

EXAMINER
SUBSTITUTE FOR MISSING XR

No. 624,392.

Patented May 2, 1899.

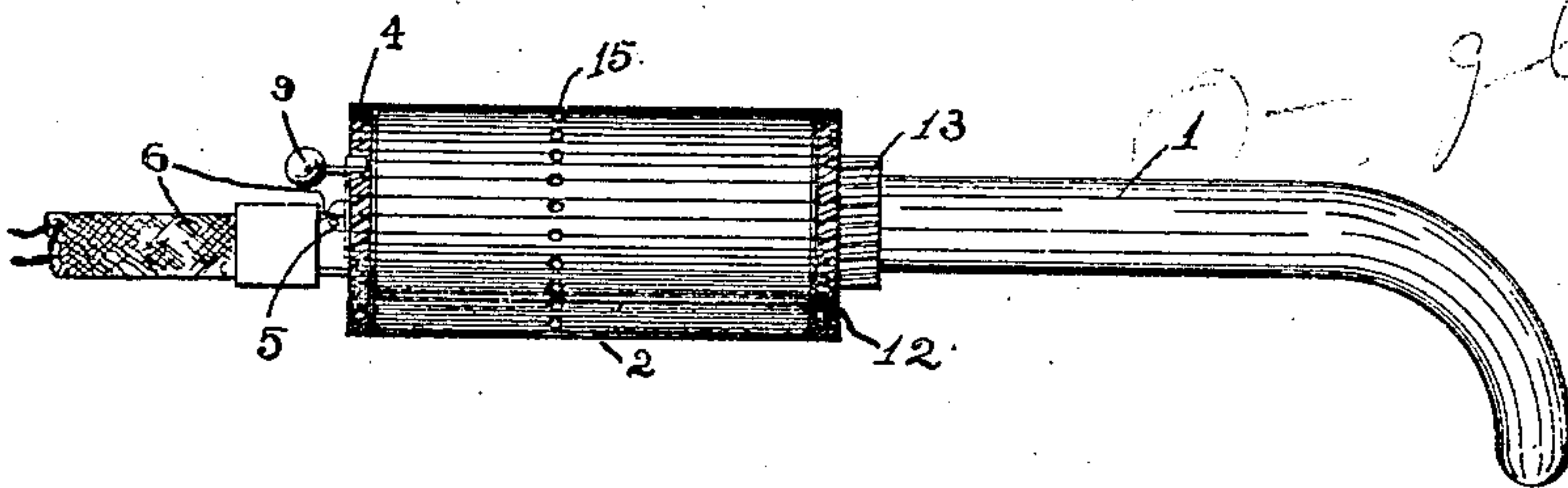
D. D. SMITH.
SURGICAL LAMP.

(Application filed Apr. 25, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



glass rod
polished surface

Fig. 2.

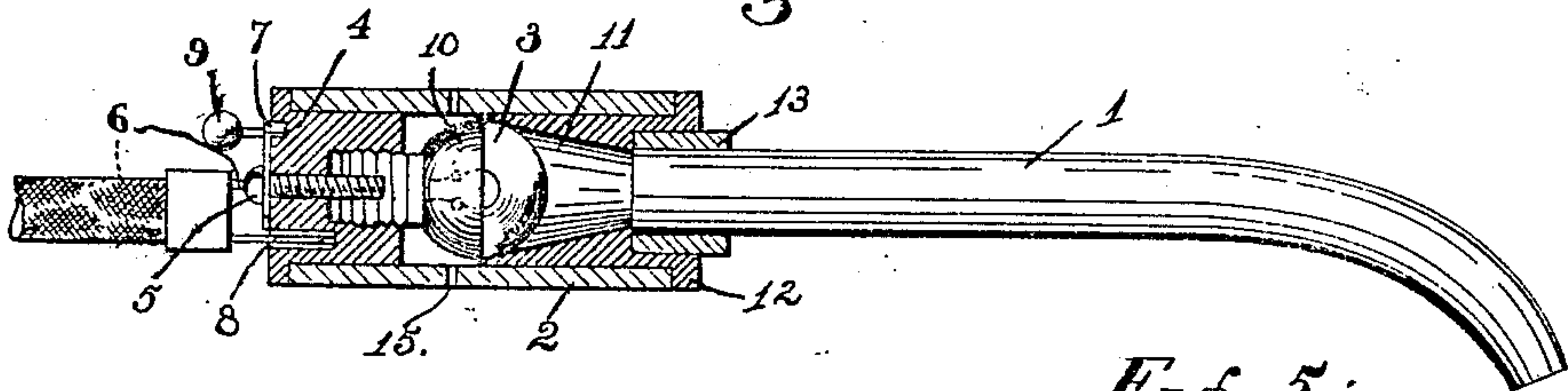


Fig. 5.

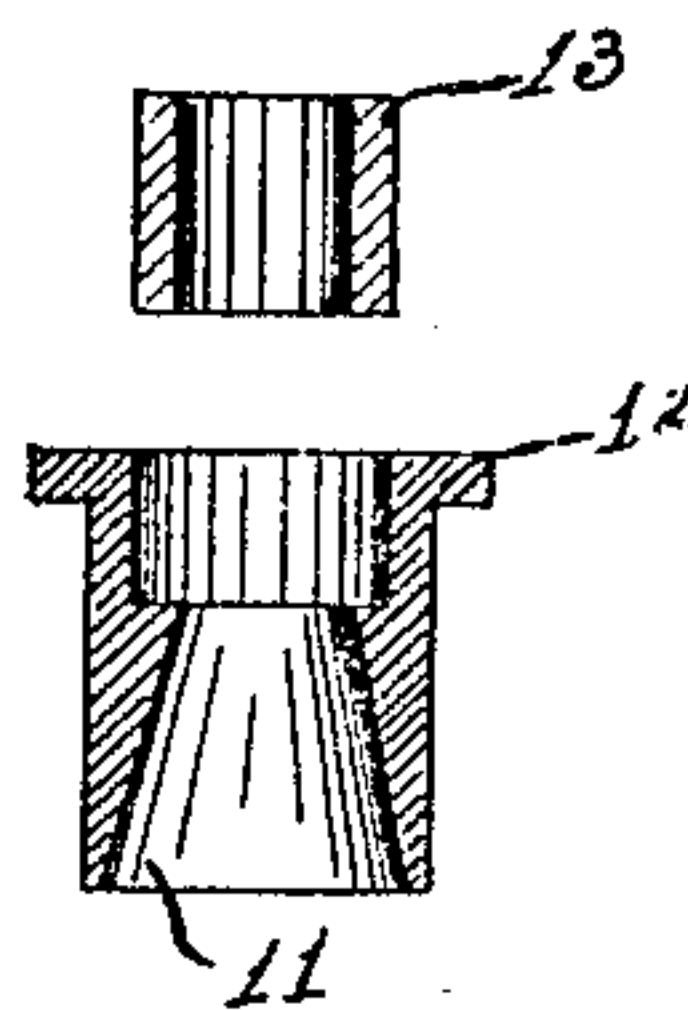


Fig. 4.

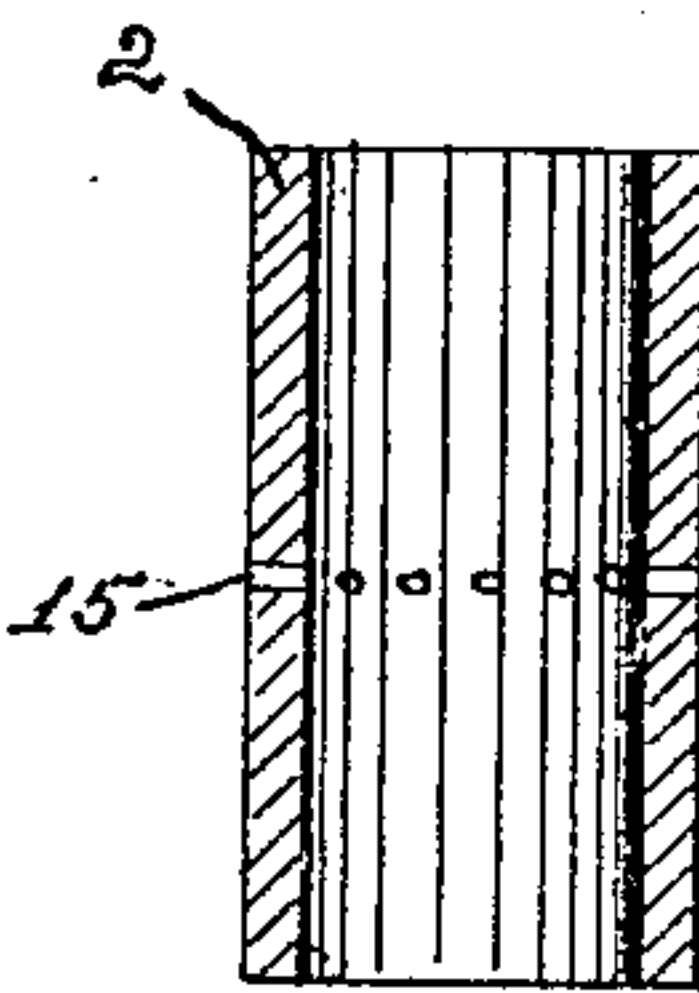


Fig. 3.

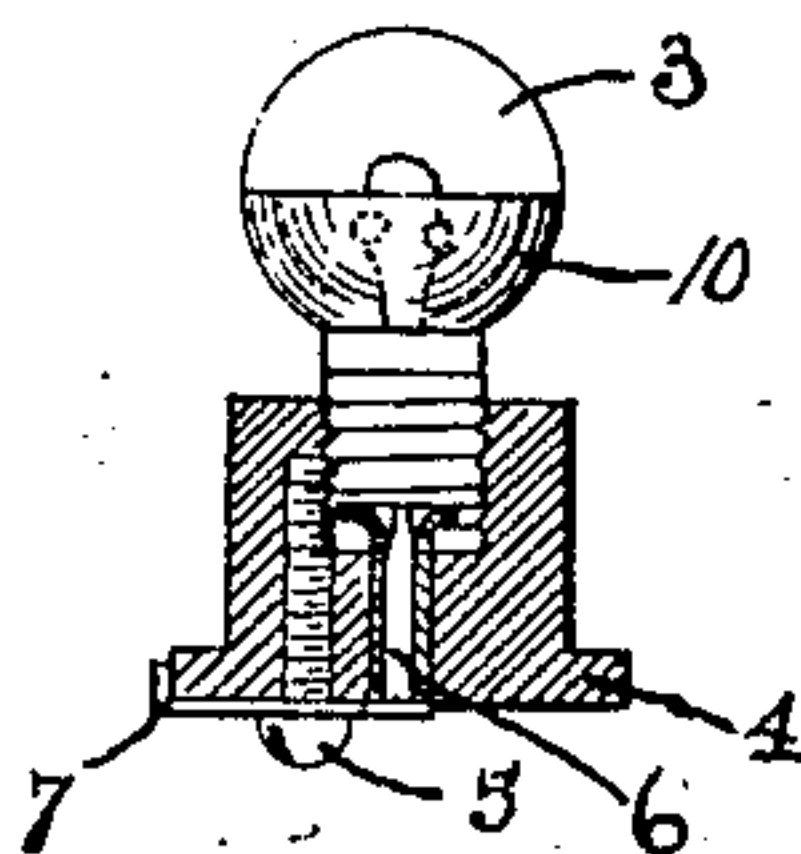
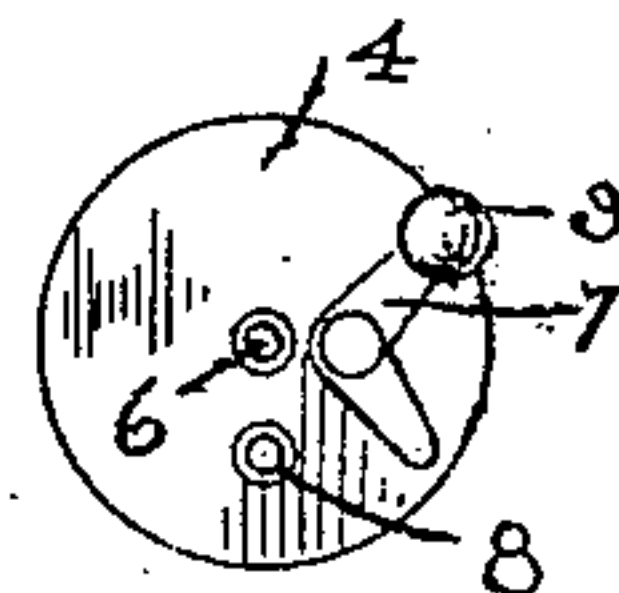


Fig. 6.



WITNESSES:

A. S. Fairbairn
Kate Dunlap

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BY *V. H. Lockwood*
His ATTORNEY.

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2 Sheets—Sheet 2.

Fig. 7.

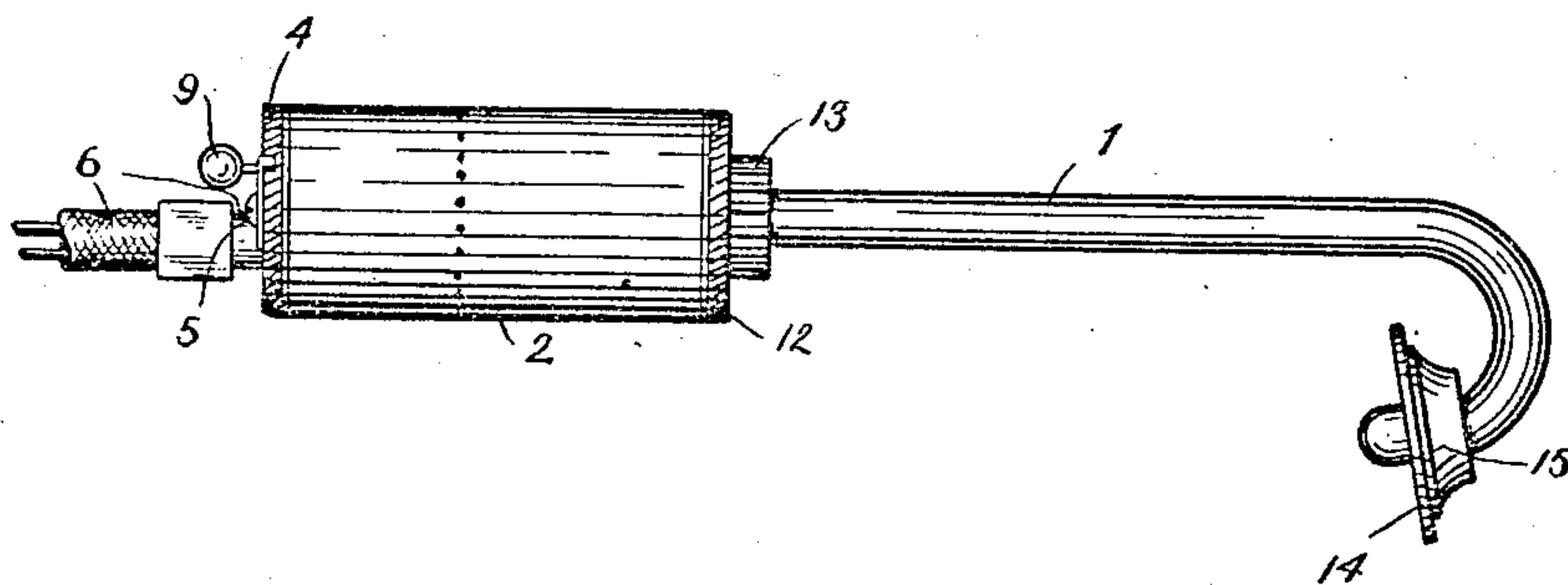


Fig. 9.

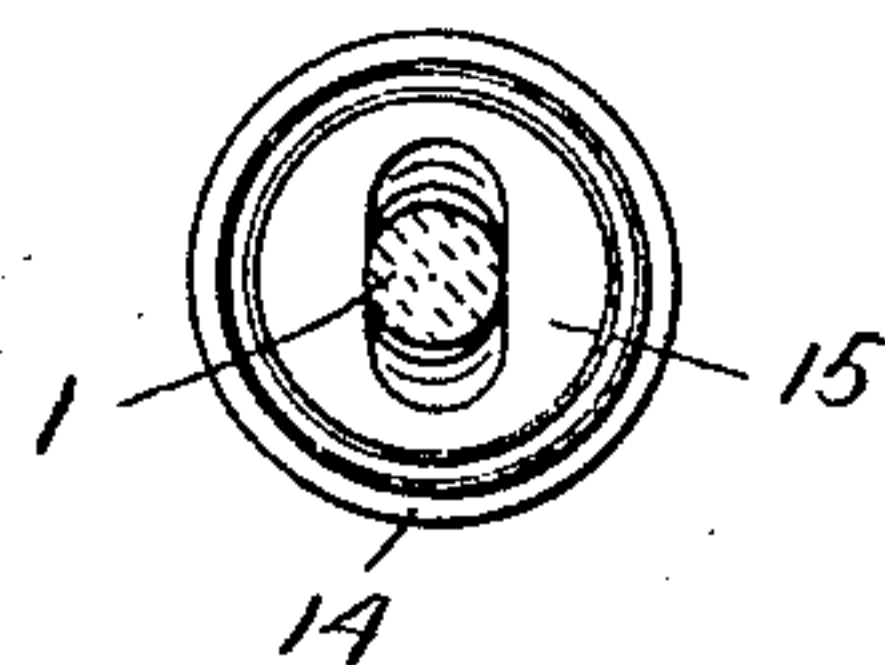
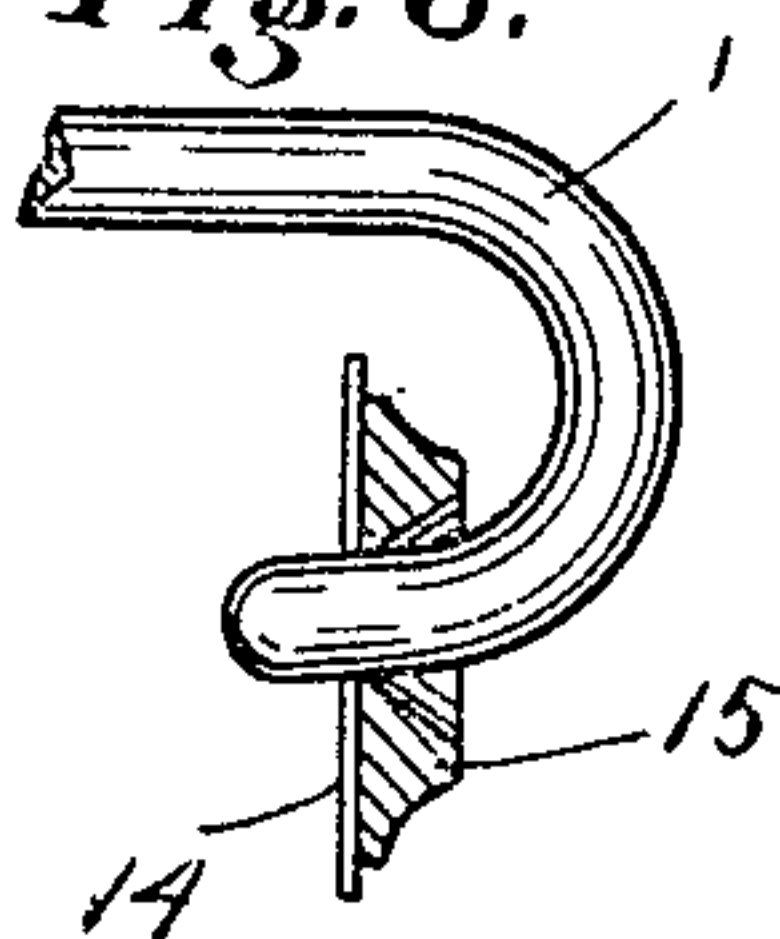


Fig. 8.



Witnesses

R. D. Hawkins.

Minnie C. Buck.

Inventor

David D. Smith

By V. H. Lockwood
His Attorney.

UNITED STATES PATENT OFFICE

DAVID D. SMITH, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO ADDIE RENNICK SMITH AND FLORENCE FOSTER CROWELL, OF SAME PLACE.

SURGICAL LAMP.

SPECIFICATION forming part of Letters Patent No. 624,392, dated May 2, 1899.

Application filed April 25, 1898. Serial No. 678,815. (No model.)

To all whom it may concern:

Be it known that I, DAVID D. SMITH, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Surgical Lamp; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

This invention relates to a surgical or dental lamp or search-light which involves the application of the principle of total reflection of light and comprises a transparent rod for insertion in the body and the transmission of light, with a lamp or light at its outer end.

This lamp or search-light can be used for surgical and dental purposes and is wholly free from heat in the part that touches or enters the body. With such a lamp no inconvenience results when it touches the body, and the operator need pay no attention to that matter, and it can also be used for any length of time in one operation without any inconvenience from heating. The portion of the device which penetrates the orifices of the body is free from danger of breakage or of any rough or cutting surfaces that might abrade the body. To that end a glass rod made of as tough a quality of glass as desired and with its surfaces perfectly smooth is used. In this respect it not only acts as a means for transmitting light, but also can be used as a tool, as it is as smooth and strong as the ordinary tools used for holding or pushing parts away.

Another feature is the simplicity and cheapness or economy of the device and its smallness, lightness, and ease of manipulation and use.

These, together with the other features of my invention, will more fully appear from the accompanying drawings and the description and claims following.

In the drawings, Figure 1 is an elevation of my invention where an incandescent lamp is used. Fig. 2 is a longitudinal central section of the same, excepting the glass rod, which is modified and shown in elevation. Fig. 3 is a detail of the incandescent lamp and its attachment. Fig. 4 is a detail in section of the lamp-holder. Fig. 5 is a longitu-

dinal section of the forward reflector and the parts in which the glass rod is secured. Fig. 6 is a detail of the switch. Fig. 7 is an elevation of my invention with an outside reflector. Fig. 8 is a detail of the outer end of the glass rod with the reflector in cross-section. Fig. 9 is a front elevation of such reflector with the glass rod in cross-section.

What I have shown is merely for the purpose of illustrating my invention rather than indicating the extent of its application or possibilities. In the first six figures I have illustrated my apparatus where an incandescent lamp is used and in the remaining figures where an acetylene-gas lamp is used.

In detail, 1 is a solid glass rod which is to be seen extending into a lamp-holder 2. This lamp-holder may be of any suitable form for containing a lamp or light on a line with the center of the glass rod. The end of the glass rod 1 that extends into the lamp-holder has a smooth surface, preferably at right angles to the center line of the glass rod. The glass rod is preferably round and its surface very smoothly polished to cause a reflection of the rays of light that pass longitudinally through it and to prevent their passage out of the rod until they reach the other end thereof. The diameter and length of the body of the glass may be such as is desired. The other end—that is, the end from which the light emanates—may be formed in any way for the particular purpose desired. In the drawings four forms are illustrated. In all of them the light radiates from the end, and by turning the end as seen in Fig. 7 the light may be put behind a cavity or part to be illuminated. In Fig. 1 the lighted end is bent at right angles to the center line of the body of the rod. In Fig. 2 the angle is less. In Fig. 8 the rod is straight. By increasing the diameter of the rod and proportionately decreasing the diameter or size of the lighted end the intensity of the light emanating from such end is proportionately increased. Where the lighted end is curved as seen in Fig. 7 the rays of light are focused to a point near the lighted end, and crossing each other at such focused point spread away from such point. Therefore by placing such lighted end near the part to be examined the light is in-

tense, but limited to its scope, whereas if the end be placed somewhat farther away from the part being examined the field of light is considerably increased, although the intensity is correspondingly diminished. Therefore the surgeon can adjust the lighted point to suit his use. He can at first examine a considerable surface and then more closely examine certain parts of that surface by a slight movement of the lighted end of the glass rod.

Where it is not desired to concentrate or focus the light on a point, a very good form of the lighted end is that shown in Fig. 2, where the end is ground flat; but even in this case the intensity of the light desired may be modified by reducing the diameter of the end. These glass rods are perfectly smooth at all points, and therefore cannot cut or abrade. They are strong and can be made tough, so that there is no danger of breakage or otherwise doing injury to the body. Hence they can be used simultaneously for the purpose of illuminating a certain part of the body and for holding back or displacing parts, like several of the ordinary surgical instruments.

The lamp-holder 2 is made preferably of hard fiber and is cylindrical, as shown. Its diameter is preferably about one inch. Within this is inserted an incandescent lamp 3, that is held in the plug 4, that is made of hard fiber also and of such diameter as to slip tightly in at one end of the lamp-holder 2. A metal screw 5 connects with the lamp, and so does the wire 6. The circuit is closed by the switch 7, that is pivoted on the screw 5, so that one of its arms will engage the wire 8. The switch-lever has a little finger-piece 9 to make it easily operative.

The rear half of the globe of the lamp at 10 is coated with silver to make a reflector upon the lamp. In front of the lamp a metal reflector 11 is placed, being held by the hard-fiber cylinder 12, that slips tightly into the end of the lamp-holder 2. The reflector 11 is thimble-shaped and deflects all the rays of light from the lamp to the glass rod. 13 is a rubber sleeve fitting in a suitable seat for the reception of the glass rod. With this arrangement the glass rod can be readily changed, so that if the surgeon or, dentist has several of them in various forms on hand he can readily replace and use them as the needs of his work require.

The lamp-holder is provided with a series of apertures 15 for ventilation to reduce the temperature thereof.

To reflect the light outward from the orifice of the body that is being examined, where the operator cannot see the parts desired, I mount on the inner end of the glass rod a reflector 14, so that it can be adjusted to properly direct the light to the surgeon's eye. This may be in any suitable form, that shown being se-

cured to a rubber holder 15, having a conical aperture elliptical in cross-section of such dimensions that the rubber will bind the glass and remain in any position in which it is placed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A surgical lamp including a perforated tubular body, plugs for closing the ends thereof, one of said plugs being hollow, a glass rod with one end mounted in the hollow plug, and means for maintaining a light in said tube in line with the glass rod.

2. A surgical lamp including a perforated tubular body, a removable plug for closing the ends thereof, one of said plugs being hollow, a glass rod with one end mounted in the hollow plug, an incandescent lamp so secured to the other plug as to be held in line with said rod, and a suitable electrical connection with said lamp through said plug.

3. A surgical lamp including a lamp-holder, a lamp therein, a conical reflector immediately in front of the light, and a transparent rod with one end secured adjacent to the small end of such conical reflector.

4. A surgical lamp including a transparent rod with one end so placed that the light will enter it, and an adjustable reflector mounted on the other end of such rod.

5. A surgical lamp including a perforated tubular body, a removable plug for closing the ends thereof, one of said plugs being hollow, a glass rod with one end mounted in the hollow plug, an incandescent lamp so secured to the other plug as to be held in line with said plug, and a switch secured to said plug for opening and closing said electrical connection.

6. A surgical lamp including a perforated tubular body, a removable plug in each end thereof, one plug being hollow, a glass rod with one end secured in the hollow plug, means for maintaining a light between said plugs, a reflector carried behind the light by one plug, and another reflector in front of the light secured to the other plug.

7. A surgical lamp including a perforated tubular body 2 and plugs 4 and 12 to close the ends of such tube, said plug 12 being hollow with a flaring inner wall, a reflector secured to said flaring wall, a rubber ring 13 fitting in the outer end of the plug 12, a glass rod in one end secured in said rubber ring, and means for maintaining a light within said tubular body in line with the glass rod.

In witness whereof I have hereunto affixed my signature in the presence of the witnesses herein named.

DAVID D. SMITH.

Witnesses:

V. H. LOCKWOOD,
CATHARINE DUNLAP.