Aug. 16, 1932. P. H. MACNEIL 1,871,626

PHOTO ELECTRIC TUBE

Filed June 6, 1930

Fig. 1.

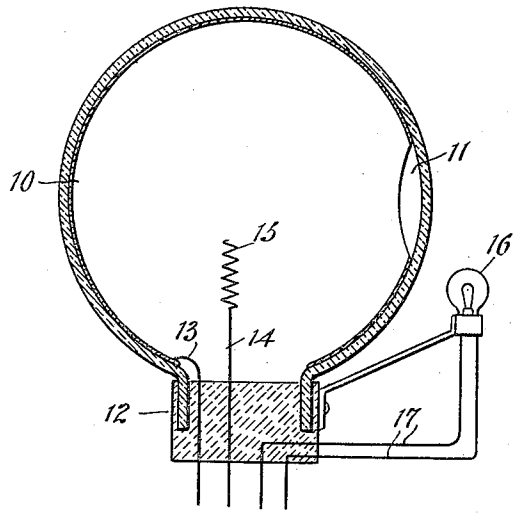


Fig. 2.

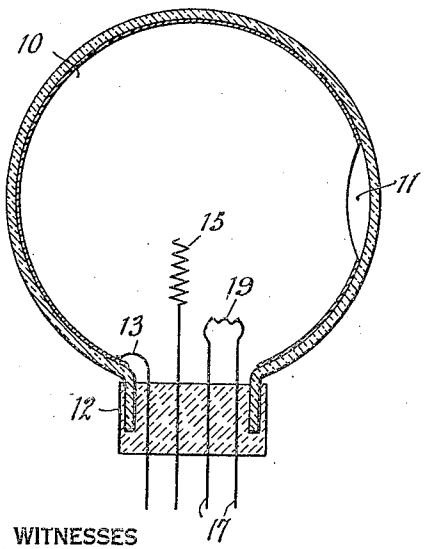
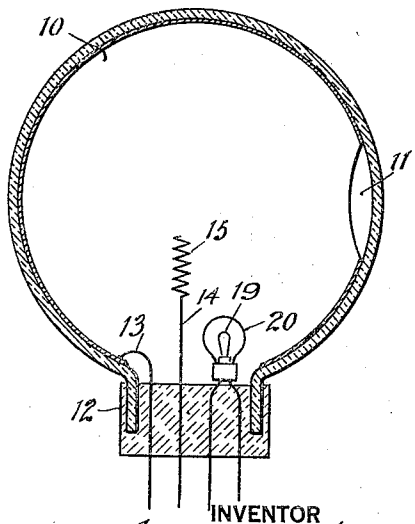


Fig. 3.



WITNESSES

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PHOTO ELECTRIC TUBE

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This invention relates to photoelectric tubes.

It is among the objects of the present invention to provide a novel and improved photoelectric or equivalent vacuum tube light-responsive device with which is associated means for overcoming the time lag of the operation of such tube, and means for maintaining said tube at a high pitch of responsiveness.

In the operation of photoelectric tubes, a pair of elements is provided in an evacuated shell, one of which elements is responsive to light whereby upon the admission of light to the tube, current is passed between the electrodes. It will be seen that there is a time lag due to the fact that the light must overcome any inertia characteristic of the tube before the light sensitive element has reached the necessary degree of activity to cause the passage of electrons between the elements. In such devices, it will also be noted that feeble light source will not bring the light responsive element to an active point because the energy therefrom is consumed in overcoming the inertia characteristic referred to. The present invention provides a continuous predetermined energization for the light responsive element, which energization is not sufficient to bring the light energized element to actuation point, but maintains it at the end of the inertia point, whereby feeble light source will instantly bring the light responsive element beyond the inertia point, thus rendering the tube more responsive to light and avoiding a great portion of the time lag.

In connection with the present invention, various forms of constant energization source may be used. The invention is therefore not limited to such structural features as herein presented.

Numerous other objects of the present invention will be apparent from a consideration of the following specification taken in conjunction with the accompanying drawing, in which

Figure 1 is a sectional view of one embodiment of the present invention;

Fig. 2 is a sectional view of another form of the present invention, and

Fig. 3 is a view of a third embodiment of the invention.

Referring more particularly to Fig. 1 of the drawing, a photoelectric tube of conventional form is illustrated. The form of the tube herein shown comprises the conventional glass shell or envelope 10, the inner surface of which is coated with selenium sulphate or equivalent light-responsive material, a portion 11 of the envelope being of clear glass to permit the entrance of light rays. The envelope 10 is mounted upon a conventional four-prong base 12, one of the prongs of which is electrically connected by a conductor 13 to the selenium coating, while one of the other prongs is connected by a conductor 14 to the other element 15 of the tube.

For providing an energization source sufficient to overcome the inertia of the light sensitive coating, thus to provide the coating in a state of energization not sufficient to operate the tube but sufficient to overcome the inertia of the tube whereby feeble light source will speedily completely overcome the inertia, thus to actuate the tube, a conventional electric light in the form of a lamp 16 is provided externally of the envelope. Two of the prongs of the base 12 are arranged to deliver electric energy through the conductors 17 to light the lamp 16, which may be suitably supported by a bracket from the base 12.

In connection with this form of the invention, it will be seen that by control of the light source or lamp 16, it may be adjusted to deliver to the tube light not quite sufficient for energization of the tube but sufficient to hold the tube in such state of semi-activity that a feeble light source will speedily actuate it. In connection with this form of the invention it will be understood that the device is not in any way restricted to the type of light source here shown, its structural mounting or its mode of energization. These features are herein shown merely by way of illustration and an equivalent structure may obviously be used without departing from the spirit of the invention.

By referring more particularly to Fig. 2, it will be seen that the form of the invention herein illustrated, provides a heat or light source filament 19. Within the shell 10, the general structural arrangement is, as indicated in Fig. 1, the filament being adapted for energization through the conductors associated with the two extra prongs of the base 12. In this form of the invention it will be seen that the filament 19 may through its heat or its light, actuate the selenium coating to overcome the inertia in the manner of the light source 16. This structure may have some advantage over the external light source in that the structural arrangement is more simple and the positioning of the supplementary energization source is directly within the tube, thus overcoming certain possible variations or fluctuations in the tube action.

By referring more particularly to Fig. 3, it will be seen that if desired, the filament 19, as illustrated in Fig. 2, may be positioned within the shell 10, but shielded therefrom by separate individual envelope or shell 20. By this arrangement, any discharge of electrons from the filament 19 or the danger of any electronic action between the filament 19 and the selenium coating is prevented.

In accordance with the present invention, it will be understood that the invention is not confined to any specific arrangements here provided and that numerous changes, modifications and the full use of equivalents may be resorted to without departing from the spirit or scope of the invention as outlined in the appended claims.

What is claimed is:

1. A photoelectric tube including an envelope and supporting base therefor, an anode, a selenium sulphate member acting as a photo-cathode, an energizing filament supported by said base for energization to maintain the photo-cathode of said tube just below its actuation point, said filament being positioned within said envelope to be energized through said base, and an individual envelope within said first-mentioned envelope sealing said filament with respect to said first-mentioned envelope.

2. A photoelectric tube including an envelope, a supporting base for the envelope, an anode positioned in said envelope, a selenium sulphate coating interiorly of said envelope and acting as a photo-cathode, and an energizing member formed as a source of light positioned to energize said photo-cathode to a point just below its actuation point.

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