

April 9, 1929.

H. J. BOSWORTH

1,708,047

LIGHT FIXTURE

Filed Dec. 1, 1926

2 Sheets-Sheet 1

Fig. 1.

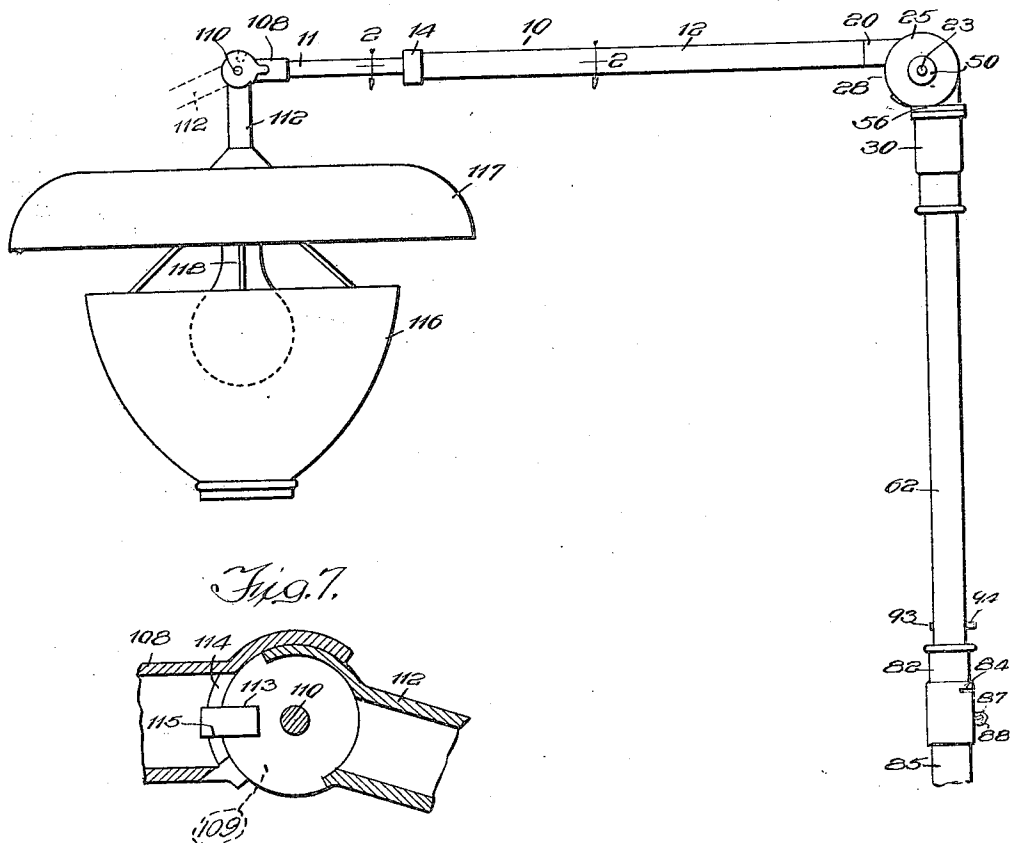


Fig. 7.

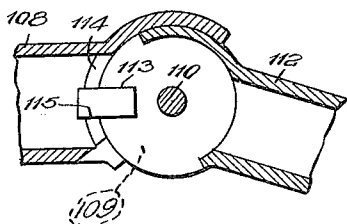


Fig. 2.

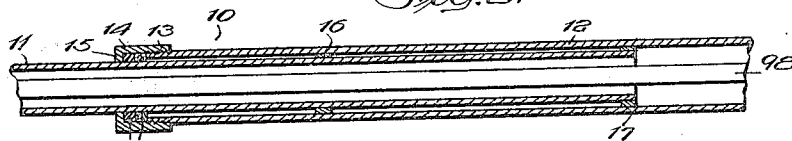
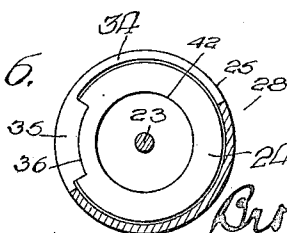


Fig. 6.



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2 Sheets-Sheet 2

Fig. 3.

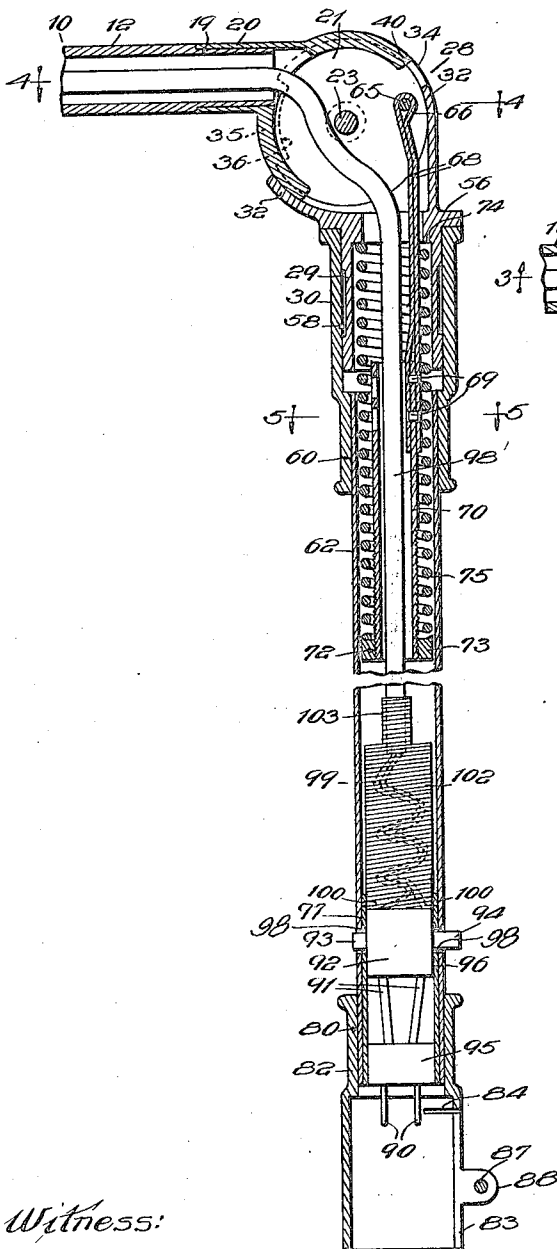


Fig. 4.

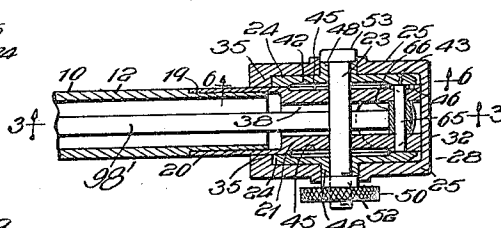
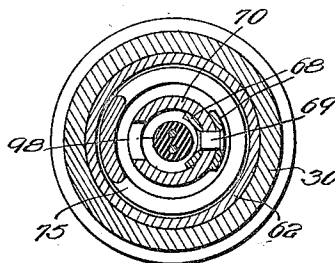


Fig. 5.



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## UNITED STATES PATENT OFFICE.

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## LIGHT FIXTURE.

Application filed December 1, 1926. Serial No. 151,912.

This invention relates to light fixtures and it may be characterized as an improvement upon the fixtures illustrated and described in my prior Patent 1,573,799 issued February 23, 1926 and in my prior Patent 1,644,231 issued Oct. 4, 1927.

The present invention is particularly adapted for use with the equipment employed by dentists, physicians, and the like, although it may, of course, be employed wherever suitable or desired.

The fixture of my present invention has a light arm adapted for angular adjustment in different directions, also extensible for adjustment of the arc or radius of angular adjustment and counterbalanced to be retained in any position into which the light is moved or adjusted, with means for varying or adjusting the counterbalancing action to balance the light arm in its various extended and retracted positions, as well as in its various angular positions and the objects of the present invention are to provide an improved mounting for the fixture together with an improved conductor take-up and controlling switch arrangement and a generally improved and simplified structure that may be economically produced.

The invention is illustrated in the accompanying drawings in which

Fig. 1 is a side elevational view of a light fixture embodying the present invention;

Fig. 2 is a fragmentary longitudinal section through the extensible and retractible light arm on the line 2—2 of Fig. 1;

Fig. 3 is a vertical axial section through the upright mounting post and longitudinally through the adjacent end of the light arm on line 3—3 of Fig. 4;

Fig. 4 is a detail section taken on the line of 4—4 of Fig. 3;

Fig. 5 is a cross section taken on the line 5—5 of Fig. 3;

Fig. 6 is a section on the line 6—6 of Fig. 4 showing the manner of interlocking the friction discs with the outer head member; and

Fig. 7 is a fragmentary longitudinal section through the pendant support at the outer end of the light arm.

Referring to the drawings, the light arm of the fixture is designated generally after 10 and comprises a pair of telescoping tubes 11 and 12.

Threaded at 13 upon the outer end of the

tube 12 is a ferrule 14 having an inwardly extending radial flange 15 cooperable with an abutment 16 suitably fixed upon the tube 11 for limiting the extension of the tube 11. The abutment 16 may be in the form of a ring soldered upon the tube 11 and similarly fixed upon the inner end of the tube 11 is a similar ring 17 which has sliding fit in the tube 12 and guides the inner end of the tube 11 therein. Suitable washers 18 may be interposed between the end of the tube 12 and the radial flange 15 of the ferrule 14.

The opposite swingably mounted end of the outer tube 12 is rigidly fixed as by a pressed fit at 19 in a tubular projection 20 extending from a friction head 21. While the various parts may be of any suitable metal, the head 21 is preferably of aluminum for lightness and to provide a relatively high coefficient of friction. The head member 21 is mounted to turn freely upon a horizontal pin 23 and between a pair of friction discs 24, 24.

The friction discs 24 are mounted between the sides 25 of a head member 28 having a depending tubular post 29 which is mounted to rotate in a sleeve 30 so that the entire head 28 and the light arm 10 and light carried thereby may be turned laterally into any desired position by turning the head member 28 in the sleeve 30. Above the tubular post 29 the head member 28 is bifurcated to form the integral sides 25. The cross or connecting web between the sides 25 along the bottom and back of the head member 28 joins these sides 25 into an integral unit and extends partially around the head 21 and friction discs 24 therebetween. The free margins of the sides 25 above and forward of the web 32 have inturned flanges 34 which fit over and enclose the peripheries of the discs 24 and the inner surface of each side 25 of the head member 28 has an integral arcuate lug 35 which engages in an arcuate notch 36 in the periphery of the adjacent disc 24, holding the discs stationary with the head member 28 and against rotation.

The discs 24 have axial openings which register with the axial openings in the sides of the head member 21 and with openings through the sides 25 of the head member 28. The head member 21 is preferably hollow at 38 for lightness and to permit leading the conductors therethrough and the head member 21 has a shoulder 40 engaging the adjacent end of the web 32 of the head member 28

to limit the upward swinging movement of the arm 10. The friction discs 24 are preferably of brass and their inner radial surfaces are preferably relieved centrally slightly at 42 to form marginal friction surfaces 43. The outer radial surfaces of the sides of the head member 21 are also preferably relieved centrally slightly at 45 to form marginal friction surfaces 46 for frictionally engaging the surfaces 43 and resisting rotation of the light arm 10.

The discs 24 have axial hubs 48 which fit in the co-axial openings in the sides 25 of the head member 28 and the pin 23 comprises a bolt having a head which passes loosely through the opening in the side 25 of one head member 28 and engages the end of the hub 48 of the adjacent friction disc 24. The shank of the bolt 23 passes through the discs 24 and through the sides of the head member 21 and threaded upon the opposite end of the shank of the bolt 23 is an adjusting nut having a knurled peripheral edge and a hub or axial projection 52 which enters the co-axial opening of the adjacent side 25 of the head member 28 and engages the end of the hub 48 of the adjacent friction disc 24. The head at the opposite end of the bolt 23 is designated at 53 in Fig. 4.

The head member 28 is flanged at 56 to provide a horizontal shoulder for resting upon the upper flanged end of the sleeve 30. The head member 28 is also preferably of aluminum and the depending tubular post 29 is relieved or reduced circumferentially at 58 so that the ends of the post 29 will fit properly in the sleeve 30 which is also preferably of aluminum. The sleeve 30 is rigidly secured as by a pressed fit at 60 upon the upper end of a tubular mounting post 62 the opposite end of which is provided with a universal mounting to be hereinafter described.

Extending between the sides of the head member 21 and secured at its opposite end in suitable openings therein is a cross pin 65 and looped about this pin at 66 to form a pivotal connection therewith is a rigid metal strap 68 folded back upon itself and extending down and riveted or otherwise rigidly secured at 69 to the upper end of an internal tube or sleeve 70. Threaded at 72 upon the lower end of the sleeve or tube 70 is a nut 73 and interposed between this nut 73 and a shoulder 74 in the head member 28 is a coiled spring 75. The nut 73 transmits the expansion of the spring 75 to the light arm 10 through the pivotal connection at 65 and the nut 73 is adjustable on the tube 70 for the purpose of adjusting the tension of the spring 75. The tendency of the spring 75 is to turn the head member 21 in a clockwise direction in opposition to the turning tendency imposed upon said head member by the weight of the light arm 10, light and associated parts carried thereby.

From the foregoing it will now be apparent that by drawing up or tightening the nut 50 the friction discs 24 may be drawn together and clamped more tightly upon the outer radial surfaces of the head member 21 to increase the friction between these surfaces 43 and 46 and thereby the frictional resistance to turning or rotation of the head member 21. By loosening the nut 50 this frictional resistance may be decreased to permit the light arm 10 to be swung more freely in a vertical direction. The resistance imposed by the expansion of the spring 75 and the friction resistance are independently adjustable and by adjustment of these resistances the light arm may be counterbalanced in all of its angular positions and extension and retraction of the arm 10 may be conveniently and effectively compensated for. As the length of the light arm is increased a tightening up of the nut 50 will increase the friction between the head 21 and friction discs 24 so that the spring 75 may properly counterbalance the light arm in its various angular positions. If the length of the light arm is decreased, loosening of the nut 50 will decrease the friction between the head 21 and friction discs 24 and thereby the counterbalancing action.

Rigidly secured upon the lower end of the tubular post 62 as by means of a pressed fit thereon at 80 is a mounting sleeve 82. This sleeve 82 is split longitudinally at 83 from the lower end and circumferentially slightly at the upper end of the split 83 as indicated at 84. This frees the lower part of the sleeve 82 so that it may be mounted upon an upright post or the like 85 (Fig. 1). The post or mount 85 may form a part of or be provided in conjunction with the various dental units and stands or a wall bracket or other desired support may be provided with such a mount as desired. The sleeve 82 is clamped rigidly and securely upon the mount or support 85 by a screw 87 which passes freely through one and has threaded engagement with the other of two lugs 88 formed integral with the tube 82, one on each side of the split 83.

For the purpose of supplying current to the light or lamp at the outer end of the arm 10 the lower end of the tubular post 62 is provided with a pair of suitable terminal contacts 90 connected by conductors 91 with a snap switch 92. The switch 92 is shown as of the diametrically opposite push button type, pushing in of the button 93 on one side closing the circuit to the light at the outer end of the arm 10 and pushing in of the button 94 at the other side opening this circuit.

The switch 92 and base 95 of the terminals 90 are rigidly secured in a relatively short tube 96 as by pressing them therein and upsetting the wall of the tube 96 into engagement therewith. The tube 96 is rigidly secured as by means of a pressed fit at 97 in the lower end of the tubular post 62 and the post

has diametrically opposite openings 98 through which the buttons 93 and 94 of the switch 92 may be projected.

The relatively heavily covered or sheathed conductors 98' which lead up and out through the arm 10 to the light are connected through more flexible and individually wound conductors 99 with the switch 92, the conductors 98 being shown enclosed in a common cover or sheath. Anchored at its lower end to internal radial pins 100 secured in the sleeve 96 is a coiled spring 102, the convolutions at the upper end of which become smaller at 103 and are securely anchored to the lower end of the sheath or covering enclosing the conductors 98. The conductors 99 by reason of their compactness and flexibility may be bunched or laid loosely within the spring 102 to provide for the extra length of conductor required when the arm 10 is extended. As the arm 10 is extended the conductor 99 tends to straighten out and the spring 102 expands and when the arm is retracted the spring 102 immediately takes up the slack in the conductor and bunches that portion of it designated at 99 within the spring for further extension of the arm.

Fixedly mounted upon the outer end of the tube 11 is the tubular end of a light supporting fitting 108 having a downwardly opening mouth in which and between the opposite sides 109 is pivoted at 110 a pendant light support 112. One of the sides of the upper end of the pendant support 112 is notched at 113 and the member 108 has a flange 114 provided with a notch 115 which is adapted to register with the notch 113 when the support 112 is swung into the position shown in dotted lines Fig. 1 and in this position a suitable key is adapted to be placed in these registering notches to hold the support 112 in this angular position.

The particular light shown comprises a lower translucent bowl or open topped globe 116 and an upper shade 117 and the light or lamp is shown at 118.

The sleeve 82 is preferably of brass or other suitable material which will permit providing the slits 83, 84 and making the wall of the sleeve thin for the desired clamping action and which will at the same time provide ample strength.

I claim:—

1. In a lighting fixture, an upright tubular post, a sleeve fixed upon the upper end of said post, a head member having separated sides and a depending tubular extension journaled in said sleeve to turn about a vertical axis, a light supporting arm having a friction head rotatably journaled between the sides of said first head member to turn about a horizontal axis, counterbalancing means for the light arm, a pair of separate friction discs one between each of the outer sides of the friction head on the light arm and the

adjacent side of said first head member, said discs being interlocked with said first head member against turning with the friction head on the light arm and means for drawing said friction discs upon and releasing them from the friction head on the light arm to adjust the frictional resistance independently of said first head member.

2. In a lighting fixture, an upright tubular post, a sleeve fixed upon the upper end of said post, a head member having separated sides and a depending tubular extension journaled in said sleeve to turn about a vertical axis, a light supporting arm having a friction head rotatably journaled between the sides of said first head member to turn about a horizontal axis, counterbalancing means for the light arm, a pair of separate rigid friction discs one between each of the outer sides of the friction head on the light arm and the adjacent side of said first head member, said discs being interlocked with said first head member against turning with the friction head on the light arm and having integral hubs disposed in openings in the opposite sides of said first head member, means operating through the openings in the sides of said first head member and engageable directly with said friction discs for drawing said discs upon and releasing them from the friction head on the light arm and a split clamping sleeve fixed upon the lower end of the post and adapted for mounting the post upon a support.

3. In a lighting fixture, an upright tubular post, a sleeve fixed upon the upper end of said post, a head member having separated sides and a depending tubular extension journaled in said sleeve to turn about a vertical axis, a light arm having a friction head rotatably journaled between the sides of said first head member to turn about a horizontal axis, counterbalancing means for the light arm, a pair of separate friction discs one between each of the outer sides of the friction head on the light arm and the adjacent side of said first head member, said discs being interlocked with said first head member against turning with the friction head on the light arm, a relatively short sleeve having pressed fit in the lower end of the post, a switch mounted in said relatively short sleeve and having button means passing through said short sleeve and through the tubular post for external access and a conductor extending through the post and a take-up spring having a smaller end secured to the conductor and secured at its opposite end to the relatively short sleeve, said conductor having a more flexible portion extending through said spring and connected with said switch.

4. In a lighting fixture, a mounting post, a sleeve having a pressed fit in the end of the post, a switch and contact means secured in

- said sleeve, a conductor extending through the post, and a coil spring secured to the sheath of the conductor at one end and to said sleeve at its opposite end, said conductor having a slack portion extending through said spring and connected with said switch, said coiled spring adapted to take up the slack in the conductor cord extending through the post.
5. In a lighting fixture, a mounting post, a sleeve having pressed fit in the end of the post, a switch and contact means secured in said sleeve and having button means passing outwardly through the sleeve and post, a conductor extending through the post, and a mounting sleeve having external pressed fit upon the end of the post, said mounting sleeve extending beyond the end of the post and having a relatively thin split clamping portion for mounting the post upon a support.
6. In a lighting fixture, a head member mounted to turn on a vertical axis, a pair of friction discs mounted in and interlocked with said head member, a telescoping light supporting rod terminating in a forked head, the outside of which bears against the inside faces of said friction discs, a horizontal pivot extending through said head member and head to rotatably support the latter in the former, a counterbalance rod pivotally supported within said forked head by a pivot disposed near the edge of said head, a coil spring disposed concentrically around said vertical axis, a nut disposed on the lower end of said counterbalance rod against which said coil spring bears and through the operation of which the spring is tensioned to counterbalance said light supporting rod, and means on said horizontal pivot for adjusting the frictional resistance of said discs independently of said head member to compensate for differences in counterbalance caused by the telescoping of said supporting rod.
- In witness whereof, I hereunto subscribe my name this 26th day of November, 1926.
- HARRY J. BOSWORTH.