G. CUTTER.

SUPPORTING MECHANISM.

APPLICATION FILED SEPT. 10, 1904.

900,265.

Patented Oct. 6, 1908.

3 SHEETS—SHEET 1.

Fig. 1

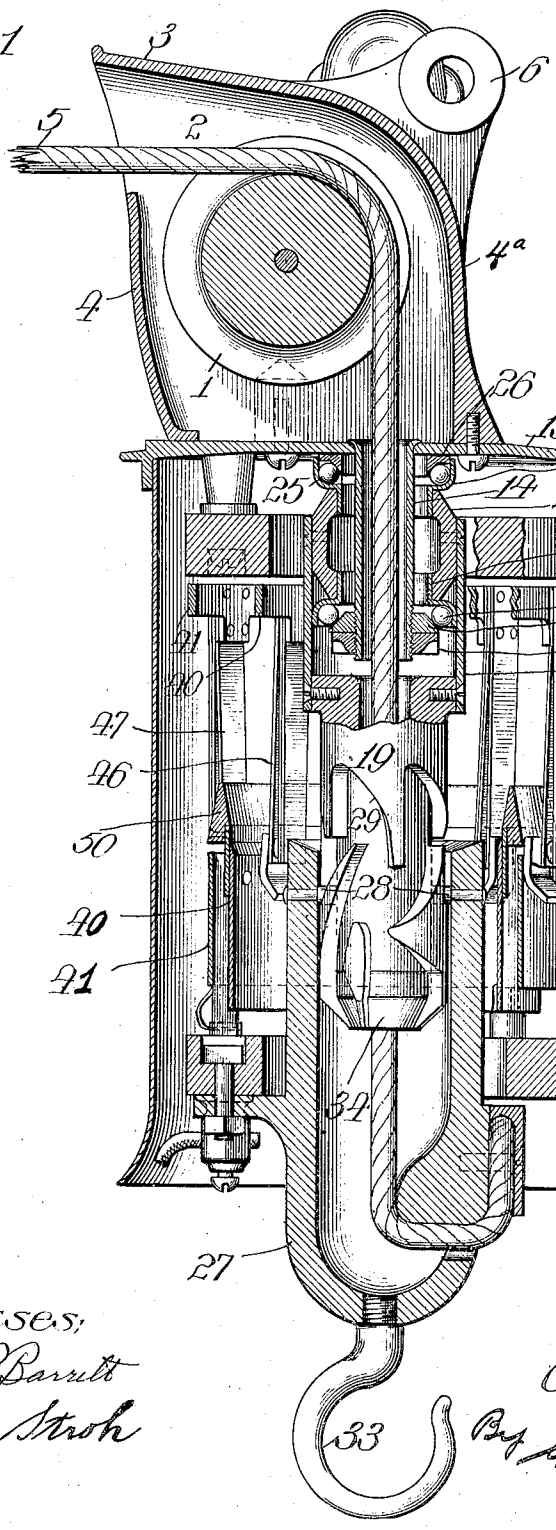
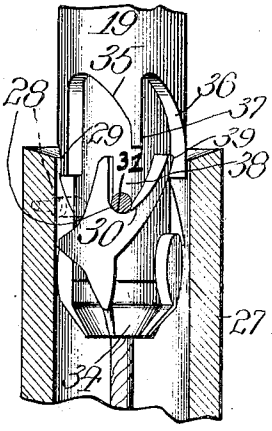


Fig. 2



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3 SHEETS—SHEET 2.

Fig. 3.

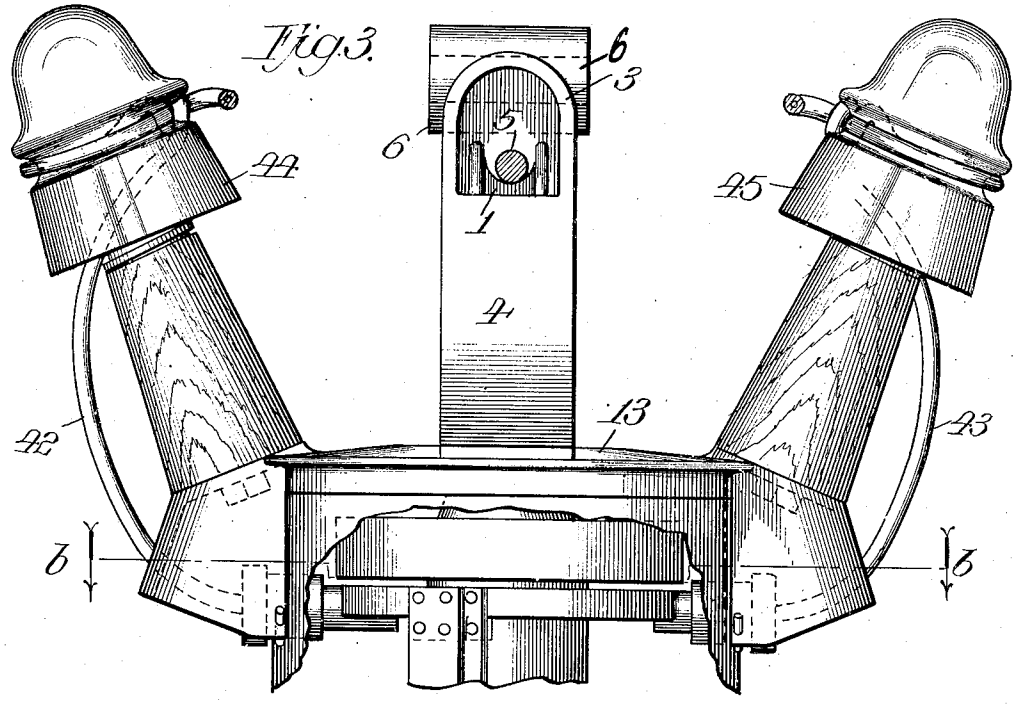
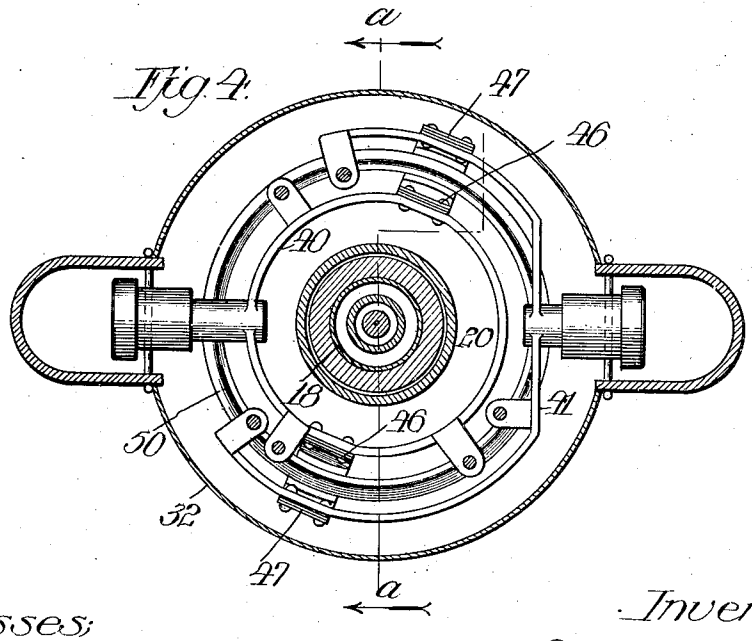


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 7.

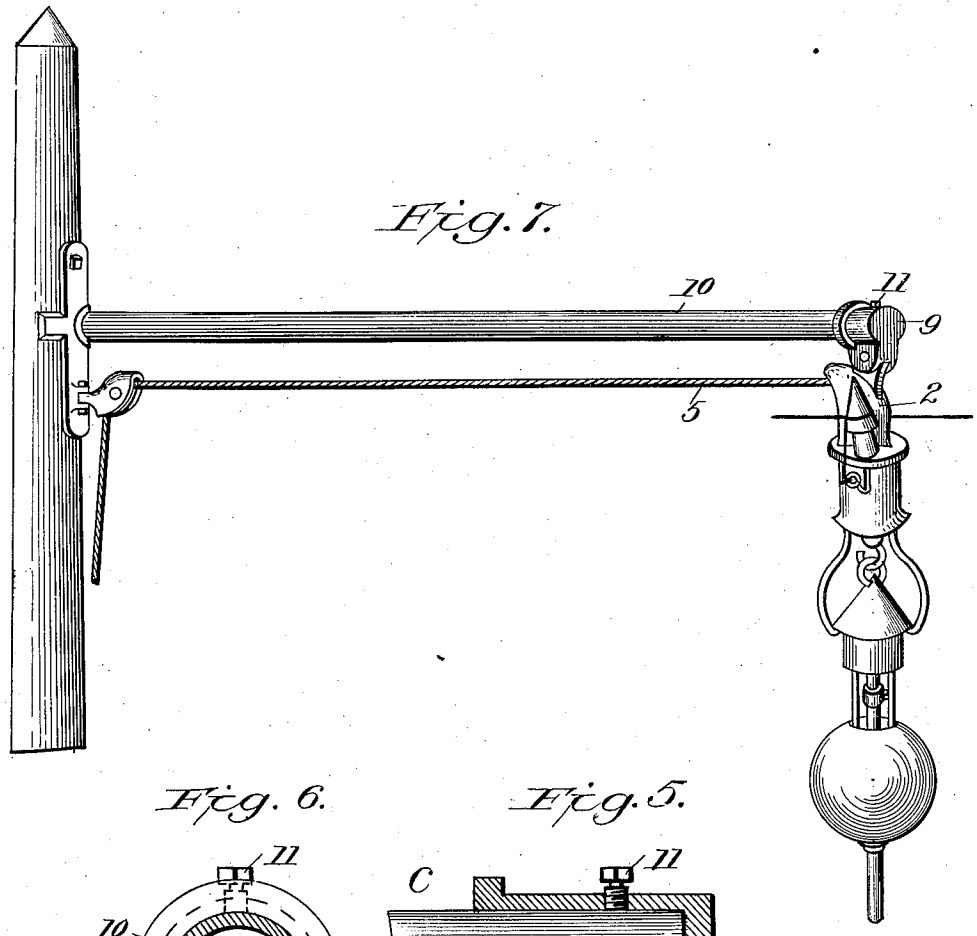


Fig. 6.

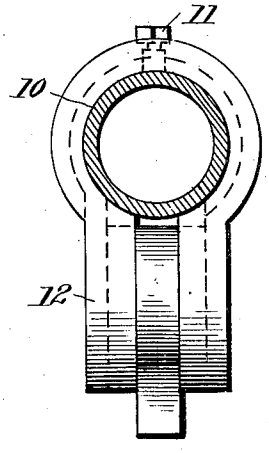
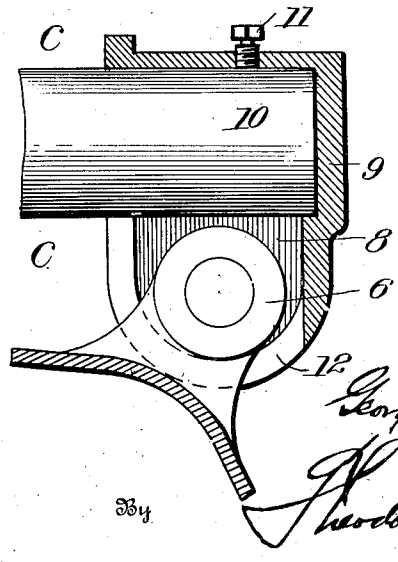


Fig. 5.



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SUPPORTING MECHANISM.

No. 900,265. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed September 10, 1904. Serial No. 224,006.

To all whom it may concern:

Be it known that I, GEORGE CUTTER, citizen of the United States, residing at Winnetka, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Supporting Mechanism, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to supporting mechanism, and is of particular utility in supporting arc lamps.

Hitherto there has been devised a supporting mechanism for arc lamps comprising a pulley whose housing is provided with cams and grooves and an interlocking enlargement provided upon the cable or rope passing over the pulley and adapted when the rope is pulled at one time to enter certain of the cam ways or grooves provided in the housing and to engage certain of the cams provided in the housing to support the arc lamp. The rope when pulled another time guides the said enlargement into another set of cam ways or grooves which permit the enlargement upon the rope to leave the pulley housing when the rope is released. This construction does not altogether fulfil the present requirements. For example, each time the engagement between the enlargement upon the rope and the pulley housing is made or broken, bodily movement of the said housing follows, whereby the operation of the mechanism is rendered difficult unless the rope is jerked, which jerking will affect the lamp adjustment.

The device of my invention in one aspect includes an element in association with the pulley housing and preferably forming a continuation thereof, which element is movable with respect to the main pulley housing and upon which is provided the cam mechanism coöperating with the rope enlargement to secure the lamp in a supported position or to permit its release. The two portions of the housing, that portion whose plane is substantially fixed with respect to the plane of rotation of the pulley and that portion that is movable with respect to the aforesaid portion, are desirably mechanically united by means of an anti-friction bearing preferably including a race-way, one of whose walls is carried by the major element of the housing in which the pulley is mounted, the other wall of the race-way being carried by the movable cam element and supported upon the first aforesaid race-way wall by balls interposed between said walls. By this construction the movable cam element readily adapts itself to the enlargement upon the rope without having to occasion a bodily change in the position of the pulley and the walls by which it is carried.

Viewing my invention from another standpoint, I have disposed the cam elements and grooves upon a body that is tubular and which preferably forms a continuation of the walls of a housing that carries the supporting pulley. By arranging the cam mechanism upon a curved surface, the rope as it is raised and lowered may be confined to a single line of vertical travel, a result that was not accomplished by the device of the prior art, whereby the tendency to affect the lamp adjustment is eliminated and the operation of the apparatus is rendered easier. This tubular cam element is preferably movable with respect to the walls that carry the pulley.

In another aspect of my invention, this tubular extension of the housing provides a passage-way for the supporting rope about which are located the engaging portions of the switching mechanism that is employed to cut the lamp into circuit when it is elevated and to cut it out of circuit when it is lowered, the said tubular extension of the housing acting to prevent the moisture from creeping from the rope to the said engaging portions of the switching mechanism to prevent short circuits or grounds, this function of the tubular extension of the housing being performed whether or not said extension is movable with respect to the balance of the housing. I preferably provide in coöperation with the tubular extension of the pulley housing an improved construction of switching mechanism whereby the lamp may be cut into and out of circuit. To this end, there is provided a guide coöperating with the tubular extension then acting as a guide that

serves to cause the movement of the lamp in a direction practically parallel with the tubular extension, a switching guide being provided whereby the elements of the switch may be nicely directed into engagement without jerking the lamp and modifying its adjustment.

There are other features of my invention that will be hereinafter set forth.

The preferred embodiment of my invention will be fully described in connection with the accompanying drawings and the said invention will be pointed out in the claims hereinafter.

In the drawings—Figure 1 is a vertical section on line *a*—*a* Fig. 4 of the mechanism of my invention, a part being shown in elevation. Fig. 2 is a view at right angles of a part of the structure shown in Fig. 1. Fig. 3 is a view in elevation of the upper portion of the mechanism taken in a direction at right angles to Fig. 1. Fig. 4 is a sectional plan view on line *b*—*b* of Fig. 3. Fig. 5 is a view showing the anchorage device for the mechanism of my invention. Fig. 6 is a view on line *c*—*c* of Fig. 5. Fig. 7 is a perspective view of a mast arm and an arc lamp employing my invention.

Like parts are indicated by similar characters of reference throughout the different figures.

The pulley 1 is provided with a mounting 2, in which it is journaled, this mounting preferably being in the form of a housing having walls between which the pulley is located and substantially parallel with the plane of rotation of the pulley, which walls are united at the top preferably by a curved wall 3 and at the front and rear by transverse walls 4 and 4^a, whereby a substantially inclosed hood is afforded for the pulley. Ample space is afforded between the top margin of the front wall 4 and the top wall 3 in which the pulley rope 5, preferably manila rope, may play. The pulley housing described is provided with a journal 6 projecting laterally beyond the housing on both sides thereof and being adapted for reception within the pockets 8 provided in the socketed end or cap piece 9 secured upon the mast arm 10 that may be employed for supporting the structure. The cap 9 is desirably formed in one integral casting having, as illustrated, a seat or pocket at its upper part that receives the mast arm and which conforms in cross-section to the shape of the mast arm in cross-section, the mast arm and cap being adapted to be secured together by means of a set bolt 11. The cap 9 is provided with downwardly extending projections or ears 12 in which the before mentioned pockets 8 are provided.

In assembling the parts, the mast arm 10 is the last element to be associated with the pulley housing support 9, the journal 6 being the first to pass through the opening in the element 9 that later receives the mast arm. In order that the journal 6 may enter the pockets 8, the said pockets are not made exactly to receive the journal but are extended upwardly and into communication with that portion of the support or end plate 9 that receives the mast arm. After the journal 6 has been passed through the opening for the mast arm and into engagement with the bottom of the pockets 8, the mast arm is inserted to prevent the journal from emerging from said pockets. This portion of the supporting mechanism just described constitutes an important feature of my present invention.

As the supporting mechanism is herein set forth as being especially adapted to the support of arc lamps, the top or cap 13 of the arc lamp circuit controlling mechanism hood is fastened to the bottom of the mounting 2. A central opening is provided in the cap 13 in which is rigidly secured a tube 14 that may be threaded upon its lower end to afford lodgment for the race-way wall 15 and the fastening nut 16, to hold the said race-way wall in adjustment. Roller bearings, as the balls 17, roll upon the race-way wall 15, which balls support the race-way wall 18 that is fixed with respect to and carried by the tubular extension 19, which, in effect, constitutes a tubular extension of the housing 2. The extension 19 includes an upwardly extending cylindrical projection 20, a casting 21 and the race-way wall 22, whereby an inclosure is afforded for the rope or cable 5 to prevent the moisture from creeping therefrom to the switching or circuit controlling mechanism. There is disposed upon the wall 22 a number of balls 25 upon which rests a wall 26, companion to the wall 22, the wall 26 being desirably fixed with respect to the plate 13. By means of both ball bearings that have been described, the tubular extension 19 of the housing 2 is maintained in alinement, and by means of the construction specified the desired mechanical union between the housing 2 and the tubular extension 19 is effected to permit the relative motion between the said housing and extension that is desired in the preferred embodiment of the invention. To this end, the wall 18 is fixed with respect to the tubular extension 19, as is also the wall 22, so that the wall 15, which is fixed with respect to the covering 13 and the housing 2, carries the element 19. The element 19 acts as a guide with which the element 27 coöperates, the latter element being preferably tubular and adapted for snug sliding fit with the tube 19. The element 27 carries one or more cam rollers 28, which, in effect, constitute enlargements upon the rope 5 as one end of

said rope is clamped to the element 27, whereby said enlargements 28 are caused to move with the rope. The tubular extension 19 is shown with a series of inclined cams or guides 29 coöperating with a series of inclined cams or guides 30 in such a manner as to cause the enlargements 28 to be guided by the cams into seats 31 when the tube 27 is elevated into the hood 32 to hold the said tube 27 in an elevated position, together with any lamp or other structure that may be carried by the hook 33 extending from the bottom of the tube 27. A subsequent pull upon the rope 5 will effect a slight elevation of the tube 27, causing the cams 29 and 30 to so act upon the rope enlargement or enlargements 28 as to guide the same into the channels 34, permitting separation between the enlargements and the tube 19, so that the tube 27 and the apparatus carried thereby may be completely lowered.

It will be seen that in directing each enlargement into a channel 34 (reference now particularly being had to Fig. 2 for clearness, a position of the enlargement 28 in passage being indicated in dotted lines) the curved cam wall 35 will guide the corresponding enlargement 28 into line with the corresponding exit groove 34. It will be further seen that in seating the enlargements 28 the coöperating curved cam surface 36 will guide the corresponding enlargement 28 over the wall of the pocket that is to receive said enlargement, so that when the rope is slackened the said enlargement will fall into the pocket. Each of the upper set of cams 29, it will be seen, terminates in a downwardly extending projection, the extensions 37 being located over the pockets 38 that are to receive the enlargements 28 to direct the said enlargements in and out of said pockets, while the remaining extensions 39 project into the channels 34 to direct said enlargements into said channels when the element 27 is to be lowered and into engagement with the projections 39 when the element 27 is to be raised and supported.

It will be seen that there is positive action by the cams upon the enlargements 28, whereby the course of travel of said enlargements is positively directed with respect to the sleeve 19 and with respect to the pockets that are to receive the enlargements and the channels 34, in which the said enlargements travel toward the pockets and from the same.

The invention being of particular service in connection with arc lamps, I have provided switching mechanism preferably including an annular terminal 40 and a segmental terminal 41 to which the wires 42 and 43 connected with the supply circuit are led. These wires are wrapped about the insulators 44 and 45, each wire being twisted about itself at such a point upon its insulator as to bring the twists in substantial alinement with the axis of the journal 6. Thus, whenever the lamp support is swung upon the journal 6, the distance between the twists of said wire and the anchorage of said wire at a stationary pole, for example, remains unchanged. This is another feature of my present invention.

The terminal 40 is preferably provided with two terminal brushes 46, while the terminal 41 is also preferably provided with two terminal brushes 47. Said terminal brushes are mechanically united with the housing 2, as will be clearly understood by reference to Figs. 3 and 4. The structure illustrated is adapted to a series arc lamp, each brush 46 being adapted to engage its companion brush 47 when the lamp is lowered to maintain the lighting circuit intact. The lamp terminals are preferably tubular or annular, as indicated, the inner brushes 46 serving to engage the inner terminal 40, while the outer brushes 47 engage the outer terminal 41. The terminals 40 and 41 move with the tubular element 27 and are thus brought into and out of connection with the brushes 46 and 47 upon corresponding manipulation of the cable to which the terminals 40 and 41 are thus attached. Apart from their other functions and characteristics, the tubular element 19, acting as an extension for the housing 2, also acts as one element of a guide, the other element 27 of which guide travels with the terminals 40 and 41 with respect to which it is fixed. These guides so coöperate as to maintain the annular terminals 40 and 41 in a fixed path with respect to the brushes 46 and 47, so that the said brushes are properly guided into engagement with the said terminals. In order that this engagement may properly be effected without suddenly jerking the rope 5, there is provided a ring 50 which is wedge-shaped in cross-section and whose wedge edge opposes the free ends of the jaws of the switch brushes 46 and 47, the lower ends of the brushes 46 being preferably flared inwardly toward the rope, while the lower ends of the brushes 47 are flared oppositely. The wedge edge of the ring 50 is forced between the free ends of the brushes 46 and 47, so that, apparently, gradual separation thereof is effected to place the said brush ends in position readily to engage the terminals 40 and 41. The ring 50 is desirably made of metal, in order that the separation of the brushes preparatory to their engagement with the terminals 40 and 41 will not be followed by an opening of the lamp circuit.

It will be seen that the tubular structure, preferably including the elements 19, 20, 21 and 22, acts as a shield to prevent the moisture from creeping from the rope 5 to the brushes 46 and 47 and the associated parts,

whereby short circuiting and grounding by the action of such moisture is prevented.

It will be seen that the tubular element 27 of the lamp carrier irrespective of the tubular element 19 acts to prevent moisture from passing from certain parts of the cable 5 to the circuit controlling mechanism.

It will be seen that the enlargement 28 is substantially fixed with respect to the carrier. This characteristic forms an essential feature in some embodiments of my invention. While this enlargement is in coöperative relation with the tubular element 19, the brushes 46 and 47 slide over the elongated terminals 48 and 49. It will also be seen that the enlargement 28 not only acts to support the lamp carrier, but also serves to engage the housing or its tubular extension 19 when the carrier is elevated to limit the upward movement of the carrier, said enlargement being seated in the socket when the carrier is supported by the housing.

It is obvious that changes may readily be made in the apparatus of my invention without departing from the spirit thereof, and I do not, therefore, wish to be limited in all embodiments of the invention to a tubular formation of the cam element 19, nor do I wish to be limited to the shapes of elements as herein shown and specifically described, but

Having thus described my invention, I claim as new and desire to secure by Letters-Patent:—

1. The combination with a stationary member, and a movable member, of a rotary extension on the stationary member adapted to enter the movable member, and provided with external cam grooves, and means carried by the movable member for engaging in said cam grooves, the grooves being formed that the movable member is alternately released from and locked to the stationary member upon pulls on the movable member.

2. The combination with a stationary member, of a rotary part on said member, provided with cam portions, and a movable member having means engaging said cam portions, to alternately release the movable member from and lock it to the stationary member upon pulls on the movable member.

3. The combination with a stationary member, of a member movable thereon and carrying cam portions, and a movable member having means engaging in said cam grooves to alternately release the movable member from and lock it to the stationary member upon pulls on the movable member.

4. The combination with a stationary member, of a tubular member arranged to rotate on the stationary member and carrying a cam mechanism, a movable member adapted to coöperate with the cam mechanism, and a cable extending through the tubular member and connected to the movable member.

5. In a device of the class described, the combination with a pulley housing, of a member rotatably mounted on the housing and carrying cam mechanism, a cable, and a member having attachment with the cable and adapted for coöperation with said cam mechanism to become engaged therewith and to be disengaged therefrom upon the manipulation of the cable.

6. In a device of the class described, the combination with a pulley housing, of a tubular part rotatably mounted on the housing and provided with cam mechanism, a cable passing through said tubular part, and a member having attachment with the cable and adapted for coöperation with said cam mechanism to become engaged therewith and to be disengaged therefrom upon the manipulation of the cable.

7. In a device of the class described, the combination with a pulley housing, of a tubular part thereof permanently mounted thereon but movable with respect thereto and provided with cam mechanism on the outer face thereof, a cable passing through the housing and through said tubular extension, and a tubular guide having attachment with the cable and adapted to receive said tubular extension and coöperate with the cam mechanism to become engaged therewith and to be disengaged therefrom upon the manipulation of the cable.

8. In a device of the class described, the combination with a pulley housing, of a tubular part permanently mounted thereon but rotatable thereon and provided with cam mechanism on the outer face thereof, a cable passing through the housing and through said tubular extension, and a tubular guide having attachment with the cable and adapted to receive said tubular extension and coöperate with cam mechanism to become engaged therewith and to be disengaged therefrom upon the manipulation of the cable.

9. In a device of the class described, the combination with a housing and a lamp carrier movable relatively thereto, of a tubular member carried by one of said parts, a member for movement in the tubular member, carried by the other of said parts, means rotatably securing one of said members to the housing, and a cam mechanism carried by the member secured to the housing.

10. In a device of the class described, the combination with a housing, and a lamp carrier movable relatively thereto, of a pair of oppositely extending projections carried by one of said parts, and a cam mechanism rotatably mounted on the other of said parts and operated by said projections.

11. In a device of the class described, the combination with a housing, of a cam mechanism including a part rotatable on the housing about a vertical axis, and a lamp carrier held by said cam mechanism.

12. In a device of the class described, the combination with a socketed end piece, of a mast arm upon which the said end piece may be disposed, the said end piece being provided with downwardly projecting ears having pockets forming continuations of the space in the upper portion of the end piece, and a pulley housing provided with a journal adapted for insertion through the upper portion of the end piece and from thence for reception within said pockets, said journal being prevented from displacement by the portion of the mast arm inserted within said end piece, substantially as described.

13. The combination of a stationary member carrying an annular terminal, a segmental terminal, a plurality of terminal brushes carried by each terminal, the terminal brushes of one terminal being adapted to contact with the terminal brushes of the other; a movable member carrying two tubular terminals, and a wedge shaped metallic ring arranged above the two tubular members and adapted to separate the contacting brushes.

14. The combination of a stationary member and a movable member, one of which is provided with an extension and the other of which is guided onto the extension, a pair of terminals carried by the stationary member, each terminal being provided with a plurality of brushes which are adapted to contact with the brushes on the other terminal, a pair of tubular contacts carried by the movable member, and an annular ring, wedge shaped in cross section, arranged above the tubular contacts and adapted to separate the brushes.

15. The combination of a stationary member and a movable member, one of which is provided with an extension and the other of which is guided onto the extension, a pair of terminals carried by the stationary member each terminal being provided with a plurality of brushes which are adapted to contact with the brushes on the other terminal, a pair of tubular contacts carried by the movable member, and a metallic wedge-shaped annular ring adapted to separate and bridge the contacts, and direct them onto the tubular contacts.

16. In a device of the class described, the combination with a housing, of a hood having connection with the housing, an interlocking mechanism disposed in the hood, and a lamp carrier held by said interlocking mechanism.

17. The combination with a stationary member, of a tubular member arranged to rotate on the stationary member, a movable member, interlocking connections between the tubular and movable members, and a cable extending through the tubular member and connected to the movable member.

18. The combination with a stationary member, of a movable extension on said member, a second movable member, interlocking connections between the movable members and a cable to alternately throw the interlocking connections into and out of operative relation upon a pull upon the second movable member by the cable.

19. In a device of the class described, the combination with a socketed end piece, of a mast arm upon which said end piece may be disposed, said end piece having pockets, and a pulley housing provided with a journal adapted for insertion in said pockets, said journal being prevented from displacement by the portion of the mast arm inserted within said end piece.

20. In a device of the class described, the combination with a socketed end piece, of a mast arm upon which said end piece may be disposed, the said end piece being provided with downwardly projecting ears having pockets forming continuations of the space in the upper portion of the end piece, a pulley housing provided with a journal adapted for insertion through the upper portion of the end piece and thence for reception within said pockets, said journals being prevented from displacement by the portion of the mast arm inserted within said end piece.

21. The combination of a stationary member carrying a pair of oppositely disposed terminals, terminal brushes carried by each terminal, the brushes of one terminal being adapted to contact with the terminal brushes of the other, a movable member carrying a pair of oppositely disposed tubular terminals, and an annular wedge shaped member arranged above said tubular terminals and adapted to separate the brushes.

In witness whereof, I hereunto subscribe my name this twentieth day of August A. D., 1904.

GEORGE CUTTER.

Witnesses:

ALBERT SCHEIBLE,

CHAS. B. SIMMONS.