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P. GOOD

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SURGICAL HEAD LAMP

Filed Jan. 22, 1930

Fig. 1.

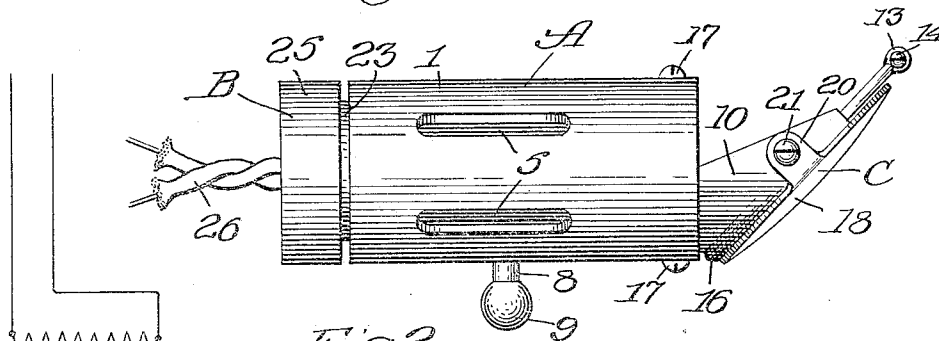


Fig. 2.

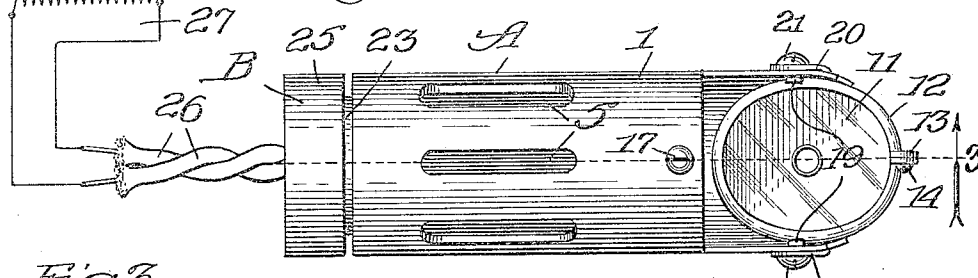


Fig. 3.

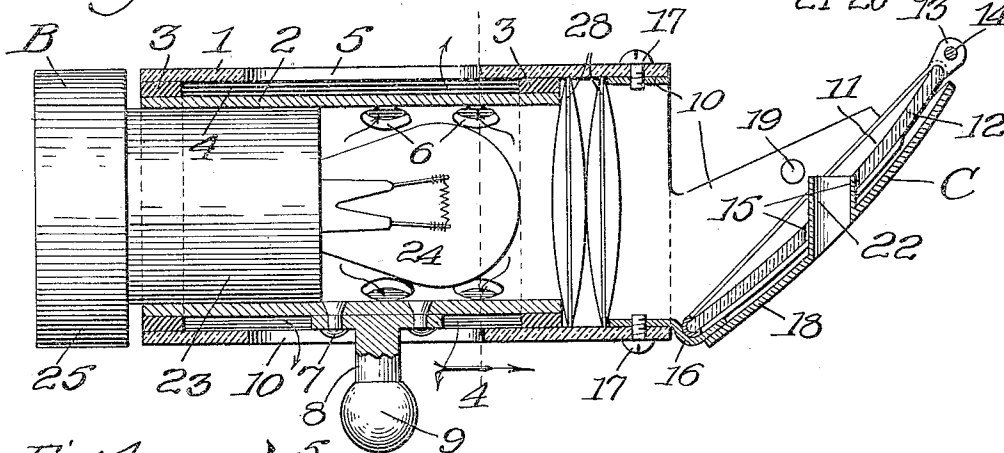
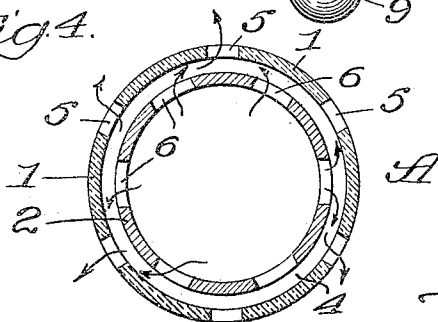


Fig. 4.



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SURGICAL HEAD LAMP

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This invention relates to illuminating devices and more particularly to a head lamp illuminator adapted for surgical purposes.

One of the objects of the invention is to provide a surgeon's head lamp which will illuminate evenly and uniformly the area which is to be examined. Another object is to provide means for preventing glare or other effects interfering with vision when the head lamp is used. Another object is to provide light adjustment means whereby the intensity and character of the reflected light pattern may be varied as desired. Another object is to provide means whereby the heat generated by the source of light may be carried away without inconvenience to the wearer. A still further object is to provide an apparatus, the main parts of which may be readily disassembled or reassembled. Another object is to provide means whereby the mirror employed may be readily inserted in or removed from the apparatus. Other objects and advantages will appear as the description proceeds.

Another object is to provide a surgeon's head lamp which will illuminate evenly and uniformly the area which is to be examined, with the line of vision directly in the center of the beam of light. Another object is to provide means whereby the incandescent lamp employed may be readily inserted in and removed from the apparatus.

The invention is fully described in the following specification and shown in the accompanying drawing in which—

Figure 1 is a longitudinal view of apparatus embodying my invention;

Fig. 2 is a top plan view of the apparatus as positioned in Fig. 1;

Fig. 3 is an enlarged sectional view, the section being taken at line 3 of Fig. 2; and

Fig. 4 is a transverse sectional view, the section being taken as indicated at line 4 of Fig. 3.

In the illustration given A represents a casing member, B a socket member, and C represents a reflector member.

The casing member A comprises a pair of telescoping tubular members, an outer tube or shell 1, and an inner tube 2. The inner

member 2 is shorter than the outer member 1, the rear end being substantially flush with the outer member 1 but the front end falling some distance short of the front end of outer member 1. Ring spacers 3 are preferably employed to separate the two tubular members and to provide therebetween a ventilation space 4.

The outer tubular member 1 is preferably formed of some heat-insulating material such as, for example, bakelite. At an intermediate point it is provided with a series of longitudinal slots 5 which serve as ventilating apertures.

The inner member 2 is preferably made of some metal material such as, for example, brass and is provided with apertures 6 which preferably are covered by the bakelite shell 1. In other words, the apertures 6 and longitudinal slots 5 are in staggered relation.

Secured to inner member 2 by means of rivets 7 is a flanged member 8 which is provided at its outer end with ball 9. Ball 9 is adapted to be received in a socket member which is worn upon the head band of a surgeon and forms therewith a ball and socket joint. Any suitable means, however, for securing the illuminator to a surgeon's head band may be employed. In the illustration, the member 8 extends through an opening 10 in the outer shell 1.

The reflecting apparatus C comprises preferably a concave mirror 11 inclosed by a rim 12 having a split end connection 13 which is normally held together by means of a screw 14. The mirror 11 has an inclined aperture 15 near its center.

The mirror 11 and frame 12 are supported outside of the casing A and at an angle thereto by means of supporting member 16 which is secured to the inner side of shell 1 by means of screws 17. Back piece 18, which is screwed to supporting member 16 carries the mirror 11 and frame 12. The frame 12 is preferably held firmly in position by solder or other suitable means. The inner ends 19 of screws 17 preferably extend over a portion of rim frame 12. Back piece 18 is equipped with a pair of ears 20 which are preferably formed integrally therewith and

which lie adjacent the supporting member 16. The ears 20 and the supporting member 16 are secured together by means of screws 21. It will be observed that these parts may be readily disassembled by removing the screws 21.

The back piece 18 is preferably equipped centrally with a tubular eye piece or sight aperture 22 which is adapted to be received within the aperture 15 of mirror 11. It is preferably covered on its inner side with a black enamel or other coating to aid visibility and also the inner side of the back piece which is behind the mirror is preferably blackened in order that an ordinary concave eye glass may, if desired, be used. It will be observed that with the construction illustrated, an ordinary eye glass piece may be centrally apertured and used as a mirror.

The socket member B preferably comprises a removable tubular socket 23 in which an ordinary light bulb 24, having preferably a straight filament, may be connected. It is provided also with an enlarged cylindrical flange member 25. Suitable electric light wires 26 may be connected to the socket member B and to a transformer 27. With the construction shown, it will be observed that the cylindrical member 23 will be readily rotatable within the tubular member 2 and may be easily adjusted longitudinally thereof.

Located between the forward end of member 2 and the supporting member 16 are a pair of convex lenses 28. The ends of the lenses are braced by the forward end of member 2 and ring spacer 3 and also by member 16.

In the use of the apparatus, the ball connection 9 is inserted within the shell socket upon a surgeon's head band and adjusted so that the eye of the wearer is just behind the back piece 18. The tubular socket member is adjusted longitudinally of the casing and by rotary movement until the light filament is in a plane and at a proper distance from lenses 28 to give a reflected light of the desired character. Any suitable source of light may be employed. In practice it has been found satisfactory to use a standard automobile 15 candle power, 6-volt light operated from a transformer. The heat generated within the light chamber passes through opening 6 in tubular member 2 and out through longitudinal slots 5 of the outer shell 1. The staggered arrangement of apertures and slots prevents light rays from passing through the casing but permits free circulation.

The combination of a straight incandescent filament or line of light with the lens and concave mirror forms a reflected field of light which is substantially square in shape and uniform in illumination. By rotating the filament or line of light, the area of illumination formed by the reflecting mirror may be caused to assume the shape of a long line or

by rotating the mirror 90° more, the area of illumination will become substantially square. With this arrangement, the operator can control the shape of the illuminated field. For practical purposes, a square field of illumination is preferable.

It will be observed that with the construction illustrated, the reflector supporting apparatus is not connected to the metal member 2 and that its only connection is with the bakelite member 1. By this means the back piece 18 which may come into contact with the wearer's eye is not affected by the heat formed within the light chamber.

The split ring frame 13 may be opened by turning screw 14 to permit the removal or insertion of the mirror 11. Any suitable means may be used for securing the mirror in place. If desired, it may be held merely by friction within the supporting member 16 and back piece 18.

With the casing member and socket member construction illustrated, it will be observed that the member B may be conveniently removed from the casing and a similar socket member or the same member with another light bulb of different power may be inserted without removing the lamp from the surgeon's head band.

It will further be observed that with the concave mirror employed, the pattern of light reflected by the mirror will be uniform and will not have a dark spot in the center, as would otherwise be the case if a plain mirror were employed. The tubular eye piece or sheath 22 which extends entirely through the glass 11 prevents glare or reflection which would otherwise come from the glass and affect the wearer's vision.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim:

1. In a device of the character set forth, a casing member, a source of light therein, a reflector mirror supported in angular relation to said light, said mirror being apertured, and a glare-preventing shield extending through said aperture.

2. In a device of the character set forth, a casing member, a source of illumination supported in said casing, a concave mirror supported in juxtaposition thereto and adapted to reflect light rays from said illuminating body, said mirror being provided with an eye-piece opening, a lens supported between said illuminating body and said mirror, and a glare-preventing shield extending through said eye-piece opening.

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