H. G. HEROLD.

ELECTRIC ATTACHMENT FOR OPHTHALMOSCOPES.

APPLICATION FILED MAR. 14, 1914.

1,145,586. Patented July 6, 1915.

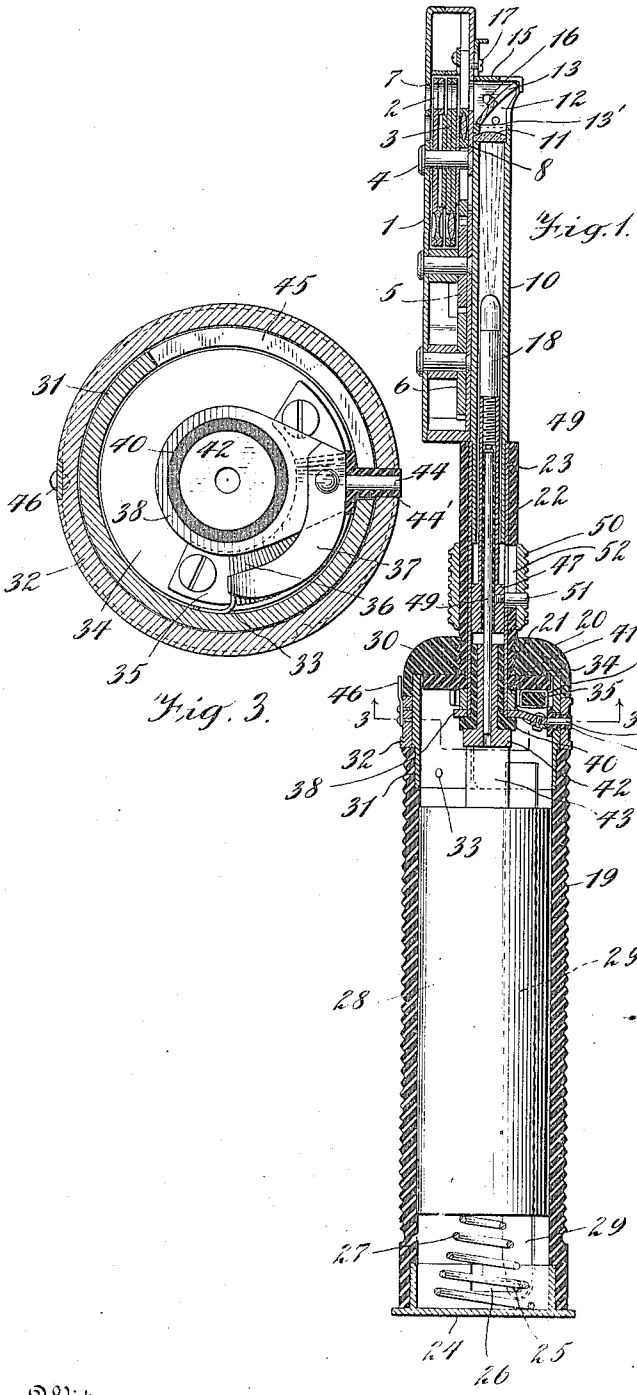


Fig. 1.

Fig. 3.

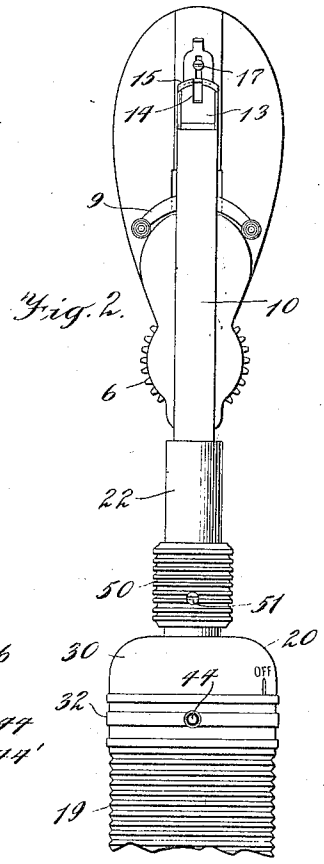


Fig. 2.

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ELECTRIC ATTACHMENT FOR OPHTHALMOSCOPES.

1,145,586. Specification of Letters Patent. Patented July 6, 1915.

Application filed March 14, 1914. Serial No. 824,665.

To all whom it may concern:

Be it known that I, HARRY G. HEROLD, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Attachments for Ophthalmoscopes, of which the following is a full, clear, and exact description.

This invention relates to electric attachments and more specifically to electric attachments for ophthalmoscopes of the multiple lens type.

In order to insure the requisite amount of light for an examination of the eye of the patient, it is common to use the so-called luminous ophthalmoscopes which are generally provided with a condensing lens and a reflecting mirror whereby the rays of light emanating from a small electric lamp may be focused directly upon the eye of the patient so that the examination may be conducted independently of any external fixed source of light.

Luminous ophthalmoscopes of various types have heretofore been used and generally comprise an electric attachment consisting of a hollow handle for supporting the ophthalmoscope, the handle carrying an electric lamp which is adapted to slide within the supporting sleeve of the ophthalmoscope, upon which sleeve is mounted the condensing lens and mirror while within the handle are concealed the electrical connections for supplying current to the lamp and also frequently a source of electrical energy such as a dry battery.

In the types of instruments heretofore produced and more frequently in those in which the current for the electric lamp is supplied by the battery, difficulties have been experienced in obtaining the proper and uniform intensity of light, as the strength of current supplied by the battery necessarily varies with the age of the battery. Moreover, in all instruments of this character, it is desirable that the intensity of the light be under the direct control of the oculist or other person without withdrawing his attention from the examination or test which he is conducting.

One of the aims of the present invention is, therefore, to provide an instrument which will avoid these difficulties and will comply with the requirements above stated, the invention consisting of placing a current controller within the handle of the ophthalmoscope which current controller is operated by means of an annular member or ring rotatably mounted on the outside of the handle and so positioned thereon that it may be manipulated by the fingers or thumb of the hand grasping the handle.

The invention also consists of a simple and compact arrangement of the parts which are manipulated during the test, that is, the member for operating the current controller, the driving mechanism for the lens carriers of the ophthalmoscope and the member for moving the electric lamp to change the focus of its rays are arranged in close proximity of each other so that they may each be manipulated by the fingers of the hand and thumb grasping the instrument, without necessitating a change of the position of the hand or without requiring the oculist or other person using the instrument withdrawing his attention from the examination which he is conducting.

Other objects of the invention will be apparent to those skilled in the art from the detail description hereinafter set forth and will be particularly pointed out in the appended claims.

In the accompanying drawings; Figure 1 is a central section of an ophthalmoscope having associated therewith, an electric attachment embodying the features of the invention; Fig. 2 is a front view of Fig. 1, only a part of the handle being shown; Fig. 3 is a transverse section on the line 3—3 of Fig. 1.

For the purpose of illustration, an ophthalmoscope is shown which is similar to that disclosed in the application for Letters Patent of Gustav W. Opitz, Serial No. 801,371, filed November 17th, 1913, which instrument consists broadly of a two piece casing 1, inclosing lens carriers 2 and 3 respectively which are concentrically mounted on a pin 4.

The lens carriers are driven by an intermediate gear 5 and a drive wheel 6, the casing 1 being cut away to permit a portion of the circumferential surface of the drive wheel 6 to be exposed so that it may be engaged by the fingers of the operator. The casing 1 is provided with the usual alining sight opening 7 with which the various combination of lenses carried by the carriers 2

and 3 are respectively brought into alinement to obtain lenses of the proper power for conducting the examination and tests on the eye of the patient. Arranged within the casing 1 and interposed between the carrier 3 and the front face of the casing is a slide 8 carrying a supplemental test lens which may be thrown into and out of alinement with the sight opening 7 by means of a forked rod 9 which is adapted to be engaged by the fingers of the operator. Secured to the front of the casing and extending from a point just below the sight opening 7 to the bottom of the casing 1 is a hollow substantially rectangular member 10 which is open at both ends and in the upper end of which is placed a condensing lens 11. Preferably integral with the upper end of the tubular member 10 are lugs 12 extending from the side faces of the tubular member, which lugs have their edges, which face the front of the casing, cut at an angle of 45 degrees thereto, and form seats for a reflecting mirror 13. The mirror 13 is of slight spherical curvature and is provided with a U-shaped slot 14 in order that the line of vision of the operator through the sight openings 7 to the eye of the patient will not be obscured. The mirror 13 is held in place by means of a U-shaped cap 15 having inwardly bent lugs 16 which engage with and securely hold the mirror against the seats 13'. The cap 15 is fastened to the lugs 12 and also to the front face of the casing by means of a screw 17 sliding in an elongated slot in a lug carried by the upper end of the cap.

The tubular member 10 forms the casing for the electric lamp 18 whose rays pass through the condensing lens 11 and are reflected by the mirror 13 upon the eye of the patient and the ophthalmoscope is supported and the lamp 18 is carried by and receives its current from the electric attachment which forms the features of the present invention. This electric attachment comprises a hollow tubular cylindrical member 19 of insulating material such as hard rubber or the like, the outer surface of which is preferably serrated or roughened in order to afford a good gripping surface. The upper end of the member 19 is closed by a semi-spherical shaped cap which is broadly designated, 20 and which has a threaded circular opening 21 in its top substantially concentric with the axis of the member 19. A tube 22 which is also of insulating material is threaded into the opening 21 and has a metallic lining 23, and the portion of the hollow tubular member 10, which extends below the bottom of the casing 1 is circular in cross section forming a hollow stem which fits snugly within the lining or sleeve 23 and rigidly supports the ophthalmoscope.

The lower end of the tubular member 19 is closed by a metallic cap or closure 24 which fits into the interior of the member 19 where it is held in place by means of pins 25 and bayonet slots 26. Secured to the inner face of the closure 24 is a helical spring 27 which yieldingly supports a dry battery 28 and also serves to electrically connect the closure or cap 24 to the casing or negative electrode of the dry battery. Connected to the pin 25 is a strip of conducting material 29 which rests against the inner wall of member 19 and extends to the upper end of the same, forming a part of the electric connections for supplying current to the lamp, as will hereinafter be referred to.

The cap which has broadly been designated 20 comprises a top 30 made of insulating material such as hard rubber or the like, to which is secured a depending metallic sleeve 31, which snugly fits into the upper end of the tubular member 19 and to which the conductor strip 29 is fastened. The sleeve 31 is secured to the tubular member 19 by means of screws 33, and surrounding the sleeve is an annular member or ring 32 which is capable of turning relatively to the handle and forms the operating member for the current controller, which will now be described.

Secured to the inner face of the top 30 is an annular disk 34 of insulating material, to which is fastened an arcuate shaped bar 35 which is also of insulating material. A resistance 36 consisting of a wire wound around the bar 35 is fastened at one end to the metallic sleeve 31 as shown in Fig. 3, while the other end is fastened to the insulating bar, thus constituting the break in the circuit of the lamp as will be later referred to. A switch blade 37 is secured to an arm 38 which is rotatably supported on a sleeve 40 of insulating material which passes through the opening in the annular disk 34 and fits snugly into the lower end of the metallic lining 23, the switch blade and arm being maintained in proper position to contact with the resistance 36 by means of a spacer block 41. Mounted within the insulating sleeve 40 is a hollow contact plug 42, the lower end of which is headed to form a terminal contact against which the positive electrode 43 of the dry battery 28 is maintained in good electrical contact by means of the helical spring 27.

The switch arm 37 is connected to the annular member or ring 32 by means of a pin 44 which passes through an elongated slot 45 formed in the sleeve 31, the pin being surrounded by an insulating bushing 44' which prevents short-circuiting of the resistance 36 by the contact of the pin 44 with the sleeve 31.

The resistance 36 and the slot 45 respec-

tively extend through substantially a quadrant of a circle and are so positioned with respect to each other that when the pin 44 is at one end of the slot 45, the resistance 36 will be entirely cut out of circuit as is shown in Fig. 3, while when the annular member 32 is turned to move the pin 44 to the other end of the slot 45, the contact between the switch blade 37 and the resistance 36 is broken, the end of the switch blade 37 resting on the end of the arcuate shaped bar 35. Secured to the annular member 32 is a pointer or marker 46 which registers with words "On" and "Off" printed on the depending walls of the top 30 and thus indicates the position of the current controller.

Slidably mounted within the tube 22 is a sleeve 47 having its lower end of enlarged diameter which is in electrical contact with the metallic lining 23, within which sleeve is secured a contact rod 49, insulated from the sleeve but is in electrical contact with the metallic contact plug 42 through which it passes. The upper end of the sleeve 47 is provided with an interior thread into which is screwed the electric lamp 18 one of the terminals for the lamp being the metallic sleeve 43 while the other terminal is the contact rod 49 which is adapted to contact with the center contact of the lamp.

The sleeve 47 and hence the electric lamp 18 are moved relatively to the condensing lens 11, to change the focus of the rays of light directed upon the eye of the patient by means of an annular member 50 which surrounds the exterior of the tube 22 and which is connected to the sleeve 43 by means of a pin 51 passing through a vertical elongated slot 52 cut in the tube 22 and lining 23 respectively.

Assuming that the circuit to the lamp is broken, *i. e.*, the switch blade 37 rests on the insulating bar 35 with the pin 44 abutting the left hand end of slot 45 (see Fig. 3), to turn on the current, the annular member 32 is moved in a clock wise direction, to carry the switch arm 38 and the switch blade 37 into contact with the resistance 36. Current will then pass through the lamp by means of the following circuit: from the positive electrode 43 of the dry battery 28 to plug contact 42, contact rod 49, to the lamp, through sleeve 47, metallic lining 23, switch arm 38, switch blade 37, resistance 36 to the metallic sleeve 31, and thence by means of conductor strip 29 to the metallic closure 24, helical spring 27 to the negative electrode or the casing of the battery.

After the lamp has been lighted, it is sometimes desirable to twist the lamp 18 within the tubular member 19 in order to position the carbon filament of the lamp so that the rays emanating therefrom will be thrown on the reflecting mirror 13 in a predetermined manner as is well known to one skilled in the use of the instrument. The annular member 32 may then be still further rotated in a clock wise direction to cut out a greater portion of the resistance 36 so as to increase the intensity of the light, and it will be apparent that irrespective of the position of the hand on the hand member 19, the fingers or thumb of the hand will be in a position to readily engage the annular ring 32 in order to control the supply of current. It will also be evident that the annular member 32 and associated parts serve as a switch for opening and closing the circuit to the lamp as has been described.

The annular member 50 being located immediately above the top of the hand member, and the drive wheel 6 being also located adjacent the annular member 50, any of them may be manipulated or engaged by the fingers of the hand of the operator during the test without withdrawing his attention from the test which he is conducting. The above construction affording a very simple and compact arrangement of parts which has been found highly desirable in practice.

While I have shown the electrical attachment which forms the main features of the invention in combination with an ophthalmoscope, yet a hollow handle, which contains electrical connections including a current controller operated by an annular ring mounted on the exterior of the handle in a position to be grasped by the fingers of the person holding the handle, is adapted for use with instruments other than an ophthalmoscope and it is not my intention to limit this feature of the invention to a specific use with an ophthalmoscope, but only by the scope of the claims appended hereto.

Having described my invention, I claim:

1. In an electric attachment for a diagnostic instrument, a hollow hand member, a lamp supported thereby, electrical connections for said lamp therein including a current controller, and an annular member rotatably mounted and surrounding the handle for operating said current controller, said annular member being mounted in a position to be manipulated by the fingers or thumb of the hand of the person grasping the hand member.

2. In an electric attachment for a diagnostic instrument, a hollow hand member, a lamp supported thereby, electrical connections for said lamp in said hand member including a resistance, a switch arm adapted for engagement with said resistance and an annular member rotatably mounted on the exterior of the hand member connected to said switch arm.

3. In an electric attachment for a diagnostic instrument, a hollow hand member

adapted to contain a dry battery; an electric lamp supported by said hand member; connections for electrically connecting the battery to the lamp, including a current controller comprising a resistance and a switch arm for engagement therewith, and means comprising an annular band on the exterior of the hand member for operating said current controller.

4. In an electric attachment for a diagnostic instrument, a hollow handle adapted to contain a source of electric energy; a metallic sleeve on said handle adapted to support said instrument, a hollow tubular member slidably mounted in said sleeve, an electric lamp carried by said member; an electric resistance in said handle, a switch arm coöperating therewith and electrically connected to said tubular member, a hollow contact plug supported in but insulated from said sleeve, and a contact rod in said tubular member insulated therefrom and in electrical contact with said contact plug and means for connecting the electrodes of the battery to said contact plug and resistance respectively.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

HARRY G. HEROLD.

Witnesses:
R. A. MEYROWITZ,
ERNEST A. HAUSER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."