment may be effected before and/or after the attaching portion 24' has been secured in position on the pole 10 by lag bolts 28. This adjustable means is especially important where the upright 10 tends to bend or sag with the weight of its installations and enables a luminaire on the end of the sweep arm member 20 to be properly aligned vertically (up and down). It also provides some tilting adjustment over and above that of the luminaire, itself. The nuts 13a and 66a are, of course, tightened down to rigidly secure the fixture in position after the necessary adjustments have been made.

In Figures 23 to 26, inclusive, I have shown a unitary mounting piece, means, or member 70 which takes the place of or combines the upper and lower elements or portions 30 and 24 of the embodiment of Figure 3, for example. In this construction, the member 70 is provided with a pair of lower, backwardly-extending lug, wing or leg portions 71a and 71b that have a shape or curvature substantially corresponding to the shape or curvature of the upright or pole 10 (which may be round, square, rectangular, etc.). Holes 72 provide means for mounting the lag screws or bolts 28. A transversely-curved body portion 73 of the unitary member 50 is provided with an outwardly and substantially horizontally-extending lower mounting portion 74 which has an opening 75 to receive the lower end of the up-sweep arm member 20'''. Weld metal 76 may be employed to secure the portion 74 to the arm member.

As shown particularly in Figure 25, the body portion 73 is transversely shaped, curved or sloped to conform substantially to the shape or curvature of the pole or upright 10 and is provided with an enlarged, lower slot portion 80b and an upper, narrow slot portion 80a corresponding to the previous described 36b and 36a of the embodiment of Figure 4, and for the same purpose.

The central body portion 73 terminates at its upper end in an outwardly-extending, substantially horizontal mounting portion 77 that is, at its end, provided with a downwardly inclined, extending portion 78. The portion 78 is at substantially right angles to the length of the sweep arm member 20''', and is provided with a hole or slot 79 to receive the arm member. Suitable weld material 76 is shown to secure the portion 78 to the arm member 20'''.

It will appear that the embodiment of my invention shown in Figures 23 to 26, inclusive, is mounted in position in a manner somewhat similar to the previously described embodiments, in the sense that the unitary piece or means 70 is first slid into position against the pole 10 and into alignment with the head 12 of the bolt 11, and is then slid down the pole from the dot and dash position of Figure 23 to the full line position of the same figure. It will be noted that the arm member 20''' may have a substantially continuous curvature along its full length in this particular embodiment of my invention.

Another advantage of my invention is that it makes possible the utilization of inexpensive strap material that may be rolled from bars and very little if any waste is involved. It will be apparent to those skilled in the art, although I eliminate the need for scroll work, that any suitable top or bottom scroll work or braces may be employed with the fixture of my invention without departing from its spirit and scope thereof as indicated in the appended claims. The entire assembly may also be galvanized or provided with a protective coating after it has been assembled in the plant, that is, after the welding operations have been effected.

Although cables or wires, can by reason of the open end tubular construction and the curvature of the sweep arms of my fixture may be easily threaded through them from their ends 22, 22', 22'', etc., such cables may also be mounted outside, if so desired.

The arrangement shown in Figures 10 and 11 is very flexible in that the clamping band 40 may be preliminarily loosely positioned and the crossbolt 43 can be preliminarily tight or loose as desired. The bolts 49 of the band 40 and the bolts 58 of the band 55 permit adjustment about the support or pole 10' as well as vertically therealong.

What I claim is:

1. In an improved overhead outdoor lighting bracket adapted to be preliminarily pivoted on a headed take-up pin extending transversely from a vertical upright and after suitable alignment, to be securely mounted on the vertical upright to project therefrom; the combination of a tubular upsweep member having a substantially vertical lower end portion and an upwardly-outwardly bent connecting portion both defining a

mounting length part of said member, said member having an outwardly-transversely projecting upper end adapted to carry a luminaire; an attaching construction secured to said mounting length part, said attaching construction having upper and lower attaching parts in a vertically spaced-apart relationship with respect to each other on said mounting length part; said upper attaching part having a pair of wings integrally secured to the bent portion of said mounting length part and projecting transversely in a spaced-apart relationship with each other to bridge a space between said mounting length part and the vertical upright, said pair of wings terminating in an integral vertical connecting plate, said plate having a vertical slot thereon that is shaped at its lower end to receive the headed take-up pin and pivotally mount said plate thereon to suspend said upsweep member therefrom; said lower attaching part having an at least partially encircling attaching portion extending transversely about and integrally secured to the lower end portion of said mounting part, said attaching portion having spaced-apart mounting tabs extending transversely from the lower vertical end portion of said mounting part, said tabs being shaped to extend in opposite directions transversely along the vertical upright; and means for rigidly securing each of said tabs to the vertical upright after said upsweep member has been aligned on the headed take-up pin.

2. In an improved overhead outdoor lighting bracket as defined in claim 1, wherein said tubular upsweep member has open top and bottom ends and a substantially smoothly curved shape, so that a heavy electric cable may be easily threaded therethrough.

3. In an improved overhead outdoor lighting bracket as defined in claim 1, wherein in the combination, said vertical connecting plate is integral with said mounting tabs.

4. In an improved overhead outdoor lighting bracket as defined in claim 1, wherein in the combination, an aligning part is provided with wing portions interfitting with said pair of wings, said wing portions terminating in turned-out portions, said turned-out portions being adapted to abut the vertical upright to resist sway of the bracket, and means adjustably securing said wing portions to said pair of wings.

5. In an improved overhead outdoor lighting bracket as defined in claim 4, wherein in the combination, clamping means is adapted to engage said turned-out portions and secure them to the vertical upright.

6. In an improved overhead outdoor lighting bracket as defined in claim 4, wherein in the combination, means is provided to slidably-adjustably secure said wing portions with said pair of wings.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
611,766	Eorka	Oct. 4, 1898
900,265	Cutter	Oct. 6, 1908
1,547,915	Hirn	July 28, 1925
1,588,566	Wismer	June 15, 1926
1,843,454	Manson	Feb. 2, 1932
1,916,509	Hammer	July 4, 1933
1,936,451	Hildebrand	Nov. 21, 1933
2,182,660	Dillard	Dec. 5, 1939
2,231,137	Ohm	Feb. 11, 1941