

1,434,404.

Patented Nov. 7, 1922.

Fig. 3.

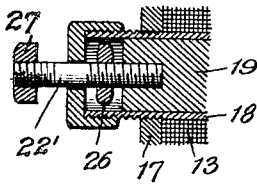


Fig. 1.

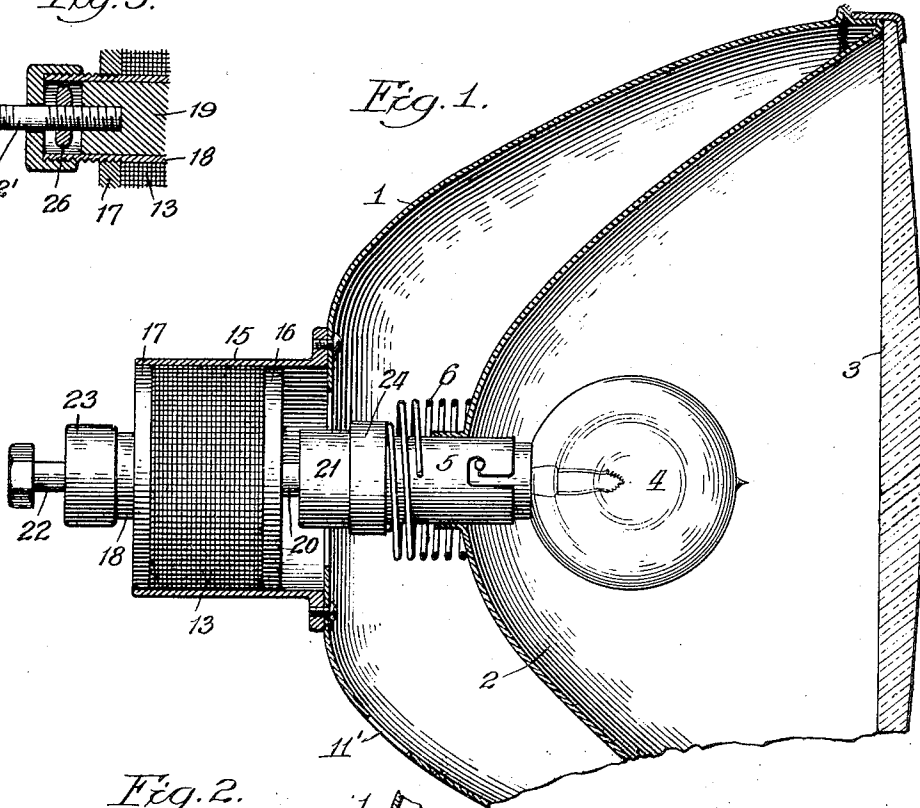
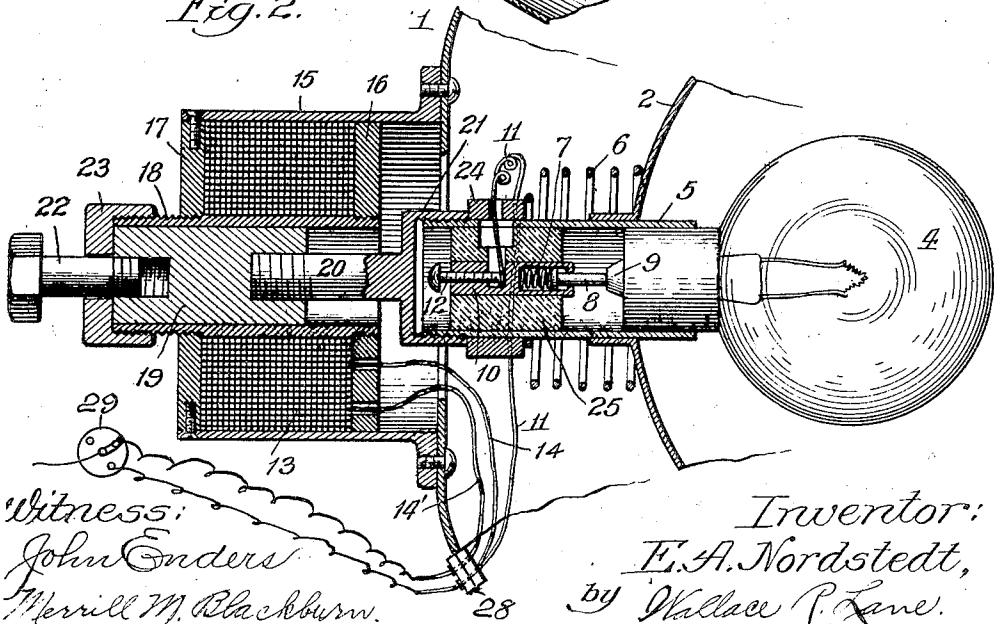


Fig. 2.



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UNITED STATES PATENT OFFICE.

EINAR A. NORDSTEDT, OF JOLIET, ILLINOIS.

DIMMER.

Application filed December 31, 1919. Serial No. 343,536.

To all whom it may concern:

Be it known that I, EINAR A. NORDSTEDT, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Dimmers, of which the following is a specification.

My invention relates to dimmers, and in particular to electro-magnetically operated dimmers.

Among the objects of my invention are to provide means for shifting an electric lamp out of and into the focus of a reflector; to provide means for limiting the amount of motion of the adjustable lamp; to provide an electro-magnetic means for shifting the lamp in one direction and automatic means for returning it to normal position; to provide means in which the effect of shifting the lamp out of the focus is supplemented by putting the coil of the electro-magnet in series with the lighting circuit; and such further objects, advantages, and capabilities as will later more fully appear.

My invention further resides in the combination, construction, and arrangement of parts illustrated in the accompanying drawing, and while I have shown therein preferred embodiments, I desire the same to be understood as illustrative only, and not as limiting my invention.

In the annexed drawing, forming a part of my application, Fig. 1 shows the reflector and supporting casing of my device in section, with the lamp, electro-magnet, and connections in elevation. Fig. 2 is a fragmentary detail, enlarged, showing the electro-magnet, socket, and connections in longitudinal section. Fig. 3 is a longitudinal section of a modified construction, showing adjusting means for varying the distance which the lamp may be moved in either direction.

Referring more in detail to the constructions shown, numeral 1 refers to the supporting casing, 2 to the reflector mounted therein, 3 the glass plate or lens closing the open end of the above-mentioned parts, 4 the lamp, 13 the electro-magnet for actuating the lamp in one direction, and 6 the coil spring for actuating it in the opposite direction. The lamp 4 is an ordinary Edi-

swan lamp, connected to the sleeve 5 by a bayonet slot connection, the spring 7 and plunger 8 holding the lamp in the socket and making electric connection with the central terminal thereof, while the other terminal is connected through the metallic shell of the lamp stem and the sleeve 5 through a grounded connection to a battery or other source of electrical supply. The central terminal 9 of the lamp is connected through pin 8 and spring 7, as stated above, with the metallic plug 10, to which is secured a lead wire 11 by means of a screw 12. Wire 11 is connected to a double pole socket (28), mounted in aperture 11' of casing 1, and to the same terminal of this socket is connected one terminal 14 of the solenoid 13, while the opposite terminal 14' of this solenoid is connected to the other terminal of the double pole socket. From this socket lead two wires to a 3-way switch 29 by means of which the current may be cut off or sent through the solenoid and the lamp, or sent directly to the lamp without going through the solenoid. The current, in going to the solenoid and lamp in series, will pass through wire 14', coil 13, wire 14, wire 11, plug 10, spring 7, pin 8, lamp 4, sleeve 5, reflector 2, to ground as shown in Fig. 2. In getting from the source of current of the lamp without going through the electro-magnet, it will pass from the switch directly through wire 11 and follow the course as stated above.

Secured to the back of the support 1 is a flanged sleeve 15, in which is mounted the solenoid 13, held in place by disks 16 and 17, and sleeve 18 (of brass or other suitable material), screw-threaded at its opposite ends to engage the metallic disks 16 and 17 and to hold them in place against the ends of the coil. Within the sleeve 18 is mounted an iron core 19 drilled and tapped at its opposite ends to receive the bolt 22 and the screw-threaded plug 20 of the socket member 21. Limiting the outward motion of the core 19 is a cap 23, secured to the external screw-threaded end of the sleeve 18, the inward motion of the core being limited by the head of bolt 22 striking against the outer face of cap 23. This can be made adjustable, if desired, by having the hole, into which bolt 22

fits, deeper than shown and the bolt threaded for a greater portion of its length. The socket member or cup 21 is shown connected to sleeve 5 by means of the screw threads on the end of the sleeve. Therefore, when core 19 is drawn inwardly by solenoid 13 sleeve 5 will also be forced forwardly and will carry with it the electric lamp 4, which is normally in focal point, and move it forwardly out of the focus of reflector 2, thereby reducing the intensity of the illumination in front of the reflector. It will be understood from the foregoing that when the current passes through wire 14' and the solenoid 13, the solenoid will be in series with the lamp 4 and will therefore supplement the action of the removal of the lamp from the focal point of the reflector by inserting a considerable resistance in the circuit of this lamp, while, when the current flows directly to the lamp through wire 11, this resistance above referred to is entirely out of the circuit, so that one gets substantially full benefit of the current consumed in the illumination produced.

It will be seen that spring 6, having one end resting against the back of the reflector 2 and its other end resting against the ring 24 will force this backwardly against the force of the solenoid, which, however, is strong enough to overcome the tension of the spring. When the current has been switched from wire 14' to wire 11, the spring will draw the lamp backwardly, as indicated above. Metallic sleeves 15 and 18 and disks 16 and 17 together form a magnetic circuit for lines of force passing through the core 19 of the solenoid. It should perhaps be mentioned that sleeve 5 is insulated from plug 10 by means of sleeve 25.

In the device shown in Figs. 1 and 2, the head of bolt 22 limits the inward movement of the core and the movement of the lamp, while in the device shown in Fig. 3, bolt 22' is provided with two adjustable nuts, 26 and 27, the first of these being adjustable longitudinally along the inner end of the bolt to limit the backward movement of the lamp, so that the same may be caused to stop precisely at the focus of the reflector, while the nut 27 at the outer end of bolt 22' may be adjusted to limit the distance that the lamp is moved out of the focus of the reflector. In this way a variable effect may be produced as well as securing the best adjustment of the lamp with respect to the focus of the reflector.

The advantages secured by operating the solenoid in series with the lamp during the dimming of the light are so evident that it is scarcely considered necessary to detail them herein. However, it may be noted that a greater dimming of the light may be secured with the same current consumption, and for a light of a given brilliancy, less current will be consumed, owing to

the fact that the resistance of the wire which throws the lamp out of focus is utilized in cutting down the current flowing through the lamp circuit. This is a very marked improvement over a construction in which the solenoid and lamp are operated in parallel circuits.

It is of course understood that the specific description of structure set forth above may be departed from without departing from the spirit of my invention, as set forth in this specification and the appended claims.

Having now described my invention, I claim:

1. In a structure of the character specified, the combination of an electric lamp slidably mounted along the axis of the structure, a spring for normally pushing the lamp in one direction, a solenoid for actuating the lamp in the opposite direction, an adjustable stop exteriorly mounted for regulating the extent of movement of said lamp in one direction, and a switch whereby electric current may be caused to flow either through the lamp alone or alternatively through the lamp and solenoid in series.

2. In combination, a casing, a concave stationary reflector mounted within said casing, a sleeve mounted on the outside of said casing, said sleeve carrying a solenoid provided with a reciprocable core, a cup connected with said core and carrying an electric lamp inside of the concave reflector, and means for passing an electric current at will through the lamp alone or through the lamp and solenoid in series.

3. In a device of the character specified, a casing, a lamp mounted for reciprocation with respect to said casing, a solenoid provided with a core and adapted to reciprocate the lamp, in combination with means for limiting the amount of reciprocation of said lamp, said means being constructed to permit adjustment of the amount of reciprocation of the lamp from the exterior of said casing, comprising an adjustable bolt to cooperate with a recess with said reciprocating core.

4. In a lamp dimmer, a casing, a reflector, a lamp normally located at the focus of the reflector, resilient means tending to hold the lamp in normal position, a sleeve mounted on one side of said casing and housing, a solenoid in series with the lamp and provided with a core slidably mounted along the axis of the reflector and connected with the lamp to operate same against the tension of the resilient means, in combination with an electrical connection between the lamp and solenoid, and a switch for including in a power circuit the lamp alone or the lamp and solenoid in series.

5. In a device of the class described, a casing, a reflector having mounted therein an electric lamp longitudinally movable into and out of focal position, a solenoid for mov-

ing said lamp out of focus externally my name to this specification in the presence
mounted on said casing, and connections to of two witnesses.
throw said solenoid and lamp in series when
the lamp is out of focus and to shunt the
5 current around the solenoid and directly into
the lamp when it is in focus.

In witness whereof, I hereunto subscribe

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Witnesses:

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