

April 25, 1933.

E. O. ERICKSON

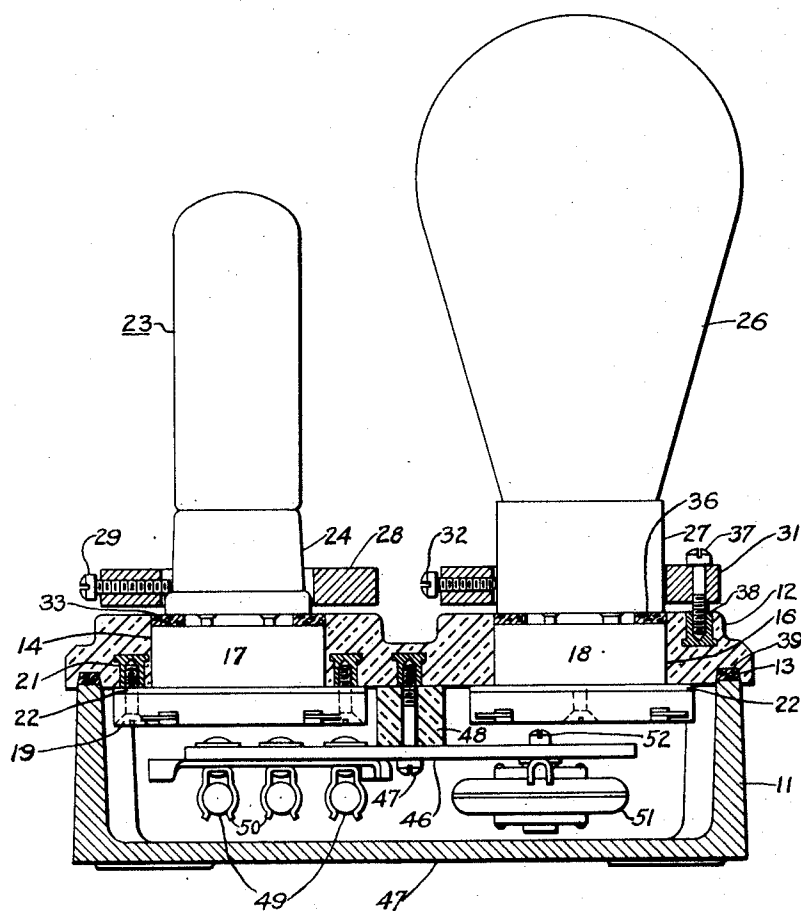
1,905,276

PHOTOCELL AMPLIFIER UNIT

Filed Feb. 11, 1930

2 Sheets-Sheet 1

Fig. 1



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Fig. 2.

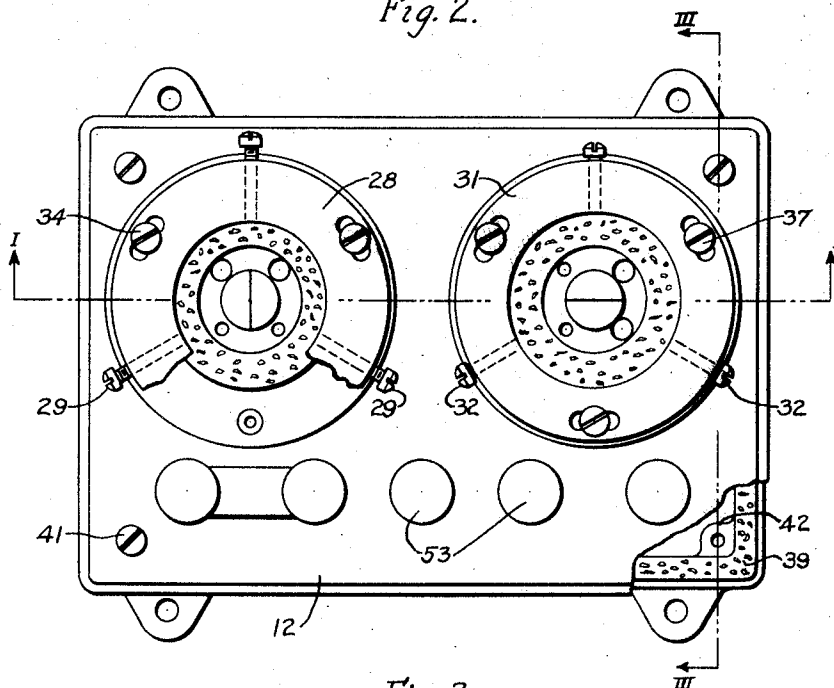
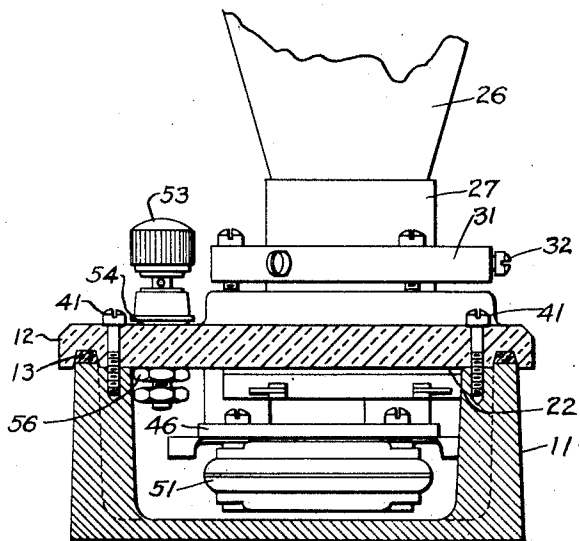


Fig. 3.



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ELLIS O. ERICKSON, OF PASADENA, CALIFORNIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA

PHOTOCELL AMPLIFIER UNIT

Application filed February 11, 1930. Serial No. 427,462.

My invention relates to light-sensitive devices and particularly to photo-cell amplifier units.

An object of my invention is to provide a photo-cell amplifier unit that may be located in positions where it will be subjected to variations of moisture content of the air without affecting the sensitivity of the assembled elements constituting the system.

Another object of my invention is to so assemble the various elements constituting the unit as to make it impossible for moisture to enter a casing in and on which the elements are mounted, while permitting easy and quick replacement of parts of the system.

In practicing my invention, I provide an open-end box, a peripherally grooved cover to be located thereon having a plurality of openings therethrough, tube sockets mounted in said openings, a photo-cell tube and an amplifier tube mounted in said sockets, means for providing a hermetic seal between the socket and the cover and between each socket and its tube, and means located in the groove of the cover for providing a hermetic seal therebetween in order to protect certain highly sensitive elements of the unit which are located within the casing.

In the drawings,

Figure 1 is a view, in vertical longitudinal section, through an amplifier unit embodying my invention, taken on the line I—I of Fig. 2.

Fig. 2 is a top plan view of the assembled unit, the tubes being omitted and a portion of the cover being broken away, and

Fig. 3 is a view in lateral vertical section through the unit, taken on the line III—III of Fig. 2.

An open-end casing 11 of relatively small depth may be made of a suitable cast metal and have associated therewith a cover 12 which I prefer at present to make of a phenolic condensation material, such as bakelite or micarta, although I do not desire to be restricted thereto. The lower surface of the member 12 is provided with a peripheral groove 13 within which the upper edge

of the casing 11 is located as will be hereinafter set forth more in detail.

A plurality of openings 14 and 16 are provided in the cover 12, and socket members 17 and 18 are secured therein, being supported against the lower surface of the cover by a plurality of screws 19, only two of which are shown at the left-hand side of Fig. 1, the screws fitting into metal inserts 21 suitably molded into the cover during the process of manufacture thereof, or into the cover itself, if made of metal. An annular member 22 of felt that has been treated with shellac as by being saturated therewith is located between the enlarged flange portion of the socket members 17 and 18 and is, therefore, tightly clamped between the lower surface of the cover and the socket member located in the respective openings.

A light-sensitive or photocell 23, of usual construction, embodying a tube and a base portion 24, is located in the socket 17, and an amplifier tube 26, having a base portion 27, is located in, and supported by, the socket 18. An annular clamping member 28 surrounds the base 24 of the photocell and is clamped thereagainst by a plurality of screws 29. A similar clamping ring 31 surrounds the base 27 of the amplifier tube 26 and is clamped thereon by a plurality of peripherally spaced screws 32.

An annular member 33 of cork, which has been wax-treated, as by being dipped in heated paraffin, is located between the lower surface of the base 24 and the upper surface of the socket 17, the initial fit of the annular member 33 in the opening 14 being relatively close. A plurality of clamping screws 34 extending through slots in the member 28 and into the cover 12 and shown more particularly in Fig. 2 of the drawings, force the ring 28 downwardly to compress the annular member 33 tightly in its operative position, as well as causing some expansion of the ring in the socket, the total effect being to hermetically seal the base 24 against the socket 17, so far as the upper portion of the opening 14 is concerned, while the treated felt washer 22 securely closes the lower portion of the opening 14.

A similar annular member 36 of cork, which has been wax-treated by being dipped in heated paraffin, is located between the bottom of the base 27 and the top of the socket 18, and the clamping ring 31 is drawn downwardly by a plurality of screws 37, both the screws 34 and the screws 37 fitting into molded-in metal members 38, in a manner well known in the art.

The groove 13 is partially filled with a strip 39 of cork which has been wax-treated as by being dipped in heated paraffin, and a plurality of clamping screws 41 extend through the cover 12 adjacent to the corners thereof and have screw-threaded engagement with a corner lug or portion 42 in each of the corners of the casing, in order to tightly clamp the cover against the upper edge of the casing and, more particularly, to compress the paraffined strip of cork.

The lugs 42 extend to within a short distance below the upper edge of the walls of casing 11, so that the downward movement of the cover 12, by the action of the clamping screws 41, is limited. It may be noted that the peripheral groove 13 is of wedge-shape in lateral section in order that drawing the cover down as tightly as possible by means of the clamping screws 41 may not make its removal impracticable whenever repairs on the unit become necessary.

All of the hereinbefore described elements, cooperating to provide a hermetically sealed casing, are necessary because of the great sensitivity of the photocell and of the amplifier tube, and the hermetical seals are provided, more particularly, to protect certain elements located within the casing.

A plate 46, which is preferably made of suitable electric-insulating material, is supported beneath the cover 12 by one or more clamping screws 47, and bushings 48 surround body portions of the screws to suitably space the plate 46 below the bottom surface of the cover. A plurality of current-limiting resistances 49 are suitably supported in clip members 50 below the plate 46, and a condenser 51 is also supported below the plate 46 by suitable screws 52.

Because of the high sensitivity of the photocell and of the amplifier tube, it is necessary that moisture shall be prevented from reaching any of these elements. I have found that an amplifier unit of the type and construction shown in the drawings will operate without appreciable change of sensitivity over long periods of time even if located in a room which is subjected to temperature changes and to accompanying changes in the moisture content of the air.

A plurality of terminal members 53 are mounted on the cover 12 and are of the usual construction, with the possible exception that a shellacked felt washer 54 is tightly clamped between the upper portion of

the terminal member and the upper surface of the cover by a nut 56 having screw-threaded engagement with the body portion and being located against the under side of the cover.

It may be noted that replacement of a damaged photocell or amplifier tube may be effected easily and quickly, without impairment of the insulating and protecting characteristics of the assembly. The means hereinbefore disclosed permits of obtaining the highly desirable continuity in the electrical conditions, particularly as to the insulation resistance, while still having the main elements visible for observation, as to their condition, at all times.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art or are set forth in the appended claims.

I claim as my invention:

1. In a control-unit assembly including an open-end box, a grooved cover thereon, a pair of sockets in said grooved cover on the outside surface thereof, a photocell and an amplifier tube in the respective sockets and control elements located in said box and supported from said cover, means for hermetically sealing the control elements in said box, said means including resilient-material wax-treated strips in the groove of the cover and operatively engaging the edge of the box and additional resilient-material wax-treated strips between the sockets and the photocell and the amplifier tube, and means for tightly clamping the treated strips in their respective operative positions.

2. In a control-unit assembly including an open-end box, a cover therefor having openings therein, sockets in said openings, a light-sensitive-cell tube and an amplifier tube mounted in said sockets, means for hermetically sealing said openings, said means including a wax-treated ring of resilient material in each of said openings between the socket and the respective tubes therein, a ring surrounding the base of each tube and mounted thereon, and screws drawing said rings toward said cover to compress the rings in said openings.

In testimony whereof, I have hereunto subscribed my name this 31st day of January, 1930.

ELLIS O. ERICKSON.