(No Model.)

J. W. PACKARD.

INCANDESCENT LAMP SOCKET.

No. 417,788. Patented Dec. 24, 1889.

Fig. 1.

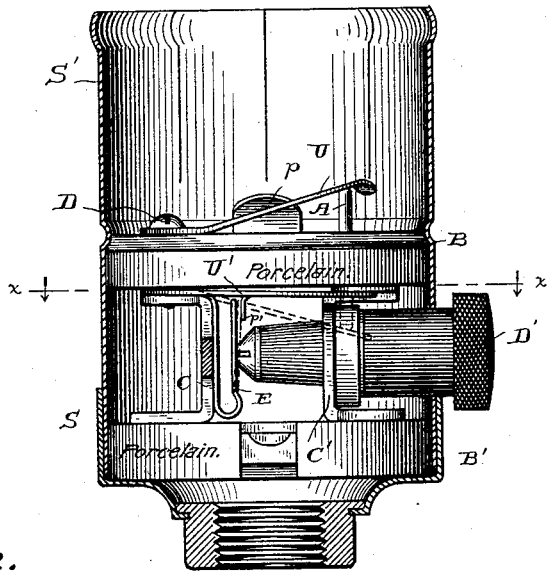


Fig. 2.

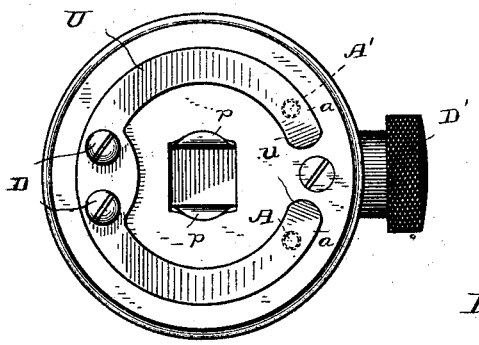


Fig. 4.

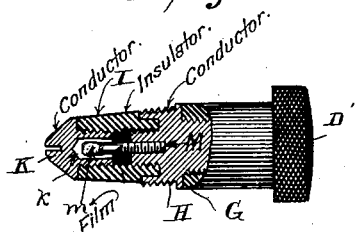
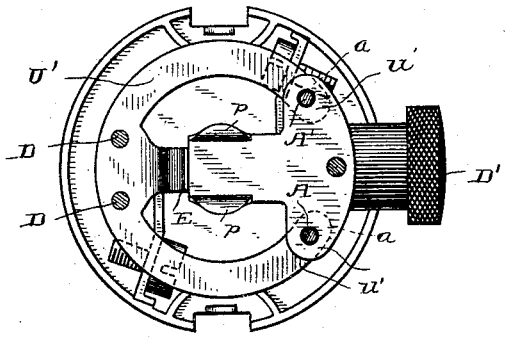


Fig. 3.



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UNITED STATES PATENT OFFICE.

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INCANDESCENT-LAMP SOCKET.

SPECIFICATION forming part of Letters Patent No. 417,788, dated December 24, 1889.

Application filed September 7, 1889. Serial No. 323,311. (No model.)

To all whom it may concern:

Be it known that I, JAMES WARD PACKARD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Incandescent-Lamp Sockets; and I 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.

My invention consists in the improved construction of lamp-socket for incandescent electric lamps, hereinafter to be described and claimed.

In the drawings, Figure 1 shows a longitudinal section of the shell of the lamp-socket, together with a side view of the internal construction. Fig. 2 is a plan view of Fig. 1, the shell being removed. Fig. 3 is a horizontal section of Fig. 1 on the line *x x*. Fig. 4 is a detail view and partial section of the automatic cut-out plug.

When incandescent electric lamps are to be connected up in series in an electrical circuit, it is necessary that provision shall be made for the automatic closing of the circuit in the lamp-socket whenever the lamp is removed therefrom or is destroyed, or whenever any detachable portion of said socket is withdrawn. To accomplish these objects and at the same time produce a lamp-socket which shall be neat, compact, and easily manipulated, I have designed the following apparatus, in which S S′ are the portions of the metallic shell of the lamp-socket into which the lamp proper (not shown) is to be introduced. The internal electrical connections for said lamp-socket are fastened upon or between the two circular plates B B′, made of porcelain or other suitable insulating material. The wires of the external circuit are connected to the binding-posts C C′ by suitable screws (best shown in Fig. 3) in the ordinary manner. Connected to the binding-posts C and the plate B, by the screws D or their equivalent, is the U-shaped contact-spring U. The branches *u u* of this spring bear against a suitable metallic plate in the lamp when the latter is introduced into the socket, and establish electrical connections between the binding-post C and one of the electrodes of the lamp in the well-known way. Fastened upon the plate B by means of the screw D′, and in electrical connection with the binding-post C′, is the contact-plate P, (best shown in Fig. 3,) which has suitable projections extending upward through an opening in the plate B, and thereby establishing electrical connection between the binding-post C′ and the other electrode of the lamp when the latter is in its place in the socket. On the contact-plate P, and extending downward therefrom, is the projection *p′*. Against this projection a spring E normally presses. This spring E is mounted upon and in electrical connection with the binding-post C. A suitable insulating-plug G screws into the binding-post C′ and bears against the spring E, lifting the same from contact with the projection *p′*.

The construction of the plug G is shown in Fig. 4. It consists of the conducting portion H, which is in electrical connection with the binding-posts C′ when the plug is in its place in the socket. The hollow tip of the plug is supported in the insulating portion I. This tip K, which has the cavity *k*, is thus insulated from the portion H. The spindle M of conducting material is set in the portion H and extends into the cavity *k*. That portion of the spindle which is within the cavity is covered with a film of fusible material *m*, which is normally out of contact with the interior walls of said cavity, though in close proximity to the same. Fastened on the under side of the plate B is the U-shaped circuit-closing spring U′, whose branches *u′* normally press upward against the contact-plate P and thereby establish a short circuit from the binding-post C to the binding-post C′, either directly through the said spring U′ or indirectly through the spring U, the plungers A and the branches *u′ u′* of the spring U′, or through both these paths. The plungers A A move freely through holes in the insulating-plate B, and furnish both mechanical and electrical connection between the corresponding branches of the contact-spring U and the circuit-closing spring U′. These plungers A

are insulated from the contact-plate P by reason of the fact that the holes *a a* in said plate through which these plungers pass are of greater diameter than the holes in the plate B in which said plungers are guided, and are concentric therewith, as shown in Fig. 3.

The method of operation of my invention is the following: When the plug G is inserted, the short circuit between the spring E and the projection *p'* is broken. When the lamp is introduced into the socket, the branches *u u* of the contact-spring U are pressed downward and the short circuit afforded by the circuit-closing spring U' is broken. The current consequently passes through the carbon filament of the lamp and the latter is raised to incandescence. If the filament breaks, a spark passes from the spindle M to the conducting-tip K of the automatic cut-out plug G and fuses the fusible material *m*, which collects in a globule and establishes a short circuit from the binding-post C to the binding-post C', thereby preserving the continuity of the entire circuit and preventing the extinction of all the lamps on the circuit. If the plug G should work loose, so that contact between its tip K and the spring E would be destroyed and the safety apparatus be thereby thrown out of condition for action in the emergency of a lamp breaking, the short-circuiting through said spring E and the projection *p'* will occur and call attention to the fact of the derangement of the safety apparatus by the extinction of the lamp in that socket. When the lamp is removed from the socket, the short circuit through the contact-plate P and the circuit-closing spring U' is established, and the remaining lamps in the circuit are left undisturbed.

The advantages of my invention are evident from the above description of its operation and from inspection of the simple and compact construction illustrated.

A further advantage also arises from the fact that the two branches *u' u'* of the circuit-closing spring render the action of that device doubly sure, since, in the event of one branch failing to act through the interposition of any foreign insulating substance or otherwise, the other branch will still close the circuit on the removal of the lamp from the socket. Moreover, this construction has the additional advantage of presenting the opposition of only one spring to the introduction of the lamp into the socket, the pressure of the contacts *p* being in a lateral direction, while in many other constructions there is a spring pressing outward against both of the contacts in the lamp, tending to throw the same out of the socket.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an incandescent-electric-lamp socket, the combined double-contact spring and circuit-closer, which consists of the U-shaped contact-spring, through which electrical connection is made from one electrode of the lamp to one binding-post when the lamp is in the socket, and the corresponding U-shaped circuit-closing spring, together with the independent mechanical connections between the corresponding branches of the U-shaped springs, which, when the pressure of the lamp upon the contact-spring is released by the removal of the lamp from the socket, permit the circuit-closing spring to rise and close the circuit between the binding-posts, all combined substantially as described.

2. In an incandescent-electric-lamp socket, the combined contact-making and circuit-closing device, which consists of the U-shaped contact-spring, through which electrical connection is made from one electrode of the lamp to one binding post of the socket, the contact-plate by which electrical connection is made from the second electrode of the lamp to the other binding-post of the socket, and the corresponding U-shaped circuit-closing spring, whose two branches normally bear upon the above-mentioned contact-plate, and thereby establish a short circuit between the binding-posts, together with the independent mechanical and electrical connections between the corresponding branches of the U-shaped springs, by which the said short circuit is broken when the lamp is introduced into the socket, all combined substantially as described.

3. In an incandescent-electric-lamp socket, the automatic short-circuiting plug, which consists of the conducting portion which is to be screwed into one binding-post, the hollow conducting-tip which is to be put in electrical connection with the other binding-post, the intermediate insulating portions, and the conducting-spindle, which has its extremity coated with a film of fusible material, and which extends from the first-named conducting portion of the plug into the hollow tip, but is normally out of contact with the latter, together with the spring in electrical connection with the second binding-post, against which spring the conducting-tip presses, all combined substantially as described.

4. In an incandescent-electric-lamp socket, the combination of a binding-post which has a conducting-spring in electrical connection therewith, the spring, a second binding-post, a projection in electrical connection with said second binding-post, against which projection the spring normally presses, together with an insulating-plug which screws into the first binding-post and lifts the spring from contact with the projection thereon, substantially as described.

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

JAMES WARD PACKARD.

Witnesses:
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