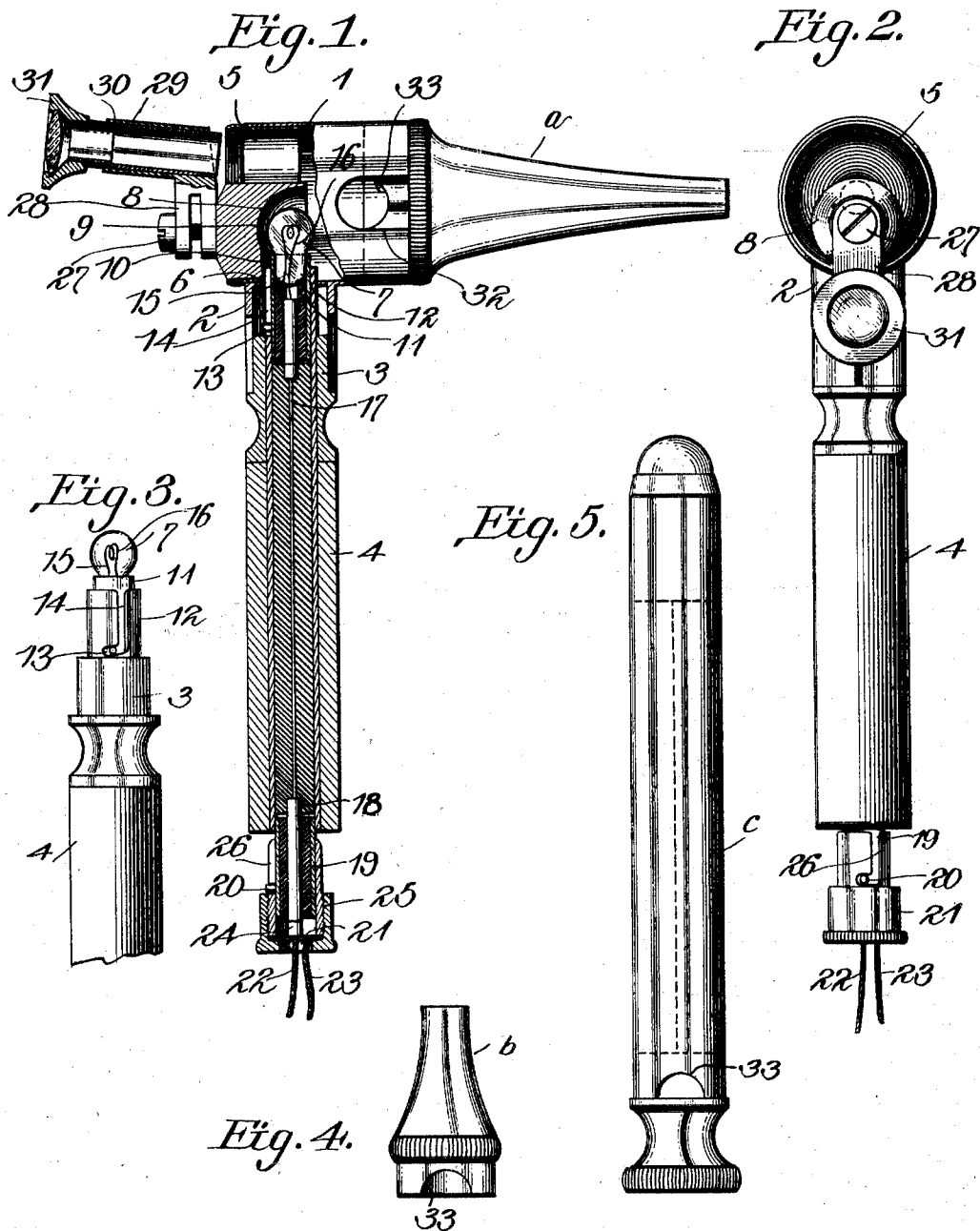


No. 760,395.

PATENTED MAY 17, 1904.

T. A. HOUGHTON.
SURGICAL INSTRUMENT.
APPLICATION FILED AUG. 20, 1903.

NO MODEL.



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SURGICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 760,395, dated May 17, 1904.

Application filed August 20, 1903. Serial No. 170,311. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. HOUGHTON, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented a new and useful Surgical Instrument, of which the following is a specification.

This invention relates generally to electrically-illuminated surgical instruments, and more particularly to an electrically-illuminated or auro-nascope and rectal instruments.

The objects contemplated in the invention are to provide in an instrument of the class described means for effecting better illumination of the parts to be operated upon or treated, to provide means for viewing the parts through magnifying-lenses or by the unaided eye at will, and to provide for the introduction of surgical instruments through the side or the end of the device.

With the objects above stated and other minor objects in view, which will appear when the invention has been more fully disclosed, the same consists in the construction and combination of parts of an electrically-illuminated surgical instrument hereinafter described, illustrated in the accompanying drawings, and having the novel features thereof specifically pointed out in the appended claims.

In the drawings, Figure 1 is a view principally in vertical section through the main vision-tube and the handle. Fig. 2 is a view in elevation from the left of Fig. 1. Fig. 3 is a detail view in elevation of one end of the handle and the incandescent lamp carried thereby. Fig. 4 is a view in elevation, on reduced scale, of a nasal speculum for use with the device; and Fig. 5 is a view in elevation, upon a reduced scale, of a rectal speculum for use with the device.

In the drawings corresponding parts are designated by the same characters of reference throughout, and it is to be understood that various changes in the form, proportions, and exact mode of assemblage of the elements exhibited may be resorted to without departing from the spirit of the invention.

Referring to the drawings in detail, 1 designates the main vision-tube of the instrument, and 2 designates a lateral branch from the tube 1, which is split throughout the greater portion of its length to form a friction-grip for the reduced extremity 3 of a handle 4. The main vision-tube 1 is short and serves principally as a support for the other members of the device. At the rear of the tube 1 is secured a ferrule 5, which fits closely within the tube and is provided at its rear margin with a knurled surface, by means of which it may be turned. The ferrule 5 is open at both ends, as shown, and at one point in its periphery a portion is cut away to provide a notch 6 to receive the end of the handle 4, which projects within the vision-tube and carries a small incandescent lamp 7. Rigidly mounted within the ferrule adjacent to the notch 6 is a reflector 8, which consists, preferably, of a block of brass or other metal susceptible of high polish hollowed out at its forward end to present a concavity 9 of paraboloidal contour and provided with a notch 10, which registers with the notch 6 in the ferrule. The block of metal is preferably cylindrical and of a diameter considerably less than that of the ferrule, so that when the block is rigidly attached to the inner surface of the ferrule by soldering or otherwise a considerable portion of the open end of the ferrule will be left unobstructed for purposes that will presently be explained.

The incandescent lamp 7, carried by the handle 4, is of very small size and has a stem 11, which fits smoothly within a socket 12, formed on the end of the handle. The stem 11 is formed of metal and is provided with a stud 13, which engages a bayonet-slot 14 in the socket 12, which is also of metal. Within the stem 11, which is electrically connected with one of the lead-wires 15 of the lamp-filament, is a wire 16, electrically connected with the other lead-wire and insulated from the outer portion of the stem 11, as shown. The wire 16 projects at its end beyond the stem 11, and when the stem is secured in the socket 12 the wire 16 contacts with the end of a conductor

17, which extends through the center of the handle and terminates at the other end in a small projection 18, which extends slightly beyond the end of a small sleeve 19, bearing a stud 20 and electrically connected with the socket 12. The sleeve 19 and the projection 18 are designed for introduction within a socket 21, in which terminate two current-bearing cables 22 and 23. The cable 22 terminates in a contact-piece 24, designed for contact with the projection 18, and the cable 23 connects with a sleeve 25, having a bayonet-slot 26 for the reception of the stud 20. The slot 26 consists of a portion extending longitudinally of the sleeve and an inner portion disposed obliquely to the portion first mentioned and serving as means for forcing the projection 18 into contact with the contact-piece 24 when the stud 20 is forced toward the inner end of the slot 26. On the other hand, when the stud 20 is moved in the opposite direction the contact of the projection 18 and contact-piece 24 will be broken.

In the back of the reflector 8 is secured a screw 27, which passes through a split arm 28, upon the free end of which is mounted a tube 29, disposed at a slight angle to the axis of the main vision-tube 1 and forming a support for a slender lens-tube 30, which is slidable and rotatable within the tube 29. The lens-tube 30 is provided at its rear end with a removable lens-holder 31 in threaded engagement with the tube, the lens-holder 31 being made removable to permit the introduction of lenses of different magnifying power to suit the conditions under which the device is used and to suit the eyes of the user.

In the front end of the tube 1 at an angle of about ninety degrees to the lateral branch 2 is formed a notch 33 for the introduction of applicators, probes, or other suitable instruments, and the end of the tube is designed for the reception of specula of different patterns, as shown in Figs. 1, 4, and 5 and lettered *a*, *b*, and *c*, which are used for aural, nasal, and rectal examinations, respectively. Each of the specula is provided at its rear end with a notch to cooperate with the notch 33 in forming an instrument-receiving opening, and it is to be understood that each type of speculum will be furnished in different sizes to adapt the instrument for work under various conditions. As the modes of introducing the different types of specula will be the ordinary modes of so doing, description thereof is regarded as unnecessary, and in describing the use of the instrument attention will be directed to the manipulation of the parts to secure proper lighting and easy vision.

In order to secure the best lighting effects, the handle 4, carrying the light 7, is adjustable longitudinally of the branch tube 2, within which it is frictionally held, and the ferrule 5, carrying the reflector 8, is adjustable longitudinally of the main tube 1. By these

two adjustments it is possible to bring the light to the exact point relative to the reflector at which it must be placed to secure the best lighting effects. The light and the reflector having been brought into proper relation, the tube 30, carrying the lens-holder, will be adjusted back and forth in the tube 29 to secure perfect focus upon the part to be examined, and the operator will then be able to observe the part through the speculum toward which the end of the tube 29 will always be directed. When it is desired to view the part with the unaided eye, the arm 28, carrying the tube 29, may be swung upon the screw, by which it is held in frictional engagement with the back of the reflector, and the open end of the ferrule left free for observation. The swinging of the lens-carrying tube out of the way also enables the operator to introduce his instrument through the open end of the tube instead of through the notch 33 in the side thereof, which will be of great convenience whenever a considerable degree of movement of the instrument is necessary.

Having thus described the construction and use of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a device of the class described, of a main vision-tube open at both ends, a concave reflector of smaller diameter than said tube removably secured at one side of the axis thereof, and a lamp in front of said reflector.

2. The combination in a device of the class described, of a main vision-tube, a ferrule secured within said tube, a reflector mounted within said ferrule at one side of the axis of the tube, and a lamp disposed in front of said reflector.

3. The combination in a device of the class described, of a main vision-tube, a ferrule carrying a reflector frictionally held within said vision-tube with the center of the reflector at one side of the axis of the tube, and an incandescent lamp disposed in front of said reflector.

4. The combination in a device of the class described, of a main vision-tube, a concave reflector disposed within said tube with its center at one side of the axis thereof, means for adjusting said reflector longitudinally of said tube, and an incandescent lamp disposed in front of said reflector.

5. The combination in a device of the class described, of a main vision-tube having open ends, a ferrule having an open back secured in the rear of said tube, a reflector of smaller diameter than said ferrule mounted in the ferrule at one side thereof, and an incandescent lamp disposed in front of said reflector.

6. The combination in a device of the class described, of a main vision-tube having a lateral branch tube, a reflector of smaller diameter than said tube mounted within the vision-tube adjacent to the branch tube, a handle frictionally held in said branch tube, and an incan-

descent lamp on the end of said handle projecting within said vision-tube.

7. The combination in a device of the class described, of a main vision-tube, a reflector of smaller diameter than said tube secured within said tube at one side, and a lens-tube mounted at the rear of said vision-tube and disposed at an angle to the axis of the tube.

8. The combination in a device of the class described, of a main vision-tube, a reflector of smaller size than said tube secured within the tube at one side thereof, an arm pivotally mounted at the back of the reflector, and a lens-tube carried by said arm.

9. The combination in a device of the class described, of a main vision-tube, a reflector of smaller size than said tube secured within the tube at one side thereof, a split arm pivotally mounted on a screw inserted into the rear of said reflector, and a lens-tube mounted on said arm.

10. The combination in a device of the class described, of a main vision-tube, a reflector of smaller diameter than said tube mounted within said tube and at one side thereof, an arm pivotally mounted at the rear of said reflector, and a lens-tube disposed at an angle to the axis of said vision-tube mounted on said arm.

11. The combination in a device of the class described, of a handle having a socket con-

nected with a current-bearing cable, a contact-piece in the end of said socket connected with a return-cable, and an incandescent lamp having a stem, the outside of which is electrically connected with one terminal of the lamp-filament and adapted for contact with said socket, and an inner part electrically connected with the other terminal of the filament and adapted for contact with the contact-piece within said socket.

12. The combination in a device of the class described, of a handle, an incandescent lamp carried by said handle, a sleeve on the outer end of said handle electrically connected with one terminal of the filament of the lamp, a conductor within said sleeve electrically connected with the other terminal of the filament and projecting beyond the end of said sleeve, said sleeve being provided on its exterior with a stud, and a socket having a bayonet-slot with an inclined terminal portion for the reception of said stud, and a contact-piece for contact with the conductor projecting beyond said sleeve.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS A. HOUGHTON.

Witnesses:

EUGENE M. STROUSS,
B. E. SCHADEL.