No. 896,252. PATENTED AUG. 18, 1908.

J. SCHILLING.

MEANS FOR ATTACHING METALLIC FILAMENTS TO THEIR CARRIER ARMS.

APPLICATION FILED OCT. 10, 1906.

Fig. 1.

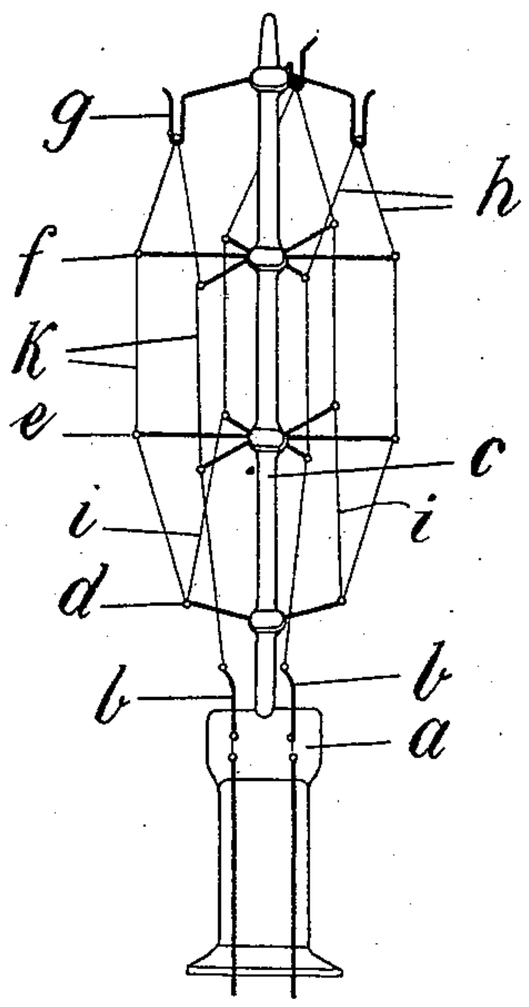
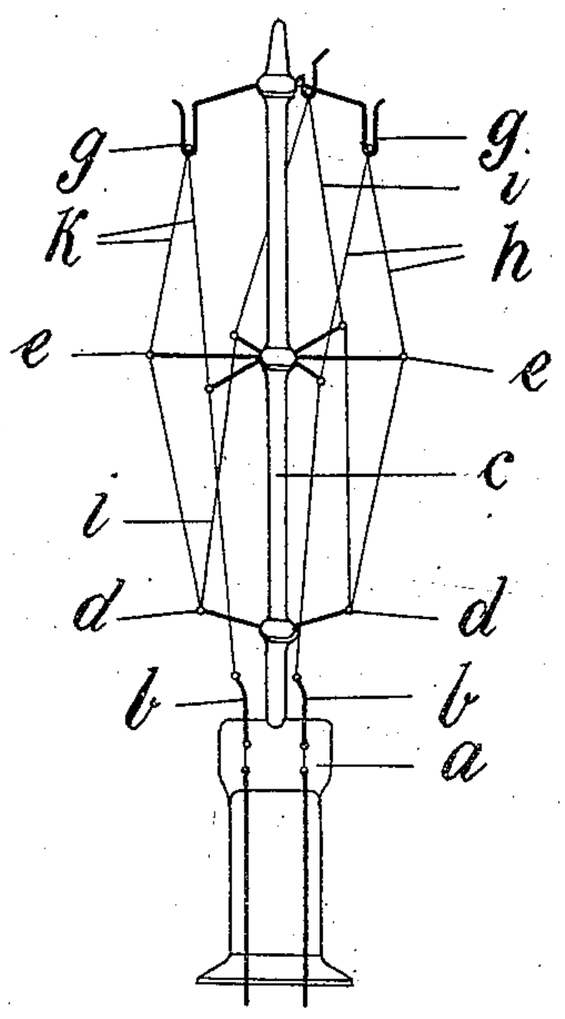


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHANNES SCHILLING, OF HALENSEE, NEAR BERLIN, GERMANY.

MEANS FOR ATTACHING METALLIC FILAMENTS TO THEIR CARRIER-ARMS.

No. 896,252. Specification of Letters Patent. Patented Aug. 18, 1908.

Application filed October 10, 1906. Serial No. 338,299.

To all whom it may concern:

Be it known that I, JOHANNES SCHILLING, a citizen of the German Empire, and residing at Halensee, near Berlin, Germany, have invented certain new and useful Improved Means for Attaching Metallic Filaments to their Carrier-Arms, of which the following is a description.

My present invention relates to incandescent electric lamps having metallic filaments, and has for its particular object to improve the manner of supporting said filaments, with a view of simplifying the manufacture and of obtaining a more reliable contact.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings in which

Figures 1 and 2 are perspective views showing two forms of my invention.

Filaments for incandescent electric lamps made from highly refractory metals such as molybdenum, tungsten, tantalum, zirconium and the like have a tendency to sag when incandescent, that is, the bow or loop of the filament, if unsupported, will gradually lose its shape. On account of this peculiarity, filaments of this character are now commonly supported by suitable carriers, and according to one of the types now in use, a continuous long filament is wound on the carriers, while according to another type, a number of individual bows of comparatively short length, are employed, each of which bows has both ends secured to individual carriers, the bows being connected in series. With this latter construction there are as many carriers or supports, and as many joints, as there are bow ends, (with the exception of the terminals) or, in other words, almost twice as many supports, and almost twice as many joints, as bows. The connection at the joints has been effected by means of cements which have the defect of becoming brittle and weakened when they are exposed to a high heat upon the passage of an electric current through the filament. There is, therefore, danger of breakage at the joints, with the construction above referred to. To avoid this defect, I have devised a structure in which the adjacent ends of two neighboring bows are connected with the same carrier by cement, so that the number of joints is reduced, and furthermore, the connection from one bow to the other is not made exclusively through the carriers as heretofore, but the passage of the current will cause the adjacent or contiguous ends of neighboring bows to bake or weld together, so that even the breaking or dropping off of cement would not destroy the continuity of the filament.

In Fig. 1, *a* indicates the glass foot or stem in which are embedded the usual terminals or leads *b* and to which is secured the central spindle *c* on which are mounted arms *d* nearest to the stem *a*, then two radially arranged sets of arms *e*, *f*, and finally a set of carrier arms *g* at the free end of the spindle *c*. The filament comprises three bows, one of which, *h*, extends from one of the terminals *b* to one of the arms *d*, passing on its way in contact with two of the arms *e*, two of the arms *f*, and one of the arms *g*. Another loop *k* extends in a similar manner from the other terminal *b* to the other arm *d*. Finally the third filament *i* extends from one arm *d* to the other, passing on its way in contact with two of the arms *e*, two of the arms *f*, and one of the arms *g*. It will, therefore, be seen that the outer end of each carrier arm *d* serves as a connecting point for the adjacent ends of two of the bows, which ends are, therefore, quite close to each other, so that when they are heated by the passage of the electric current, they may bake together, welding automatically, as it were, and forming a joint which is practically as conductive as the metal itself, so that the fastening or cementing at the ends of the carrier arms will practically be free from current, and thus will remain cooler than when the entire current passes through it, as in the prior construction referred to. The joint is, therefore, much less liable to break. The construction shown in Fig. 2 differs from that illustrated by Fig. 1 only by the omission of the second set of supports *f*.

It will be seen that the adjacent ends of two neighboring bows are cemented to the same supporting carrier arm; thus with three bows as in the construction illustrated only two supporting arms are required for connecting the adjacent ends of neighboring bows, or, in a general way, the number of carrier arms for supporting such ends is one less than the number of bows. With the former construction the number of carrier arms for supporting the intermediate bow

ends is equal to twice the number of bows, less two. I therefore, first, effect a considerable saving in the time and labor required for the manufacture of the lamp; second, as has already been indicated, I obtain a much more reliable joint from the fact that the adjacent ends of the neighboring bows are brought into close juxtaposition, so that on the passage of the current they will be welded together. The joint is therefore much stronger and is also of better conductivity.

I claim as my invention:

1. An incandescent electric lamp, provided with an internal support having carrier arms, and a filament consisting of a plurality of bows engaged with said arms, the adjacent ends of two neighboring bows being secured to the same carrier arm.

2. An incandescent electric lamp, provided with an internal support having carrier arms, and a metallic filament consisting of a plurality of bows engaged with said arms, the adjacent ends of two neighboring bows being secured to the same carrier arm and welded together.

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

JOHANNES SCHILLING.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.