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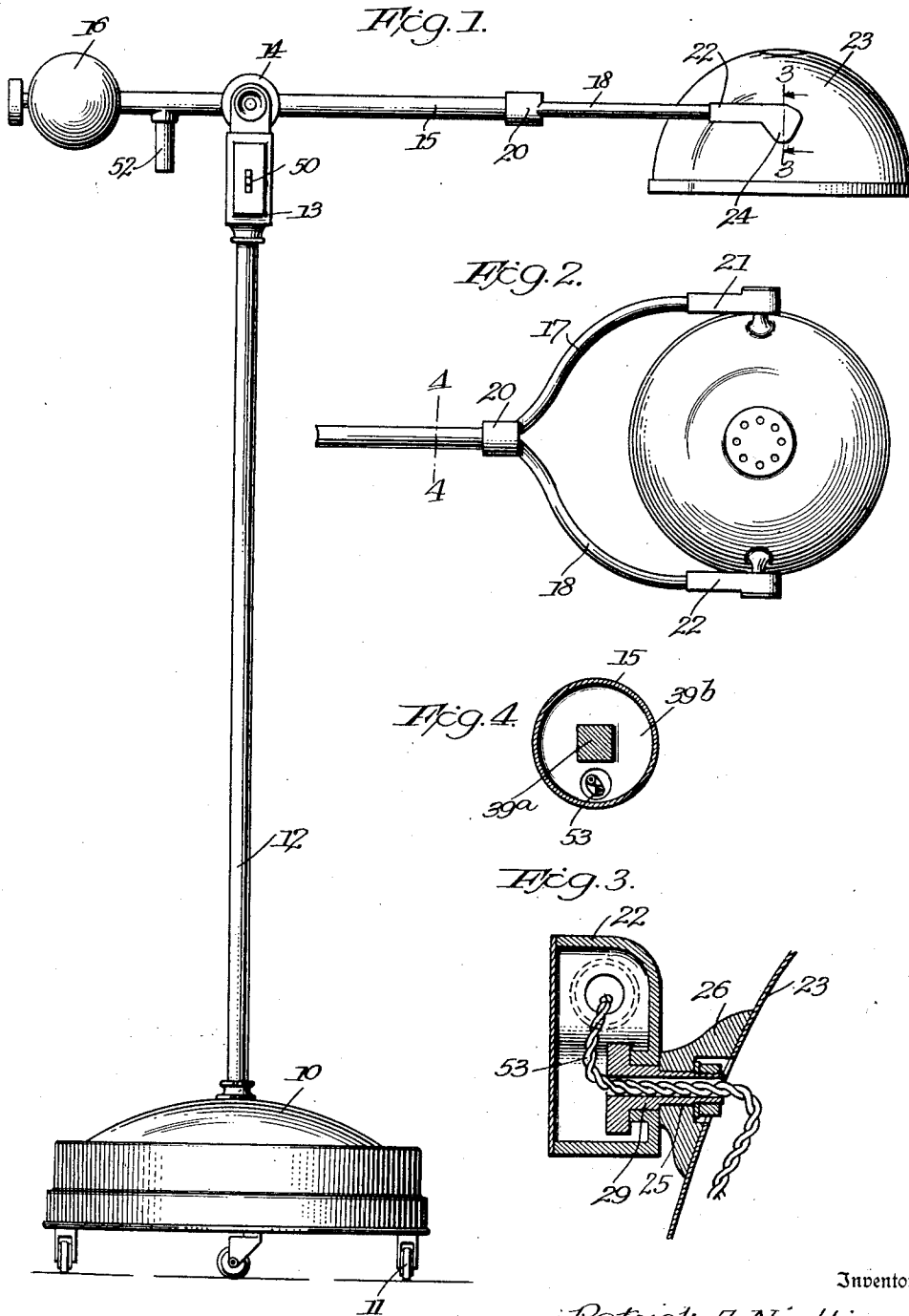
P. A. NIRDLINGER

2,144,197

PORTABLE SURGICAL LAMP

Original Filed Dec. 3, 1934

2 Sheets-Sheet 1



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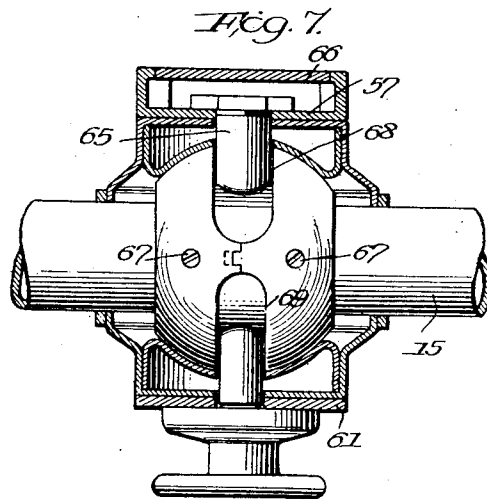
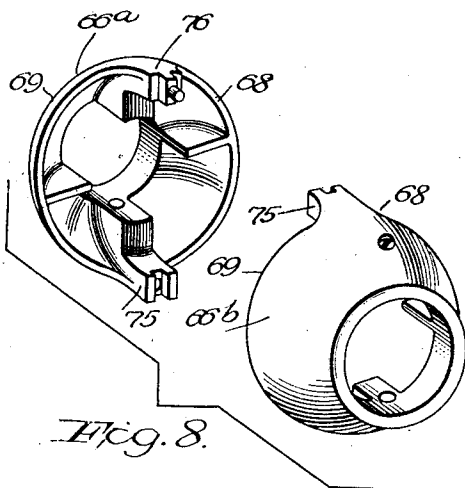
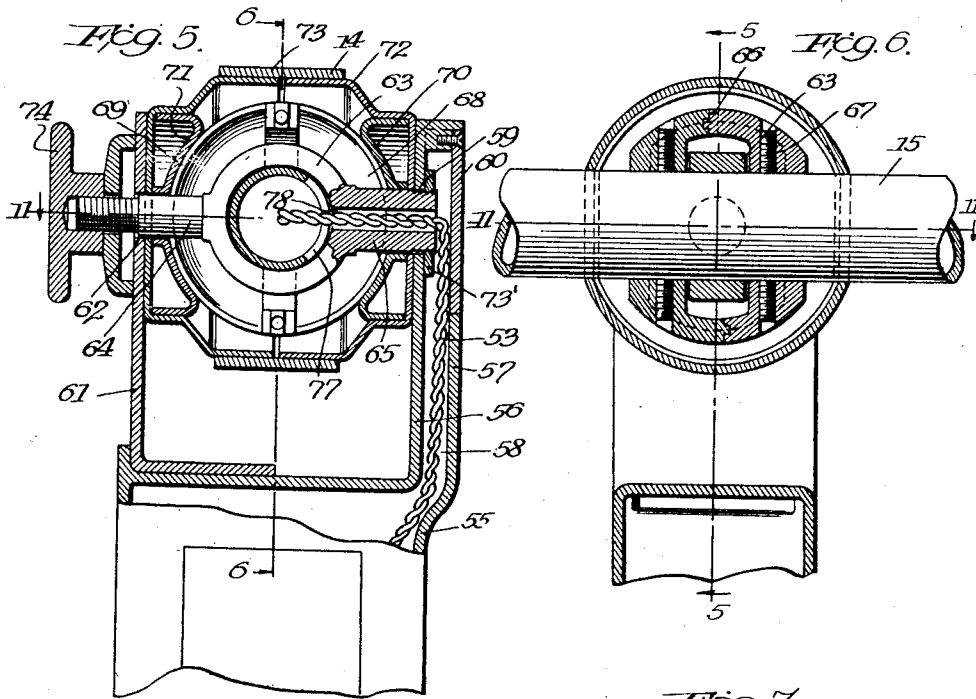
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PORTABLE SURGICAL LAMP

Original Filed Dec. 3, 1934

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,144,197

PORTABLE SURGICAL LAMP

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Original application December 3, 1934, Serial No.
755,795, now Patent No. 2,103,013, dated De-
cember 21, 1937. Divided and this application
April 14, 1937, Serial No. 136,909

7 Claims. (Cl. 248—122)

This invention relates to surgical lamps, or to lamps peculiarly adapted for use in operating rooms, dispensaries, clinics and the like. More particularly it relates to a lamp of this general class which is portable and adjustable, so that a beam of light may be projected to any desired point.

The present application is a division of my co-pending application Serial No. 755,795, filed December 3, 1934, now Patent No. 2,103,013 of December 21, 1937 for Portable surgical lamps. The former application is, in turn, a continuation-in-part in my copending application, Serial No. 704,577, filed December 29, 1933, now Patent No. 2,012,284, issued August 27, 1935.

It is a primary object of the present invention to simplify and improve devices of this kind and to provide novel means whereby the electric conduit extending from the base or support of the lamp to the light projector may be entirely concealed from view. In this connection, it is an object of the invention to provide a novel form of universal joint through which an electric conduit may be threaded in such manner that it will not become damaged by relative movement of the parts.

Other and further objects and advantages of the invention will become apparent from a consideration of the following description of the illustrative embodiment of the invention, shown in the accompanying drawings, in which:

Figure 1 is a side elevation of a surgical lamp constructed in accordance with the invention.

Figure 2 is a top plan view of the projector and supporting fork.

Figure 3 is a sectional detail taken on line 3—3 of Figure 1.

Figure 4 is a transverse section on line 4—4 of Figure 2.

Figure 5 is a transverse section through a preferred form of a universal joint.

Figure 6 is a section of the joint taken on line 6—6 of Figure 5.

Figure 7 is a horizontal section through the joint, taken on section lines 11—11 of Figures 5 and 6.

Figure 8 is a perspective view of the ball member of the universal joint, with the two halves separated.

Referring to Figure 1, the lamp of the present invention is preferably mounted upon a base 10 having casters 11 which permit its ready removal from place to place as desired. A vertical post 12 projects upwardly from the base and is provided at its upper end with a bracket 13. This

bracket may be rotatably mounted on the post 12, for instance by a screw thread, or any other convenient construction, so that the bracket may be turned through one complete rotation. In some cases it may be found desirable to have the bracket 13 rigidly mounted on the post and to provide the rotatable connection at the lower end of the post where it is secured in the base 10. Either construction is within the scope of my invention.

The bracket 13 functions as a part of a ball and socket universal joint connection represented generally, in Figure 1, by reference character 14. This joint may conveniently be in the form of the joint shown in my prior Patent 1,901,527, granted March 14, 1933, and in such a case, it is necessary to provide an electric conduit bridging the joint, as explained below. On the other hand, if it is desired to eliminate an exposed electric conduit, a novel form of joint may be used, as illustrated in Figures 5 to 8 inclusive. In accordance with this phase of the invention, all of the electric conduits are concealed.

A substantially horizontal bar 15 is carried in the joint 14 for limited universal movement about the center of that joint. This bar has a counterweight 16 secured to one of its ends, and a fork comprising arms 17 and 18 secured to its other end. The bar and both of the fork arms are preferably hollow and the interior bores thereof are in communication through the connecting sleeve 20. The outer ends of each of the fork arms are provided with housings 21, 22 in which the lamp projector 23 is pivotally mounted.

Each of the housings is formed with an offset portion, or enlargement 24, and in the wall of this enlargement a bearing aperture 25 is disposed. The lamp projector 23 has, on opposite sides of its outer surface, a pair of brackets 26 (Figure 3) and outwardly extending trunnions 29 secured therein. These trunnions project into and through the bearings 25 and permit tilting of the light projector with respect to the fork and the housings 21, 22.

The mechanism for tilting the light projector about the axis of the bearings 25 and trunnions 29 is completely described and claimed in my co-pending application Serial No. 755,795 referred to above, and, therefore, is omitted in the present case. In Figure 4, the reciprocating rod 39a which effects this tilting movement, is shown, together with the stationary bushing 39b having a squared aperture therein closely fitting the squared portion of the rod 39a and also having a

circular aperture to accommodate the electric wire or cable 53, hereinafter referred to.

It will be understood that the light projector of the present invention may be moved in any direction for adjustment purposes. As stated above, the bracket 13 is mounted for rotation about a vertical axis. The joint 14 is such that the bar 15 may be oscillated about its own axis to tilt the projector from side to side. Also the bar may be rocked about a horizontal axis extending at right angles to its own axis, to raise and lower the projector. These movements may be effected by an attendant manipulating the handle 52, which depends from the bar 15 at a point remote from the light. The means which permit the projector to be tilted about the pivoting axis of the trunnions 28, 29 complete the universally adjustable mounting of the projector, and make it capable of a wide variety of uses.

The electrical connections for the lamp positioned in the projector 23 have been constructed and arranged in a novel manner in the present device. A cable from an appropriate source leads to the base 10 and wires extend therefrom up through the vertical post 12. A switch 50, preferably of the mercury tube type, is carried by the bracket 13, and the electric wires may lead through a flexible cable from the switch upwardly through the operating handle 52 to the interior of the bar 15. The wires run lengthwise in the hollow bore of the bar and are threaded through the hollow fork arm 18, as shown in Figures 3 and 4.

In the universal joint shown in Figures 5 to 8, the use of a cable extending exteriorly from the switch 50 to the bar 15, has been eliminated. The details of a universal joint which permit the electric wires to be entirely concealed therein, without danger of fouling will now be described.

Referring to Figure 5, the switch housing 55 is provided with a pair of upstanding rear supporting walls 56, 57, defining a passage 58 communicating with the interior of the housing. The inner wall 56 is provided with a bearing aperture 59 and the outer wall is provided with an opening and an access plate 60. The switch housing also carries an upstanding forwardly disposed supporting wall 61 provided with a bearing aperture 62. The members 56, 61 serve as a supporting means for the joint 14 and the various parts carried thereby.

The rod 15 carries a collar 63 in slidable relation thereon, and the collar is provided with diametrically projecting trunnions 64, 65 journaled respectively in apertures 62, 59. A ball member 66, which may be formed in two halves 66a, 66b, is fixed to the bar 15 by set screws or the like 67. The ball member is provided with a pair of diametrically disposed slots 68, 69, through which the trunnions project.

Pressure cups 70, 71 are slidably mounted on the trunnions in frictional engagement with opposite sides of the ball member. The several parts of the joint are enclosed within a two-part housing 72, and the joint between the two parts is closed by a ring 73 or the like. The trunnion 65 is provided with a lock nut 73' disposed within the chamber 58, and the other trunnion 64 has an end of reduced diameter upon which a pressure applying knob 74 is threaded. From a consideration of the relation of parts shown in Figure 5, it will be apparent that the knob 74 is capable of applying more or less pressure through the friction cups 70, 71 to the ball 66 which is fixed on the bar 15. Thus, adjustable means are

provided for varying the frictional resistance to movement of the various parts of the joint. Resistance to oscillation of the bar 15 about the axis of the trunnions 64, 65 is also effected by frictional engagement between the inner faces of the supporting members 61, 56 and the adjacent outer faces of the housing 72.

The ball 66, as stated above, may be made in two halves and, as shown, these elements may be die stampings which are substantially identical to one another. The construction is such that projections 75, 76 are provided on the two halves and these elements are provided with interfitting ribs and grooves and pins, and apertures. When the two parts of the ball are assembled in accordance with the disclosure of Figure 7, the spaces between the projections 75, 76 provide the two slots 68, 69, and it should be noted that the slot 68 is considerably wider than the other. This is of importance because the trunnion 65 is preferably larger than the trunnion 64. The projections 75, 76, when assembled, constitute abutments which mark the ends of the slots and limit the relative turning movement between the collar 63 and its trunnions on one hand, and the ball member on the other.

The bar 15 is provided with a slot 77 through its side wall opposite the trunnion 65, and the latter is provided with a longitudinal bore 78 registering therewith. The arcuate length of the aperture 77 in the bar 15 substantially equals the arcuate length of the slot 68. Thus, the bar 15 and the ball 66 cannot be turned relative to the trunnion 65 a sufficient distance to foul the wire 53. It should be noted that, as a result of the construction disclosed in Figures 5 to 8, the wire 53 extending upwardly from the switch housing 55 is entirely concealed within the passage 58, the bore 78 of the trunnion, and the interior of the bar 15. The elements of the joint are so constructed that the wires are not only protected and hidden from view, but they cannot be subjected to rubbing or other destructive forces.

Referring to Figure 3 it will be seen that the electric wire 53 extends into the housing 22 and is threaded through the hollow trunnion 29 into the interior of the casing of the lamp projector. Thus, the wires are substantially completely hidden from view.

It will be understood that the present invention is not limited to the details of construction shown in the accompanying drawings and described in this specification. Many modifications will occur to one skilled in the art, and all such modifications as fall within the scope of the appended claims, or their equivalents, are within the scope of the invention.

I claim:

1. A joint of the class described comprising a substantially horizontal bar having a light projector mounted adjacent one end thereof and a concealed electric conduit extending into said light projector, a diametrically slotted, substantially spherical member fixed to said bar, a collar loosely surrounding said bar, and disposed interiorly of the member and provided with diametrically extending trunnions disposed in the diametric slots therein, supporting means for said trunnions, and frictional retarding means for said spherical member, said electric conduit being concealed in and threaded through a portion of the trunnion supporting means, and through one of said trunnions to the interior of the bar.

2. A joint of the class described, comprising

a substantially horizontal bar, a vertical supporting post terminating in spaced apertured supporting plates, one of which plates has a conduit communicating with the aperture therein, trunnions on said bar journaled in the apertures in said plates, a housing having apertures through which said trunnions project, said housing being positioned between said spaced plates and having surfaces disposed in frictional engagement with the inner faces thereof, a concealed electric conduit extending from the interior of said post to the interior of said bar, said conduit being threaded through said vertical supporting post, said conduit in said plate, the trunnion journaled therein, and therefrom into the interior of said bar, and pressure applying means associated with said spaced supporting plates to vary the resistance to movement effected by said frictional engagement between said plates and said housing.

3. A joint of the class described, comprising a vertical supporting post, a substantially horizontal bar having a light projector mounted adjacent one end thereof, a pair of substantially semi-spherical members assembled on said bar having their facing surfaces cut away to provide diametrically opposed slots, a collar surrounding said bar and disposed interiorly of the semi-spherical members, said collar having diametric trunnions projecting through said slots radially of the bar, supporting means for said trunnions, and friction cups embracing the semi-spherical members.

4. A joint of the class described, comprising a vertical supporting post, a substantially horizontal bar having a light projector adjacent one end of the bar, a pair of spaced apertured supporting plates on said post, a housing mounted between said plates and provided with diametrically opposed apertures through which said bar projects, a collar in the housing embracing said bar and having trunnions projecting radially therefrom and disposed in the apertures in said spaced plates, whereby the bar and the housing may pivot with respect to said plates on the axis of the trunnions, means for applying pressure between the plates and the housing to resist such pivoting movement, and additional frictional means restraining oscillation of the bar on its own axis in the housing.

5. A joint of the class described, comprising a substantially horizontal bar, a vertical sup-

porting post terminating in spaced apertured supporting plates, a pair of sleeves fixed to said bar, a collar loosely surrounding said bar and having diametrically opposed trunnions projecting radially from said bar and disposed between said sleeves, said trunnions being journaled at their outer ends in the apertures in said spaced supporting plates, a housing disposed between said plates and provided with oppositely disposed apertures aligned with the apertures in the plates and through which the trunnions project, and means for applying pressure between said plates and said housing.

6. In a joint of the class described, a pair of spaced, apertured supporting plates, a two-piece housing between said plates, a pair of opposed pressure cups disposed in the housing, said cups and said housing having apertures aligned with the apertures in the supporting plates, a bar extending through the housing, a collar loosely mounted on the bar having trunnions projecting radially therefrom through the apertures in the cups and the housing and journaled in the apertures in the plates, a split ball member fixed upon said bar and surrounding said collar and disposed in frictional engagement with said pressure cups, and means for drawing said plates toward each other to apply friction pressure between the plates and the housing and between the cups and the ball member.

7. In a joint of the class described, a pair of spaced, apertured supporting plates, a two-piece housing between said plates, a pair of opposed pressure cups disposed in the housing, said cups and said housing having apertures aligned with the apertures in the supporting plates, a bar extending through the housing, a collar loosely mounted on the bar having trunnions projecting radially therefrom through the apertures in the cups and the housing and journaled in the apertures in the plates, a split ball member fixed upon said bar and surrounding said collar and disposed in frictional engagement with said pressure cups, one of said plates and the trunnion journaled therein being provided with an enclosed passage for the reception of a concealed electric conduit, and means for drawing said plates toward each other to apply friction pressure between the plates and the housing and between the cups and the ball member.

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