July 9, 1957 R. L. JEWELL 2,798,938

SURGICAL LIGHT

Filed Sept. 17, 1954

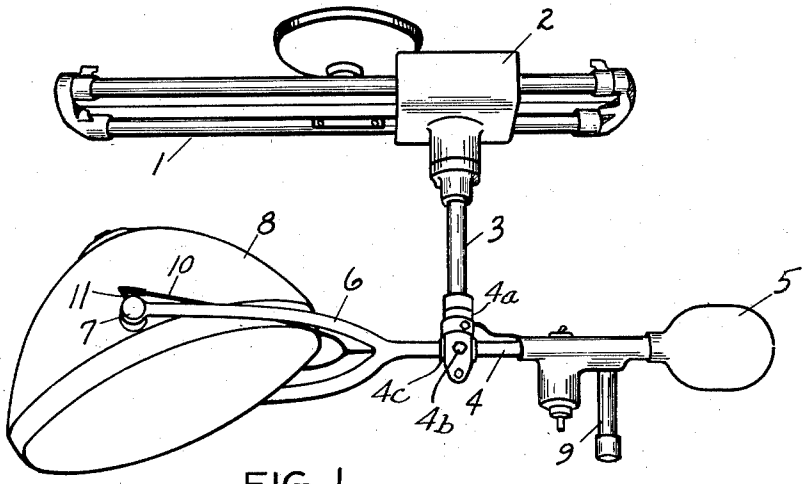


FIG. 1

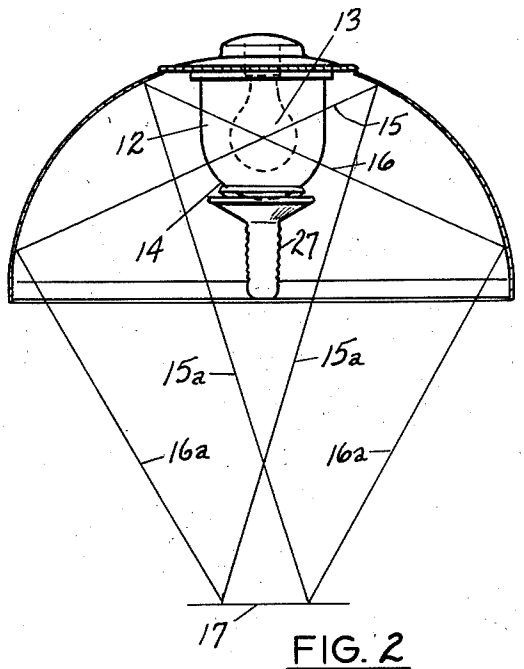


FIG. 2

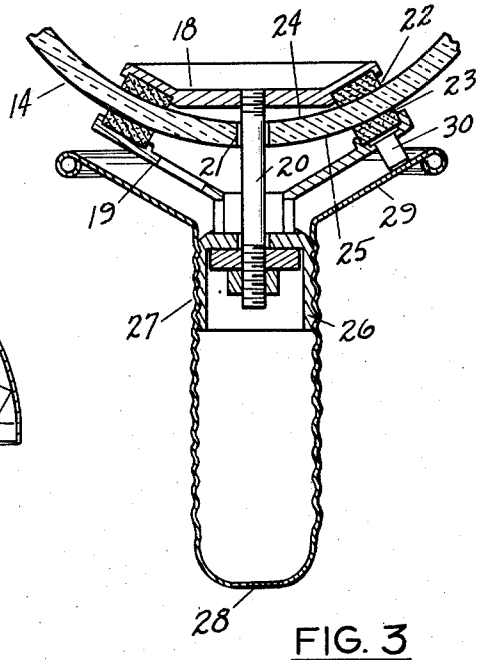


FIG. 3

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SURGICAL LIGHT

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1 Claim. (Cl. 240—1.4)

This invention is intended to provide a surgical light which the surgeon can adjust during the course of an operation without substantially blocking the illumination and without risk of contamination. In a preferred form, direct illumination from the light source is blocked off and most of the light comes from a reflector surrounding the light source which reflects the light in bands converging along the axis of the reflector which intersect at the operating field thus eliminating shadows because the light comes in angularly from all sides. In this form there is a cone directly beneath the light source in which there is little or no illumination. To provide for adjustability, the light source has at its center a handle depending along the axis of the reflector which the surgeon may grasp to move the reflector in any direction so as to get the desired illumination. The location of the handle has a minimum effect upon the illumination because it is within the light free cone. The handle is located the maximum distance from the reflector so that the risk of contamination by contact with the reflector or any other part of the light is kept to a minimum. The handle can be easily removed for sterilization and weighs so little that removal of the handle does not cause the light to change its position.

In the accompanying drawing, Fig. 1 is a diagrammatic view of a surgical light, Fig. 2 is a section through the reflector, and Fig. 3 is an enlarged section through the lower end of the light source and the depending adjusting handle.

In the drawing there is shown a ceiling suspended light having a track **1** for a carriage **2** having a depending suspension tube **3** at the lower end of which is a light supporting arm **4** with a counterbalance weight **5**. The arm is mounted at the lower end of the tube **3** for rotation on its axis and for pivotal movement about horizontal and vertical axes. A common structure for this mounting may be effected by a bushing **4***a* rotatable on the lower end of vertical tube **3** and having at its lower end horizontal bearings for trunnions **4***b* on a bushing **4***c* in which the arm **4** is journaled. At one end of the arm is a yoke **6** having a trunnion support **7** for a reflector **8**. By means of a handle **9**, the reflector can be moved in vertical, horizontal and angular directions. There is also provided a yoke **10** connected to arms **11** fixed to the reflector by means of which the reflector may be pivoted about its trunnion axis by back and forth translation of the yoke **10**. The parts so far described are or may be of common construction and may differ substantially from those illustrated.

Within the reflector is a source of illumination having a globe **12** for an incandescent light bulb **13**. The bottom walls **14** of the globe are treated to block direct illumination from the lamp bulb along the axis of the reflector **8**. The side walls of the globe **12** are transparent and transmit light laterally or radially within the space between lines **15** and **16** to the reflector from which the light is reflected in bands or beams between lines **15***a* and **16***a* converging and intersecting on a field **17** on the axis of the reflector. At the field **17** shadows are minimized because the light comes in angularly on all sides. It will be noted that there is a cone between the lines **15***a* beneath the bottom of the globe **12** in which there is no illumination because any direct transmission of light from the bulb **13** is blocked. Accordingly, any parts placed in this cone would not interfere with the illumination on the field **17**.

At the bottom of the globe **12** there are inner and outer plates **18** and **19** which are clamped against the globe by a bolt **20** extending through a hole **21** in the bottom wall of the globe. Suitable gaskets **22** and **23** are arranged between the plates and the inner and outer surfaces **24** and **25**. Integral with the outer or bottom plate **19** is a depending projection or stud **26** on which is threaded a hollow cup shaped handle **27** which extends substantially to the plane of the rim of the reflector. The handle has tubular side walls and a closed bottom wall **28** so that when the handle is in place the entire lower end of the studlike projection **26** is enclosed. At the upper end of the handle is an outwardly extending flange **29** which butts against spaced projections **30** of insulating material when the handle is screwed in place and provides an air space between the flange **29** and the bottom plate **19**. The purpose of this air space is to keep the handle from getting too hot. It will be noted that when the handle is in place, it depends within the light free cone between the lower end of the globe. Accordingly, when the handle is grasped to change the position of the reflector and thereby change the location of the field **17** on which the illumination is directed, there is a minimum of interference with the illumination on the field. Also, the handle is located at a maximum distance from the reflector so that accidental contact with unsterilized surfaces is minimized. The flange **29** prevents accidental contact with the globe **12**. Because of the hollow construction of the handle, it is not heavy enough to interfere with the counterbalancing of the light. If the handle is removed, the light will remain in the same place. This is desirable for the handle may have to be removed during the course of an operation if it should become contaminated. The handle is made of a material which can be readily sterilized.

By having the handle located at the light source finer adjustment is possible than can be obtained by a handle **9** mounted at the other end of the arm **4**. Either of the handles can be used to position the light. The possibility of adjusting the light at the source and without interfering with the illumination of the field makes possible a more precise control. The location of the control has the further advantage that contact with unsterilized surfaces is minimized since the handle which is in the most prominent position is completely sterilized and the other parts such as the rim of the reflector are located as far away from the handle as is possible.

What is claimed as new is:

In a surgical light of the type having means for mounting the light on a support above and spaced from the field to be illuminated and for free universal movement, said light being counterbalanced to remain in any position to which it is moved, said light having a hollow structure with a depending rim of diameter substantially larger than the field to be illuminated surrounding and radially outward of an axis normal to said field and including a light source above the plane of the rim designed to transmit light in beams converging toward said axis and intersecting at said field, the combination of a stud fixed to said structure below said light source and depending therefrom along said axis, a hollow cup shaped sterilizable handle fitting over and enclosing said stud,

said handle having a continuous surface to facilitate sterilization with a closed bottom wall extending substantially to the plane of said rim and having upwardly extending tubular side walls providing a hand grip portion below said light source projecting prominently toward said field, and means inside the handle for removably fastening the handle on the stud, the hand grip portion of the handle extending along said axis remote from said surrounding structure of the light and said handle having integral therewith an outwardly flaring guard flange at the upper end of said tubular side walls to prevent contact with unsterilized surfaces of said structure upon grasping the handle to adjust the light.

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