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PHOTOCELL STRUCTURE
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Fig. 1

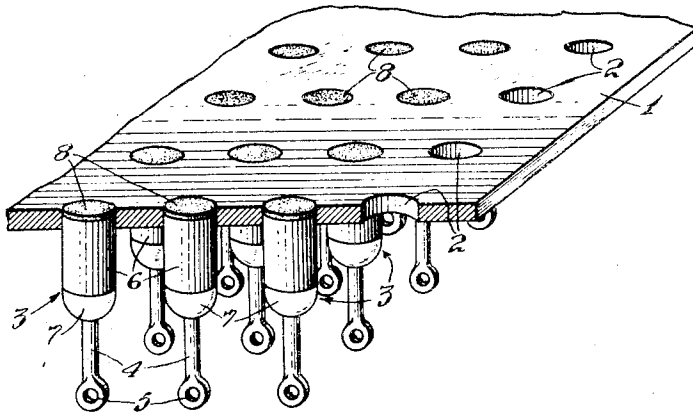
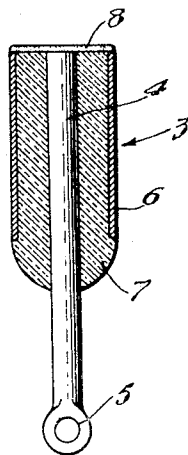


Fig. 2



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PHOTOCELL STRUCTURE

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5 Claims. (Cl. 201—63)

1

This invention relates to improvements in photocell structures and in target plate assemblies employing such cells in multiple unit arrangement to be selectively energized by irradiation by a controlled light source so as to perform varied industrial operations in response thereto.

An object of the present improvements is to produce a photocell unit of a separable or insert type adapted for readily replaceable assembling within apertures in a supporting or target plate. It is also of a construction designed for standardization in manufacture with a minimized danger of fracture or change in potential values by reason of temperature changes incident to the place and conditions of its use.

An illustrative and preferred embodiment of the features of the invention is that of the selenium type photocell wherein a cylindrical cell unit is formed composed of a central core and terminal of wire enclosed within a glass insulating cylinder which is in turn surrounded by a metal terminal tube. These elements are concentrically arranged with the glass or other insulating material supporting and bonding the inner and outer metal terminal members and providing a hermetical seal therebetween. The active material or selenium is adherently applied over the outer end surfaces of the three members and is pressure and heat treated for crystallization in the customary manner. It accordingly bridges the inner and outer terminals of like metal having a low coefficient of expansion and of a value substantially corresponding to that of the insulation employed. In further accordance with the invention, the photocells are incorporated in the target plate assembly within apertures in the plate so as to be readily separable for replacement and are further of a form to facilitate positioning within the aperture without danger of fracturing or marring of the active selenium material.

The described and other features and advantages of the present invention will be more fully understood by reference to the accompanying drawings wherein like reference characters are applied to the corresponding parts in the different views.

In the drawings:

Fig. 1 is a fragmentary perspective view illustrating a target plate incorporating photocells in the arrangement and structural formation of the invention; and

Fig. 2 is an enlarged sectional view of the photocell unit.

In the preferred embodiment of the features of the invention as here illustrated, the photocell

2

units are of a cylindrical cartridge type formation particularly adapted for slide pressure fit or insert assembly within apertures in a target plate 1 of conducting metal. The target plate is formed with a series of apertures 2. The photocell unit or photo-conductive cell 3, as best shown in Fig. 2, comprises the central terminal 4 of wire having a connecting terminal portion 5 expanded and perforated as shown for wire connection. Surrounding the inner terminal 4 there is provided an outer terminal in the form of a cylinder or tube 6 positioned concentric with the inner terminal and bonded therewith by an adherent insulating binder 7, desirably of glass having the same coefficient of expansion as the metal parts 4 and 6. The outer end surface of the terminal members 4 and 6 and of the insulating binder 7 are positioned in the same plane and covering the entire outer surface of the unit so formed there is applied an active selenium layer 8. This active layer 8 in accordance with customary practice is adherently applied by melting of the selenium on to the surface and the active layer is thereafter pressure and heat treated for crystallization.

The cylindrical cartridge type photocell as thus formed, permits of the cell units being readily assembled in the apertures of the target plate as illustrated in Fig. 1. The individual photocells may be pressure fit within the apertures 3 and if desired may also be soldered or otherwise attached to the underside of the plate 1. The plate 1 will serve as a common electrode for all cells, which terminals 5 will serve as the connectors for each individual cell.

The improved photocell as disclosed, is particularly adapted for separable insert assembly in a smooth, multi-element target assembly, such, for example, as is used in electronic card-sorting machines in a manner permitting of the individual units being readily inserted and removed without danger to the active selenium material. Further, by the employment of a metal in conjunction with the insulating material of the same coefficient of expansion, high dielectric strength is assured with danger of fracture by reason of temperature changes minimized. It is further of a construction and form to be substantially free of circuit disturbances by reason of absorption of moisture.

While there is shown and described an improved embodiment of the invention, it will be understood that varied modification may be made therein without departing from the scope of the invention as defined in the appended claims. As illustrative, as will be apparent to those skilled

in the art, while the active layer is herein referred to as of selenium certain of the features of the invention may be incorporated with photocell structures employing other light sensitive material such as copper oxide.

What is claimed is:

1. A multiple unit photocell that comprises a substantially flat metallic plate having a plurality of openings formed therein; a plurality of like photocell units mounted on said plate, one in each opening; each of said photocell units comprising an inner terminal element, an outer tubular terminal element concentric therewith, an insulating support for at least one of the terminal elements interposed between the terminal elements, and a layer of light sensitive material applied to one end of the unit connecting the terminal elements, the terminal elements and the insulating support having substantially the same coefficient of expansion, the photocell units being disposed relative to the plate whereby the outer terminal of each unit is in electrical contact with the plate and the exposed surface of the light sensitive layer is substantially flush with the surface of the plate.

2. A multiple unit photocell that comprises a substantially flat metallic plate having a plurality of openings formed therein; a plurality of like photocell units mounted on said plate, one in each opening; each of said photocell units comprising an inner terminal metal element, an outer tubular terminal metal element concentric therewith, a glass insulating support for at least one of the terminal elements interposed between the terminal elements, and a layer of light sensitive material applied to one end of the unit and connecting the terminal elements, the terminal elements and the insulating support having substantially the same coefficient of expansion, the photocell units being disposed relative to the plate whereby the outer terminal of each unit is in electrical contact with the plate and the exposed surface of the light sensitive layer is substantially flush with the surface of the plate.

3. A photocell target assembly comprising an

apertured target plate and a series of removable photocell units separately retained within the apertures said photocell units formed with outer conducting surfaces and said target plate being in electrical contact with said outer conducting surface.

4. A photocell target assembly comprising a target plate of conducting metal, provided with a series of spaced apertures, photocell units formed with outer cylindrical terminals in electrical contact with said target plate and slidably fitted within the apertures of said target plate of conducting metal and an inner terminal metal element, said outer cylindrical terminal being equidistant along its whole length from said inner terminal metal element.

5. A multiple unit photocell that comprises a substantially flat metallic plate having a plurality of openings formed therein; a plurality of like photocell units mounted on said plate, one in each opening; each of said photocell units comprising a substantially cylindrical body of electrically insulative material, a first conductor extending axially therethrough and being exposed through the insulative body at the ends thereof, a second conductor extending along a portion of the outer surface of the insulative body, and a photo sensitive layer on one end of the insulative body in electrical contact with said first and second conductors, the cells being disposed relative to the plate whereby the outer surface of the photo sensitive layer is substantially flush with the surface of the plate with the second conductor of each photocell in electrical contact with the plate.

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