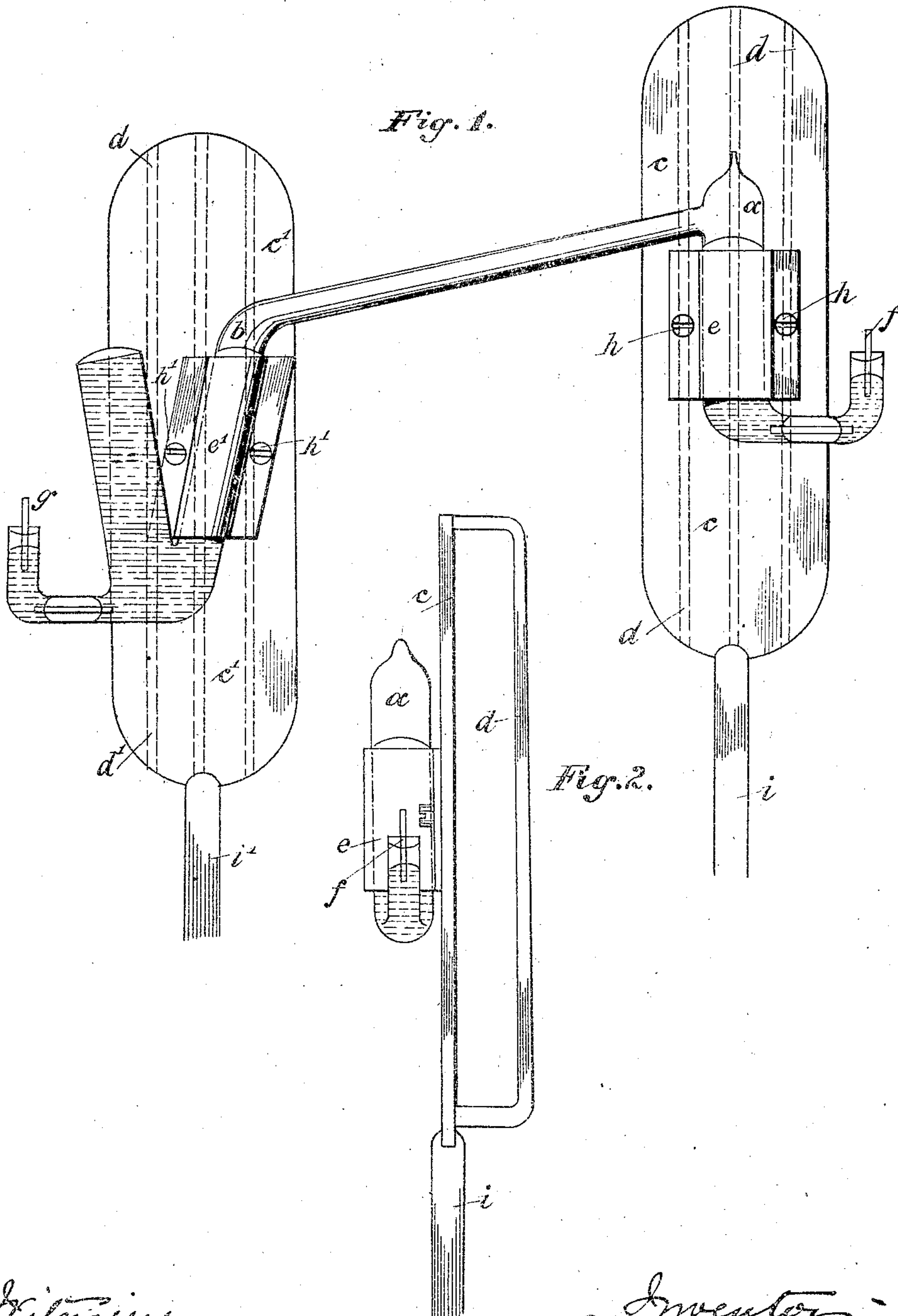


No. 793,530.

PATENTED JUNE 27, 1905.

R. KÜCH.  
COOLING DEVICE FOR ELECTRIC LAMPS.  
APPLICATION FILED MAR. 3, 1904.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## COOLING DEVICE FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 793,530, dated June 27, 1905.

Application filed March 3, 1904. Serial No. 196,407.

To all whom it may concern:

Be it known that I, RICHARD KÜCH, a subject of the German Emperor, and a resident of Hanau, Germany, have invented certain new and useful Improvements in Cooling Devices for Electric Lamps, of which the following is a specification.

As is well known, the good working of gas or vapor electric lamps comprising mercury electrodes largely depends upon the preservation of the pressure of the gas or vapor within the lamp so that this pressure neither exceeds nor falls behind a certain measure—*vide*, for instance, the article by Dr. Max von Recklinghausen in the German periodical *Centralblatt für Elektrotechnik*, 1902, No. 23. For this reason the original Aaron's lamp was provided with a water-cooling device, while Hewitt employs special cooling or condensing chambers blown or molten upon the lamp parts outside the arc part for regulating the pressure of the vapor.

My invention relates to a simple cooling device in such gas or vapor electric lamps whereby the same result can be obtained; and the objects of my improvement are, first, to provide the electrodes of the lamp on the outside with metallic mantles, and, second, to connect these mantles with ribbed metallic plates which present large surfaces to the circulating air, so that the electrodes are sufficiently cooled and the pressure of the gas or vapor within the lamp never exceeds a certain predetermined limit. I attain these objects by the device illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of a gas or vapor electric lamp in a mode of execution and provided with my cooling device, and Fig. 2 is a side view of the right part of the same seen in the direction from right to left in Fig. 1.

Similar letters of reference refer to similar parts in both views.

My trials have shown that the cooling of the two electrodes of the lamp can be effected by wrapping them up with metal sheets which present large surfaces to the rising air.

In the drawings, *a* and *b* denote two cylindrical parts of the glass vessel of the lamp,

which normally contain mercury as electrodes. This lamp is connected with the respective circuit by means of the two poles *f* and *g*. The two glass parts *a* and *b* are wrapped up with thin metallic foil and secured on two vertical metallic plates *c* and *c'* by means of two metallic clasps *e* and *e'* and the screws *h* *h* and *h'* *h'*, the two clasps embracing the metallic foils, and thus conductively connecting the latter with the metallic plates. As is clearly shown in the drawings, the two metallic plates *c* and *c'* are on their rear sides provided with vertical ribs *d* and *d'*, respectively, whereby their surfaces in contact with the ambient air are considerably increased, in a similar manner as the surfaces of the known ribbed radiators. The two plates *c* and *c'* may form parts of two supports *i* and *i'*, respectively. It will be evident that during the work of the lamp both mercury electrodes will be effectively cooled by the rising air passing along the vertical surfaces of the two clasps *e* and *e'* and the two plates *c* and *c'* and their ribs *d* and *d'*. By suitably proportioning these cooling-surfaces the pressure of the gas or vapor within the lamp can be adjusted so that it never exceeds a certain convenient limit.

The cooling device described may be varied without deviating from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of a metallic mantle surrounding said electrode, and means for cooling said metallic mantle.

2. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of a metallic mantle inclosing said electrode, and a radiator in contact with the ambient air and conductively connected with said metallic mantle.

3. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of a metallic foil inclosing said lamp-tube, a vertical metallic plate provided with a plurality of vertical ribs and serving as a radiator, and a metallic clasp se-



curing said lamp-tube on said vertical metallic plate and conductively connecting the latter with said metallic foil.

4. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of a conducting-clasp about said electrode, and a radiator conductively connected to said clasp.

5. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of a metallic clasp about said electrode, and a radiator conductively connected to said clasp.

6. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of a metallic clasp about said electrode, and a metal plate conductively connected to said clasp.

7. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of a metallic foil inclosing said lamp-tube, a metal plate, and a metallic clasp conductively connecting said plate and foil.

8. In a gas or vapor electric lamp, the combination with a lamp-tube containing mercury as an electrode, of metallic radiators connected conductively with said tube, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RICHARD KÜCH.

Witnesses:

FRANZ HASSLACHER,  
MICHAEL VOLK.