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2 Sheets—Sheet 1.

W. F. WOLLIN & E. H. WERLINE.

INCANDESCENT LAMP SOCKET.

No. 422,360.

Patented Feb. 25, 1890.

Fig. 1.

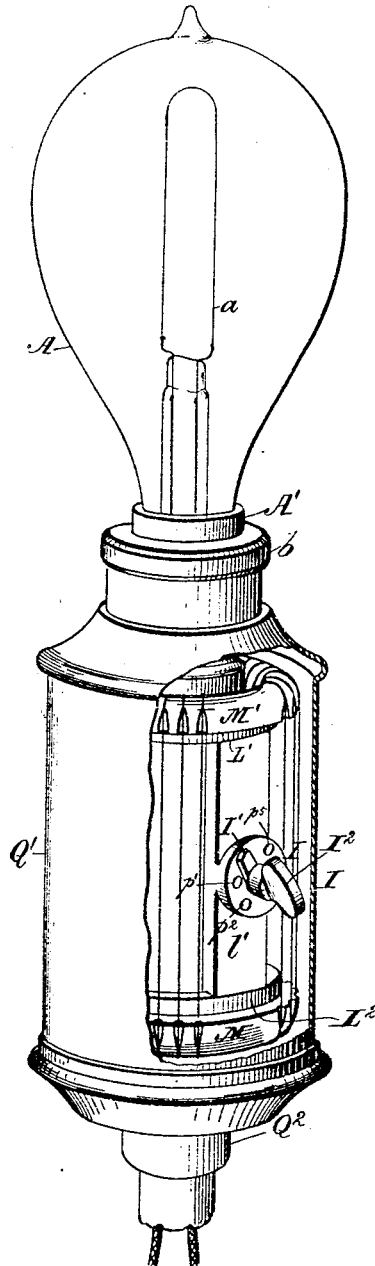
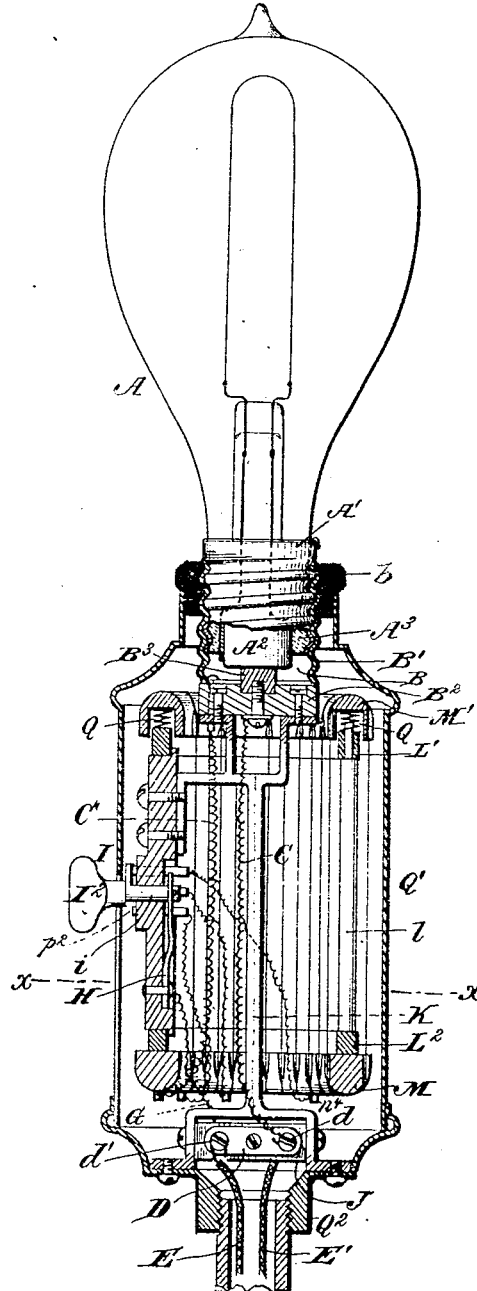


Fig. 2.



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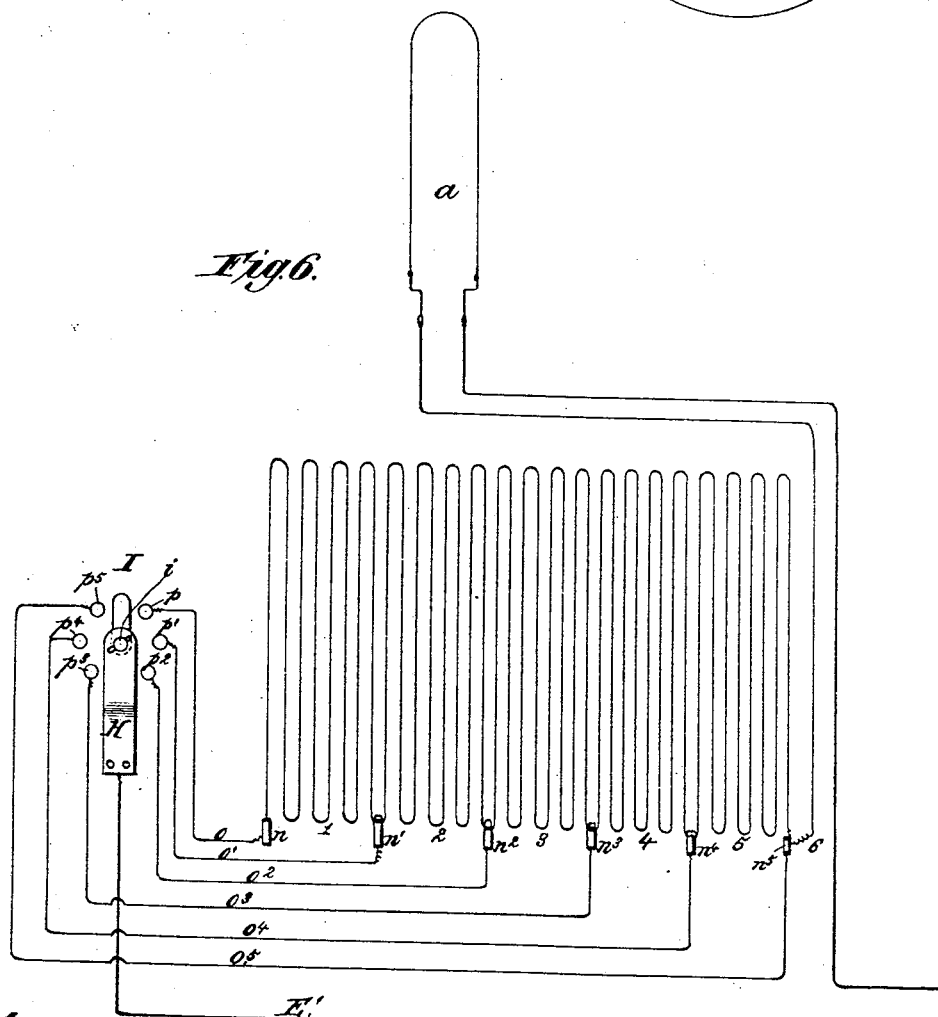
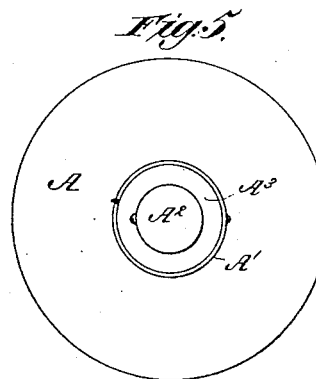
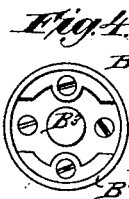
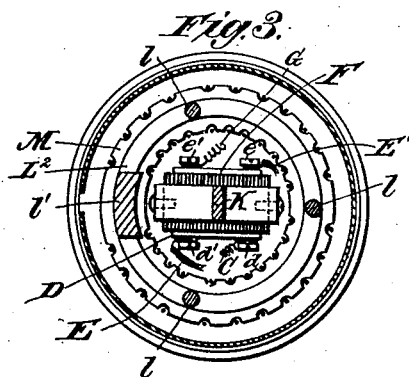
2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

WILLIAM F. WOLLIN AND ELMER H. WERLINE, OF YORK, PENNSYLVANIA,  
ASSIGNORS OF ONE-HALF TO AMOS E. RIEKER, OF SAME PLACE.

## INCANDESCENT-LAMP SOCKET.

SPECIFICATION forming part of Letters Patent No. 422,360, dated February 25, 1890.

Application filed October 16, 1889. Serial No. 327,209. (No model.)

### *To all whom it may concern:*

Be it known that we, WILLIAM F. WOLLIN and ELMER H. WERLINE, citizens of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Lamp Sockets with Regulating Attachment; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide means for controlling the intensity of the light of an incandescent electric lamp, so that it may be of any degree desired, as is the case with the flame of an ordinary gas-burner. To this end we make use of devices substantially as hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 represents a perspective view of a burner with our regulating attachment. Fig. 2 represents a vertical central section through the same. Fig. 3 represents a horizontal section through the same on the line  $x x$  of Fig. 2. Figs. 4 and 5 are detail views. Fig. 6 is a diagram illustrating the circuits and operation.

A designates the globe of an electric lamp, having within it the usual carbon filament or platinum wire  $a$ , one end of which is attached to a metallic sleeve  $A'$ , encircling the neck of said globe, the other end being attached to a metallic block or cylindrical piece  $A^2$ , that is fitted centrally into the end of said neck and insulated from said sleeve by a mass  $A^3$  of plaster-of-paris or other non-conducting material.

The sleeve  $A'$  is screw-threaded, as usual, to enter a socket  $B$ , which consists of a metallic shell  $B'$ , internally screw-threaded and surrounded at its upper end by a collar  $b$ , of vulcanized rubber or other insulating material. An insulating-disk  $B^2$  is fastened to the lower end of this shell and forms the base of the socket. A metal block  $B^3$  extends up through the central part of this disk for contact with the similar block  $A^2$ , already mentioned, at the lower end of the neck of the globe. The sleeve  $A'$  and shell  $B'$  are of course in electrical contact.

From the block  $B^3$  a wire  $C$  descends to a

binding-screw  $d$  on a plate  $D$ , which has another binding-screw  $d'$  for the attachment of a circuit-wire  $E$ . The corresponding circuit-wire  $E'$  is attached to a screw  $e$  on a second plate  $F$ , similar to plate  $D$ , and having another binding-screw  $e'$  for a wire  $G$ , which extends to a spring or other electrical conductor  $H$  in contact with the metal shaft of a rotary key or governor  $I$ . The plates  $D$  and  $F$  are separated by and attached to an insulating-block  $J$ , which is inclosed by and fastened to the spread lower ends of a central standard  $K$ , preferably formed of two flat plates arranged and held against each other. The upper ends of these plates also diverge and support the insulating-disk  $B^2$ , already mentioned.

The governor  $I$  turns in an insulating-strip  $L'$  on the side of a frame consisting of upright rods  $l$  and top and bottom rings  $L$  and  $L'$ , all of metal. This frame has below it a base-ring  $M$ , of vulcanized rubber or other insulating material, and has also fitted on the top of its upper ring  $L'$  a crown  $M'$ , of similar insulating material, surrounding the disk  $B^2$  and recessed to receive said ring. Over the said insulating base-ring and insulating-crown wires are wound lengthwise of the frame, so as to give the device the aspect of a cage. These wires furnish the resistance whereby the intensity of the light is determined. As illustrated, they are six in number—1, 2, 3, 4, 5, and 6—each constituting a section of the resistance, and connected by one of several studs  $n n'$ , &c., to the next section or wire—that is, wire 1 is wound at each end around such a stud; wire 2 is wound at one end around the same stud that one end of wire 1 is wound around; wire 3 is wound at one end around the stud which receives the other end of wire 2, and so on throughout the series. These studs  $n n'$ , &c., are attached to the base-ring  $M$  at intervals corresponding to the ends of the several resistance-wires. They are six in number, (indicated by  $n n' n^2 n^3 n^4 n^5$ ), and each is connected by a wire  $o, o', o^2, o^3, o^4, o^5$  to a contact-stud  $p p' p^2 p^3 p^4 p^5$ , attached to the insulating-strip  $L'$ . These studs are arranged in a circle, or approximately so, and collectively constitute a switch-board.

The governor or key  $I$  is provided with a radial arm  $I'$ , which moves over this circle as

the said key is turned, and by being in contact with one or another of said contact-studs determines the number of wires 1 2; &c., which shall be in the circuit. Of course the greater the number of the wires in circuit at any time the dimmer will be the light, and the resistance may be calculated to make the light exceedingly dim if all be in circuit. The governor is provided with a thumb-piece or handle I<sup>2</sup>, and may be turned by hand either way at will for dimming or brightening. To avoid the loosening of the wires and their consequent disarrangement growing out of the expansion of the wire by heat, I insert springs Q between the upper ring I' of said frame and the crown-piece M' of insulating material which fits thereon, making the supporting-frame automatically extensible. These springs are in the recess of said crown and around the upwardly-extended ends of rods l. By their expansion the said springs force the crown M' upward, and consequently keep the wires 1 2 3, &c., taut and in place. The peripheries of the base-ring M and crown M' are provided with vertical grooves m, corresponding to the successive lengths of the wires. These serve to keep the parallel parts of each wire separate and avoid short-circuiting. One end of the entire system of resistance-wires connects directly with the sleeve A' aforesaid by a spring C', and the other end with the final contact-stud p<sup>5</sup>.

A metallic casing Q' surrounds the entire socket and its attachments, except the thumb-piece I<sup>2</sup> of the governor, which protrudes laterally through an opening in said casing. The lower end of this casing is reduced to a neck Q<sup>2</sup>, which allows the circuit-wires E and E' to extend up through it side by side.

If all the resistance-wires are in circuit, the latter will be as follows: through wire E, binding-screw d', plate D, binding-screw d, and wire C to blocks B<sup>2</sup> A<sup>2</sup>, filament a, sleeve A', spring C', the entire series of wires 1 2 3 4 5 6, wire o<sup>5</sup>, contact-stud p<sup>5</sup>, arm I', governor I, spring H, wire G, binding-screw e', plate F, binding-screw e, and circuit-wire E'. If the arm I' be turned to the right to contact-stud p<sup>4</sup>, the circuit will be the same, except that one wire—namely, 5—will be eliminated. Each successive turn to the right eliminates another wire and brightens the light proportionally. By turning to the left beyond stud p<sup>5</sup> the circuit is broken and the light ceases. A larger space is left between stud p<sup>5</sup> and stud p' than between any of the other contact-studs to allow this. Preferably the other intervals are so small that as soon as the arm I' leaves one contact-stud it comes into contact with another. Of course the resistance-wires and their elastic support may be used in electric circuits which are not for illumination.

Having fully described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. In combination with an electric lamp and the circuit-wires leading thereto, a series of fixed resistance-wires independent of the lamp-filament, an expansible frame on which said wires are wound, a key and switch, and independent connections between the several resistance-wires and the several contact-points of said switch, substantially as and for the purpose set forth.

2. In an attachment for regulating the intensity of an electric light, a series of resistance-wires, a base and movable crown on which they are wound, a frame between said base and crown, and a spring or springs for holding said crown away from said frame, so as to tighten said resistance-wires and keep them in place, substantially as set forth.

3. In combination with the circuit-wires and filament of an electric lamp, a resistance-wire and an elastic frame on which it is wound, substantially as set forth.

4. The supporting-frame, in combination with the base-ring M and crown M', of insulating material, the springs inserted in a recess of said crown and acting to force it from said frame, and the resistance-wires wound on said crown and base-ring and held in position by the action of said springs, substantially as set forth.

5. The insulating movable crown M', having an annular recess to fit upon the upper ring of the supporting-frame, in combination with said frame, having rods l, which extend up into said recess, springs which surround the upper ends of said rods, the insulating base-ring M, a resistance wire or wires wound on said crown and base-ring, the circuit-wires, and an electric lamp, substantially as set forth.

6. In combination with the conductors of an electric circuit, a series of stationary resistance-wires arranged in said circuit and connected end to end, an expansible supporting-frame on which said wires are wound, wires running independently from the individual resistance-wires, and a switch or governor communicating at will with any one of these latter wires to vary the resistance, as set forth.

7. In combination with the conductors of an electric circuit, a resistance-wire introduced into said circuit, and an elastic frame on which said resistance-wire is wound, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

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ELMER H. WERLINE.

Witnesses:

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