(No Model.) 2 Sheets—Sheet 1.

E. T. STARR.

ELECTRIC MOUTH AND THROAT ILLUMINATOR.

No. 313,782. Patented Mar. 10, 1885.

Fig. 1.

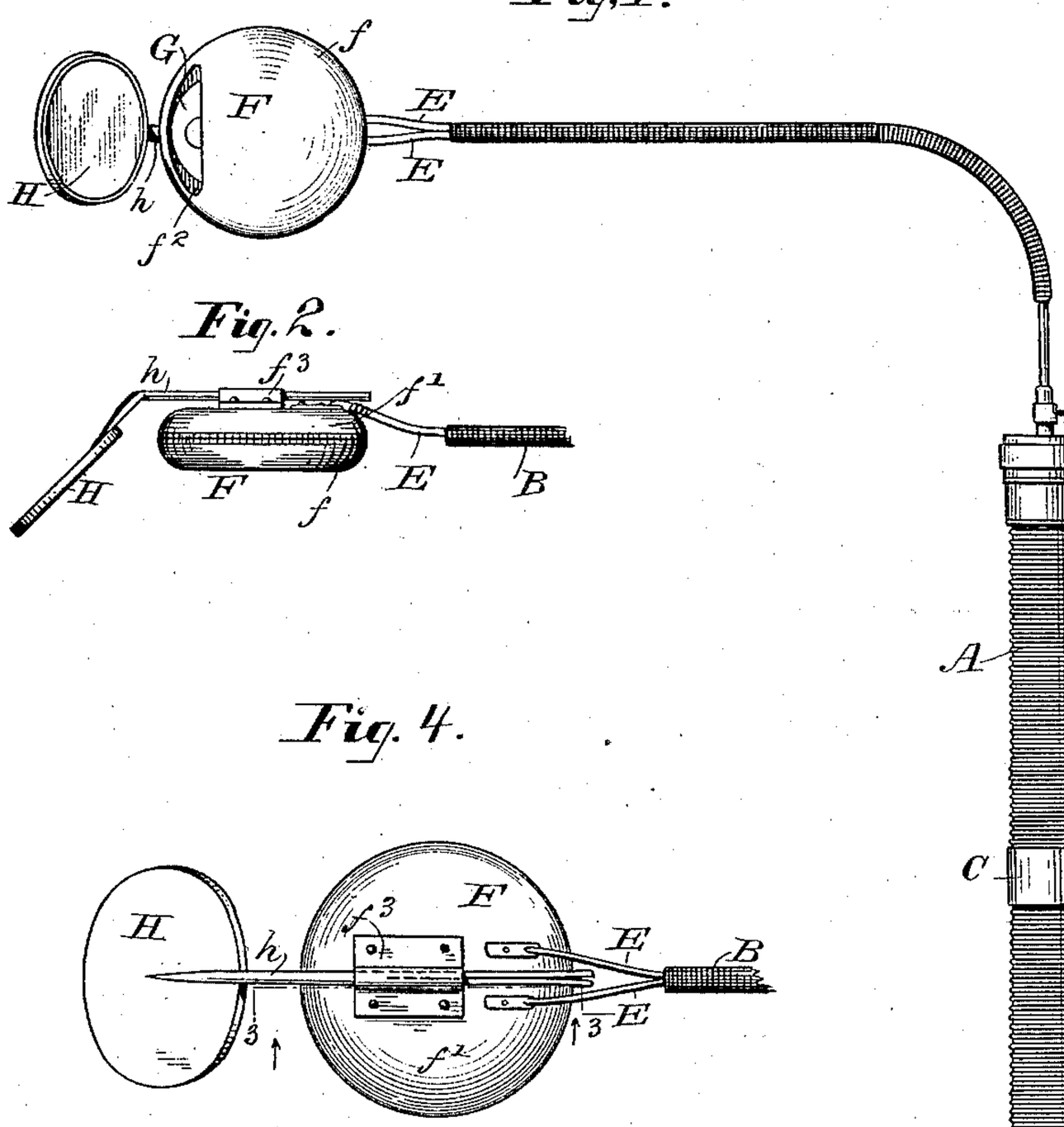
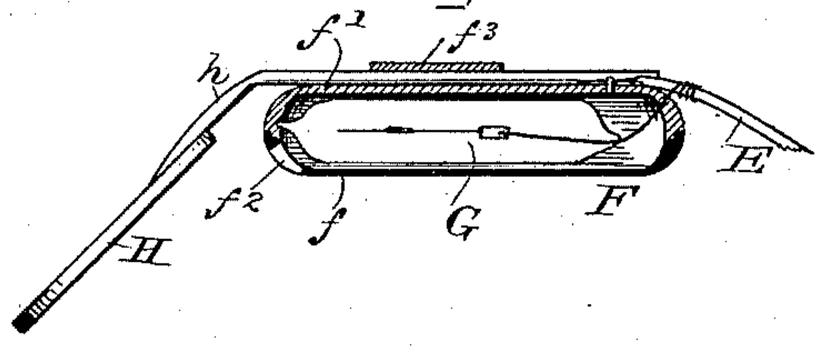


Fig. 2.

Fig. 4.

Fig. 3.



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Eugene V. Brown,

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(No Model.) 2 Sheets—Sheet 2.

E. T. STARR.

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Fig. 6.

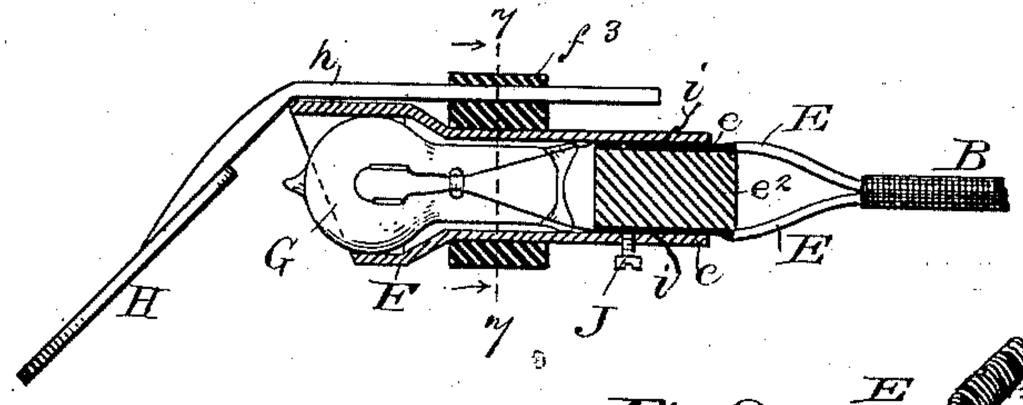

Fig. 7

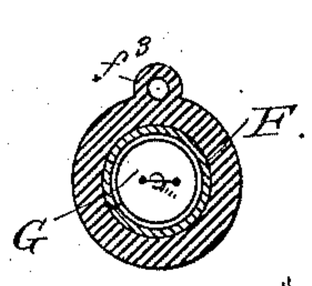

Fig. 8.

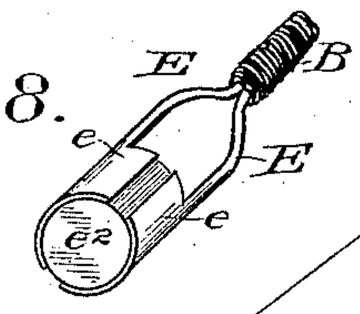

Fig. 9

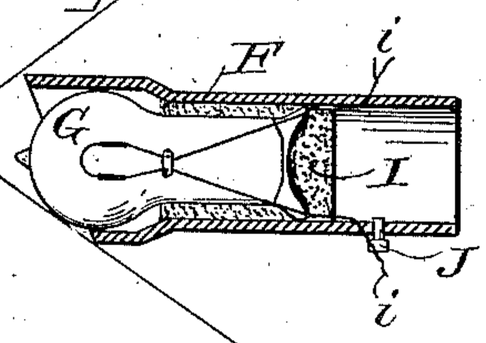

Fig. 5

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UNITED STATES PATENT OFFICE.

ELI T. STARR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE S. S. WHITE DENTAL MANUFACTURING COMPANY, OF SAME PLACE.

ELECTRIC MOUTH AND THROAT ILLUMINATOR.

SPECIFICATION forming part of Letters Patent No. 313,782, dated March 10, 1885.

Application filed May 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, ELI T. STARR, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Electric Mouth and Throat Illuminators or Laryngoscopes, of which the following is a specification.

This invention relates to illuminating the respiratory tracts and throat of the human body, such devices being known as "laryngoscopes."

The improvement also relates to electric-lamp holders or guards, so arranged with respect to a handle which carries them that the eyes of the operator are protected from the direct rays of the lamp.

The objects of my invention will hereinafter sufficiently appear, and the subject-matter claimed will be specifically pointed out at the close of the specification.

In the accompanying drawings, Figure 1 is a face view of the improved instrument, showing the front or illuminating face of the electric lamp and the glass or reflecting-surface of the mirror of the instrument. Fig. 2 is an edge view of the lamp and mirror, showing the manner of fitting the stem of the mirror or reflector to the back of the lamp-casing. Fig. 3 is a section through the lamp-casing, on the line 3 3 of Fig. 4; and Fig. 4 is a back or rear view of the lamp and mirror. Fig. 5 is a view of the instrument, showing the position of the hand of the operator and handle portion of the instrument relatively to the illuminating part of the instrument in operation, whereby the handle and hand of the operator are removed from the line of vision of the operator and obstruction to his sight removed, while more room is afforded for any operation upon the throat or the tubes leading thereto which may be desired. Fig. 6 is a longitudinal section through a modified form of the lamp and casing and connections with the handle, and Fig. 7 is a section therethrough on the line 7 7 of Fig. 6. Fig. 8 is a view of a portion of the conducting-connections of the modified form of lamp shown in Fig. 6; and Fig. 9 is a view of said modified form of lamp and its holder detached, this figure also showing lines drawn from the rear at angles relatively to the line of the lamp, to show that the eye of the operator to a wide angle or wide line of divergence from the center will be protected from the direct rays of the lamp.

In the form of instrument shown in Fig. 1 a suitable handle, A, carrying conducting-connections B, consisting of wire wound about an insulating-rod, and fitted with a sliding contact-piece, C, to vary the resistance to the passage of the electric current, is preferably provided, such handle being shown, described, and claimed by me in a prior application filed February 11, 1884, No. 120,385, and patented June 10, 1884, as No. 300,115. This form of handle is preferred.

The conducting-connections D D, leading from the battery or other source of electrical supply to the handle of the instrument, are connected to conducting-terminals of the wire of the handle at the butt-end of said instrument, while the conductors between the lamp and handle extend from the front end of said handle, as shown. Said conducting-connections between the lamp and handle preferably consist of two wires, E E, insulated from each other and bound together, for instance, by a suitable wrapping of braid or wire. These conducting connections or wires E E are bent, preferably, at a right angle to the handle A, as clearly shown in Figs. 1 and 5, so that the lamp at the outer end of said conducting-connections is carried to one side of the handle, and so that when the lamp is inserted in the mouth or into the throat the handle will be to one side of the head of the operator and out of the line of vision, and so that both the handle and the operator's hand will not be in the way to obstruct either the vision or operations of the operator.

The method of connecting the lamp with the outer end of the connections or wires E E is, as far as the apparatus shown in Figs. 1 to 5, inclusive, is concerned, as follows: The outer ends of the wires E E are preferably flattened and fitted to the back of the lamp-casing F, to which they are attached by small screws passing through the ends of the wires, and through or into said lamp-casing F, suitable screw-threads being provided. This lamp-casing F preferably consists of two shallow or

cup-shaped pieces, *f f'*, united together by screw-threads or by a slip or friction joint, or otherwise, if desired. This casing consists, also, of an insulating material, preferably hard rubber, which prevents the conducting of heat of the inclosed lamp G to the surface of the casing. Said lamp consists, preferably, of a flat glass vacuum-globe of well-known construction, in which is sealed a carbon or equivalent loop the terminals of which pass through the lamp-globe and through the non-conducting casing inclosing it, and are connected with the respective wires E E, whereby the circuit through the loop is established to render it incandescent when an electric current is passing over the circuit, as is common with electric incandescent lamps. By means of this incandescence of the carbon loop the light is produced which in the instrument is designed to light up the throat and its various tubes. The escape of the light of the lamp from the non-conducting casing which surrounds it is permitted through an opening, f^2, in the face of said casing F, as clearly shown in Figs. 1 and 3. A reflector or mirror, H, is fitted by its stem *h* to the back of the lamp-casing, and may be adjusted longitudinally in the socket or loop f^3, in which its stem slides by means of dividing the stem of the reflector so as to make the stem a spring-stem, as is obvious. Consequently, when the reflector or mirror is adjusted by its stem relatively to the lamp, it will be held in that position by friction due to the springing tendency of the members of the stem. The mirror is located at an angle to the lamp-casing, as shown, whereby the light escaping through the opening f^2 of said casing impinges upon the face of the mirror or reflector and is reflected down the throat or upon that portion which the instrument may be adjusted to throw the light upon, and thus clearly illuminates it for inspection and for operation by the surgeon.

By the construction described it will be seen that the connections between the lamp and handle are so curved as to carry the hand of the operator and handle of the instrument out of the direct line of vision of the operator in making his examination. So, also, it will be seen that the casing is so constructed as to throw the light of the lamp upon the reflector or mirror, which is adjustable and located at an angle to said casing, and be thus reflected into the throat or upon the surface desired, while at the same time the direct rays of the lamp are shielded from the eyes of the operator.

In Figs. 6, 7, 8, and 9 a modified form of lamp and guard or casing is exhibited. The handle and bent connections between the lamp and handle will preferably be the same as above described. In this construction the lamp has a cylindrical shank and round globe fitted in a tubular casing and secured therein, preferably, by means of a cement, I—such, for instance, as oxide chloride of zinc—which may be rendered plastic in order to be filled in around the shank or cylindrical part of the lamp-globe and between the walls of the guard or casing, and will then set or harden, so as to connect the two firmly together. The terminals *i i* of the incandescent loop are led down below the termination of the cement I, and preferably within the lower end of the tubular guard or casing, and then extended to the outside of said casing and suitably fastened. The connection between these terminal wires *i i* and the conducting-wires E E, which extend from the handle of the instrument, is effected in this instance by constructing the terminals of said wires E E in the form of bent plates *e e*, the two being fitted upon an interposed cylindrical plug, e^2, of non-conducting material, as clearly shown in Figs. 6 and 8. Said plates *e e* do not touch each other, as will be seen, so that in order to establish a circuit a conducting-connection must be formed between the respective plates *e e* and the terminal wires *i i* of the incandescent filament or loop, as shown in Fig. 6. When the plug or end of the wires E E is inserted in place in the end of the casing or guard F, it may be fastened by means of a set or thumb screw, J. By this means the lamp and its casing may be turned around or adjusted upon the conducting-wires E E, which adjustment is an important feature, as it enables the sliding or adjustable mirror or reflector, which is also carried in this modified construction of implement by means of the lamp-casing or a surrounding strip or holder thereon, as shown in Fig. 6, to be brought to the desired position for each operation. The tubular guard or casing F in the form of instrument illustrated in Figs. 6, 7, and 9 extends sufficiently far forward to surround all but the end of the lamp inclosed by the casing, and so that in operation the guard or casing will shield the operator's eyes, even from wide points of divergence, as illustrated, for instance, in Fig. 9, from the direct rays of the lamp.

Before reciting what I claim herein I would have it understood that I do not claim herein anything shown or described in my prior applications of November 17, 1883, No. 112,033, (subsequently patented June 17, 1884, as No. 300,523,) and January 25, 1884, No. 118,729, (subsequently patented June 17, 1884, as No. 300,524,) for electric-light mouth-lamps; nor anything shown or described in my application of February 11, 1884, No. 120,384, (subsequently patented June 17, 1884, as No. 300,525,) for electric-light speculums; nor anything shown or described in my application of February 11, 1884, No. 120,385, (subsequently patented June 10, 1884, as No. 300,115,) for electric cauterizing device, except as to the latter case, the electric lamp shown therein, which consists of a substantially flat electric-lamp globe surrounded by a casing consisting of two cup-shaped pieces held together at their edges. This particular improvement in electric lamps (shown in my said application of February 11, 1884, No. 120,385, Patent No.

300,115) is not claimed in that application, but is claimed herein, and constitutes part of the subject-matter of the present case; nor do I claim herein the particular construction of the lamp and casing and the particular slip-joint conducting-connections and clamp-screw arrangement between said lamp and the handle of the instrument, (shown in Figs. 6 to 9, inclusive,) as they form the subject-matter of another application filed by me as a division of this case at the demand of the Patent Office.

I claim as my invention—

1. The combination, with the substantially flat electric-lamp globe, of a substantially flat casing surrounding it, said casing consisting of two cup-shaped pieces held together at their edges, substantially as described.

2. The combination, with an electric lamp and its guard or casing, of a mirror or reflector arranged at an angle to and fitted directly upon said casing by a sliding connection, substantially as described.

In testimony whereof I have hereunto subscribed my name.

ELI T. STARR.

Witnesses:

P. GEO. VINSON, Jr.,

W. R. POTTER.