F. BENZ, JR.

INCANDESCENT ELECTRIC LAMP.

APPLICATION FILED SEPT. 23, 1910.

1,046,547.

Patented Dec. 10, 1912.

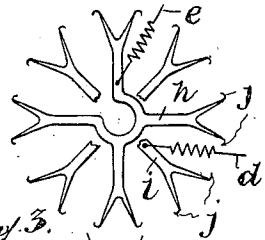


Fig. 3.

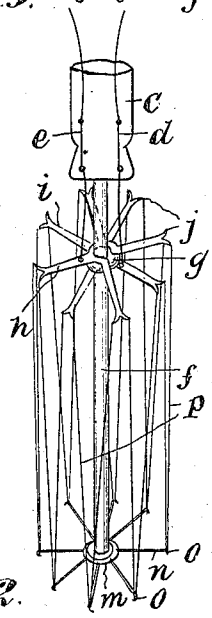


Fig. 2.

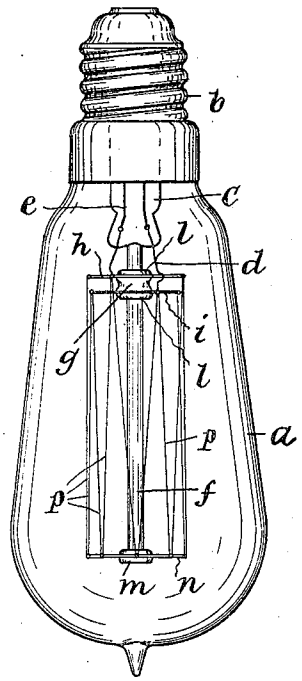


Fig. 1.

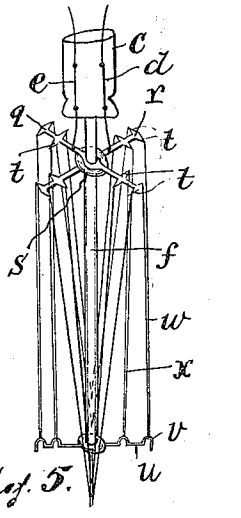


Fig. 5.

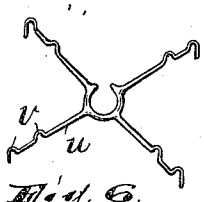


Fig. 6.




Fig. 4.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## INCANDESCENT ELECTRIC LAMP.

1,046,547. Specification of Letters Patent. Patented Dec. 10, 1912.

Application filed September 23, 1910. Serial No. 583,351.

*To all whom it may concern:*

Be it known that I, FREDERICK BENZ, Jr., a citizen of the United States, residing in Haledon, Passaic county, and State of New Jersey, have invented certain new and useful Improvements in Incandescent Electric Lamps; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to increase the burning life of an incandescent electric lamp of the kind wherein the light emitting medium consists of a number of filaments or other incandescent portions, a type of which medium is that wherein the said portions or members are produced by forming a series of up and down bends in a suitable filament; in such lamps as now made, the component portions of the filament or other light emitting medium are arranged in series relatively to the leading-in wires of the lamp, in consequence of which, if any one of said portions is broken, the lamp becomes at once completely useless. According to my invention, the leading-in wires are connected by incandescent devices or members arranged in parallel, whereby the disruption of any one portion or member leaves the lamp fully efficient with respect to all the rest of said portions or members.

In the accompanying drawing, wherein my invention is fully illustrated, Figure 1 is a side elevation of an incandescent electric lamp constructed in accordance with my invention; Fig. 2 is a perspective view of the internal mechanism of the lamp, a part of the means for securing one of the filament-supporting spiders in place being omitted; Fig. 3 is a plan view, partially fragmentary, of the two spiders which are respectively connected with the leading-in wires; Fig. 4 is a perspective diagrammatic view of what is shown in Fig. 2; Fig. 5 illustrates a modification; and, Fig. 6 is a perspective view of the spider *u* shown in Fig. 5.

The globe or bulb *a*, socket *b*, glass post *c* and leading-in wires *d* and *e* are or may be all constructed and arranged substantially the same as now common in the manufacture of electric lamps of the type indicated above.

In the axis of the globe or bulb *a* and projecting from the post *c* is an insulating stem *f*. Near the upper end of this stem is formed a hub or boss *g*, and secured against the upper and lower sides of this boss are the spiders *h* and *i*, each arm of each of which is preferably forked and provided with terminal hooks or other suitable attaching means *j*; each spider *h* and *i* may be secured against the boss *g* by a cap *l* (not shown in Fig. 2), say of glass applied in molten condition. The boss *g* is of course insulating and it and the stem *f* may likewise be composed of glass. The spiders *h* and *i* are arranged so that their respective arms alternate with each other when seen in plan (Fig. 3), and to one of them the leading-in wire *d* is electrically connected while to the other the leading-in wire *e* is connected.

In an insulating enlargement *m* at the lower end of the stem *f* is secured a spider *n* having hooks *o* or other suitable attaching means at the ends of its several arms.

In that adaptation of my invention now being referred to the spider *n* has the same number of arms as the two spiders *h* and *i* together have, but since there are two attaching means for each arm of the spiders *h* and *i* there are twice as many attaching means *j* as there are attaching means *o*.

*p* designates a series of filaments, composed say of tantalum, tungsten, or the like. One end of each of these is electrically connected, by soldering or otherwise, to one of the attaching means of one of the arms of the spider *h*, being then extended downwardly and connected with the attaching means at *o* at the end of one of the arms of the spider *n* and then extended up to the spider *i* having its other end soldered or otherwise electrically connected to that attaching means *j* of said spider *i* which adjoins the attaching means of the spider *h* where its first-mentioned end is connected. The result is that the terminals for the leading-in wires, which are in effect formed by the spiders *h* and *i*, are connected by incandescent devices or members which are arranged in parallel, the spider *n* affording an auxiliary support serving principally to maintain a desired bend in each of said portions or members.

In Fig. 5 the post *c*, leading-in wires *d* and *e* and post *f* are all the same as in Figs.

1 and 2. Instead of spiders being employed as the terminals of the leading-in wires, cross-arms $q$ and $r$ are secured in intersecting relation to each other on the stem $f$ by the means $s$ serving to insulate said cross-arms from each other. Each arm has at each end thereof two oppositely projecting pairs of spurs $t$, forming attaching means for the filaments. The cross-arms $q$ and $r$ are arranged near the upper end of the stem and to its lower end is secured a spider $u$ (Fig. 6) having the bends $v$ in each of its arms. The filaments are arranged in two sets $w$ and $x$. Each filament of the set $w$ has one end attached to an outer spur $t$ of the cross-arm $q$ and the other end attached to the adjoining outer spur of the cross-arm $r$, it being extended between its ends in engagement with the outer bend $v$ of one of the arms of the spider $u$. Each of the filaments $x$ is connected in the same manner at its ends with the inner adjoining spurs of the cross-arms $q$ and $r$ and between its ends with the inner bend of one of the arms of the spider $u$. The result of this arrangement is in principle substantially the same as that in the case of the construction first described, that is, the terminals $q$ and $r$ of the leading-in wires are connected by incandescent devices or members arranged in parallel.

What I claim is:

In an incandescent lamp, the combination of terminals for the leading-in wires disposed relatively near each other, an auxiliary support spaced from said terminals, and incandescent members arranged in parallel and each comprising electrically connected portions, one portion of said member electrically connecting one terminal with said support and the other electrically connecting the other terminal with said support, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand, this 21st day of September, 1910.

FREDERICK BENZ, JR.

Witnesses:

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WM. D. BELL.