Aug. 18, 1931. C. W. MOORE 1,819,842

LAMP SUPPORT

Filed Feb. 29, 1928 4 Sheets-Sheet 1

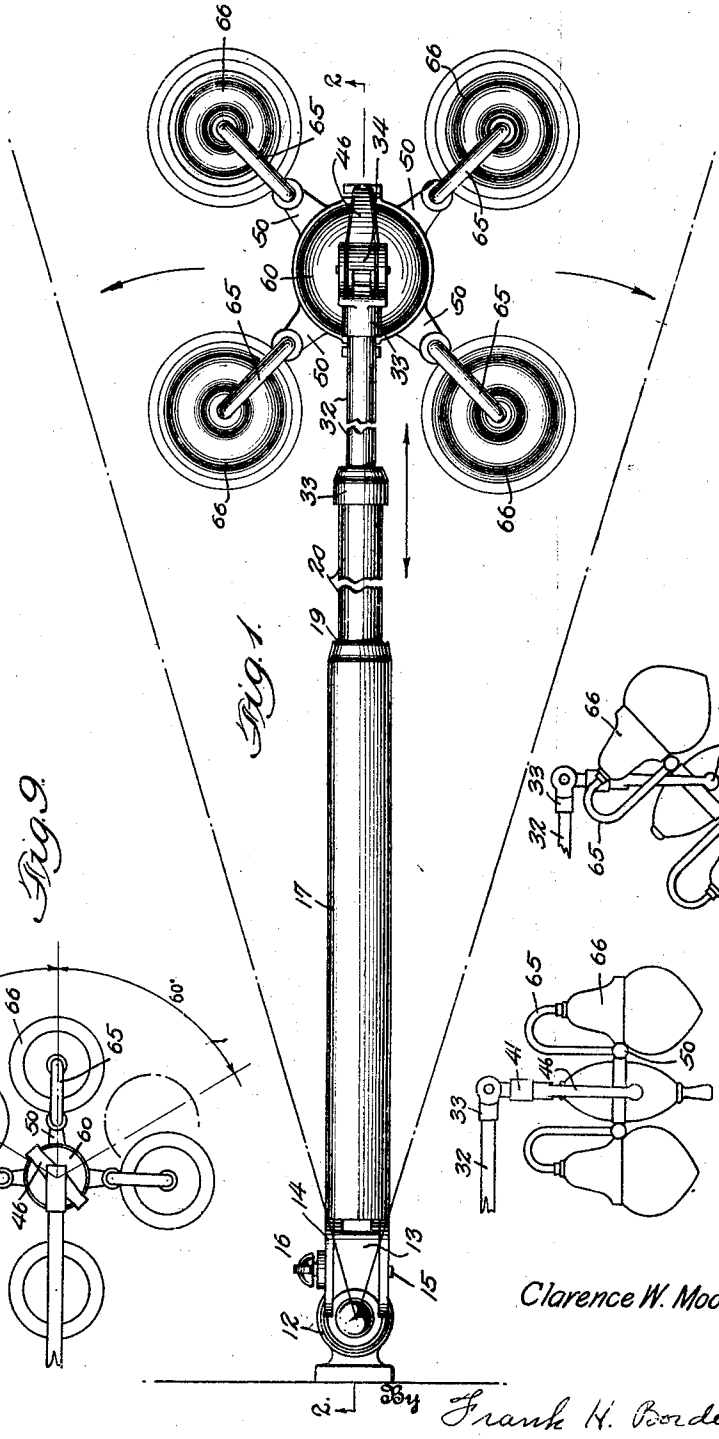


Fig. 1.

Fig. 11.

Fig. 9.

Fig. 10.

Inventor

Clarence W. Moore.

By Frank H. Borden

Attorney

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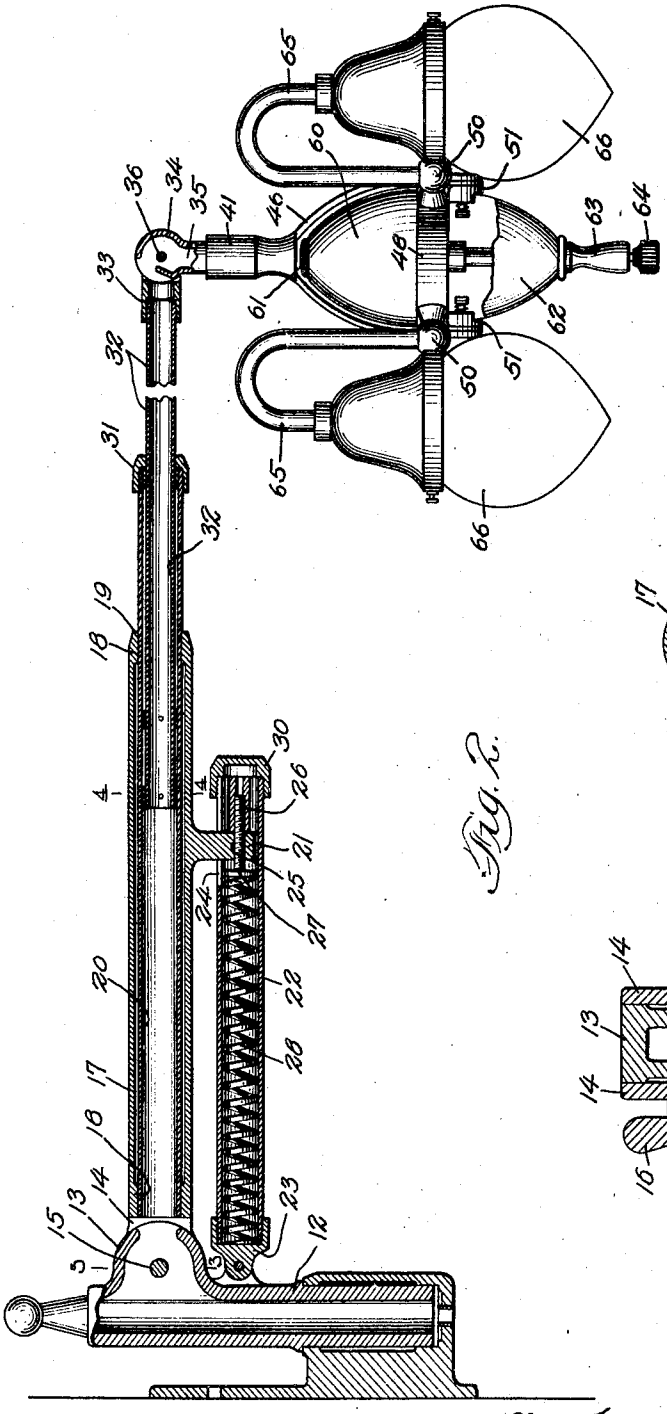


Fig. 2.

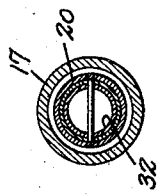


Fig. 4.

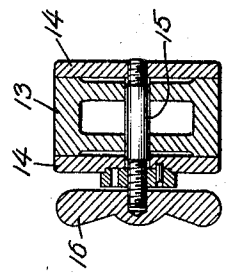


Fig. 3.

Inventor
Clarence W. Moore.

By Frank H. Borden
Attorney

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Fig. 5.

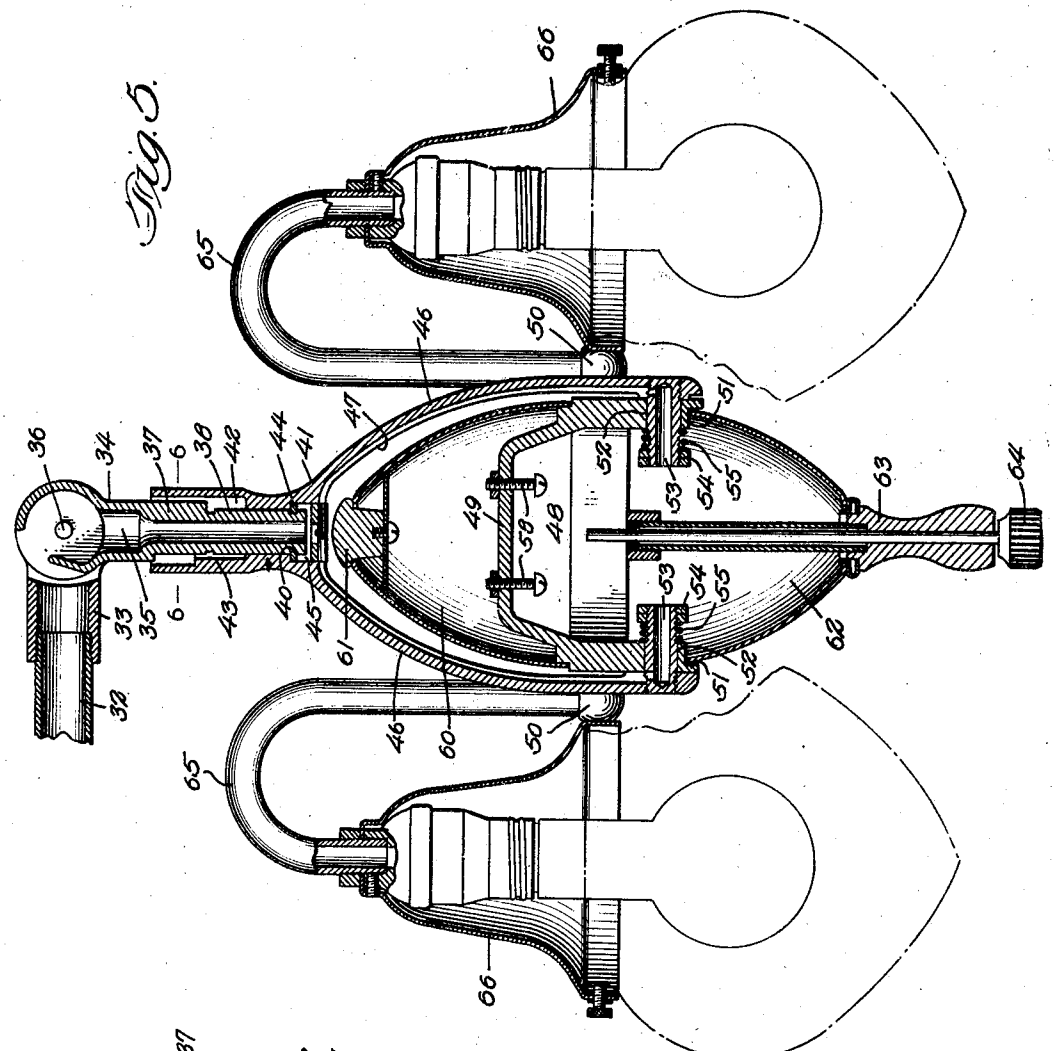
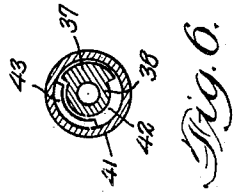


Fig. 6.



Inventor

Clarence W. Moore.

By Frank H. Borden

Attorney

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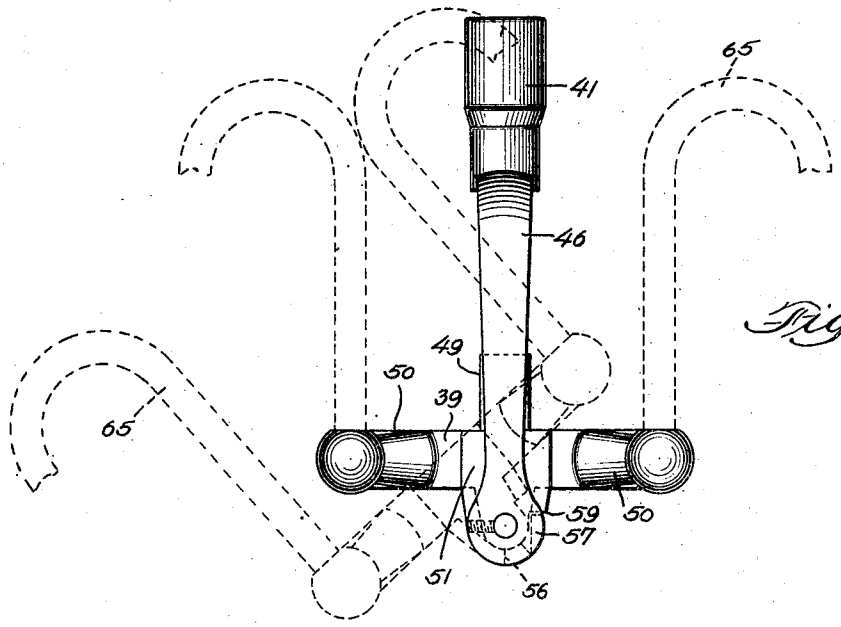


Fig. 7.

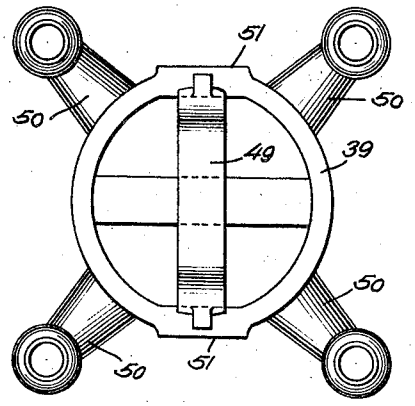


Fig. 6.

Inventor

Clarence W. Moore

By Frank H. Borden

Attorney

Patented Aug. 18, 1931 1,819,842

UNITED STATES PATENT OFFICE

CLARENCE W. MOORE, OF ROSLYN, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO RITTER DENTAL MANUFACTURING COMPANY INC., OF ROCHESTER, NEW YORK, A CORPORATION OF DELAWARE

LAMP SUPPORT

Application filed February 29, 1923. Serial No. 258,002.

This invention relates to lamp supports, and particularly to improvements in the lamp clusters known as dental operating lights.

Among the objects of the invention are; to provide a dental operating light cluster with means for adjusting the cluster in three planes; to improve the construction of lamp clusters and supports; to provide a lamp cluster about a hub susceptible to oscillation on a horizontal axis passing through the hub; to so balance the parts in an adjustable lamp cluster that an imparted position of adjustment will be retained with a minimum of frictional resistance; to provide a dental operating light susceptible to adjustment to any required position in response to a single movement by the operator; to provide an adjustable dental operating light instantly returnable to a normal vertical position without careful and minute adjustments; to provide a dental operating light susceptible to easy and quick adjustments with an enhancement of ornamental and compact appearance thereof; to improve the crane construction of dental operating lights; and many other objects and advantages as will be more apparent as the description proceeds.

In the accompanying drawings disclosing an illustrative form of the invention:

Fig. 1, represents a top plan of the assembled dental operating light, and the pivoted, extensible crane upon which it is supported,

Fig. 2, represents a longitudinal section through the assembly taken on line 2—2 of Fig. 1,

Fig. 3, represents a section through the frictional pivot at the inner end of the crane, taken on line 3—3 of Fig. 2,

Fig. 4, represents a vertical section through the telescoping elements of the crane, taken on line 4—4 of Fig. 2,

Fig. 5, represents an enlarged vertical section taken through the lamp cluster, the yoke and its support,

Fig. 6, represents a horizontal section through the connection between the yoke and its support, taken on line 6—6 of Fig. 5,

Fig. 7, represents an elevation of the supporting yoke and a structural element of the hub of the lamp cluster, showing an adjusted position of the element in the yoke in dotted lines,

Fig. 8, represents a top plan of the structural element of the lamp cluster disclosed in Fig. 7,

Fig. 9, represents a diagrammatic plan of the lamp cluster of the invention, indicating the range of oscillation on a vertical axis to which it is susceptible,

Fig. 10, represents a diagrammatic elevation of the lamp cluster in its normal unadjusted position in the supporting yoke, and

Fig. 11, represents the same with the cluster tilted or adjusted in the yoke.

With the development of the mechanical side of dentistry there has arisen the necessity for better lighting facilities. Better lighting has been effected by the cluster of lights about a central hub, forming standard equipment in the modern dental office, although as previously arranged this lamp cluster has been mounted on a vertically adjustable support as the only means for adjusting the position of the cluster, and therefore does not provide the utmost in lighting efficiency. It has been discovered that even better results were obtainable when the lamp cluster was made angularly adjustable relative the vertical support. So far as known, however, the only means provided in the past for this purpose, involved a universal connection disposed in the hub of the cluster, by means of a ball and socket connection, which, while affording a measure of adjustability was also possessed of a number of disadvantages. Among others, the undesirable characteristics of the ball and socket connection were; undue frictional resistance to movement, necessitating the use of both hands of the operator in order to secure the proper adjustment as an incident of the large frictional area of the ball and socket connection; improper balance of the cluster and hub relative the support, requiring that there be appreciable frictional resistance to movement in order to maintain an imparted position of adjustment; displeasing and unorna-

mental appearance due to the necessary disposition of the elements of the lamp cluster; difficulty in returning the cluster to proper vertical or normal position without careful and minute adjustments; undue expense owing in part to the number of parts used. It was with these factors in mind that the invention herein was invented.

The preferred form of the invention contemplates the provision of a lamp cluster comprising light sources grouped about a central hub, to which a yoke is affixed upon a horizontal axis passing substantially through the center of gravity of the cluster, the yoke having a limited swivel connection with a vertical member, and the vertical member in turn supported upon a novel counterbalanced crane.

Referring now to the drawings, in Figs. 1 and 2, a vertical element or pintle 12 is provided, which may be mounted upon a wall as disclosed, or otherwise maintained in a vertical position, as by being mounted on a dental unit. It is preferred that the pintle 12 be pivotally mounted so as to swing on a vertical axis. The pintle 12 is enlarged as at 13, to receive the clevis 14 joined thereto by a pivot pin 15. The pin is differentially threaded at opposite ends, and is engaged by a thumb nut 16 arranged to vary the tension of the legs of the clevis on the enlargement 13, so that pivotal movement of the clevis on the pintel is subject to varying resistances, as will be clear. The clevis 14 forms a terminal of a relatively heavy tube 17 formed with internal restricted bearing surfaces 18 at each end thereof, with which a relatively thin hollow tube 20 is axially held in the heavy tube. The tube 17, at a point between its pivot 15, and its free end 19, is formed with an integral vertical lug 21, preferably extending downwardly to engagement with a spring unit counterbalancing the crane. The preferred, illustrative form of spring unit, comprises a tubular housing 22, closed at one end by a hinge piece 23 pivoted to the pintle 12 in vertical alignment with the pivot 15, the housing having a longitudinal slot 24 through which the lug 21 extends into the housing. The lug 21 has a threaded opening 25 in which an adjusting pin 26 is movably mounted and arranged for adjustment at the outer open end of the tubular housing, and having a head 27 arranged to compress a coil spring 28 against the hinge piece 23. The open end of the housing is preferably closed by a threaded cap 30. It will be clear that if the spring unit were disposed above the crane instead of below, that the coil spring would in that case be a tension spring instead of the compression member disclosed. This spring unit extends in parallel spaced relation with the crane, and is susceptible to easy and quick adjustments when it is desired to vary the compression of the spring. The spring unit is so arranged that vertical movement of the crane on its pivot downwardly is against the increased tension of the spring, but it is effective to counterbalance the weight of the crane and its supported weight in any position of adjustment, being maintained in a desired position of adjustment by the frictional resistance of the pivot 15.

The inner fixed tube 20, has a threaded outer end to receive a clamping nut 31, through the center of which extends the telescopic arm 32, slidably disposed in the tube 20. The outer end of the arm 32 carries a clevis 33. It will be noted that the pintle 12, enlargement 13, and the entire crane so far described, are hollow and form conduits through which conductors may extend.

A vertical sleeve or swivel member 34 having an internal wire receiving bore 35, is pivoted from the clevis 33, by a hinge pin 36, and is provided with an eccentric lug 37 toward its upper end, beneath which the sleeve is restricted in diameter as at 38, and has a peripheral groove 40 close to the lower end. The swivel member is arranged for swivel connection with the upper end of the yoke 41, which is provided with a bore of such diameter as to have sliding engagement with the portion 38 of the sleeve, and which bore opens at the top in a lug recess 42 having an internal eccentric stop 43 disposed at one side of the recess in position to be abutted by the lug 37 when the yoke is turned in the sleeve, but so arranged as to permit the sleeve to be inserted downwardly with the lug 37 against the bottom wall of the recess, in which position the portion 38 extends into the bifurcation of the yoke to permit the insertion of a split washer 44 in the groove 40, which is seated in a lower recess 45 in yoke 41. This recess is preferably closed by a plug having openings registering with the bore 35 of the sleeve or swivel member to form a conduit for conductors. The yoke at its lower end terminates in a pair of bowed legs 46, having each a vertical groove on its inner surface, as at 47, in which conductors may lie. Each leg 46 is relatively slender to enhance the ornamental aspects of the assembly.

The hub of the cluster, identified broadly by 48, is preferably comprised of a casting 39, as an annulus, having a cross-web 49, and carrying a plurality of radially extending relatively short bracket arms or sockets 50, evenly spaced on the periphery of the annulus. The arms are preferably four in number, although any even number may be used. On diametrically opposite sides of the annulus, and evenly spaced between adjacent bracket arms, the depending ears 51 are formed with openings 52 spaced below the plane of the bracket arms for reasons to be explained. The bowed legs of the yoke are engaged with the ears of the annulus by hol-

low threaded pins 53 passing through the respective openings 52 and into the ends of the legs, in registry with the grooves 47 formed therein, so that wires or conductors lying in the grooves may pass through the hollow pins into the interior of the hub. Within the hub nuts 54 are threaded upon the hollow pins 53, compressing coil springs 55 against the inner surfaces of the ears, in order to impart a slight frictional resistance to the pivotal connection, which is varied by movement of the nuts on the threads of the pins, as desired.

At least one of the ears 51, carries a lug or stop 56, and a shoulder 59, on its under surface, in position to be engaged by a lug 57 carried by a leg of the yoke, to maintain the perpendicular relation of the hub to the yoke in one direction, and to limit its relative movement in the other direction, when the cluster is adjusted for position relative a patient. The lugs and shoulder cooperate to limit the oscillation of the hub, and thus the cluster, relative to the yoke in both directions.

The web 49 is arranged to support a switch of any desired construction, as by means of screws 58, and such other terminals, etc. as may be used. The hub is completed by the proper positioning of opposed, preferably substantially identical semi-ovular shell portions, the upper shell 60 having a plug 61 in the axis thereof to form a neat closure therefor, and the lower shell 62 having a depending axially extending handle 63, in which a switch control 64 is mounted, in position to function on the switch mounted on web 49. It will be clear that if desired a counterweight, (not shown), may be positioned within the shells of the hub, subject to vertical adjustments in any desired manner, as by proper actuation of the handle 63, so that the center of gravity of the lamp cluster may be caused to coincide exactly with the horizontal axis of the hub as defined by the pins 53. With such accurate adjustment the frictional devices associated with the pins 53 would be discarded as unnecessary. However, without such counterweight, it is pointed out that the center of gravity of the lamp cluster is substantially on the horizontal axis in any case, owing to the disposition of the bracket arms with their attached illuminants, to be described, on a plane above that passing through the axis, so that the frictional elements shown, or such others as may be used will impose but little resistance to adjusting movement, being merely sufficient and adequate to maintain a desired position.

It will be understood that the bracket arms 50 are internally bored to house conductors passing through them, and each is arranged to receive the vertical portion of a gooseneck 65, extending upwardly to a point above the bifurcation of the yoke then bending downwardly and outwardly in planes radially of the hub, and supporting illuminating sources or lamps 66, the lower extremities of which are below the bottom end of the hub and so disposed that the center of gravity of the assembled light sources and their immediate supports is substantially in the plane of the horizontal axis of the hub.

It will be noted that there is but little clearance between the thin but fairly wide legs of the yoke, and the outer surface of the hub so that the compactness of the assembly, and its ornamental effect is maintained, while affording ample clearance for the hub, and the lamp cluster of which it is the center, to swing on the horizontal axis without interference between the hub and the yoke, or the yoke and the bracket arms or goosenecks.

As it is neither necessary nor desirable that the lamp cluster be swung in any direction other than toward the patient the limitations placed upon the adjustments between the yoke and hub conduce toward that end, but also enable the operator to return the lamp cluster to normal position instantly by swinging it from its adjusted position on its horizontal axis, (Fig. 11), to its vertical position thereon, (Fig. 10), by the abutment of the lugs of the yoke and ear of the hub, as will be clear. In securing any desired adjustment, whether vertical, by movement of the crane, horizontal, by the vertical axis of the swivel connection at the top of the yoke, or of the cluster itself on a horizontal axis, it will be clear that the operator may simply grasp the handle 63, and secure any of these adjustments, or any combinations of them by proper manipulations of the handle, and thus of the cluster. In the same manner, and without appreciable effort the lamp cluster may be returned to normal position. As noted such ease of adjustment and return is in contrast to the minute and careful, and manually difficult manipulations heretofore necessary in the art.

The cluster of this invention provides a neat, ornamental and well balanced lighting source, in which the hub is properly disposed vertically to secure the best results from an ornamental standpoint, and not being depressed below the lower levels of the individual lights of the cluster as is necessary when the universal connection at the top of the hub is provided.

The lamp support of this invention is easier to adjust than the previous constructions involving the ball and socket as it will move properly even though the operator inadvertently exerts force and turning stress on the cluster in the wrong direction, whereas due to unavoidable imperfections resulting in uneven and unpredetermined friction the ball and socket connection tends to assume an improper position as much as the proper one,

even though the operator's force is properly directed.

I claim as my invention:

1. A lamp cluster including a hub having a closed upper end, light sources mounted on the hub below the closed end, the hub having a substantially horizontal supporting means extending between certain of the light sources below the closed end, means for supporting the hub for oscillation on the supporting means, both said last mentioned means being provided with electric conductor receiving channels whereby conductors may extend from the last mentioned means to the light sources on the hub below the closed end of the hub.

2. A lamp cluster including a hub comprised of a ring and radially extending arms, hub shells mounted on the ring and extending vertically therefrom, light sources mounted on the arms, ears formed on the ring at diametrically opposite points between the arms, a yoke arranged to straddle the upper shell of the hub, and means pivotally connecting the yoke to the ears so that the hub may oscillate on a horizontal axis.

3. A lamp cluster including an oval shaped hub, arms extending from the substantial center of the hub, light sources carried by the arms and evenly disposed about the hub, a yoke arranged to straddle the hub, means for connecting the yoke to the hub between pairs of arms below the level of said arms so that the hub may oscillate in the yoke on a horizontal axis passing substantially through the center of gravity of the cluster.

4. A lamp cluster including a cast ring having oppositely disposed depending ears, radially extending arms mounted on the ring above the level of the ears, an oval hub mounted on the ring vertically extending goose necks mounted on the respective arms and spaced from the hub by the length of said arms, substantially, the goose necks terminating in light sources and each gooseneck positioned in a plane respectively radial of the hub, a yoke having legs curved to straddle the hub in evenly spaced relation thereto substantially through their lengths, and means pivotally connecting the legs of the yoke with the respective ears, the diameter of the yoke being such as to permit relative oscillation of the yoke and hub without interference from the adjacent goose necks.

5. A lamp cluster including a hub, radially disposed light sources carried by the hub, a yoke arranged to straddle the hub, means for connecting the yoke to the hub on a substantially horizontal axis, stop means for limiting movement of the hub in the yoke in one direction so as to permit instant return to normal from an adjusted position, and means for supporting the yoke on a substantially vertical axis so that the cluster may be oscillated on a vertical axis as a unit.

6. A lamp cluster including a pivotally mounted sleeve support, arranged for free swinging on a substantially horizontal axis, the sleeve having a shank and an eccentric, a yoke having a bore to receive the shank of the sleeve and axially recessed to receive the eccentric, a stop disposed in the recess arranged to abut the eccentric to limit rotational movement of the yoke relative the sleeve, means for connecting the sleeve and yoke in a rotative assembly, and a lamp cluster supported by the yoke.

7. In a lamp cluster, sources of illumination, a yoke supporting said sources on a substantially horizontal axis, the upper end of the yoke terminating in a shank having a bore, and upper and lower recesses communicating therewith, the upper recess having an internal stop or lug projecting from the outer periphery of the shank, a sleeve having a shank slidably insertable in the bore of the yoke, an eccentric extending from the last mentioned shank limiting the inward movement of the said shank in said bore, the last mentioned shank having a peripheral groove, means engageable in said groove to limit the outward movement of the shank in said bore, and seatable in the lower recess of the yoke shank, the stop and eccentric arranged for abutting engagement as the yoke is oscillated in relation to the sleeve.

8. A lamp cluster comprising a hub, light sources carried by the hub, a yoke arranged to straddle the hub, the yoke having arms having internal grooves, hollow pins connecting the yoke arms to the hub and forming conduits in registry with the grooves of said arms for the reception of conductors and permitting their extension into the hub for distribution to the light sources, the yoke having a hollow shank, a hollow sleeve rotatably supporting the yoke through which the conductors may extend to the grooves in the arms of said yoke, a hollow support for the lamp cluster arranged to house the conductors extending into the hollow sleeve.

9. In a lamp cluster, a lamp support comprising a supporting member, a crane frictionally pivoted thereto, a stud extending from the crane vertically of the crane, a spring device including a hollow tube having a longitudinal slot pivotally connected to the member vertically of the crane pivot with the member, the spring device extending in parallelism with the crane between its pivot and the stud with the stud extending into the slot in the tube, and means for varying the condition of the spring device including a follower threaded in the stud and disposed in the tube.

10. In a lamp cluster, a hub of substantially oval shape, arms and goose necks extending from the hub and substantially centered thereon vertically, a yoke including relatively thin legs arranged to straddle the upper end of the hub and substantially uniformly

but inappreciably spaced therefrom, means connecting the yoke to the hub on a substantially horizontal axis below the arms, and light sources depending from the goose necks cooperating to bring the center of gravity of the assembly in substantial registry with the horizontal axis, to form an ornamental, adjustable lamp cluster.

11. A lamp cluster including a hub having a closed upper end, radial arms uniformly spaced about the periphery of said hub and carrying light sources, oppositely disposed means engaging the hub to provide a horizontal axis extending diametrically of the hub and peripherally spaced between certain of said arms below the closed upper end, a vertically extending supporting element also spaced between certain of said arms for supporting the hub for oscillation on said oppositely disposed means, both said last mentioned means having channels for electrical conductors leading into the hub below the closed upper end thereof.

12. A lamp cluster comprising a hub, goose necks mounted on said hub at substantially the vertical center thereof, the goose necks having legs extending vertically in substantial parallelism with the vertical axis of the hub and in closely spaced relation to the hub, light sources mounted on the goose necks in such manner as to create a center of gravity for the assembled hub, goose necks and light sources in proximity to the vertical center of said hub, and vertical supporting means arranged in spaced relation to the hub and extending between a pair of goose necks, and connected to said hub on a horizontal axis passing substantially through said center of gravity to form a compact unit which is susceptible to a wide range of adjustments.

13. A lamp cluster comprising a hub, having an upper tapered surface, light sources and means for supporting said light sources on the hub in such manner as to locate the center of gravity of the assembly near the middle of the hub, said means including elements including vertical portions radially closely spaced from the hub, a supporting arm for the unit including a vertically extending element merging into a curved element, pivotally connected to the unit on a horizontal axis passing substantially through said center of gravity of the unit, upon which the unit may be oscillated with the vertical portion of the arm in the path of movement of the vertical portion of the light source supporting means, said vertically extending portion of the arm bearing such proportion to the curved portion of said arm as to prevent contact between the supporting arm and the light source supporting means incident to a maximum oscillation of the unit upon its pivot.

14. A lamp cluster comprising a hub having a closed upper end, radially disposed light sources carried by the hub, a yoke arranged to straddle the hub in substantially uniformly spaced relation to the closed upper end of the hub, and means for pivotally connecting the yoke and hub on a substantially horizontal axis passing substantially through the center of gravity of the hub and light sources, and said means having channels for electric connectors for the light sources.

15. A lamp cluster including a hub of generally oval shape having a closed upper end, radial arms peripherally spaced about the substantial center of said hub and carrying light sources, an inverted yoke having legs straddling the hub and extending vertically, means between the yoke and said hub forming a horizontal axis extending diametrically through the hub just below the level of said arms and peripherally spaced between certain of the arms, the yoke having a substantially uniform clearance from the closed upper end and the horizontal axis having a channel for the reception of electrical connectors leading into the hub.

In testimony whereof, I affix my signature.

CLARENCE W. MOORE.