Oct. 25, 1927.

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1,646,557

LIGHT PROJECTING APPARATUS

Filed April 21, 1923

2 Sheets-Sheet 1

Fig. 1

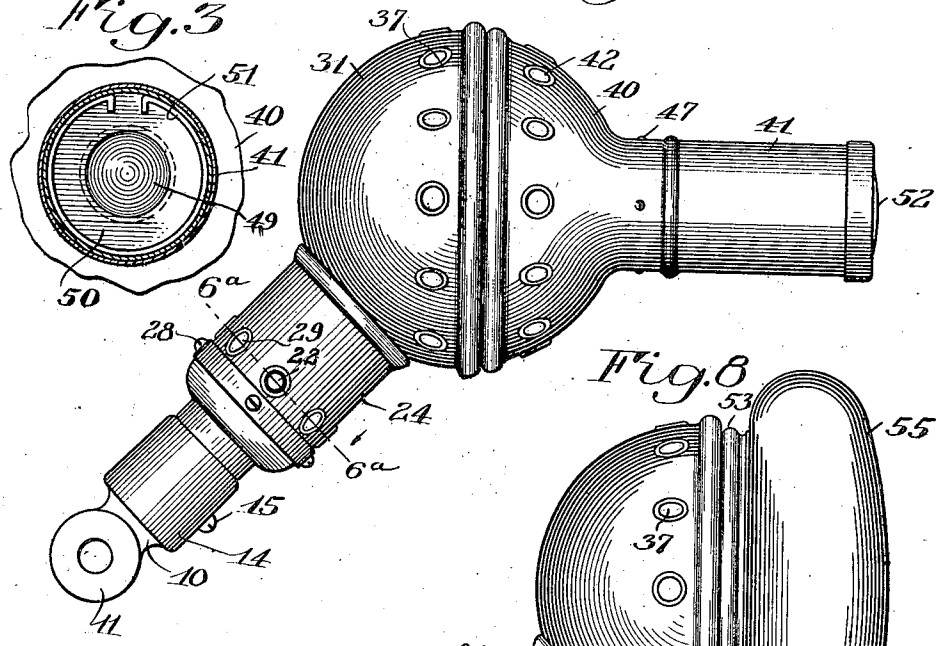


Fig. 3

Fig. 8

Fig. 2

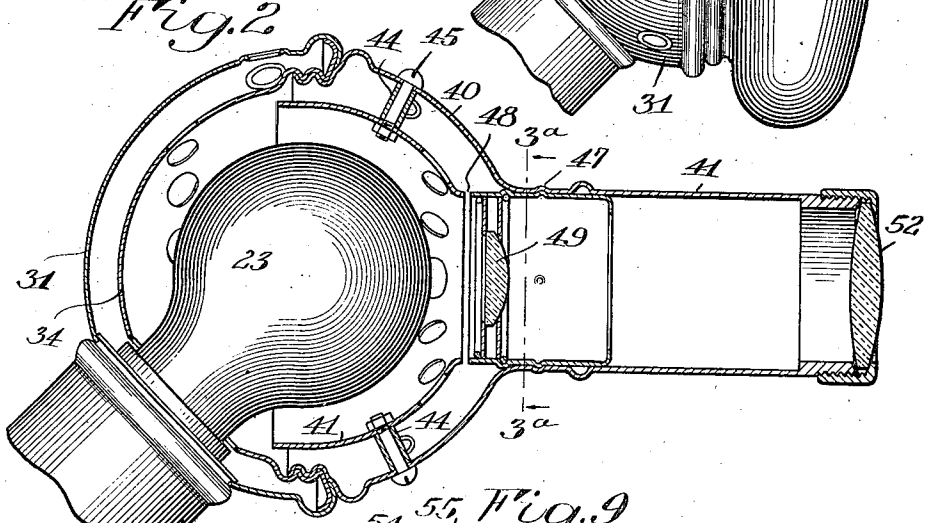
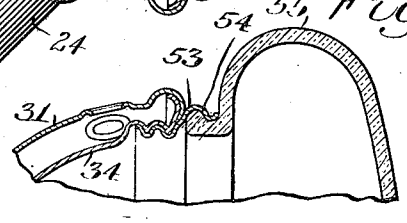


Fig. 9



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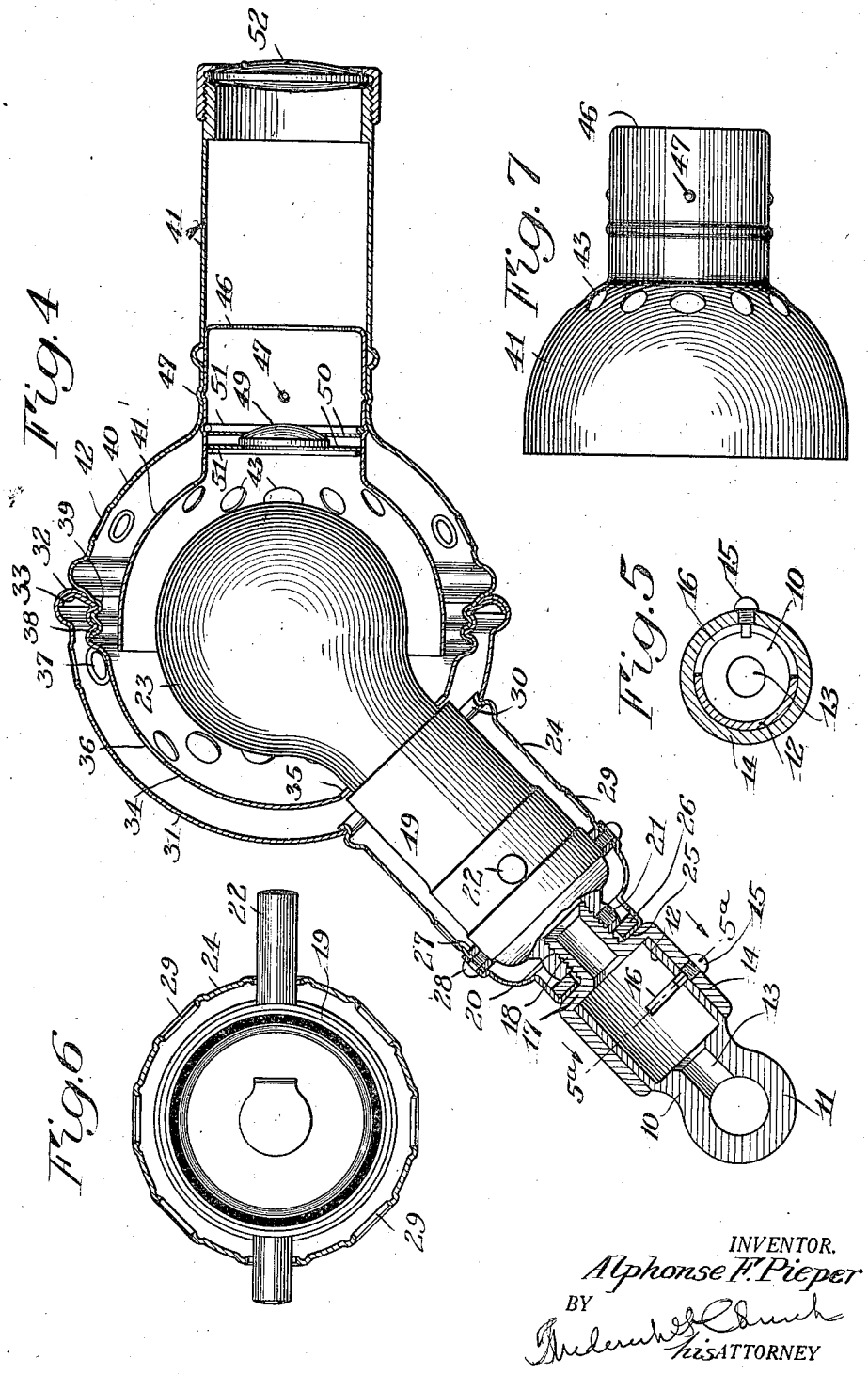
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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LIGHT-PROJECTING APPARATUS.

Application filed April 21, 1923. Serial No. 633,781.

The invention relates to light projecting apparatus of the variety commonly known as a "spotlight" and adapted for projecting a beam of light in an adjustable direction for illuminating a particular locus or object, as useful for example in the performance of dental work, one object of the invention being to provide an efficient device of the above character having a practical and economical form of construction, convenient to assemble and manipulate in use. Another object is to provide such apparatus comprising a plurality of interchangeable light projecting means for conveniently adapting the device to various uses. A further object is the provision of such a device having a practical form of construction providing for complete enclosure and shielding of the lamp parts to prevent the escape of stray light rays and heating of its exterior, as well as for the enclosure and concealment of the electrical connections. Still a further object is the provision of a device of the above character economically constructed for employing a standard lamp socket and lamp and to a large extent parts made of sheet metal formed and assembled at a comparatively low cost. To these and other ends the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a side elevation of a light projecting device embodying my present invention;

Figure 2 is a central sectional elevation of the same somewhat enlarged;

Figure 3 is an enlarged sectional detail view on the line 3^a—3^a in Figure 2;

Figure 4 is a central sectional elevation of the device showing the lamp housing modified somewhat from the construction shown in Figure 2;

Figure 5 is a sectional detail view on the line 5^a—5^a in Figure 4;

Figure 6 is an enlarged sectional view on the line 6^a—6^a in Figure 1;

Figure 7 is a side view of a portion of the light projecting tube and lamp shield, as shown in Figure 4, detached;

Figure 8 is a side elevation of the device with another form of projecting means interchangeably applied thereto, and

Figure 9 is a fragmentary sectional view of details of construction employed in Figure 8.

Similar reference numerals throughout the several views indicate the same parts.

The invention is disclosed in the present instance, by way of illustration, as embodied in a preferred form of construction particularly adapted for use in dental operations and comprising a tubular bracket 10, Figures 1 and 4, having an end formed with a joint portion 11 for association with a flexible supporting arm by which the electrical connections are carried. This bracket is preferably formed at its other end as a sleeve 12 with a passage or bore 13 connecting the latter with the joint portion 11 so that the electrical connections may be extended interiorly therethrough and thus be concealed and protected. Rotatably carried by the bracket sleeve 12 is a support 14 in the shape of a sleeve enclosing sleeve 12 and provided with a set screw 15 working in a slot 16 in the bracket sleeve to prevent longitudinal movement of one on the other but providing for limited rotational adjustment about a common longitudinal axis. Support 14 has an end portion 17 with an externally threaded nipple 18 projecting therefrom for detachably supporting a lamp socket 19 of the standard, self-contained and enclosed variety in common use, with a threaded end opening 20 detachably screwed on the nipple 18 and secured thereon as by means of a set screw 21. The socket is furthermore of the well known variety operated by push button means 22 and carries lamp 23, which latter, and preferably the socket also, are provided with protective housings, that of the lamp carrying the light projecting means proper as hereafter described.

The socket housing is preferably formed up from sheet metal as shown at 24, with a diameter larger than that of the socket so as to provide a space thereabout. The housing is preferably constructed as shown, with an inturned flange 25 provided with a washer 26 and clamped between the annular shoulder formed by the end 17 of the support and the end of the socket screwed on the support nipple. To additionally support and space the housing, the latter is provided with spacing collar means 27 secured thereto by screws 28 which connect the sectional portions in which the housing is constructed. The housing is provided with a series of ventilating perforations 29 through which

the socket push buttons 22 operatively extend.

The lamp housing is preferably of the generally spherical shape shown, being constructed in sections separably connected on one of the major sectional circles thereof to afford access to the interior of the housing, with one of the sections supported on the end of the socket housing. Each section of the lamp housing has spaced outer and inner walls, the latter of which serve as shields to decrease the heating of the housing exterior by the lamp, while also affording mean for producing ventilation and at the same time effectively confining the light rays. To this end the socket housing has its extremity beaded or rolled as at 30 to securely engage the peripheral edge of a circular opening in the outer wall 31 of the lamp housing, whereby the latter is firmly supported on the socket housing. This section of the lamp housing is preferably of the hemi-spherical shape shown having its circular edge portion rolled inwardly as at 32 to embrace the outwardly rolled edge 33 of a similarly shaped but smaller hemi-spherical inner shield or wall 34 which is apertured as at 35 to receive the lamp. The rolled edges 32 and 33 of the outer and inner walls are preferably so formed as to maintain the engagement with each other by reason of their confirmation, although they may be welded, soldered or otherwise joined. The inner wall is preferably formed with a series of ventilating perforations 36 and the outer wall with a similar set of perforations 37 which are staggered however with relation to perforations 36 to prevent the escape of light rays. The inner wall 34 of this section of the lamp housing is preferably formed with a thread 38 as shown with which engages the correspondingly threaded edge 39 of the complementary housing section 40, also of generally hemi-spherical shape except that it has a tubular extension 41 extending radially of the lamp filament for projecting the light. The housing section likewise is constructed with spaced outer and inner walls, the latter being shown at 41′ as of hemi-spherical shape and projecting in spaced relation somewhat within the inner wall 34 of the other section. The walls 40 and 41′ are provided with ventilating perforations 42 and 43, respectively, as described in connection with the first housing section. Inner wall 41′ may be supported in the manner shown in either Figures 2 or 4. In the first instance it is carried in spaced relation with the outer wall by means of spacing sleeves 44 and bolts 45 while in the second instance this wall is formed as an extension of a lens mounting sleeve 46 detachably fitted in the inner end of the projecting tube 41. The metal of the sleeve and tube may be struck up in the form of bosses 47 to locate and retain the sleeve in proper position in the tube. In the form of construction shown in Figure 2, a space 48 is left between the inner wall or shield 41′ and the lens tube 46 to provide for ventilation.

The projecting tube 41 is preferably fitted with a condensing lens 49 mounted in disks 50 located in sleeve 46 by means of spring rings 51 as shown and as will be understood in the art. The outer end of the tube carries a projecting lens 52 suitably spaced from lens 49, by means of which lens system an intensified beam of light is projected at a desired locus of operation. It is to be noted that the axis of the projecting lens system intersects the rotational axis of the socket support adjacent the filament or point of illumination at a substantial angle so that by swinging the parts as a whole on the bracket the light beam may be adjusted through an arc to project it in a desired direction, it being understood of course that the bracket itself may be adjustably mounted to provide for suitable adjustment of the beam in other planes.

As it is desired in various kinds of work and under various conditions to substitute for the intensified local illumination provided by the projected system described above other kinds of illumination as, for example, that of a more generally diffused character, a plurality of lamp housing sections may be provided for interchangeable association with the housing section 31 in place of the section 40. Thus in Figure 8 is shown a different form of section comprising an annular sheet metal ring 53 having a threaded portion for detachable engagement with the section 31 and also a rolled periphery 54 holding a globe 55 of opal or other glass for projecting a diffused light. Other forms of projecting means may obviously be provided for interchangeable association with the device in place of those described.

It is apparent from the above description and the drawings that the invention provides a convenient form of projector or spotlight which may be readily adjusted to project the light in a desired direction, and which by means of its interchangeable projecting means may be readily adapted to suit the requirements of various conditions and kinds of work. The lamp parts are effectively housed in to prevent the escape of any stray light rays as well as heating of the housing exterior and the electrical connections for the lamp are fully concealed and protected within the bracket and support. The device is economically designed to utilize a standard lamp socket and lamp and to be constructed in large measure of sheet metal parts manufactured at a comparatively low cost. The parts are further-

more easily detachable and lend themselves to a general shape and design of pleasing appearance.

I claim as my invention:

1. In a light projecting apparatus, the combination of a support, a lamp socket carried thereby, a lamp in said socket, a housing for the lamp including fixed and detachable sections, said fixed section being connected with the support and said detachable section including inner and outer shell-like portions, the former being adapted to receive a portion of the lamp and the latter being adapted to detachably engage the fixed section of the housing, and a tube carried by said detachable section and provided with light projecting means.

2. In a light projecting apparatus, the combination of a bracket, a support thereon having an externally threaded nipple projecting therefrom, a lamp socket having an opening in threaded engagement with said nipple, a lamp in said socket, a sheet metal housing for said socket having an inturned flange clamped between said support and socket, a sheet metal housing for the lamp carried by the socket housing embodying fixed and detachable sections, the latter including an inner shell partially surrounding the lamp and supported in spaced relation to the fixed section, and light projecting means carried by and communicating with the lamp housing.

3. In a light projecting apparatus, the combination of a bracket, a support thereon, a standard lamp socket carried by the support, a lamp in said socket, a housing for the socket in spaced relation therewith, a perforated housing for the lamp, shield means carried interiorly by the lamp housing in spaced relation therewith and provided with perforations staggered with respect to said housing perforations, and a lens means carried by said lamp housing and communicating therewith with its axis intersecting the axis of the lamp adjacent its filament, said support and the parts carried thereby being rotatable upon the bracket about the axis of the socket.

4. In a light projecting apparatus, the combination of a support having an externally threaded nipple projecting therefrom, a lamp socket having an opening in threaded engagement with said nipple, a lamp in said socket, a sheet metal housing for said socket having an inturned flange clamped between said support and socket, a sheet metal housing for the lamp having spaced inner and outer walls provided with perforations staggered with respect to one another and a lens system for projecting light from said lamp.

5. In a light projecting apparatus, the combination of a support, a lamp socket carried by said support and provided with a lamp, a housing for the lamp comprising sections separably connected with each other to afford access to the lamp and each having spaced inner and outer walls provided with perforations staggered with respect to one another, and light projecting means carried by one of said sections.

6. In a light projecting apparatus, the combination of a support, a lamp socket carried by said support and provided with a lamp, a housing for the lamp of circular shape in cross section and comprising threadedly and separably connected parts affording access to the lamp, each of said sections having spaced inner and outer walls provided with perforations staggered with respect to one another, and light projecting means carried by one of said housing parts.

7. In a light projecting apparatus, the combination of a support, a lamp socket carried by said support and provided with a lamp, a sheet metal housing for the lamp of substantially spherical shape comprising separably connected hemispherical parts affording access to the lamp, said sections having spaced inner and outer walls provided with perforations staggered with respect to one another, and light projecting lens means carried by one of said housing parts.

8. In a light projecting apparatus, the combination of a support having an externally threaded nipple projecting therefrom, a lamp socket having an opening in threaded engagement with said nipple, a lamp in said socket, a sheet metal housing for said socket having an inturned flange clamped between said support and socket, a sheet metal housing for the lamp of substantially spherical shape comprising separably connected hemispherical parts affording access to the lamp, said sections having spaced inner and outer walls provided with perforations staggered with respect to one another, and light projecting lens means carried by one of said housing parts.

9. In a light projecting apparatus, the combination of a bracket, a support rotatable on said bracket, a lamp socket carried by said support, a housing for the socket, a housing for the lamp carried by said socket housing, a lens holding tube carried by said lamp housing with its axis intersecting the rotational axis of said support for projecting a beam of light in an adjustable direction, and a second lens holding tube carried by the first and having an enlarged inner end adapted to receive the lamp within the housing thereof.

10. In a light projecting apparatus, the combination of a tubular bracket, a tubular support rotatably adjustable on said bracket, an enclosed lamp socket threadedly connected with said support and adapted to be connected with a source of power through said tubular bracket and support, a lamp

in said socket, a housing for said lamp, and a projecting lens tube carried by said housing and including outwardly and inwardly projecting portions, the latter being enlarged to receive the lamp within the housing thereof.

11. In a light projecting apparatus, the combination of a tubular bracket, a tubular support rotatably adjustable on said bracket, a lamp socket threadedly connected with said support and adapted to have its connections with a source of power enclosed within said tubular bracket and support, a lamp in said socket, said lamp and socket being rotatable with the support about the axis of the socket, a housing for said socket, a housing for said lamp in separable sections each comprising spaced inner and outer walls provided with perforations staggered with respect to one another, one of said sections being carried by said socket housing, and a light projecting lens tube carried by the other of said housing sections.

12. In a light projecting apparatus, the combination of a tubular bracket, a tubular support rotatably adjustable on said bracket with an externally threaded nipple projecting therefrom, a lamp socket having an opening provided with threads to receive said nipple and adapted to have its connections with a source of power enclosed within said tubular bracket and support, a lamp in said socket, a housing for said socket spaced therefrom with an inturned flange clamped between said support and socket, a housing for said lamp in separable sections each comprising spaced inner and outer walls provided with perforations staggered with respect to one another, one of said sections being carried by said lamp housing, and a light projecting lens tube carried by the other of said sections with its axis intersecting the rotational axis of said support adjacent the lamp filament, said lens tube and lamp being rotatable with the support as a unit about the axis of the socket.

13. In a light projecting apparatus, the combination of a tubular bracket, a tubular support rotatably adjustable on said bracket, a push button lamp socket threadedly connected with said support and adapted to rotate therewith about the axis of the socket and to have its power leads extended interiorly through said tubular bracket and support, a lamp in said socket, a perforated housing for said socket in spaced relation therewith with said push button operating through one of said perforations therein, a housing for said lamp carried by said socket housing, and light projecting means carried by said lamp housing with its axis intersecting the rotational axis of said support adjacent the lamp filament.

14. In a light projecting apparatus, the combination of a support, a lamp socket carried thereby, a lamp housing upon the support including inner and outer sections, said inner section comprising inner and outer spaced shell like portions, the outer portion having its inner end connected with the support and the inner portion having an opening through its inner end and having its outer end engaging said outer portion, said outer section including inner and outer shell like portions, the latter of which is detachably connected with the inner section, a lamp disposed in said sections and projected through said opening into said socket and light projecting means carried by the outer section.

15. In a light projecting apparatus, the combination of a support, a lamp socket carried thereby, a sectional lamp housing comprising an inner section fixed upon the support and a pair of interchangeably associated outer sections provided respectively with different light projecting means, said inner section and one of said outer sections each including spaced shell like portions and the lamp carried by said socket and adapted to project into said inner and outer sections.

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