Dec. 29, 1942. P. BEUCHON 2,306,376

PHOTOELECTRIC TUBE

Filed Jan. 31, 1939

Fig. 1

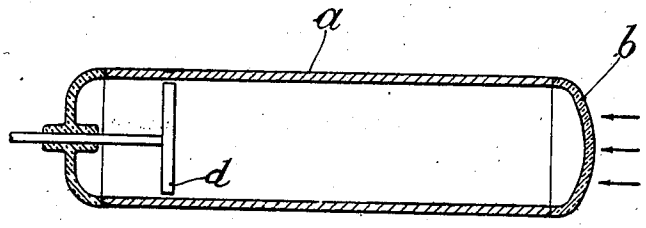
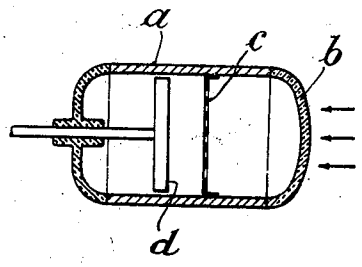


Fig. 2



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Patented Dec. 29, 1942

2,306,376

UNITED STATES PATENT OFFICE

2,306,376

PHOTOELECTRIC TUBE

Pierre Beuchon, Paris, France; vested in the Alien Property Custodian

Application January 31, 1939, Serial No. 253,839
In France November 29, 1938

1 Claim. (Cl. 250—165)

The present invention relates to photo-electric tubes in which a new arrangement of the electrodes allows of obtaining a very low saturation voltage (of the order of a few volts) a response which is very proportional to the luminous fluxes to be measured, an improved stability, a reduced hum, an increased average life, and this according to a most simple construction. The tubes can even operate in a satisfactory manner for numerous applications without any auxiliary electromotive force in circuit.

The essential feature of the invention consists in obtaining that the anode acts, relatively to the cathode, as a Faraday collector protecting the cathode from electric influences other than that of the anode itself: in such conditions all the electrons leaving the cathode can reach the anode without it being necessary to use accelerating voltages higher than a few volts. For obtaining this result, without preventing the light from reaching the sensitive surface, it suffices to place the cathode at the bottom of a metal conductor closed at the front by a metal grid, or open, but sufficiently long relatively to its diameter to act as Faraday cylinder. This metal conductor serves as anode. Such an arrangement presents no constructional difficulty and can even allow, in addition to the properties obtained, of manufacturing tubes which are stronger than the tubes actually on the market.

Further features and objects of the invention will be apparent from a consideration of the annexed drawing and the following description wherein several exemplary embodiments of the invention are disclosed.

In the drawing:

Fig. 1 is a sectional view of one form of the photo-electric tube.

Fig. 2 is a sectional view of another embodiment of the tube.

Referring to the drawing there is shown in Fig. 1 a photo-electric tube formed of a metal cylinder *a* which forms part of the tube casing. The front end portion of the metal tubular anode *a* is closed by means of a glass end portion *b* which is welded to the cylinder *a*. The rear portion of the tubular part *a* is closed and a cathode *d* is arranged within the anode *a* adjacent the rear end of the tube.

The modification illustrated in Fig. 2 is similar to the arrangement shown in Fig. 1 except for the fact that the tubular anode *a* which serves as a collector is shorter than the tubular part shown in Fig. 1 and the cylinder *a* in this modification is closed by means of an apertured metal plate or metal screen *c*.

While the invention has been described with reference to specific structural details it is to be understood that modifications may be made therein. Thus the invention is directed broadly to all arrangements in which the anode of the tube acts, relatively to the cathode, as a Faraday collector, whatever may be the shape given to said collector, its nature, whether it is in one or more pieces, and whether it forms a part of the outer casing of the tube or not, whatever may be also the shape of the cathode, provided the whole of the electrodes obtained operates and is constructed as just specified. On the contrary, the arrangement in which the anode is a sphere having a great radius at the centre of which is placed a cathode having dimensions which are so small relatively to those of the anode that it cannot present any practical interest, is excluded from this claim.

These tubes can be manufactured in any shapes and dimensions and can replace the actual photo-emissive tubes and the "stop layer" tubes, in all their applications.

I claim:

A photo-tube comprising, a disc-shaped photo-cathode, a tubular anode surrounding said photo-cathode, a transparent wall closing said tubular anode at its end through which light enters, said anode being adapted to act as a Faraday collector relative to said photo-cathode, and said photo-cathode having a diameter nearly as large as the inner diameter of said tubular anode.

PIERRE BEUCHON.