(No Model.)

M. D. GREENGARD.

REGULATING SOCKET FOR INCANDESCENT LAMPS.

No. 516,484. Patented Mar. 13, 1894.

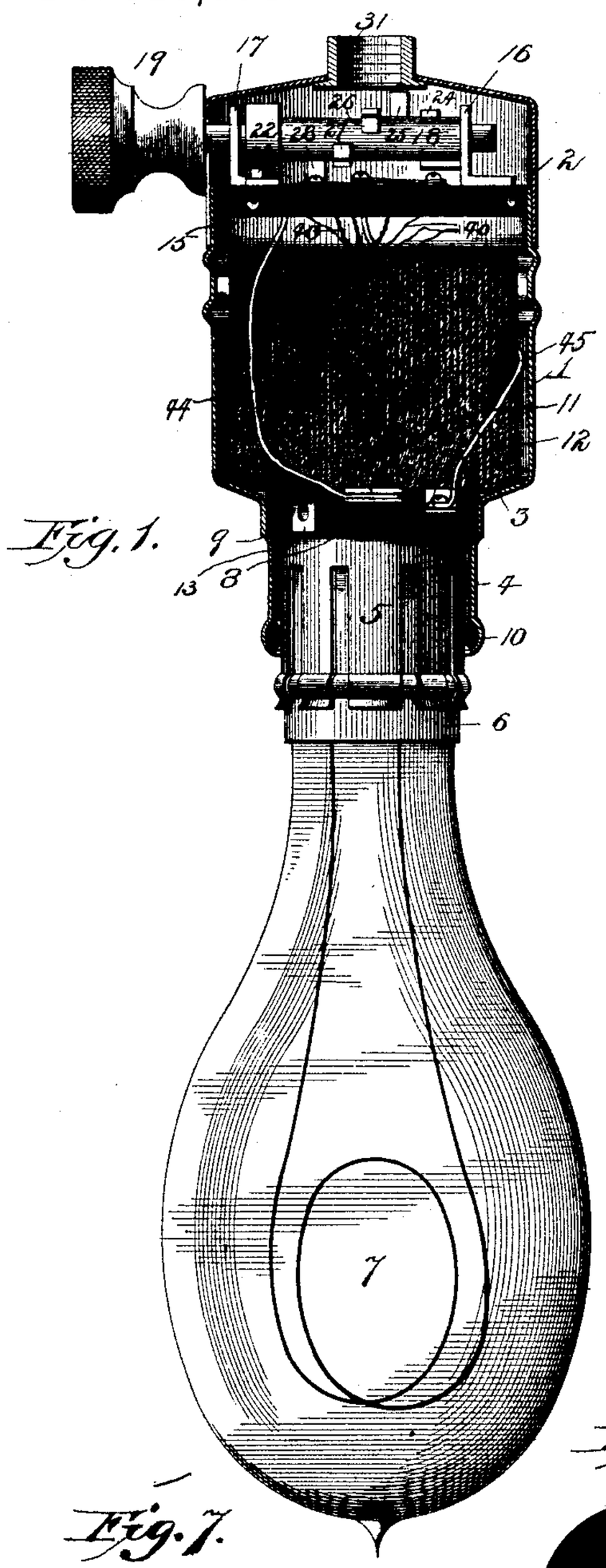

Fig. 1.

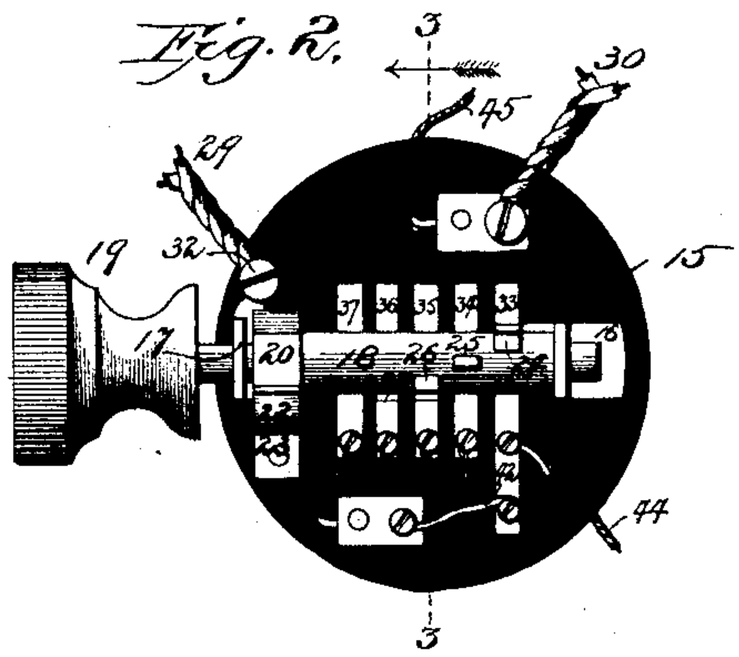

Fig. 2.

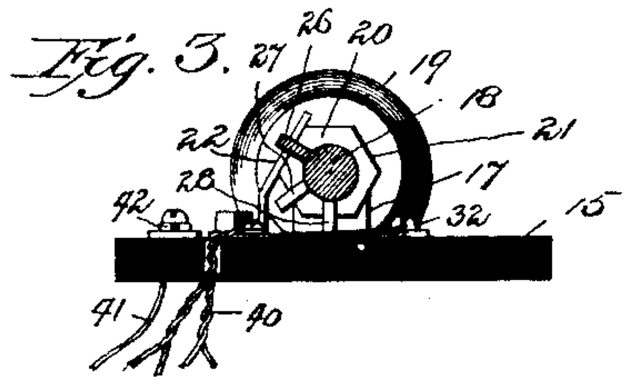

Fig. 3.

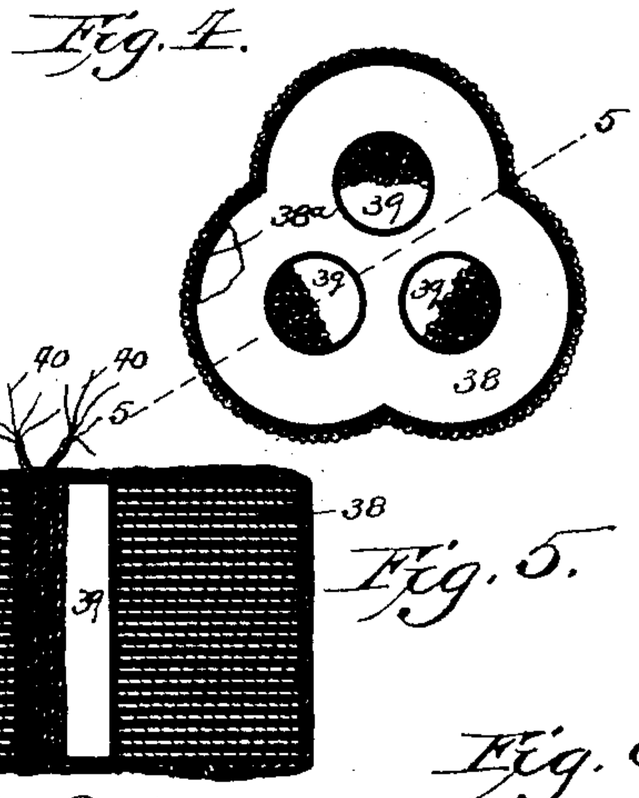

Fig. 4.

Fig. 6.

Fig. 5.

Fig. 7.

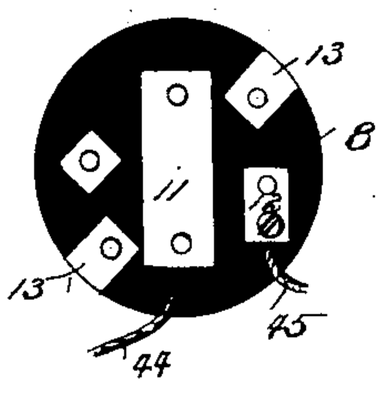

Fig. 8.

Witnesses:
John Enders Jr.
G. E. Schafers.

Inventor
Morris D. Greengard.
by
Higdon and Higdon and Longan.
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY.
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MORRIS D. GREENGARD, OF ST. LOUIS, MISSOURI.

REGULATING-SOCKET FOR INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 516,484, dated March 13, 1894.

Application filed May 18, 1893. Serial No. 474,641. (No model.)

To all whom it may concern:

Be it known that I, MORRIS D. GREENGARD, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Regulating-Sockets for Incandescent Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved "regulating socket for incandescent-lamps," and consists in the novel construction, combination and arrangement of parts hereinafter described and designated in the claims.

The object of my invention is to provide a device of this class which shall be especially adapted for alternating currents, efficient and economical in the consumption of current, and of reasonable cost.

In the drawings: Figure 1 is a sectional side elevation of a regulating socket embodying my invention. Fig. 2 is a detail plan view of same, with the housing removed. Fig. 3 is a section on line 3—3 of Fig. 2. Fig. 4 is a horizontal section through the improved core and the winding thereof. Fig. 5 is a section on line 5—5 of Fig. 4. Fig. 6 is a detail top plan view of the lamp-holder, detached. Fig. 7 is a detail view of a portion of the wire cable used in winding the core. Fig. 8 is a diagram of the electrical connections.

1 indicates the casing or metallic shell in which the operative parts are located and protected during use. It is preferably circular in cross-section, and provided with an open upper end which is to be covered during use by a detachable cap or housing 2, and its lower end is reduced in diameter so as to form a shoulder or annular projection 3 upon its interior and a tubular socket 4 in which the usual holder 5 for the neck 6 of the lamp 7, is located. As the details of construction of this holder and of the lamp (except the upper end of the holder) form no part of my invention I do not describe them. The upper end of the holder is provided with a block of insulation 8, the edges of which project beyond and overhang the outer surface of said holder, and rest upon a small annular shoulder 9 projecting upon the interior of the socket 4, to support said holder in position in said socket. The lower portion of the holder is insulated from the shell of the socket 4 by means of an annular body of insulation 10 projecting upon the interior of said shell adjacent its lower end.

11 indicates a metallic contact plate for connection with one of the terminals of the lamp, and 12 indicates another metallic contact plate for connection with the other terminal of the lamp. These plates, as well as the fastening plates 13 for securing the outer metallic shell of the holder to the block of insulation 8, are embedded or recessed into the upper surface of said block, so as to lie flush with or below said surface, and permit such surface to come into direct contact with the insulated winding of the core, and thereby permit such parts to be placed very close together, so as to occupy as little space as possible in the casing 1, as shown in Fig. 1.

The manner of connecting the contact plates 11 and 12 with the terminals of the holder 5 is unimportant, and may be accomplished by any of the common means now in use, such as by extending the screw 14 which holds the contact plate 12 in position, downward to the said holder.

15 indicates a base of insulating material, preferably circular or disk-like in form and secured within the upper portion of the casing 1 adjacent the upper end thereof. Loosely mounted in bearings 16 and 17 to revolve above the upper surface of said base 15, is a revoluble horizontal shaft 18, the ends of which project through said bearings and are free. The bearings 16 are preferably in the form of small L-shaped brackets of good conducting material, so that said shaft and its bearings are in electrical contact. One end of this shaft projects laterally and is provided with a knob or handle 19. The body of the shaft is supported a distance above the upper surface of said base. Fixed upon this shaft adjacent the bearing 17, so as to revolve therewith is a friction-disk 20 having its outer periphery provided with a series of flattened portions 21 or otherwise roughened for a purpose hereinafter mentioned. A spring 22 has its lower end secured to the base 15 by means of a screw 23 or other fastening so that its upper end is free, and its body normally engages the periphery of said friction-disk with sufficient force to hold the same and the shaft in

the points of adjustment hereinafter mentioned. The shaft 18 has fixed upon its outer surface a series of contacts 24, 25, 26, 27, 28, &c., arranged spirally thereon, so as to project a distance apart and have their ends free. This series of contacts is in electrical connection with said shaft and with eachother.

29 indicates one of the conductors for supplying currents to the socket and the lamp carried thereby, and 30 indicates the other conductor for this purpose. These conductors are lead into the casing or housing 2 through an opening 31 formed in the upper end of said housing, and the conductor 29 is connected to the bracket 17 by means of a screw or fastening 32 engaging the bared end of said conductor and the base of said bracket. (See Fig. 2.)

Mounted beneath the shaft 18 upon the base 15, so as to lie parallel with each other and at right angles to said shaft, are a series of contact springs 33, 34, 35, 36, 37, &c. Each of these contact springs has one of its ends fixed and its opposite end free and projecting a distance above the upper surface of said base, and with its body in the path of one of the contacts 24, 25, &c.

I will now proceed to describe the construction of my improved ventilated core and the winding thereof. The core is composed of a series of thin tinned sheet-iron plates 38, or plates of magnetizable material, each having a series of perforations 39, and superposed, so that the perforations 39 of each plate register with those of adjacent plates. In plan view, the plates 38 are made substantially triangular, with the perforations therein arranged in relatively triangular position, as herein shown, although they may be otherwise arranged if desired, the only essential point being that the core be composed of annular laminæ of magnetizable material. Each plate 38 is insulated from the adjoining plates and in fact the entire surface of each plate is provided with insulation, both upon its sides, and inner and outer edges. The resistance conductor is preferably formed in the manner shown in Fig. 7 of a wire cable, or a number of wires provided with insulation and twisted together in the form of a cable, and then bodily wound upon the core in the manner presently stated. In constructing this resistance, I take a suitable length of insulated wire, the same having a length and size to offer the maximum of resistance when connected in series and double it a number of times upon itself, and then twist the several strands into the form of a cable, and wind said cable upon the core above described. This winding is accomplished by passing the cable through the apertures 39 of the laminæ, and at right angles through the flat surfaces thereof, both upon the interior and exterior edges of the same, so as to lie smoothly and cover completely, or as near as possible the entire outer surface of the core. (See Figs. 4 and 5.) The series of contact springs 33, 34, 35, &c., are connected to the resistance conductor thus wound, in the manner shown in the diagram in Fig. 8, that is, said series of contacts are connected to said conductor at different points in the length thereof. The conductor is in a continuous length. I prefer to connect the contacts 33, 34, &c., with the resistance conductor at different points in the length thereof, in the above described manner, so that as there shown said contact springs and different intermediate portions of said conductor are thereby connected in series by the projecting loops 40. The contact spring 33 is connected to one terminal 41 of the resistance conductor, through a fuse 42. The contact spring 37 is connected to the other terminal 43 of said resistance conductor.

The contact plates 11 and 12 carried by the block 8 are connected as follows: The contact plate 11 is connected by a conductor 44 to the contact spring 33. The contact plate 12 is connected directly to the main conductor 30 by means of a conductor 45. The contact spring 34 is connected by a loop of two wires 40 to the resistance conductor at a point in the length thereof which is comparatively closely adjacent its terminal 41, while the contact spring 35 is connected to said conductor at a point in its length farther distant from the point at which said contact spring 34 is connected, and so on, the contact spring 36 being connected to said conductor at a point still farther remote from its terminal 41, and the contact 37 being connected as before stated to the opposite terminal 43 of said resistance conductor. The fuse 42 is mounted upon the base 15, within the shell of the device, and very closely adjacent the resistance-conductor, and it is essential that it be so located in order to afford perfect protection to said conductor under all circumstances of service. This fuse must have such size, in cross section, as to be blown or melted when the said conductor is thrown into a circuit carrying such an excess of ampèrage as would burn out said conductor if the fuse was not in circuit with it as shown. It will be noted that this is, therefore, a special fuse, located in a special position. To illustrate, suppose the conductor is wound for a fifty-volt lamp, and a hundred-volt lamp is accidentally placed in the socket, the winding of the core will be burned out unless the fuse 42, as specified, is located close to said winding and in circuit therewith.

I am aware that a fuse has commonly been applied to ceiling blocks and wall-rosettes, and used in various other places wherever needed, but I am not aware that a special fuse has ever been used as herein shown to protect the resistance of a regulating-socket from dangerous fluctuations of strength of current, a special fuse for each regulating-socket being used independently of other fuses located in ceiling and wall blocks and otherwise placed in the line.

The operation is as follows: By revolving

the shaft 18 by means of handle or knob 19 in either direction, the current may be entirely cut off from the filament of the lamp, or more or less resistance may be thrown in series with said filament, or said filament may be connected direct with the conductors 29 and 30, with the usual result of cutting out and regulating the light made by the lamp. By means of the friction disk 20 and the spring 22 which bears thereon, the shaft 18 is held at any desired adjustment, with one of the contacts 24, 25, 26, &c., in contact with one of the contact springs 33, 34, 35, &c., or with all of said contacts separated from said contact springs, in which latter case the circuit through the lamp filament will of course be broken. The contacts 24, 25, 26, &c., in engaging the springs 33, 34, 35, &c., press the free ends of said springs downward and when said contacts release said springs they return to normal position, which is with their free ends a little above the upper surface of the base 15. The revoluble movement of the shaft 18 is limited by a stop 46 projecting horizontally from the bearing or bracket 16 into the path of the adjacent contact 28, so that the operator can readily determine when he has properly turned the shaft for making a light or extinguishing the same, whether the lamp be in proper circuit or not.

In Fig. 4 I show the iron or steel plates 38 provided with a coating or layer 38[a] of tin or some equivalent metal which is less magnetizable than iron or steel. This coating extends over the entire outer surface of said plates. I have found tin to be more or less of an insulator of magnetism. In Fig. 4 I have shown a portion of the coating of tin or equivalent metal, broken away, so as to disclose the surface of the iron or steel plate beneath.

The core, as above described, is well ventilated, and not liable to become heated during use, as the perforations or apertures 39 in each of the plates of which it is composed from ventilating passages through the core. It will also be observed that the body of magnetizable material of which said core is composed, presents the appearance of a comparatively thin shell. I have found that the core is especially well adapted for alternating currents, and is very efficient and economical during operation. The fuse 42 located as above specified, acts with certainty to protect the high resistance-conductor.

What I claim is—

1. The improved light regulating socket for incandescent lamps, constructed with a casing 1, a resistance, a switch and connections therefor located in said casing, a block of insulation 8 also located in said casing with its upper surface closely adjacent said resistance, contact plates for the terminals of the lamp-holder, and the fastenings for securing the metallic shell of the lamp-holder, recessed or embedded in the upper surface of said block of insulation so as to lie flush with or below said surface, and a lamp-holder secured to the surface of said block which is opposite that in which the plates are recessed, substantially as herein specified.

2. A light regulating socket for incandescent lamps, constructed with a resistance and proper connections, a revoluble shaft connected to said resistance, a friction-disk carried by said shaft, and a spring having its body in engagement with said friction disk with sufficient force to hold the same and the said shaft at different points in their movement, substantially as herein specified.

3. A light regulating socket for incandescent lamps, constructed with proper connections, a revoluble shaft carrying a series of separate contacts, a series of fixed contacts located adjacent said shaft, a friction-disk having its periphery provided with a series of flattened portions, and a spring or arm engaging the periphery of said friction-disk with sufficient force to retain any one of the contacts carried by said shaft in engagement with a fixed contact, substantially as herein specified.

4. In a light regulating socket for electric lamps, the core composed of thin tinned plates 38 of magnetizable material made substantially triangular in plan view and superposed with a series of separate perforations 39 in each plate registering with perforations in adjacent plates, in combination with a resistance-conductor doubled upon itself and wound on said plates and engaging each of said perforations, substantially as herein specified.

5. In a light regulating socket for electric lamps, the core composed of a series of tinned iron plates substantially triangular in plan view and superposed with a series of separate perforations in each plate arranged in a relatively triangular position with the perforations in each plate registering with those of adjacent plates, in combination with a resistance-conductor wound on said plates and engaging each of said perforations, substantially as herein specified.

In testimony whereof I affix my signature in presence of two witnesses.

MORRIS D. GREENGARD.

Witnesses:
E. E. LONGAN,
JNO. C. HIGDON.