[Second Edition.]

PATENT SPECIFICATION

Convention Date (United States): Sept. 8, 1928.

318,641

Application Date (in United Kingdom): Sept. 7, 1929. No. 27,260/29.

Complete Accepted: Sept. 25, 1930.

COMPLETE SPECIFICATION.

Improvements in or relating to Photo-electric Cells.

We, ARCTURUS RADIO TUBE COMPANY, a corporation of the State of Delaware, United States of America, of 260, Sherman Avenue, Newark, New Jersey, United States of America, Assignees of SAMUEL RUBEN, a citizen of the United States of America, of 801, Riverside Drive, City and State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a photo-electric cell, and more particularly it relates to a photo-electric cell of a condenser type utilizing the change of resistance of an electronically conductive crystalline material, which is responsive to variations in light rays impressed thereon, to effect current changes.

Broadly, my present invention consists of a photo-electric cell having on the adjacent surfaces of cooperating electrodes light-sensitive material separated by a translucent dielectric material, through which the change of capacity between the electrodes occurs with the change of surface resistance under the influence of light rays impressed thereon.

To obtain the maximum effect a cell of this type should be used with high frequency current discharges.

In a preferred form of a device constructed under the terms of this invention, the electrodes are composed of copper having on their adjacent opposed surfaces an integrally formed non-porous, homogeneous, crystalline layer of cuprous oxide, and are immersed in a suitable translucent fluid, such as glycerine, within an envelope having translucent walls. However, electrodes composed of selenium, molybdenum sulphide or other materials having like electrical properties may be employed; and other di-electric fluids, such as castor oil and ethyl alcohol, may be used as the translucent dielectric material between the electrodes. Castor oil is particularly well adapted for use where high potentials are employed. For maximum capacitance current discharge the dielectric material should have a high specific inductive capacity. Where wide current variations are desired, a photo-electric cell can be arranged in a resonance circuit, its variations in reactance causing large current variations characteristic of current changes in a resonance circuit when one of the electrical elements varies from a resonance state.

The adjacent electrode surfaces should be so placed as to provide minimum external reflection of the impressed light rays.

The nature of the present invention may be readily understood by reference to the accompanying drawings, in which Fig. 1 represents one embodiment thereof, shown as connected in a high frequency circuit, Fig. 2 showing in section a plan view of the electrodes.

Referring more particularly to Fig. 1, 1 represents a glass envelope containing two copper electrodes, 2 and 3, their opposing electrode surfaces having a layer of cuprous oxide, respectively 2*a* and 3*a* the envelope being filled with glycerine 4. The electrodes have their terminals at 5 and 6, which are connected to the input terminals of vacuum tube V; that is, the grid and filament terminals. R represents a resistance in the circuit to regulate the potential applied to the grid and G is the alternating current generator which may be in any suitable form. B is the source of potential for heating the filament of the vacuum tube V and R1 the resistance in that circuit. B1 is a source of potential for accelerating the electron flow through the tube and T represents a translating device.

In operation, when an alternating potential is applied to the cell and resistance circuit there is a flow of current depending upon the electrostatic capacity and the series resistance value of the photo-electric condenser cell. As light enters the space between the opposing electrodes the surface resistance of the light-sensitive cuprous oxide immediately decreases, permitting an increase of current flow through the device which is amplified by the vacuum tube V. With the modulation of the rays entering the space, the current flow through the device is modulated correspondingly.

[*Price* 1/-]

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A photo-electric condenser cell comprising a number of cooperating light-sensitive electrodes separated by a dielectric material, whereby the capacity between the electrodes will vary with the light intensity.

2. A photo-electric condenser cell comprising a number of cooperating light-sensitive electrodes separated by a dielectric material in the form of a translucent fluid, and preferably having a high specific inductive capacity.

3. A photo-electric condenser cell as claimed in claim 1 or 2, in which glycerine is used as the dielectric material.

4. A photo-electric condenser cell as claimed in any of claims 1 to 3 in which the light sensitive electrodes have on each of their opposed adjacent surfaces a layer of integrally formed, non-porous, homogeneous crystalline material.

5. A photo-electric condenser cell as claimed in claim 4, in which the light-sensitive electrodes have on each of their opposed adjacent surfaces a layer of fused cuprous oxide.

6. The improved photo-electric condenser cell substantially as hereinbefore described and illustrated, for the purpose specified.

Dated the 7th day of September, 1929.

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Abingdon: Printed for His Majesty's Stationery Office, by Burgess & Son.
[Wt. 95A.—50/9/1932.]

2nd Edition

FIG.1.

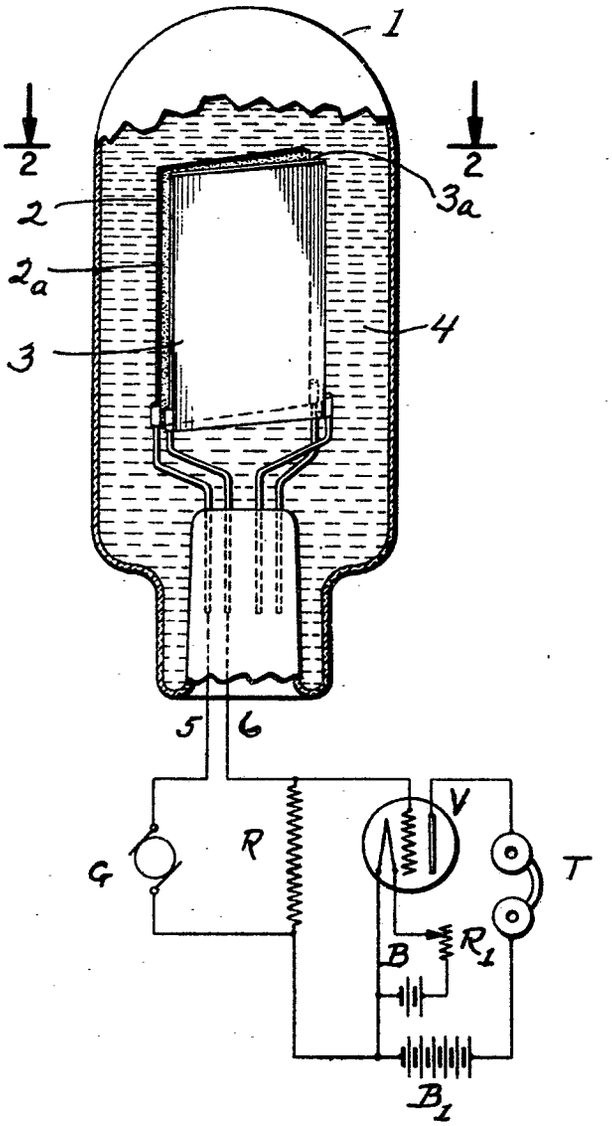
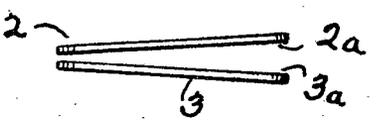


FIG.2.



[This Drawing is a reproduction of the Original on a reduced scale.]

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