

Jan. 4, 1938.

C. JONES

2,104,198

MAGNIFYING AND ILLUMINATING DEVICE

Filed Nov. 18, 1935

2 Sheets-Sheet 1

FIG. 1.

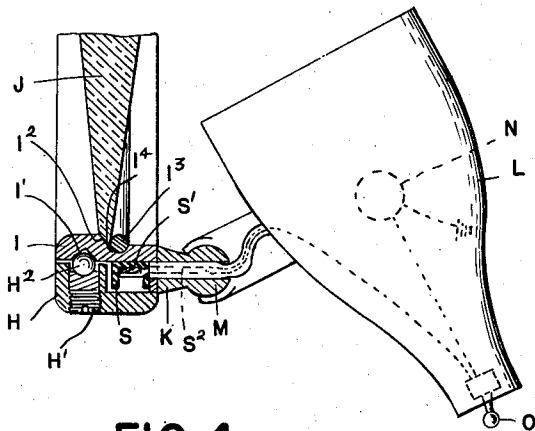
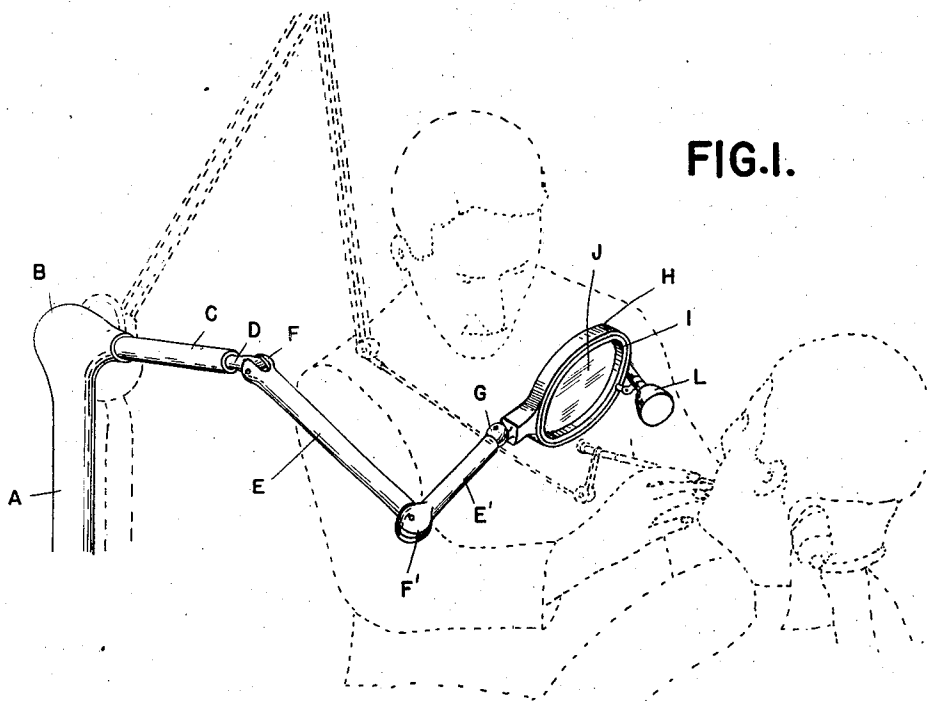


FIG. 4.

INVENTOR

CLEVOE JONES

BY *Whittemore Hulbert*
Whittemore Belknap
ATTORNEYS

Jan. 4, 1938.

C. JONES

2,104,198

MAGNIFYING AND ILLUMINATING DEVICE

Filed Nov. 18, 1935

2 Sheets-Sheet 2

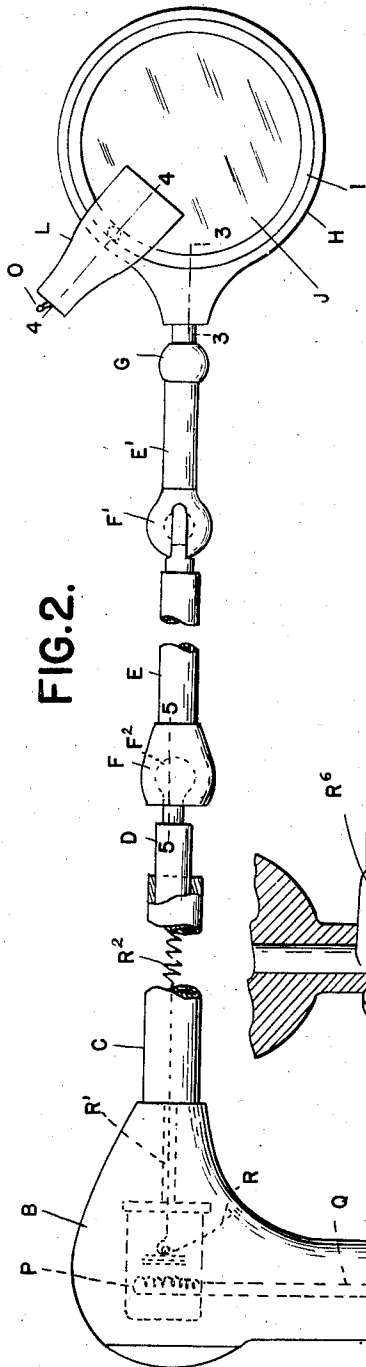


FIG. 2.

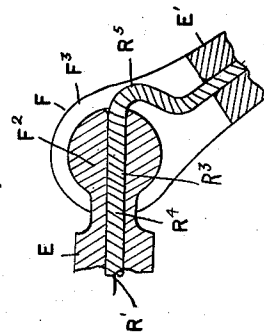


FIG. 5.

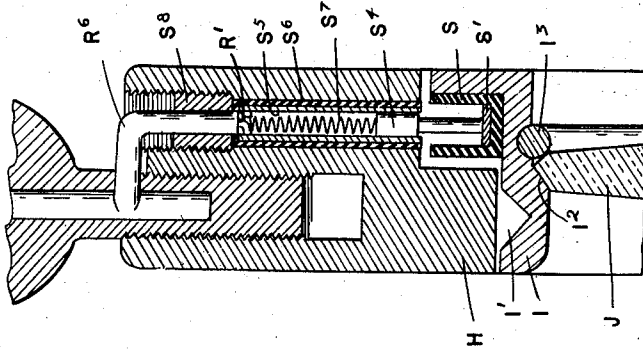


FIG. 3.

INVENTOR
CLEVOE JONES
BY *Whittemore Hulbert*
Whittemore & Bell ATTORNEYS

UNITED STATES PATENT OFFICE

2,104,198

MAGNIFYING AND ILLUMINATING DEVICE

Clevoe Jones, Detroit, Mich., assignor to Detroit Dental Manufacturing Company, Detroit, Mich., a corporation of Michigan

Application November 18, 1935, Serial No. 50,454

9 Claims. (Cl. 240-2)

The invention relates to apparatus of that type in which a magnifying lens is associated with an electric light so as to give an enlarged vision of the illuminated part. It is the object of the present invention to simplify the construction and to facilitate the use of the same, and to this end, the invention consists in the construction as hereinafter set forth.

In the drawings:

Figure 1 is a perspective view of the device;
Figure 2 is a sectional side elevation thereof;
Figure 3 is an enlarged section on line 3-3 of Figure 2;

Figure 4 is a section on line 4-4 of Figure 2;
Figure 5 is a section on line 5-5 of Figure 2.

In general structure, my improved instrument comprises a standard such as that of a dental engine to which is attached a jointed arm carrying at its outer end a magnifying glass and an electric light associated therewith adjustable into various positions. One difficulty encountered with such a structure is the supplying of electric current to the light in its various positions of adjustment without entanglement of the electrical conductors used for this purpose. Thus, the operator must frequently shift the light from one side to another of the lens, as well as changing the angle of its axis or direction in which the light is projected. With my improved construction, this difficulty is avoided; first, by placing the electrical conductor within the jointed arm on which the lens is mounted, also, by mounting the lens and the lamp on a common frame which is rotatably secured within a supporting frame, and supplying current to the lamp through an annular conductor movable therewith and engaging a stationary brush. Thus, the lamp and lens may be adjusted to any angular position as desired without entanglement of the current conductors.

In detail, A is a suitable standard such as that used for supporting the mechanism of a dental engine. B is a hollow casing mounted at the upper end of the standard A and forming a swivelling support for a laterally extending tubular arm C. This preferably has a telescopic section D which permits of extending the length thereof, and a plurality of jointed sections E, E'. The latter are connected to the arm D and to each other by universal joints F, F', and the outer section E' is connected by a universal joint G with an annular frame H. Within the frame H is rotatably secured a second annular frame I in which the lens J is mounted. At one point in the frame I is a laterally projecting post K

forming the mounting for the lamp casing L which is secured to said post by a universal joint M. The lamp casing L is provided with an electric bulb N and is of any suitable construction for projecting a beam of light therefrom. At the rear end of the casing L is a switch O for controlling the turning on or off of the light.

Where alternating electric current is available, I arrange within the hollow casing B a transformer P through which a commercial current such for instance as 110 volts is transformed to a relatively low voltage suitable for the bulb N. The primary conductors Q for this transformer are coupled by a suitable plug Q' with a source of current (not shown). The secondary circuit has one terminal R grounded on the casing B, while the other terminal is connected to an insulated conductor R' extending longitudinally through the hollow arm. This conductor R' has a coiled portion R² permitting of the extension of the telescopic section D and also has portions R³ passing through each of the universal joints. As shown in Figure 5, the universal joint F has a ball member F² and a split socket member F³ respectively connected to the members D and E. The portion R³ of the conductor R' is preferably surrounded with a resilient helical armored coil R⁴ and this after passing out from the ball F² has a loop portion R⁵ connecting the same to the portion which passes axially through the socket F³ into the portion E. A similar construction is employed at each of the universal joints F' and G, so that the jointed sections may be turned to different angular positions with a comparatively slight flexing of the conductor.

The annular frames H and I are of an off-set or rabbeted cross-section and are held in rotative engagement with each other by balls or pins in the one engaging an annular groove in the other. As shown in Figure 4, the frame H has a plurality of radial bores therein which are normally closed by screw threaded plugs H', but which permit of the insertion of balls H² so as to partly engage an annular groove I' in the frame I. These balls will thus hold the two frames from disengagement, while permitting the free rotation of the one upon the other. Between the frames H and I is an annular space in which is located a grooved insulator member S secured to the member I. Within the groove of this insulator member is a conductor band S' which at one point is connected to an insulated conductor S² passing through the universal joint M and into the lamp casing L to the bulb N, the opposite ter-

terminal of the bulb being connected to the switch O and then grounded on the frame I. S⁴ is a contact brush member slidable within a conductor tubing S⁵ which in turn is within an insulator tube S⁶ in the frame H. The brush S⁴ extends into the groove of the insulator member S and is resiliently pressed against the contact strip S' by a spring S⁷ within the tube S⁵. The opposite end of the tube S⁵ is connected to the terminal end of the conductor R', an insulated portion R⁸ of which passes through the universal joint G. S⁸ is a screw threaded plug engaging a radially extending screw threaded aperture in the frame H in which the tubes S⁵ and S⁶ are inserted and which serves to hold the said parts in position.

With the construction as just described the secondary current from the transformer P will pass through the conductor R' and the successive sections of the jointed arm to the tube S⁵. From this tube current is conducted through the spring S⁷ and contact brush S⁴ to the strip S' from which it passes through the conductor S² to the lamp bulb N. If the switch O is closed the circuit will be completed through said switch to the frame I and thence back through the metal of the arm to the transformer P. This circuit remains unchanged without regard to the position of adjustment of the lamp casing L about the frame H or the angularity of any of the parts. Also, as the lens J functions the same in every position of relative adjustment of the frame I, the operator can adjust the lamp to the most favorable angle for illuminating the work and at the same time obtain an enlarged vision of the work through the lens.

The lens J is preferably detachably mounted in the frame I by engaging the marginal portion thereof with a shoulder I² and retaining it in this position by a snap ring I³ engaging a groove I⁴.

Where the electrical service is D. C. current I dispense with the transformer and place within the hollow casing a suitable resistance for cutting down the voltage. Also, in place of grounding one terminal, two conductor wires are extended to the lamp.

What I claim as my invention is:

1. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a lamp casing pivotally attached to said frame to be angularly adjustable relative thereto, an electric lamp in said casing, a second annular frame in which said lens frame is revolvably mounted, an adjustable support for said second frame, a conductor for conveying electric current through said adjustable support and second frame, and a ring and brush contact connection between said frames for supplying current from said conductor to said lamp in all positions of relative adjustment of said frames.

2. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a lamp casing pivotally attached to said frame to be angularly adjustable relative thereto, an electric lamp in said casing, a second annular frame in which said lens frame is revolvably supported leaving an annular chamber therebetween, an insulator ring mounted on one of said frames within said annular chamber, a conductor ring supported by said insulator ring, a contact brush having an insulator mounting in the other of said annular frames and resiliently pressed against said conductor ring, an adjustable sup-

port for said second frame, and an insulated electrical conductor passing through said adjustable support and second frame and connected by said brush and ring contact to said lamp whereby current is supplied to said lamp in all positions of relative adjustment of said frames.

3. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a post projecting laterally from said frame, a lamp casing universally pivoted upon said post, an electric lamp in said casing, a second annular frame in which said first frame is revolvably supported leaving an annular chamber therebetween, a grooved insulator ring connected to said first frame within said annular chamber, a conductor ring within the groove of said insulator ring electrically connected to one terminal of said lamp, an insulated conductor tube extending radially through said second frame, a contact pin slidable within said tube and projecting into the groove in said insulator ring, a spring within said tube for pressing said contact pin against said conductor ring, a jointed support for said second frame, and an insulated electrical conductor passing through said jointed support and connected with said insulated tube to convey current to said lamp in all positions of relative adjustment of said frames.

4. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a lamp casing pivotally attached to said frame to be angularly adjustable relative thereto, an electric lamp in said casing, a second annular frame in which said lens frame is revolvably mounted, a support for said second frame including a hollow casing and a jointed hollow arm projecting laterally therefrom, an electrical step-down transformer within said hollow casing having one terminal of the secondary coil thereof grounded on said casing, an insulated electrical conductor extending from the other secondary terminal through said jointed hollow arm to said second annular frame, and a ring and brush electrical connection located between said frames for conveying current from said insulated conductor to one terminal of said lamp the other terminal of which is grounded on said frame.

5. The combination with a supporting standard, of a hollow arm formed of a plurality of universally pivoted sections projecting laterally from said standard, an annular frame universally pivoted to the outer end of said arm, a second annular frame rotatably mounted within said first frame, a lens supported in said second frame, a lamp casing pivotally supported on said second frame, an electric lamp in said casing, and means for conducting current to said lamp through said hollow arm and annular frames including an insulated annular contact on said second frame and a brush on said first frame cooperating therewith.

6. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a lamp casing pivotally attached to said frame to be angularly adjustable relative thereto, a second annular frame in which said lens frame is revolvably mounted and means for conducting current to said lamp concealed between said frames.

7. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a lamp casing pivotally attached to said

frame to be angularly adjustable relative thereto, a second annular frame in which said lens frame is revolubly mounted, a jointed arm for adjustably supporting said second frame, an electrical conductor carried by said jointed arm, and means for transmitting current from said conductor to said lamp concealed between said frames.

8. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a lamp casing pivotally attached to said frame to be angularly adjustable relative thereto, a second annular frame in which said lens frame is revolubly mounted, a hollow jointed arm for adjustably supporting said second frame,

an electrical connection passing through said hollow jointed arm and annular frames to said lamp.

9. In a device for simultaneously illuminating an object and affording magnified vision thereof, a lens, an annular frame in which said lens is mounted, a lamp casing pivotally attached to said frame to be angularly adjustable thereto, a second annular frame in which said lens frame is revolubly mounted, a hollow jointed arm for adjustably supporting said second frame, an electrical conductor passing through said hollow jointed arm, and means within said annular frames for completing electrical connection between said conductor and lamp.

CLEVOE JONES.