Dec. 28, 1926. 1,612,328

J. R. TOWNSEND ET AL

FLOODLIGHT

Filed Jan. 16, 1924

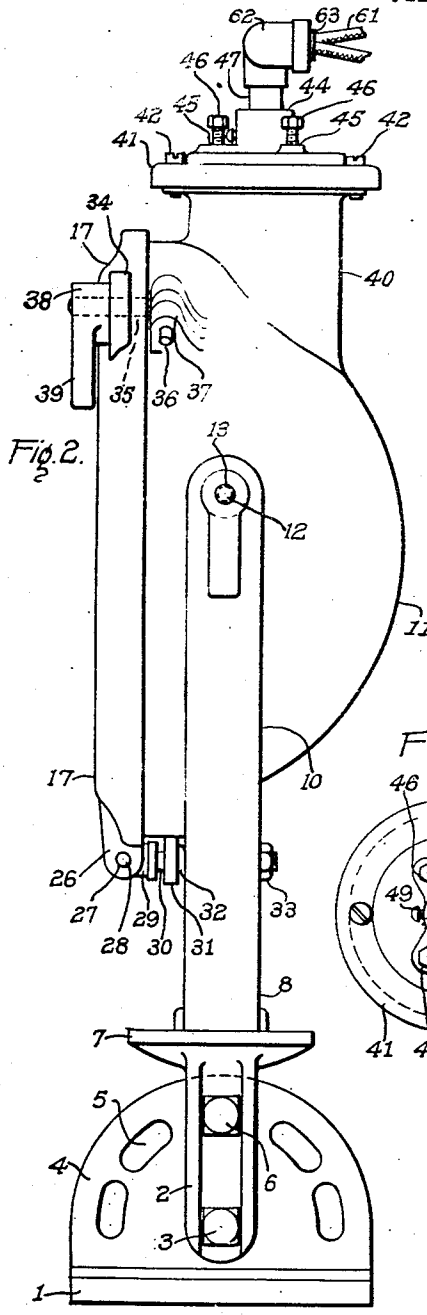


Fig. 2.

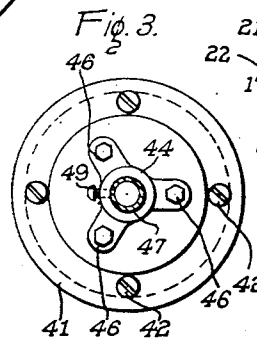


Fig. 3.

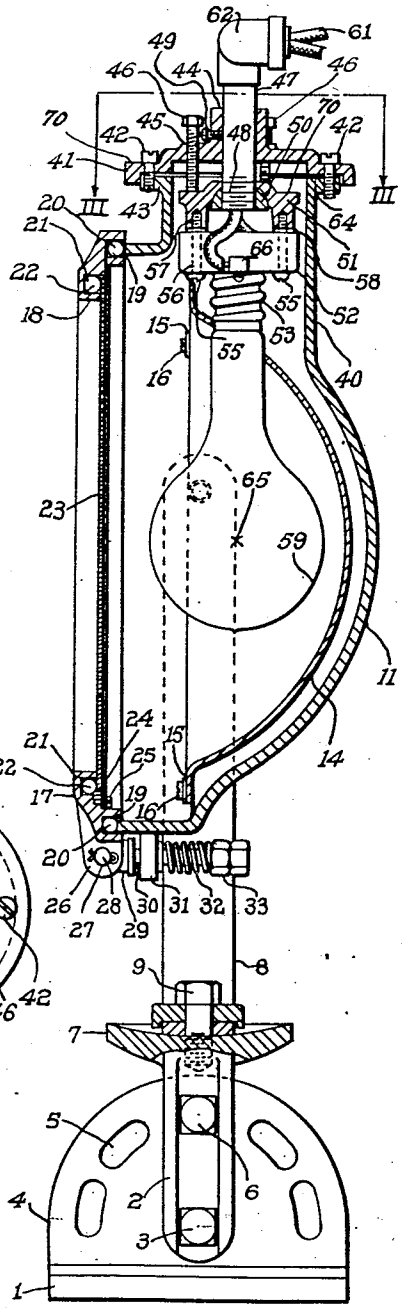


Fig. 1.

WITNESSES:
A. G. Schiefelbein.
W. C. Whelan.

INVENTORS
John R. Townsend and
Christian Halborg.
BY
Wesley G. Carr
ATTORNEY

Patented Dec. 28, 1926. 1,612,328

UNITED STATES PATENT OFFICE.

JOHN R. TOWNSEND, OF SOUTH BEND, INDIANA, AND CHRISTIAN AALBORG, OF PITTSBURGH, PENNSYLVANIA, ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

FLOODLIGHT.

Application filed January 16, 1924. Serial No. 686,538.

Our invention relates to illuminating devices and more particularly to focusing means for floodlights and similar apparatus.

It is among the objects of our invention to provide a device of this character which shall be capable of positive, convenient and exact universal adjustability in reference to a reflector or its focal point.

It is a further object of our invention to provide such an enclosure of the operating parts of the apparatus that the members thereof may be readily and conveniently caused to function to universally and longitudinally adjust a lamp in reference to the focal point of a reflector by the actuation of means exterior of the reflector case; to provide a device of this character which shall be readily and delicately responsive to adjustment, and to provide an illuminating device of such construction that light therefrom may be directed in a path at any angle from its base or support.

Our invention consists substantially in the provision of an illuminating device with a tightly enclosed, dust and moisture proof reflector case or chamber having a lamp carrying socket mechanism adapted to be universally adjusted around a ball member and be locked in adjusted position so that the lamp may be precisely positioned in reference to the reflector or its focal point, without the opening of the reflector case and which device shall also be capable of projecting light in any direction with respect to its base or support.

It has been found in the prior art, that focusing devices for floodlights and other similar illuminating apparatus have had certain defects. In some instances, it has been necessary to open the reflector case or chamber in order to secure the desired adjustment of the lamp. Accordingly, the reflector chamber and lamp itself, as well as the reflector, often become coated with dust and moisture. The illuminating power of the lamp and the efficiency of the reflector would thus be greatly diminished, not only on account of the moisture and dust, but because in removing the lamp, the highly polished surface of the reflector was sometimes scratched, and the reflecting power thereof was decreased.

Even where is was not found necessary to open the reflector chamber, in order to procure adjustment of the lamp, the reflector chamber or lamp would, nevertheless, accumulate dust and moisture, because there was not a sufficiently tight joint between the door closing the chamber and the chamber itself. To overcome these defects, we have provided a focusing device that is completely enclosed within a case or reflector chamber, in which all outlets or joints are tightly sealed by gaskets or seals of rubber, felt, or other suitable material, so that no undesired admission of dust or moisture can take place.

Referring to the accompanying drawings, in which like numerals of reference indicate like parts,

Figure 1 is a vertical, cross-sectional view showing our focusing means embodied in a floodlight;

Fig. 2 is a side elevation of a floodlight embodying our invention; and

Fig. 3 is a sectional view on line III—III of Fig. 1, looking in the direction of the arrows, showing the relative positions of the focus adjusting screws of our device.

Referring more particularly to the drawings, a base 1, which is secured to a fixed support (not shown) carries a swinging arm 2 on a pivot 3 in such a manner as to permit various degrees of adjustment of elevation thereof within an arc of 180°. This adjustment is accomplished by providing a substantially semi-circular portion 4 angularly extending from the base 1 and arranging a series of elongated slots 5 therein near its periphery, so that a stop or bolt 6 or other suitable means, carried in an aperture in the arm 2, may register in the slots 5, and by a nut or other suitable locking means, may, by engaging the extension 4, clamp or lock the arm 2 in any desired position of adjustment around its pivot 3.

Near the outer end of the arm 2 there is provided an enlarged, substantially circular foot or base 7, to which a yoke 8 is secured by a stud bolt 9, so that the yoke 8 may be adjusted around the axis of a pivot or bolt 9 through 360°. At the free ends of the arms 10 of the yoke 8 we mount the reflector case 11 of our floodlight upon the pivots 12 seated in oppositely positioned apertures 13 in

the yoke arms 10. This form of mounting of the reflector case 11 permits an adjustment of 360° on its pivotal supports 12. It will be seen that as a result of the arrangement of the arm 2 and the yoke 8 and pivots 12, above referred to, we can direct light from our floodlight in any direction and at any angle by the adjustment of these supporting members.

The reflector case 11 is a substantially hemispherical or dish-shape member which may be of any suitable cast or otherwise fabricated metal or material. Near the rear portion thereof, we provide a reflector 14 which may be of hemispherical or parabolic shape, or of any other desired form adaptable to the particular use to which the apparatus is to be directed. The reflector 14 may be silver coated or plated, or may be silver with a polished reflecting surface. In the present embodiment, it is held in position by clamps 15 engaging a flanged portion of the reflector body 14. The clamps 15 are held in gripping relation with the reflector by stud bolts 16 or other suitable fastening means threaded into or otherwise engaging the body of the reflector case 11.

For one face of the reflector case 11, we provide a door 17 having a centrally apertured portion 18. The door 17 is provided with a channel portion 19 near its peripheral edge, into which is received the peripheral edge of the reflector case 11. In the channel portion 19, we seat a gasket 20 of rubber, felt or other suitably compressible material in such manner that when the door 17 is closed on the reflector case 11, a substantially moisture and dust proof joint will be made therebetween, and thus no dust or dirt or moisture will be permitted to enter the case 11 therethrough.

In the inner periphery of the door frame 17, we provide another channel portion 21 in which we seat another resilient gasket 22. This serves as a bed or cushion upon which rests a glass or other light transmitting lens or plate 23 which completely closes the aperture of the door frame 17. The lens or plate 23 is tightly held in position against the gasket 22 by a ring 24 or other suitable means which engages it and which is retained in position by means of stud screws 25, or other suitable fastening means threaded in the body of the door frame 17.

The door frame 17 is provided with a pair of laterally extending lugs 26 having alined openings 27 therein through which a pivot pin 28 is inserted, which in turn is engaged by lugs 29 carried upon a pair of spring restrained plungers 30. The plungers 30 are slidably mounted in a pair of apertured lugs 31 laterally extending from and integral with the reflector case 11, and a helical spring 32 mounted around each of the sliding plungers is adapted to adjust and hold them in operative relation by adjusting lock nuts 33 on the threaded end of each of the plungers 30.

Approximately diametrically opposite the hinge portion of the door 17 are radially disposed and slotted lugs 34 adapted to be engaged by swivel bolts 35 carried on pivots 36 mounted on lug extensions 37 on the outer face of the reflector case 11. The swivel bolts 35 are provided on their outer ends with wing nuts 38 which are weighted by extending arms 39 whereby when the door 17 is closed and the swivel bolts 35 engage the slotted lugs 34 of the door 17 and the wing nuts 38 are tightened thereagainst, the weighted arms 39 will tend to prevent the accidental loosening or turning of the nuts 38 upon their threads. It will be seen that when the door 17 is turned upon its hinge and is open, the plungers 30 will be drawn back their fullest extent, by the springs 32 mounted thereon. When the door 17 is closed, the peripheral edge of the reflector case 11 will be impressed against the gasket 20, in the channel portion 19 of the door 17 and thereby make a complete closure of that joint.

This closure may be positively retained by swinging the swivel bolts 35 into place in the slotted lug 34, and by tightening the wing nuts 38 thereagainst. By adjusting the nuts 33 which control the pressure of the helical spring 32 against the lug 31, the pressure on the gasket 20 is regulated. In this manner, it will be observed, we effect a convenient, positive and secure dust and moisture proof closure between the door 17 and the reflector case 11.

Extending from one side of the reflector case 11, we provide an integral tubular or box like portion 40 which itself is partially closed at its outer end by a cap or cover 41. The cap 41 is held in operative relation to the tubular portion 40 by means of suitable fastening means, such as stud bolts 42 passing through its peripheral flange and engaging the flange 43 of the enlarged tubular portion 40 of the reflector case 11. The cap 41 is provided with a substantially central opening 44 or tubular portion and with a series of threaded openings 45 in its body portion, which are approximately 120° apart, and into which are inserted independently operable set or adjusting screws 46.

In the tubular central portion 44 of the cap 41, in slidable relation therein, we insert a tubular member 47 which extends both inwardly toward the body of the reflector case 11, and outwardly from the tubular portion 44 of the cap 41, and which is provided with threaded portions 48 at its opposite ends. A set screw 49 is threaded into the tubular portion of the cap 41 and is adapted to engage the slidable tubular member 47 therein. The set screw 49 may

be loosened to permit the tubular member 47 to slide longitudinally within the cap 41, or to be tightened and to lock the tubular member 47 against longitudinal movement.

On the inner end of the slidable tubular member 47 a ball like member 50 is held in detachable but fixed threaded engagement therewith, so that it will move with longitudinal movement of the slidable member. Mounted on and around the ball member 50 is a cup-shaped or socket member 51 which, with the ball member 50, forms a universal ball-and-socket joint. The cup shaped member is provided with a flattened portion 70 on its outer surface for providing a bearing for adjusting and locking bolts, hereinafter to be described. The slidable tubular member 47 and the ball 50 and socket members 51 may be of metal or any suitable material of sufficient tensile strength to be adaptable to the conditions under which they operate.

Detachably secured to the socket member 51 is a lamp supporting member 52 of porcelain or other suitable insulating material. Any suitable lamp holding member 53 may be mounted on the member 52 in any usual manner, so that it will be moved thereby, and in correspondence therewith.

The porcelain member 52 shown herewith, is attached to the socket member 51 by screws 55 passing through apertures 56 in said supporting member 52 and into threaded apertures 57 in said socket member 51. The supporting member 52 and the socket member 51 are separated by washers 58 of mica, felt, cloth or any other suitable material. The lamp 59 may be screwed or otherwise held in the lamp holding socket 53 in any usual manner. The supporting member 52 is provided with binding or connecting posts 60 to receive conductors 61 carrying current to energize the lamp 59, which conductors 61 pass through the adjustable slidable member 47 into and through the condulet 62, to a source of current, not shown.

The condulet 62 is threaded or otherwise secured to the outer end of the slidable tubular member 47 and thereby closes that end of the cap member 41 through which the tubular member 47 passes. The condulet 62 itself is closed at its outer end, except at the apertures 63 through which the conductors 61 pass.

In order to preserve the closed sealed condition of the reflector case 11 and to prevent the entrance of moisture or dust through the condulet 62, the condulet 62 is filled or otherwise sealed with any suitable sealing wax or other substance impervious to air, dust and moisture. In order to tightly close the joint made between the cap 41 and the enlarged tubular portion 40 of the reflector case 11, we may provide a gasket which may be of rubber, or other suitable material and which by the compressive action of the stud bolts 42 will be more effective in sealing the joint than a plain metal to metal connection.

To adapt an illuminating device of the character here shown, to the varying conditions under which it may be required to operate, it has been found necessary, in order to secure a maximum efficiency, to have a highly flexible degree of adjustment of the lamp 59 or source of light, in reference to the focal point of the reflector. In some cases, it may be desired to direct the light in a flood of parallel beams; in other cases, it may be desired to direct the light in diverging or diffused rays, over wide areas; and in still other cases, it may be desired to converge or concentrate the light upon a comparatively small surface or point. To meet these varying conditions, it is necessary to provide a universal adjustment of the light in respect to the focal point of the reflector 14. It is to accomplish this with facility, without the necessity of opening the reflector case 11, except in case of repairs, or when the installation of a new lamp 59 is required, that we have devised our improved focusing apparatus.

There is also reason for particularly delicate and exact adjustment of the lamp 59 in apparatus of this character resulting from the construction of the lamp usually operated therewith. It has been the practice in the operation of floodlights, to use a lamp having a very concentrated filament 65. It will be observed from this, that to properly position such a lamp 59 and its light producing filament 65 in reference to the focal point, delicacy of adjustment in the focusing apparatus is necessary.

It will be also observed that when the lamp 59 is to be adjusted it is important in order to maintain the efficiency of the device, that the adjustment be readily and accurately accomplished and positively maintained without the necessity of opening the reflector case 11, except when it may be desired to make repairs thereto, or install a new lamp.

The adjusting screws 46, acting on the socket member 51 are placed approximately 120° apart, and extend within the body of the reflector case 11, or its extended tubular portion 41. They may therefore be operated, without any opening of the reflector case 11, to effect any desired universal adjustment of the socket member 51 around the ball member 50 and the adjustment universally of the lamp 59 in reference to the focal point of the reflector 14. By the operation of the set screws 46 this adjustment may be made to any degree of fineness desired.

It is obvious that if we slightly loosen or withdraw one of the set screws and similarly tighten the other two set screws, the socket

member 51, the lamp carrying member 52 and the lamp 59 itself will be moved relatively to the focus of the reflector 14. If on the contrary, we loosen or withdraw somewhat two of the screws and tighten the third screw correspondingly, the lamp 59 and its supporting member 52 and the socket 51 will be moved thereby and differently positioned with reference to the focus of the reflector 14. From this, it will be seen that, by varying the adjustment of the respective screws 46, their cooperation and contact with the socket member 51 will adjust the lamp 59 to any position or point desired with reference to the focal point of the reflector 14.

The adjusting and set screws 46 also lock the lamp 59 and its supporting members 51, 52 and 53 in the adjusted position by forcing the socket member 51 into tight engagement with the ball member 50, thereby locking the socket 51 and ball 50 together.

Adjustment of the lamp 59 with reference to the focal point of the reflector 14 is made in the longitudinal direction, by loosening the set screw 49 in the tubular portion 44 of the cap 41 and by moving the slidable tubular member 47 either forwardly or backwardly in the cap 41. As the ball member 50 is carried on the end of said tubular member 47, this movement will result in the longitudinal adjustment of the lamp 59. The longitudinal adjustment may also be accomplished by the operation of the set screws 46 acting on the socket member 51. If they are screwed down equally, they will bear against member 51 and cause a corresponding longitudinal movement of the lamp 59.

It will be seen from the foregoing, that we have provided an illuminating device in which the lamp is enclosed in a reflector case that is dust and moisture proof and in which at the same time will permit of a fine, positive and delicate adjustment of the lamp and positive locking in adjusted position thereof, by the provision of means entirely exterior to the reflector case and without the opening thereof.

We have also provided means which will permit the light to be conveniently and readily directed to, or on a surface or point at any angle from the base or support of the device. We have also provided a simple and compact apparatus which is of comparatively few parts, is positive of operation, is capable of delicate adjustment and is of efficient and durable construction, and which may have other advantages not specifically herein set forth.

Although we have described one form of our invention, in the foregoing specification, we do not wish to be limited thereby except as the state of the art and the appended claims may require, for it is obvious that changes may be made in the organization, combination and construction of parts thereof without departing from the spirit and scope of our invention. For instance, instead of set screw 49 for adjusting the lamp focus longitudinally, we may provide threaded portions on cover 41 and member 47, which co-operate for the same purpose; or we may utilize lock nuts to co-operate with the threaded portion of the member 47.

What we claim is:

1. The combination with a lamp casing provided with a plurality of covered apertures therein, of means for mounting and universally adjusting a lamp in said casing comprising an apertured hollow member adapted to support a lamp socket, a support for said hollow member adapted to be adjustably mounted on a supporting cover for one of the apertures of said casing and to extend through an aperture in said hollow member, a bearing member on said support mounted within said hollow member, said bearing member providing means for retaining said hollow member on said support, an exterior bearing portion on said hollow member and a plurality of exteriorly operable threaded means mounted on said supporting cover adapted to engage the bearing for locking and adjusting said hollow members.

2. A light projector comprising a casing, having a removable cover in one portion thereof, a lamp in said casing, an insulating support for mounting said lamp, an apertured hollow member within said casing attached to said support, a tubular member extending through said apertured member for providing a conduit for electrical connectors, a ball member secured to said tubular member providing an inner ball joint in said hollow member, means for adjustably securing said tubular member to said cover adapted to engage said hollow member and means in said cover for adjusting and locking said jointed members.

3. A light projector comprising a casing, a cover secured to said casing, a lamp-supporting-and-focusing device attached to said cover, an apertured cup-shaped member in said device for supporting said lamp, said member having a flattened outer surface thereon, a ball member jointed within said cup-shaped member, means for rigidly connecting said ball member to said cover through an opening in said cup-shaped member and a plurality of screws extending through said cover and bearing on said flattened outer surface of said cup-shaped member for focusing said lamp.

In testimony whereof, we have hereunto subscribed our names.

JOHN R. TOWNSEND.
CHRISTIAN AALBORG.