

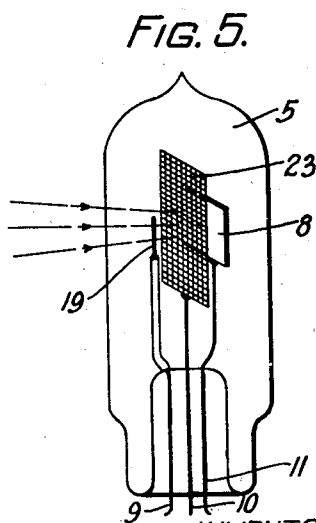
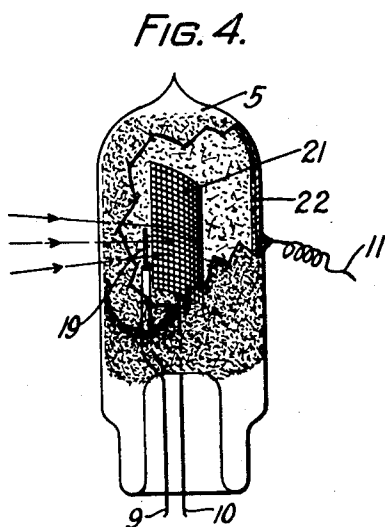
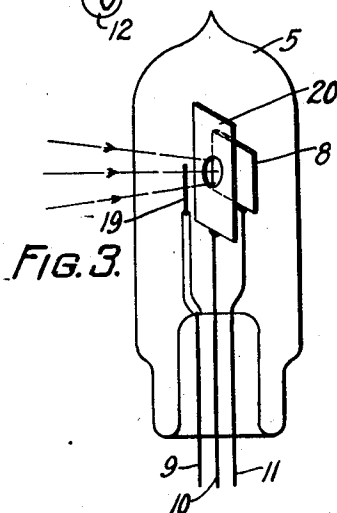
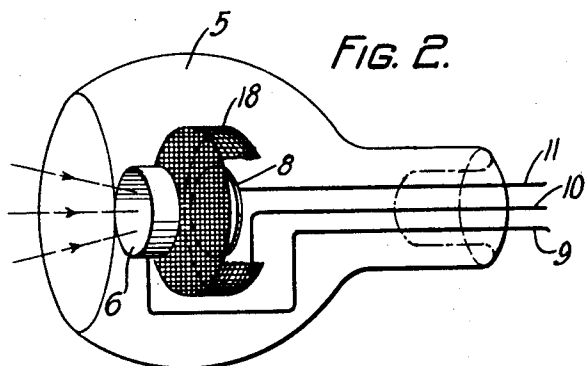
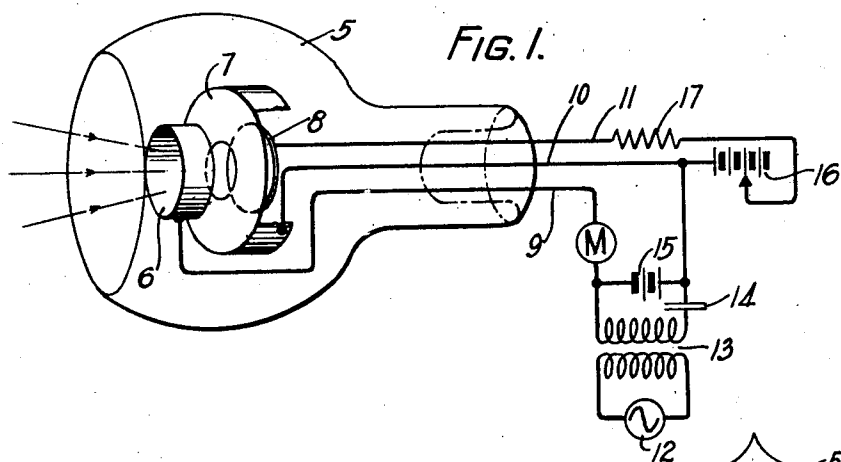
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ELECTROOPTICAL TUBE

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ELECTROOPTICAL TUBE

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2 Claims. (Cl. 250-27.5)

This invention relates to electro-optical tubes and more particularly to photoelectric tubes.

An object of the invention is to provide an improved photoelectric tube.

- 5 In an example of practice illustrative of the invention a closed vessel containing an inert gas such as argon at low pressure is provided with two main electrodes to which is connected an alternating current source of power. Adjacent to the discharge path between the main electrodes there is a light sensitive electrode adapted to emit photoelectrons into the main path when illuminated and thus initiate the main discharge. In this system only a very small current flows to the light sensitive electrode which is protected against injury from the main discharge. Any suitable work circuit may be energized by the discharge current.

The invention will now be described more in detail having reference to the accompanying drawing.

Fig. 1 shows one embodiment of the invention.

Figs. 2 to 5 show modified forms of the photoelectric device of Fig. 1.

- 25 Identical elements are designated by the same reference characters in the several figures.

Referring now to Fig. 1, a gas-tight vessel 5 preferably of glass has mounted therein a ring shaped anode 6, a cup shaped electrode 7 and a light sensitive cathode 8. Terminal wires 9, 10 and 11, are provided for the elements 6, 7 and 8 respectively. The bottom of the cup 7 is provided with an aperture so that the cathode 8 may be illuminated by light (represented by the dashed lines and arrows) shining through the ring anode 6 and the aperture in the cup shaped electrode 7. The vessel 5 contains an inert gas such as argon at low pressure.

- 40 Alternating current potential from an alternating current source 12 is impressed through transformer 13 and condenser 14 upon the main electrodes 6 and 7 through terminal wires 9 and 10. A steady biasing voltage is also impressed thereon from battery 15. A steady voltage is also impressed upon the electrode 7 and cathode 8 from battery 16 through resistance 17.

The emission of electrons from cathode 8 for a given voltage impressed thereon is dependent upon the illumination thereof. The sparking voltage of the gas between the anode 6 and the electrode 7 is lowered by the emission of electrons from the light sensitive cathode 8. The voltages in Fig. 1 may therefore be adjusted so that with a given illumination of cathode 8 sufficient electrons are emitted to produce a discharge between the anode 6 and the electrode 7 while an increase in illumination will initiate such a discharge which will continue until the voltage between the anode 6 and the electrode 7 is sufficiently reduced. Such reduction in the

present arrangement is accomplished once for each cycle of the alternating current voltage from source 12. This occurs when the alternating current voltage opposes the steady voltage from the battery 15.

In the arrangement of Fig. 1 large discharges between the anode 6 and the electrode 7 may take place without injuring the light sensitive cathode 8 which is protected by being located within the cup shaped electrode 7. Any suitable work circuit may be energized by the discharge current between the anode 6 and the electrode 7. In Fig. 1 such a circuit is indicated by the circle M.

In the modification of Fig. 2 the cup shaped electrode 18 is formed of a metallic wire mesh through which the light shines to illuminate the light sensitive cathode 8.

In the arrangement of Fig. 3, the ring shaped anode 6 is replaced by a metallic wire 19. The cup shaped electrode 7 is replaced by the electrode 20 in the form of a flat plate with an aperture therethrough, the light sensitive cathode 8 being in the form of a plate placed behind the electrode 20 on the side opposite the anode 19.

In Fig. 4 a metallic wire screen 21 is used in place of the electrode 7 and the light sensitive cathode corresponding to cathode 8 consists of a coating 22 of light sensitive material deposited on the inside surface of the enclosing vessel 5.

The modification of Fig. 5 is similar to that of Fig. 3 except that the electrode 20 is replaced by a metallic wire screen 23.

In each of these modifications the light sensitive cathode is protected from injury by the main discharge between the anode and the other electrode.

Obviously there are other modifications which come within the purview of this invention, the scope of which is defined by the appended claims.

What is claimed is:

1. An electro-optical tube comprising a closed vessel, a cup shaped electrode having an aperture in the bottom, a ring shaped electrode outside said cup but adjacent to the bottom of said cup, and a light sensitive electrode within said cup.
2. An electro-optical tube comprising a closed vessel, an opaque cup-shaped electrode having a light transmitting aperture in the bottom, a second electrode outside said cup but adjacent to the bottom of said cup, and a light sensitive electrode within said cup.

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