(No Model.)

T. D. BOTTOME.

CUT-OUT FOR INCANDESCENT LAMPS.

No. 445,686. Patented Feb. 3, 1891.

Fig. 1.

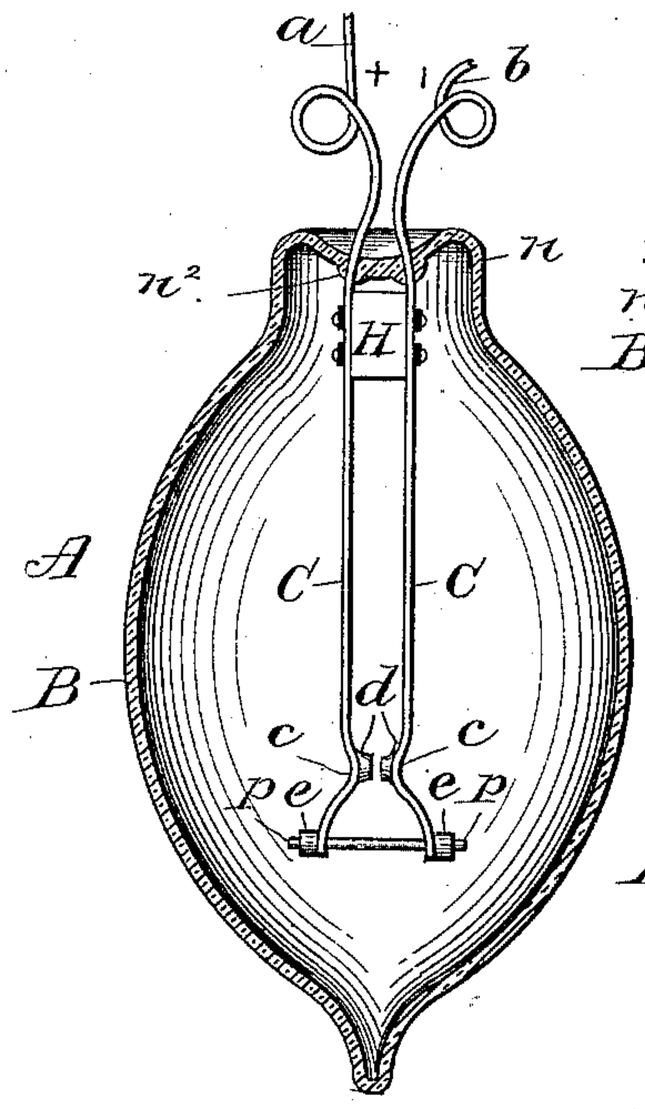


Fig. 2.

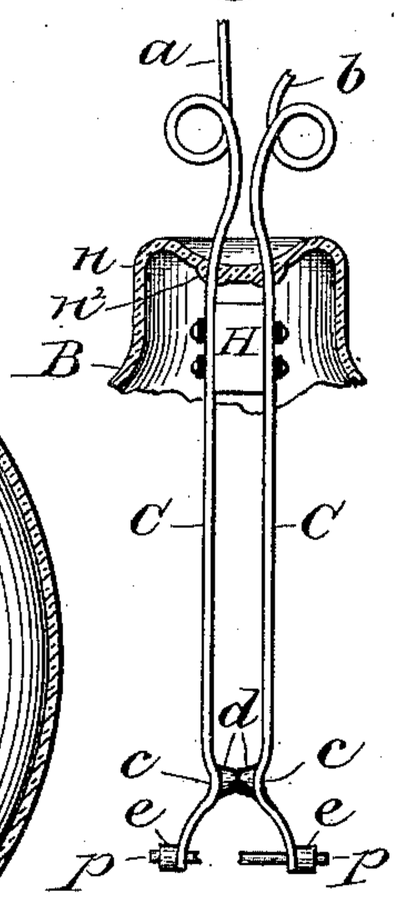


Fig. 3.

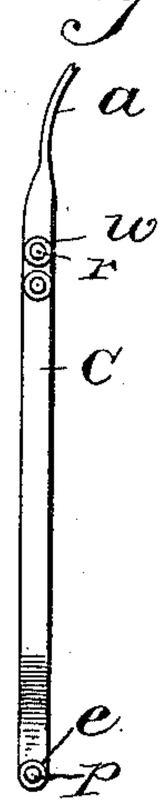
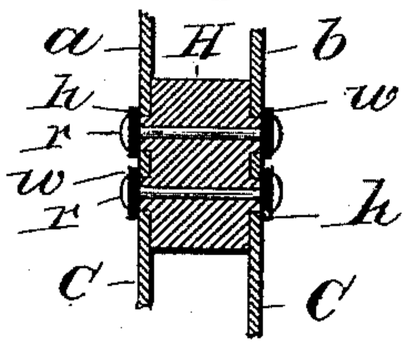


Fig. 4.



Witnesses:
Henry Fastenau Jr
Emil Reiner

Inventor:
Turner D. Bottome

UNITED STATES PATENT OFFICE.

TURNER D. BOTTOME, OF NEW YORK, ASSIGNOR TO JOHN B. TIBBITS, OF HOOSICK, NEW YORK.

CUT-OUT FOR INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 445,686, dated February 3, 1891.

Application filed July 25, 1889. Serial No. 318,688. (No model.)

To all whom it may concern:

Be it known that I, TURNER D. BOTTOME, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Cut-Outs for Incandescent Lamps, of which the following is a specification.

My invention relates to an improved method of constructing incandescent lamps for series circuits; and it consists in mounting a straight filament in metallic carbon-carrying arms and sealing the same within a glass globe. The arms are separated at their upper ends by a block of non-conducting material, and the whole being arranged whereby upon the breaking of the filament the said arms automatically engage each other, thereby forming a closed metallic circuit, and thus effectually "cutting out" the filament from the circuit.

The object of the invention is to provide simple and effectual means of keeping a "series" incandescent circuit closed and operative with a minimum of expense and cumbersome or complicated devices. Lamps of this class when connected in series must be provided with some means of keeping the circuit closed in case one of the lamps becomes ruptured or "burned out," because in such case the circuit is opened or broken, thus causing the extinguishment of the remainder of the lamps located in the circuit. To overcome this inherent defect of series lamps they are usually each provided with an external magnetic cut-out consisting of a high-resistance shunt connected across the lamp, so that upon breaking or rupture of the lamp-filament the whole current would pass through the shunt-wires and energize the magnet, the armature of which in operating cuts out the shunt, forming a closed circuit around the broken lamp. Obviously a cut-out of this description adds greatly to the cost of the lamp, as well as complication to the system.

In carrying my invention into effect reference may be had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 shows a vertical sectional view taken through the center of the glass globe and showing the lamp in its normal condition. The filament as drawn consists of a straight carbon, the ends of which are mounted in the two spring-arms. Fig. 2 is a similar view showing the action of the spring-arms (which carry the carbon) in case the latter becomes ruptured, in which event as soon as the broken filament has wasted to a certain extent the current is transferred from the filament to the contact portions of the two metallic spring-arms, thereby maintaining a continuous circuit. Fig. 3 is a side view of one of the spring-arms detached, having the filament mounted therein. Fig. 4 is an enlarged transverse sectional view of the upper portion of the arms, showing the manner of separating and insulating the same.

In reference to the drawings, A is the lamp wholly complete.

B is the glass globe, the upper portion of which is reduced in diameter and slightly elongated, forming a neck *n*. The latter is capped over and has the two wires *a b* passing through the same and hermetically sealed therein. The lower ends of the said metallic wires *a b* are electrically connected to the depending spring-arms C.

C C indicate the two carbon-carrying arms, the same being made of suitable spring metal adapted to withstand heat and yet retain its spring and be a good conductor of electricity. The arms C are separated at the upper end by the interposed insulating-block H of mica or other suitable material. Each arm is drilled to receive two raised hubs *h*, formed on opposite faces of the block H.

W W indicate enlarged washers of vulcanite, and *r r* indicate metallic rivets passing through said arms, washers, and block for the purpose of firmly securing all the parts together. (See Fig. 4.) The arms from this point extend downwardly and are bent inwardly, as at *c*, and the inner adjacent faces thereof are provided each with a small metallic button *d*, made, preferably, of platinum. Said buttons are separated about one-sixteenth inch apart when the arms are in their normal position, as shown in Fig. 1. The lower end *e* of each arm is adapted to receive and retain an end of a filament *p*. As drawn, the ends are split, forming a spring-clamp. The arms are so mounted and secured that

slight "set" is produced, which serves to automatically spring the lower ends together whenever the opposing force (the filament) is broken.

The normal or relative position of the spring-arms and filament is shown in Fig. 1. In the event of a rupture of the filament and the consequent decrease in length of the same, due to the action of the arc formed, the arms, owing to the removal of the lateral pressure from them, spring toward each other until they make metallic contact at the point *d*, Fig. 2, thus causing the current to be cut out from the path through the filament, although in no wise affecting the other lamps on the same circuit, but causing the current-circuit to be uniformly maintained, thereby preventing dangerous arcs to be formed, as in the case other cut-outs sometimes allow.

I am aware that lamps have heretofore been provided with means adapted to short-circuit the electric current from the filament when it became broken or ruptured, which virtually consisted of two current-carrying springs coming into contact with each other, but the action was nearly always premature or long before a rupture occurred, from the fact that a bow-shaped filament was used. The explanation of this fact lies from the nature of a carbon filament when heated to incandescence to become soft to a certain degree. Thus in the bow-shaped filament the tension of the springs overcomes that of the filament, thereby causing a premature cut-out. This inherent defect I overcome by using a straight filament wherein no tension of the filament is required to oppose that of the springs, as clearly seen by reference to Fig. 1.

What I claim as new and novel is as follows:

1. The combination of the current-wires *a b*, the two bent metallic spring-arms electrically connected to said wires, an insulating-body interposed between and secured to the upper portion of the spring-arms, a metallic projection, as *d*, secured to or forming a part of the spring-arms at their lower adjacent sides and having a straight filament mounted at right angles in their lower ends, as described, and for the purpose set forth.

2. The combination, within a hermetically-sealed globe, of two depending spring-arms united to electrical conducting-wires passing through said globe, an insulating-block interposed between the upper adjacent faces of the spring-arms and secured thereto, a straight filament mounted in the lower ends of the said arms to produce a closed circuit, and a surface or projection formed on each of the inner adjacent faces of the lower portion of the arms, substantially as described.

3. An electric cut-out consisting of a straight filament mounted at right angles in two spring-arms having a portion of their inner adjacent faces near the lower ends thereof normally separated by the integrity of the said straight filament and adapted upon the rupture of the filament to keep the circuit closed, substantially as described.

Signed at New York, in the county of New York and State of New York, this 24th day of June, A. D. 1889.

TURNER D. BOTTOME.

Witnesses:
LOUIS H. ZOCHER,
EMIL REINER.