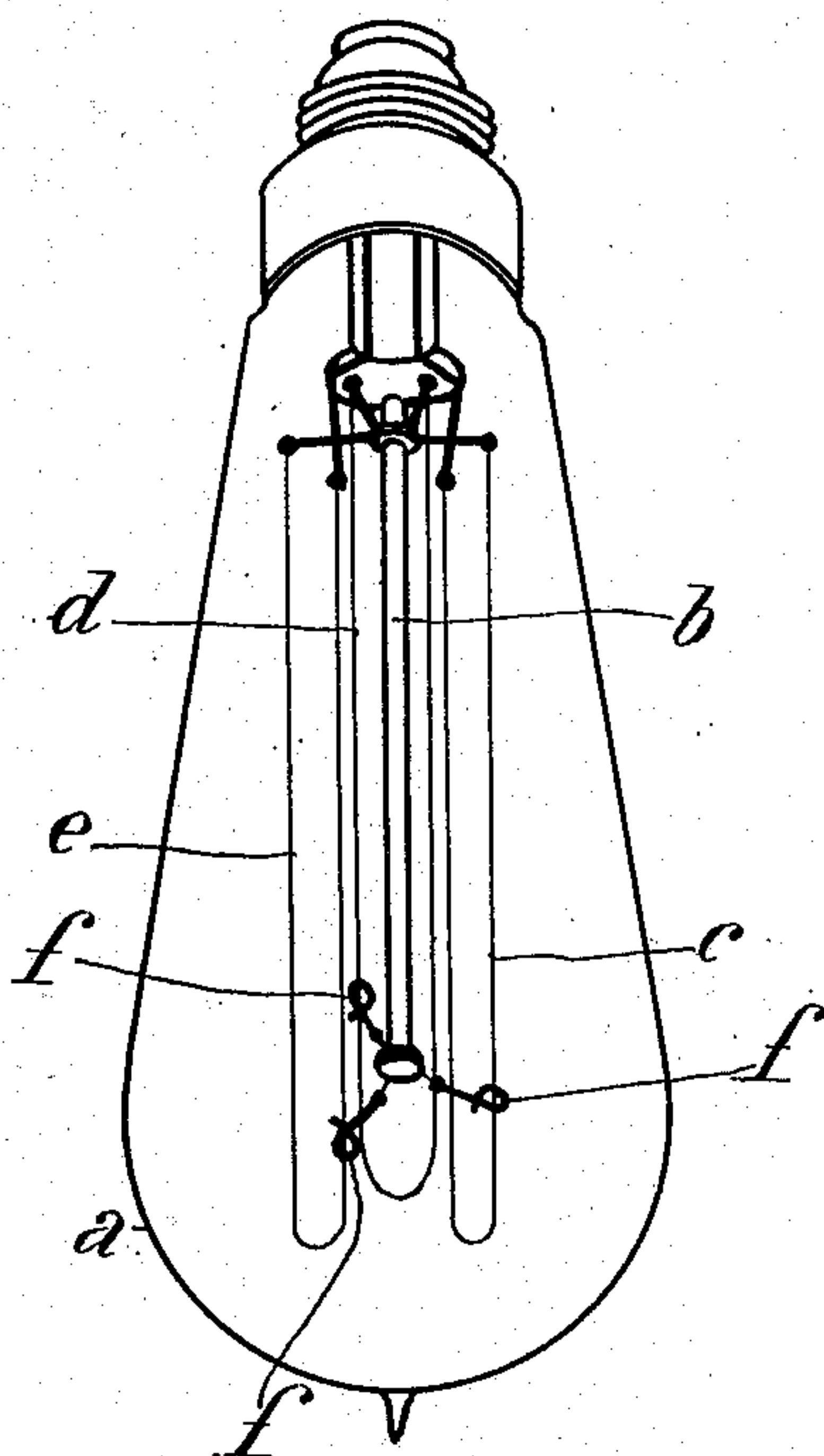


F. BLAU & H. REMANÉ.
ELECTRIC GLOW LAMP, &c.
APPLICATION FILED APR. 25, 1906.

900,909.

Patented Oct. 13, 1908.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRITZ BLAU AND HERMANN REMANÉ, OF BERLIN, GERMANY, ASSIGNORS TO DEUTSCHE GASGLÜHLICHT AKTIENGESELLSCHAFT, (AUERGESELLSCHAFT,) OF BERLIN, GERMANY.

ELECTRIC GLOW-LAMP, &c.

No. 900,909.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed April 25, 1906. Serial No. 313,708.

To all whom it may concern:

Be it known that we, FRITZ BLAU, chemist, a subject of the Emperor of Austria-Hungary, and a resident of Berlin, Alte Jakobstr. No. 139, Germany, and HERMANN REMANÉ, chief engineer, a subject of the Emperor of Germany, and a resident of Berlin, Plan Ufer No. 14, Germany, have invented a certain new and useful Improvement in Electric Glow-Lamps and in the Manufacture of the Same; and we 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 references marked thereon, which form a part of this specification.

Our invention relates to "improvements in electric glow lamps and in the manufacture of same."

Electric glow lamps having metal filaments, such as filaments of metallic tungsten are found to suffer from the defect that the filaments break, especially when the lamps are being turned off, this being attributable to the "fritting", or adhesion resulting from such "fritting" of the filaments to the holders, and so preventing the filaments from contracting.

Careful observation has revealed a number of metallic gray specks, dots or streaks, for the most part sharply defined, which are formed in advance on those parts of the holders which serve to guide the filaments, and where the "fritting" afterwards occurred. These phenomena are due to deposits of the material of the filaments dispersed in the form of powders, by the action of the electric current in the so-called vacuum, which deposit is therefore not uniformly distributed, but settles down locally in certain spots.

It has been found that from the spots on which a small portion of the atomized material had deposited, an attraction is exercised on the particles floating about inside the lamp, which results in an increase in the deposit at those places, while the other parts of the holders remain perfectly free from deposit. When the deposit at the separate spots has reached a certain thickness, the fritting of the filament ensues, and is accompanied by its adhesion to the holders. It

may be assumed that the formation of these local deposits is attributable to a process analogous to that of crystallization in which the deposition of new particles occurs on ready formed crystals, so that, as a rule, one or a few crystals of large dimensions are formed in the solution, although the super-saturation necessary to crystallization is naturally present throughout the whole of the solution. If, however, there are a large number of small crystals in the solution, then a similar increase of growth in individual crystals does not ensue, and all the crystals grow more or less uniformly.

Our invention consists in providing, within the bulb of a lamp and before the same is put into use, a comparatively large surface coated with a thin film of a deposit similar to that which, in lamps of ordinary construction would be locally precipitated in certain spots. The result obtained is that the atomized material of the filament within the lamp is at once presented with a large surface for attracting deposition, so that the formation of local and copious deposits at accidental spots, such as on the holders is prevented.

To assist in explaining our invention we have hereunto annexed a drawing which shows an incandescent electric lamp in perspective. The bulb *a* contains a carrier *b* for the holders *f* of the tungsten filaments *c, d, e*.

As an example to show how the deposit may be produced, we shall describe in the following a convenient method of carrying out the invention.

Before the exhausting of the lamp to produce the usual vacuum is completed, an atmosphere of hydrogen under a pressure of a few millimeters of mercury is introduced into the globe, and the current is then passed through the filament. In a short time an atomizing of the material of the filament ensues in the rarified gases, and is followed by the formation of a deposit on various parts of the interior of the lamp. The deposit is thrown down chiefly on the parts adjacent to the filaments, that is, on the holders *f*. As an example, in a 110-volt tungsten lamp, the filaments of which are guided by the well-known white thoria holders, the existence of the deposit is revealed by the circumstance that within a few minutes the originally pure white holders turn a uniformly

graphite-gray color. A lesser deposit, is at the same time also formed on the centrally mounted carrier *b* which is surrounded by all the filaments. The more remote the parts inside the lamp are, from the filaments, the weaker is the deposit; nevertheless, if the atomizing process be allowed to continue for a long time, even the deposit on the inner walls of the lamp bulb can be made visible to the eye. For obvious reasons, however, this is not permitted to take place in lamps intended for lighting purposes, particularly as the thinnest film of deposit, causing no appreciable absorption of the light, is quite sufficient to effect the desired result.

The desired effect can also be produced by providing new lamps with carriers that have already been in use, or by employing carriers that have previously been coated with a similar deposit by other means. In the latter case, however, the surface presented for the formation of the deposit being relatively small in comparison with that of the large inner wall of the bulb, only a diminished effect can be looked for.

It should be mentioned that the atomizing of the material actually effected cannot be discerned by the eye unless white suspenders are used or a carrier is employed.

We claim:

1. The process of making an electric glow lamp having a metallic incandescent body, which consists in providing within the bulb of said lamp a deposit of a metal, and then exhausting the bulb.

2. The process of making an electric glow lamp having a metallic incandescent body, which consists in providing within the bulb of said lamp a deposit similar to that which the electric current passing through the incandescent body tends to produce, and then exhausting said bulb.

3. The process of making an electric glow lamp having a metallic incandescent body, which consists in providing within the bulb of said lamp a deposit similar to that which in a vapor of hydrogen the electric current passing through the incandescent body tends to produce, and then exhausting said bulb.

In testimony, that we claim the foregoing as our invention, we have signed our names in presence of two subscribing witnesses.

FRITZ BLAU.

HERMANN REMANÉ.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.