Sept. 29, 1936. C. PRINZ 2,055,705

THERMOSTAT DEVICE CONTROLLING THE CORRECT POSITION OF A SOURCE OF RADIATION, ESPECIALLY OF THE ARC OF AN ARC LAMP

Filed Jan. 18, 1933

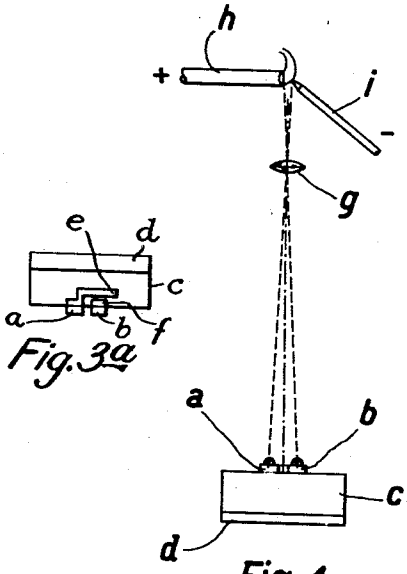


Fig. 1

Fig. 3a

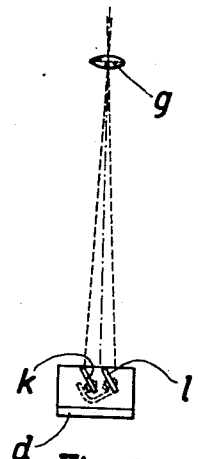


Fig. 4

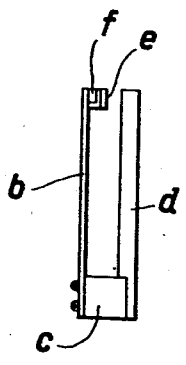


Fig. 2

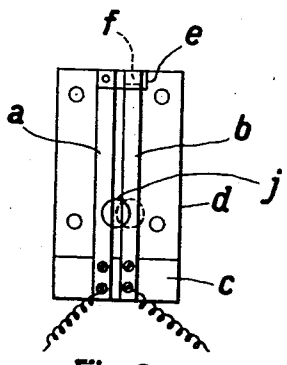


Fig. 3

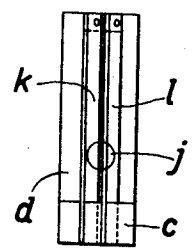


Fig. 5

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THERMOSTAT DEVICE CONTROLLING THE CORRECT POSITION OF A SOURCE OF RADIATION, ESPECIALLY OF THE ARC OF AN ARC LAMP

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Application January 18, 1933, Serial No. 652,408
In Germany January 22, 1932

1 Claim. (Cl. 176—71)

Application has been filed in Germany, January 22, 1932.

The invention concerns devices controlling the correct position of a source of radiation, especially the arc of arc lamps, which is liable to wander on account of the consumption of the electrodes, the device being used to make the light arc remain permanently, for instance, at the focus of a reflector. The known devices of this kind generally contain two elements sensitive to radiation, in most cases bimetallic strips, which are parallel, and an optical system imaging the source of radiation on the one element, the other element compensating for the effect of the temperature in the surrounding space on the first said element. Through the agency of electric contacts or the like, the sensitive elements act upon driving mechanisms, which bring the wandered source of radiation back into its original position.

According to the invention use is made of the known device in which the bimetallic strips are parallel, this device being, however, so constructed that the elements lie next to each other in that direction in which the image of the source of light is being displaced when the source of light is moving in a predetermined manner, the two strips having such positions that, when the source of radiation assumes its correct position, the image of the source of radiation projected by the said optical system is uniformly divided over the two strips. This construction has proved and ensured a considerably better and more rapid working of the control device than could be obtained so far, the improvement being due to the fact that as soon as the source of radiation is removed from the prescribed position and the image of this source of radiation leaves its position symmetrical to the bimetallic strips, the one strip is heated more strongly and the other cooled down, as a consequence of which the sensitivity of the device is twice as great as that of the devices in use hitherto, in which only the one strip is exposed to, and the other protected from, the radiation.

It is advisable to so dispose these strips in the device that the directions of their breadths are inclined relatively to the direction of radiation, so as to ensure a sufficient part of their breadth being influenced.

In the accompanying drawing, which illustrates the invention, Figure 1 represents in elevation a constructional example for use in an arc lamp, Figure 2 a lateral section, Figure 3 a plan view of the device, and Figure 3a a side view from the upper part of Figure 3. Figures 4 and 5 show an alternative form of the said example in elevation and a plan view respectively.

In the device represented by Figures 1 to 3a, the elements sensitive to radiation are two bimetallic strips *a* and *b* whose one ends are fixed to a support *c* of insulating material resting on a base plate *d*. At its free end, the strip *a* is provided with a contact piece *e* which extends below the strip *b* and is opposite a contact piece *f* fixed to the free end of the strip *b*. The strips *a* and *b* are so designed that an increase of heat bends them towards the base plate *d*. A lens *g* disposed between the electrodes *h*, *i* of the arc lamp and the strips *a*, *b* projects an image *j* of the light arc of the lamp, which uniformly covers the two strips *a* and *b* when the arc is in the prescribed position, both strips bending equally towards the base plate *d* in such a manner that the contact *e*, *f* remains open. When the positive electrode *h* is being consumed the image *j* is now bent more strongly, and the strip *a* wanders towards the strip *b* (for instance to the position represented by dash lines). The strip *b* stretches accordingly, the contact *e*, *f* being closed rapidly. As a consequence, the device for feeding the positive electrode is actuated and the original condition reassumed. An alteration of the temperature in the surrounding space causes the two strips to bend by equal amounts, so that, as desired, no closing of the contacts and no consequent actuation of the feeding device will take place.

The device represented by Figures 4 and 5 differs from the one described above only by the fact that the transverse diameters of the bimetallic strips, which are designated *k* and *l* in this case, are strongly inclined relatively to the direction of the radiation.

I claim:

A thermostat device for controlling the correct position of a movable source of radiation, especially the position of arc electrodes, comprising a support, two bimetallic strips sensitive to radiation whose one ends are fixed to the support, two contact pieces adapted to contact each other, each contact piece being fixed to one of the free ends of the two bimetallic strips, these contact pieces touching each other only when the two bimetallic strips are not equally heated, an optical system disposed between the source of radiation and the said bimetallic strips and adapted to image the source of radiation on these elements, the two strips lying next to each other in that direction into which the image of the source of light is being displaced when the source of light is moving in a predetermined manner, the two strips having such positions that, when the source of radiation assumes its correct position, the image of the source of radiation projected by the said optical system is uniformly divided over the two strips.

CARL PRINZ.