

(No Model.)

H. GREEN.
INCANDESCENT LAMP.

No. 547,249.

Patented Oct. 1, 1895.

Fig. 1.

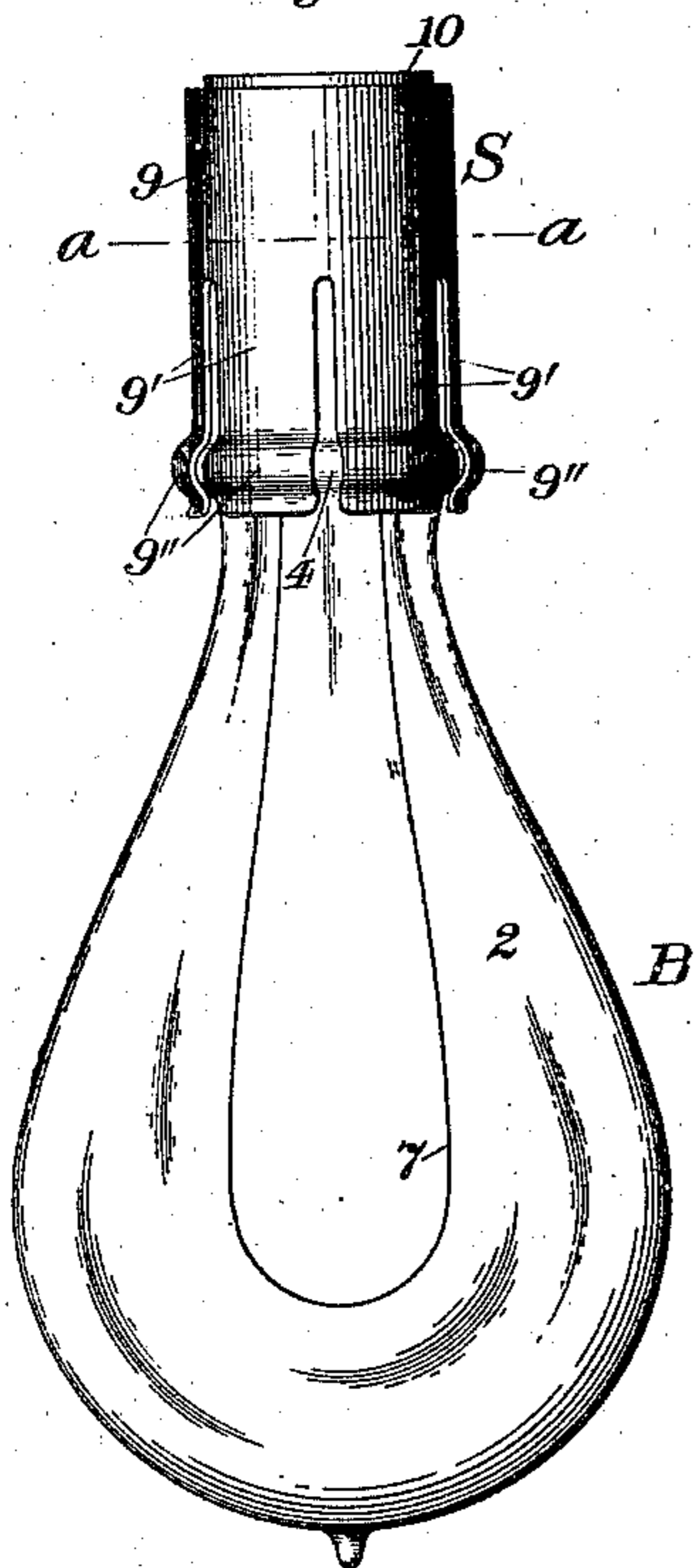


Fig. 2.

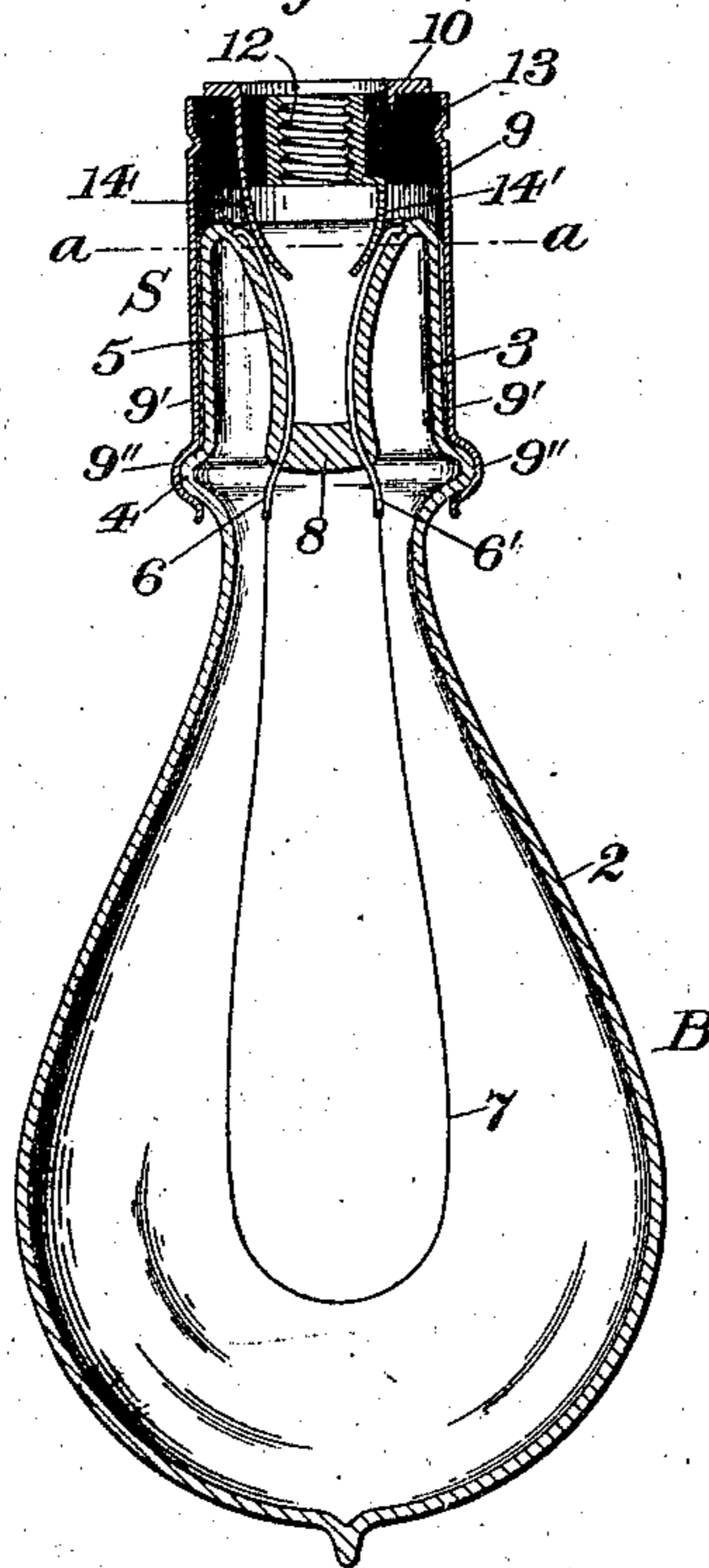


Fig. 3.

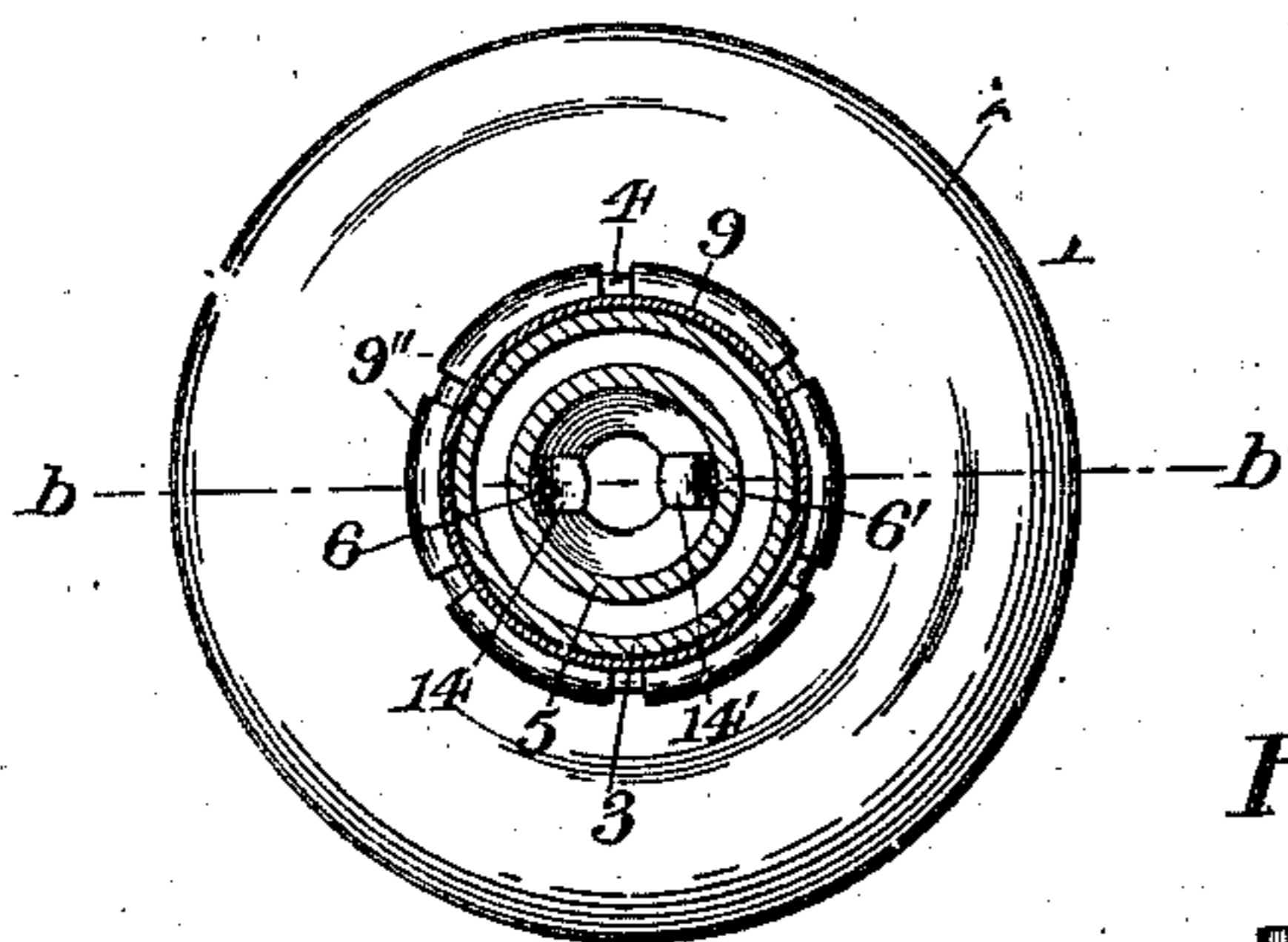


Fig. 4.

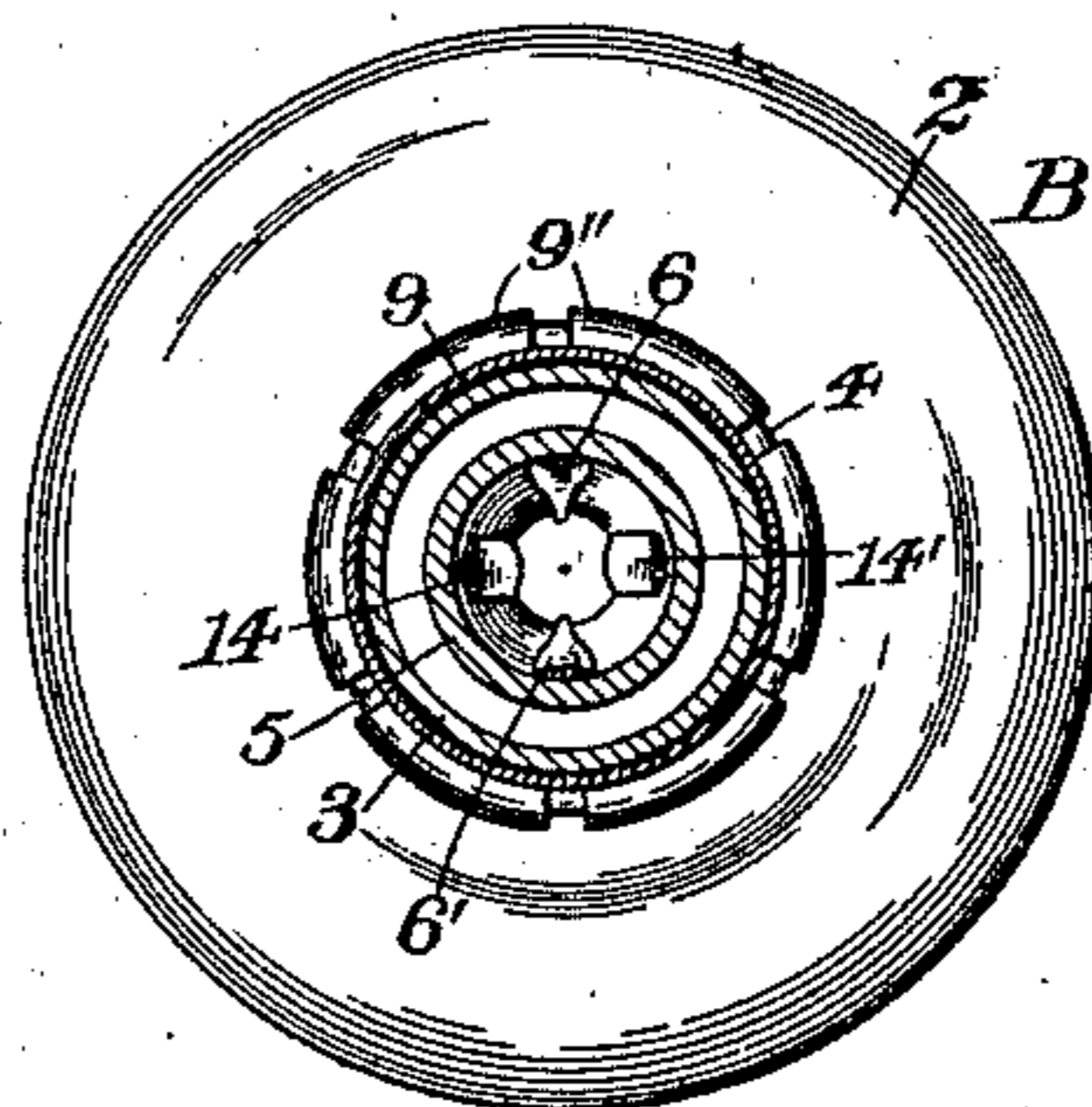
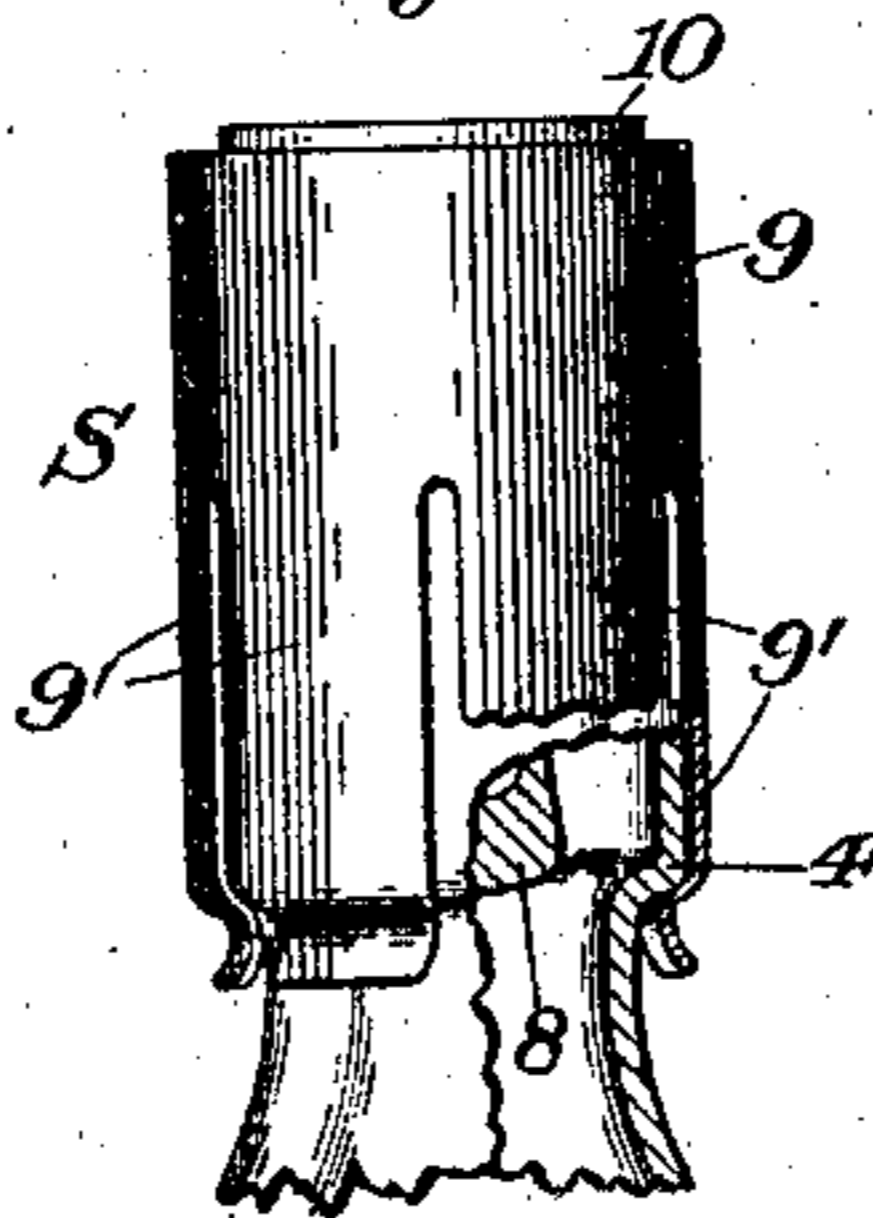


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY GREEN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE AETNA
ELECTRIC COMPANY, OF SAME PLACE.

INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 547,249, dated October 1, 1895.

Application filed January 25, 1895. Serial No. 536,164. (No model.)

To all whom it may concern:

Be it known that I, HENRY GREEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Incandescent Lamps, of which the following is a specification.

This invention relates to incandescent electric lamps, and has for its object to furnish an improved lamp of that class adapted to be readily placed and replaced in its socket or base without the aid of extraneous fastening devices attached to the lamp itself, and which shall be adapted also to be operated for making and breaking the circuit without the aid of any operative appliances or circuit makers and breakers for this purpose.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of a lamp and socket therefor embodying my present invention. Fig. 2 is a central longitudinal section of the same, taken in line *b b*, Fig. 3. Fig. 3 is a transverse section taken in line *a a*, Figs. 1 and 2, showing the lamp and socket in position for closing the circuit. Fig. 4 is a similar view, showing the parts in position with the circuit interrupted. Fig. 5 is a partial sectional side elevation of a lamp and socket, illustrating another embodiment of my invention which will be hereinafter referred to.

Similar characters designate like parts in all of the figures.

My present invention comprises, in combination with a lamp-bulb, means carried by the bulb and the socket for maintaining the same against longitudinal movement relatively to each other and for permitting rotation of said parts relatively to each other, and means also carried by said parts and controlled by the relative rotation thereof for closing and interrupting the circuit. In the preferred embodiment thereof, (shown in Figs. 1 to 4 inclusive,) the body 2 of the lamp-bulb, which is designated in a general way by B, is of the usual construction and is provided with a neck 3, preferably formed integral therewith. An annular member or enlargement is shown herein at 4 as formed in and upon the lamp-bulb, preferably at a considerable distance from the extreme upper end or neck portion

of the lamp. The end of the neck is also shown as preferably recessed at 5 to form an inwardly-extending tube through which the usual leading-in wires 6 and 6' pass to be connected with the filament 7. The usual seal for inclosing the platinum or other leading-in wires is shown at 8 as formed by closing the inner end of this re-entrant or tubular member of the bulb. I prefer to form all of these parts of the bulb in one piece from blown glass, shaped so that the several members will be organized in the manner described. The leading-in wires 6 and 6', which are shown as sealed adjacent to their inner ends in and through the seal 8 of the neck portion of the bulb, are also preferably embedded, adjacent to their opposite ends, in the sides of the tubular portion 5, in the process of forming the bulb. These wires are also preferably disposed at diametrically-opposite points along the sides of this tube, although it is not absolutely essential that said conductors should be so disposed.

The socket or base of the lamp, which is designated in a general way by S, consists of any suitable inclosing-shell, such as 9, adapted for carrying the usual circuit-terminals for the main line. These terminals are herein shown at 10 and 12, respectively, as retained in position by the usual insulating medium 13, filling the end of the shell of the socket. Each of these circuit-terminals is also shown herein as provided with a contact-arm in position and adapted to make the circuit through the corresponding leading-in wire embedded in the neck of the bulb. One of these contact-arms is shown at 14 as passing entirely through the insulating medium and thereby affording a means for maintaining its terminal disk 10 firmly in position, and the other of said arms is shown at 14', as extending from the inner side of the other or plug-terminal 12. These contact-arms are so disposed and arranged that the portions thereof which are adapted to make contact with the corresponding co-operating portions of the leading-in wires, and thereby close and open the circuit to the lamp, are at the same angular distance from each other relatively to the central axis of the lamp as are such co-operating portions of the leading-in wires. Preferably

each of these arms is a resilient conductor adapted to press firmly against the leading-in wire with which it makes circuit. Moreover, in order that the lamp may be quickly cut
 5 into or out of the circuit, I prefer to dispose the contact-arms and the leading-in wires so that the contacting portions of the same will be upon the transverse axis of the lamp-socket, whereby a half-turn of the lamp-bulb
 10 will throw the lamp from one closed-circuit position to another closed-circuit position, in which the leading-in wires will lie on opposite contact-arms and the direction of flow of the current through the filament will be reversed.
 15 In order to maintain the bulb in position in the base or socket, the shell 9 is shown as provided with a series of longitudinally-rang- ing arms 9', formed by slitting the shell in longitudinal direction for a considerable dis-
 20 tance from its bulb-engaging end. The arms thus formed are also shown as having enlarged members, in line with one another and con- stituting a holding-ring made up of a series or circuit of holding or clamping members
 25 9'', adapted to engage the enlarged annular portion or bead 4 upon the bulb, and to hold said bulb, when seated in the socket and clasped by said arms, against longitudinal movement in either direction. In order to
 30 obtain a firm hold upon the neck of the lamp these arms 9' are preferably of resili- ent metal, fitting snugly against the neck of said bulb when the bulb and the socket are assembled. Each of the laterally-resilient
 35 clamping members 9'' is shown in Figs. 1 and 2 as having shoulders engaging the longitu- dinally-opposite sides of the bead or ring 4 of the bulb, thus providing a positive means for holding the bulb in the aforesaid fixed longi-
 40 tudinal position when seated in the socket. The shoulders on the side of said ring, which is adjacent to the contact-arms, are not, how- ever, absolutely necessary, as the pressure ex-
 45 erted by said contact members may be suffi- cient in many cases to prevent the forcing in of the bulb past its proper position. It is es- sential, however, that the bulb and the socket
 50 should have complementary bearing-faces, operating substantially in the manner de- scribed for maintaining the bulb and the socket against longitudinal movement when
 55 assembled and for permitting rotation of the one relatively to the other. In Fig. 5 a con- struction is illustrated in which the annular holding-face or bearing-face upon the lamp-
 60 bulb is produced by an annular groove, which forms the retaining member 4 in a manner substantially similar to that shown in the other views. In this form of lamp the bulb may be
 65 more readily shaped than that shown in Figs. 1 to 4, inclusive, and the retaining-arms of the shell somewhat more easily produced. The arms 9', it will be understood, should be suffi- ciently resilient to permit the ready insertion
 of the bulb into and its removal from the socket, and to hold said bulb firmly when the two members of the lamp are assembled.

The internal holding-faces of the clamping- members 9'' co-operate with the annular mem- ber or bead upon the lamp-bulb, as will be
 7 seen, to form bearing-surfaces, which permit the turning of the bulb and and the socket relatively to each other, so that the contact- arms connected with the circuit-terminals
 75 may be brought into position in contact with the co-operating portions of the leading-in wires to close the circuit, as shown in Fig. 3, or to break the circuit, as shown in Fig. 4. Hence it will be evident that the described construction and organization of the parts of
 80 the lamp not only furnish a means for readily holding the bulb in place and for permitting the removal and replacing of the same, and all this without any attachments in or upon the lamp-bulb itself other than those neces-
 85 sary in any lamp of this class—viz., the lead- ing-in wires and the filament—but the com- bination also constitutes a circuit making and breaking device or switch for cutting the lamp into and out of the consumption-circuit.
 90 As the lamp is held between the arms 9' of the shell, it follows that the lamp-bulb consti- tutes the switch-member of the lamp, and the leading-in wires thereof constitute the con- tact-points through which the circuit is closed.
 95 As the improved construction of an incan- descent lamp which is herein described and shown leaves the bulb entirely free of any attachments except the necessary leading-in wires connected with the filament, the bulb
 100 itself is entirely uncovered and accessible for inspection, it being also sufficiently exposed to the air throughout its entire surface, by the ventilating-spaces formed by the slits in the shell, to prevent the heating of the neck
 105 of the bulb, and to thereby materially reduce the liability of breakage of the same. It will be noticed that these slits in the shell extend to points close to the end of the lamp-neck, so that practically the whole of the bulb and
 110 of the neck portion of the lamp is exposed to the air. It may be found desirable to con- tinue these slits to a point substantially in line with the section-line *a a* in Fig. 2, where- by a circulation of air entirely around and
 115 behind such neck portion of the lamp will be obtained. It will also be apparent that when the socket and the bulb are assembled the major portion of the neck of the bulb will be non-contiguous to the socket, and hence a
 120 maximum cooling effect will be obtained. As before stated, when the lamp-bulb is blown according to the method of construc- tion described herein it is entirely finished,
 125 so that attaching independent holding de- vices for securing or cementing the bulb in the socket, such as plaster-of-paris, is entirely avoided. Moreover, as the glass is entirely
 130 of one character throughout, a homogeneous structure is formed which is much less liable to breakage than when the principal portion of the bulb is of blown glass and the neck portion or plug thereof of pressed glass.
 A further and very important advantage

which is obtained by this construction is that upon the breaking of the lamp only the glass itself and the filament are destroyed, the socket thereof being entirely unaffected and ready to receive a new bulb to restore the lamp to its original condition, it being understood, of course, that the leading-in wires of the old lamp can be reused for the manufacture of a new lamp. It will be apparent, therefore, that the usual cost of a new socket for each lamp, and of the labor and material for connecting the socket to the bulb, is entirely avoided. As a result of these economies the lamp, when the same is furnished to the users, is not only a superior article of its kind but can be manufactured at a lower cost.

Having thus described my invention, I claim—

1. In an incandescent electric lamp, the combination with a socket having a pair of circuit-terminals, and having also bearing faces for normally maintaining a lamp-bulb against longitudinal movement relatively thereto while permitting relative rotation thereof; of a removable lamp-bulb having complementary bearing faces in position and adapted to be engaged by the bearing faces of the socket, the filament, and a pair of conducting members electrically connected with the filament and sealed into the lamp-neck and in rigid relation therewith to thereby form a unitary structure, and in position and adapted to close the circuit through the filament the circuit-terminals of the socket upon the relative rotation of the lamp-bulb and the socket and to correspondingly break said circuit, substantially as described.

2. In an incandescent electric lamp, the combination with a socket having a pair of circuit-terminals, and having also a circuit of bearing faces adapted for engaging a lamp-bulb and normally maintaining the same against longitudinal movement relatively thereto while permitting relative rotation thereof; of a removable lamp-bulb having an annular holding member cooperating with said bearing faces upon the socket, the filament, and a pair of leading-in wires connected with the filament and sealed into the lamp-neck and in rigid relation therewith to form a unitary structure, and in position and adapted to close the circuit to the filament through the circuit-terminals of the socket upon the relative rotation of lamp-bulb and the socket and to correspondingly break said circuit, substantially as described.

3. In an incandescent electric lamp, the combination with a socket having bearing faces for normally-maintaining a lamp-bulb against longitudinal movement relatively thereto while permitting relative rotation thereof, a pair of circuit terminals, and a pair of resilient contact-arms secured to said terminals; of a removable lamp-bulb having complementary bearing faces in position and adapted to be engaged by the bearing faces of the socket, the filament, and a pair of con-

ducting members electrically connected with the filament and sealed into the lamp-neck and in rigid relation therewith to thereby form a unitary structure, and in position and adapted to be engaged by said resilient contact arms of the socket and to thereby close the circuit to the filament upon the relative rotation of the lamp-bulb and the socket and to correspondingly break said circuit, substantially as described.

4. In an incandescent lamp, the combination of a socket and a lamp-bulb having their connecting devices separable longitudinally of the lamp, said connecting devices comprising laterally-resilient holding-means carried by the socket for removably engaging the lamp-bulb and normally maintaining the same against longitudinal movement relatively to the socket while permitting relative rotation thereof, and complementary bearing-faces carried by the lamp-bulb in position and adapted to be engaged by the laterally-resilient holding means of the socket; a pair of circuit-terminals carried by the socket; a filament mounted in the lamp-bulb; and a pair of conducting-members electrically connected with the filament, and sealed into the lamp-neck, and in rigid relation therewith to thereby form a unitary lamp-bulb, and in position and adapted to close the circuit to the filament through the circuit-terminals of the socket upon the relative rotation of the lamp-bulb and the socket, and to correspondingly break said circuit, substantially as described.

5. In an incandescent electric lamp, the combination of a socket and a lamp-bulb having their connecting devices separable longitudinally of the lamp, said connecting devices comprising laterally-resilient holding means carried by the socket for removably engaging the lamp-bulb and normally maintaining the same against longitudinal movement relatively to the socket while permitting rotation of said bulb, and complementary bearing-faces carried by the lamp-bulb in position and adapted to be engaged by the holding means of the socket; a pair of circuit-terminals carried by the socket; a pair of resilient contact-arms secured to said terminals; a filament mounted in the lamp-bulb; and a pair of conducting-members electrically connected with the filament, and sealed into the lamp-neck, and in rigid relation therewith to thereby form a unitary lamp-bulb, and in position and adapted to be engaged by the resilient contact-arms of the socket to thereby close the circuit to the filament upon the relative rotation of the lamp-bulb and the socket, and to correspondingly break said circuit, substantially as described.

6. In an incandescent electric lamp, the combination of a socket and a lamp-bulb having their connecting devices separable longitudinally of the lamp, said connecting devices comprising bearing-faces carried by the socket for normally maintaining the lamp-bulb against longitudinal movement rela-

tively thereto while permitting relative rotation thereof, and complementary external bearing-faces carried by the lamp-bulb in position and adapted to be engaged by the bearing-faces of the socket, said socket having openings in its longitudinal walls, and also having a pair of circuit-terminals, and said lamp-bulb having a neck adapted to be seated in said socket, and said neck having the major portion of its peripheral surface non-contiguous to the socket, whereby a circulation of air is maintained between the neck and the socket, substantially as described.

7. In an incandescent electric lamp, the combination of a socket and a lamp-bulb having their connecting devices separable longitudinally of the lamp, said connecting devices comprising bearing devices carried by the socket in position and adapted for normally maintaining the lamp-bulb against longitudinal movement in one direction relatively thereto, contact-members carried by the socket in position and adapted to prevent relative longitudinal movement of the bulb in the opposite direction, and complementary bearing-faces carried by the lamp-bulb and co-operating with the aforesaid bearing-faces of the socket, said socket having openings in the longitudinal walls, and said lamp-bulb having a neck the major portion of which is inclosed by and is non-contiguous to the socket, whereby a circulation of air is maintained between said neck and the socket; a filament mounted in the lamp-bulb; and a pair of leading-in wires connected with the filament, and sealed

into the lamp-neck, and in rigid relation therewith to thereby form a unitary lamp-bulb, and in position and adapted to close the circuit to the filament through the contact-members of the socket upon the relative rotation of the lamp-bulb and the socket, and to correspondingly break said circuit, substantially as described.

8. In an incandescent electric lamp, the combination of a socket and a lamp-bulb having their connecting devices separable longitudinally of the lamp, said connecting devices comprising bearing-faces carried by the socket for removably engaging and holding the lamp-bulb while permitting rotation thereof, and complementary bearing-faces carried by the lamp-bulb in position and adapted for engaging and holding the aforesaid bearing-faces of the socket; a pair of circuit-terminals carried by the sockets; a filament mounted in the lamp-bulb; and a pair of contact-members electrically connected with said filament, and sealed into the lamp-neck, and in rigid relation therewith to thereby form a unitary lamp-bulb, and in position and adapted for engaging the circuit-terminals of the socket and thereby closing the circuit to the filament upon the relative rotation of the lamp-bulb and the socket, and for correspondingly breaking said circuit, substantially as described.

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