(No Model.)

J. F. McELROY.

APPARATUS FOR REGULATING THE INTENSITY OF INCANDESCENT LIGHTS.

No. 484,110. Patented Oct. 11, 1892.

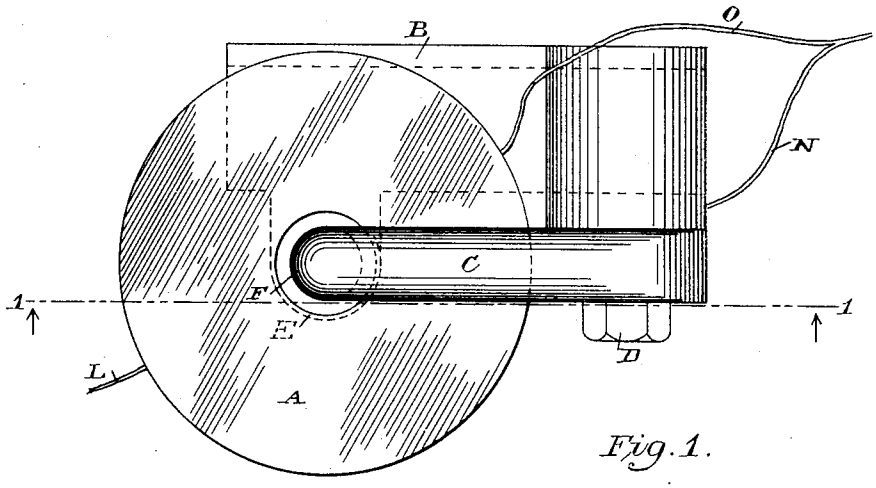

Fig. 1.

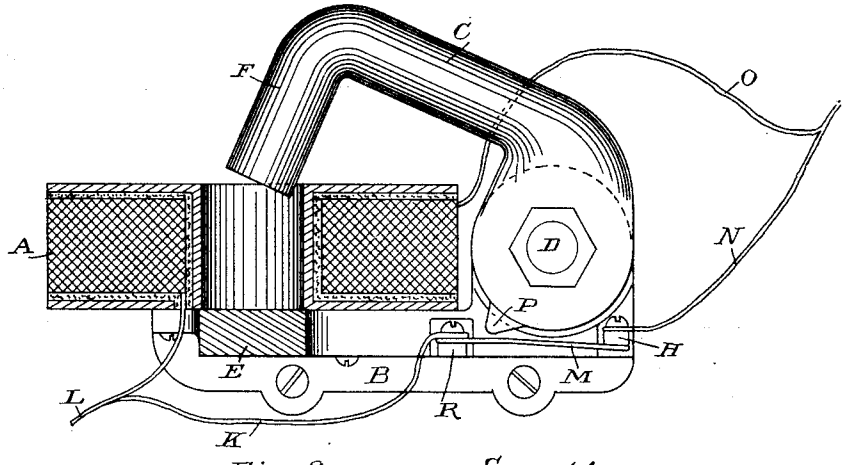

Fig. 2. Sec. 1-1.

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APPARATUS FOR REGULATING THE INTENSITY OF INCANDESCENT LIGHTS.

SPECIFICATION forming part of Letters Patent No. 484,110, dated October 11, 1892.

Application filed March 18, 1892. Serial No. 425,386. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at the city and county of Albany, State of New York, have invented a new and useful Improvement in Apparatus for Regulating the Intensity of Incandescent Lights, of which the following is a specification.

My invention relates to apparatus for regulating incandescent lights where alternating or intermittent currents are used; and the object of my invention is to produce a simple and efficacious means for increasing and diminishing the amount of light emitted by the incandescent lamps in a circuit. I attain this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan, and Fig. 2 is a section along the lines 1 1 on Fig. 1.

Similar letters refer to similar parts throughout the several views.

The coil A is supported by an iron framework B and is connected in circuit with incandescent lamps. An intermittent or alternating current is passed through the coil. Attached to the iron framework B is the iron armature C, fulcrumed at D. The armature C is bent near its end, as shown in Fig. 2, in such a manner that the portion F may be placed within the coil A, passing through the center of the coil, coming into contact with the iron frame B at the point E. When the armature C is placed through the coil A, coming in contact with the frame B at E, there is a complete magnetic circuit through the coil, through the iron frame B, through the armature C, through the end F of the armature into the frame B at the point E. When the armature C is placed in the position shown in Fig. 2, there being no iron within the coil, the iron is not magnetized and the current through the coil simply has to overcome the resistance of the coil plus its self-induction. As the current used with this apparatus is an alternating current, it is evident that the iron armature is not drawn into the coil, as it would be if a straight current were used. It will remain in whatever position it is placed. When the iron armature C is placed within the coil, the alternating current in the coil meets with the ordinary resistance of the wire, plus the self-induction of the coil, plus the impedence due to the presence of the iron armature. This impedence acts as a resistance, so that by placing the armature within the coil the resistance of the coil is increased many times, which is necessarily attended by a decreased flow of current through the coil, which consequently decreases the amount of light given out by the lamps.

The cause of the action of the coil on the iron is attributable to two things: First, to the electrical work done by the alternating current in magnetizing and demagnetizing the iron armature and the frame. As the work done by an alternating current reacts upon that current as a resistance, it is evident that whatever work is done magnetizing and demagnetizing the iron acts as a resistance upon the current through the coil and decreases the flow. Second, the flow is impeded through the coil by the induction developed within the iron armature C. These are Foucault or eddy currents, which are set up within the iron through the inductive action of the currents in the outside coil. These being within the iron itself, the currents are of large quantity, but very low potential. They nevertheless result in heating the iron armature more or less. For that reason the coil should be constructed as open as possible, so as to allow a free circulation of air through the iron parts, and so constructed that the iron does not come in direct contact with it in order to prevent any danger of heating the iron and injuring the insulation of the coil.

In order that the lights may come to their full brilliancy, I have arranged, in addition to the mechanism as already described, a means for switching the coil out of the circuit when the armature is withdrawn. For this purpose I secure the wire K to the wire L just before the wire L reaches the coil A. The wire K is insulated from the iron frame B and brought in contact with the spring M, attached to the standard R, which spring M rests against the standard H, the standards R and H being secured to the frame B. The standard H is connected by the wire N to the wire O, which wire O leads from the coil A to

the lamps. On the lower portion of the armature C, I arrange a lug P, which will press against the spring M when the end F of the armature enters the coil A.

When it is desired to reduce the lights, the first movement of the armature causes the lug P to press the spring M away from the standard H and breaks that circuit. The circuit through the coil then remains. The first action would therefore be to throw the coil in circuit, and as the armature is still farther pressed into the coil a further increase of resistance follows, until the greatest resistance that can be obtained with this apparatus is when the armature is within the coil and closes the magnetic circuit through the framework.

In using my apparatus for regulating incandescent lights, I preferably place it within a partitioned wall, covered with a neat faceplate, through which the iron armature may be caused to move in and out of the coil, operated in any suitable manner.

By the use of my apparatus the amount of illumination of the lamp-circuit may be increased or diminished at pleasure, the armature being introduced within the coil as far as desirable; and the current being intermittent it will stay in the position in which it is placed, and when it is desirable to reduce the light to a minimum the armature may be brought through the center of the coil and in contact with the iron framework, or it may be drawn entirely out of the coil and the full force of the electric current will be used for illumination. It is understood that the size of the coil and the size of the armature may be varied to suit the circumstances.

I may use my regulator without the switching device when desired, and I have therefore described it first without any mention at all of the apparatus for switching the coil out of circuit, and afterward in connection with such switching device.

My invention is extremely simple in its operation and construction and forms a very useful and inexpensive regulator.

What I claim as my invention, and desire to secure by Letters Patent, is—

In an apparatus for regulating the intensity of incandescent lights, the combination of an iron frame, an electric coil secured to said frame and so constructed as to allow a free circulation of air through the iron parts, an armature bent near its end in such a manner that the bended portion may be placed within the coil passing through the center thereof, coming into contact with the iron frame on the opposite side of the coil from which it entered, said armature fulcrumed to said iron frame and provided on its lower portion with a lug, a spring attached to the iron frame, which will be operated upon by said lug when the end of the armature enters the coil, the movement of the spring when operated by said lug breaking the circuit, substantially as described, and for the purpose set forth.

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