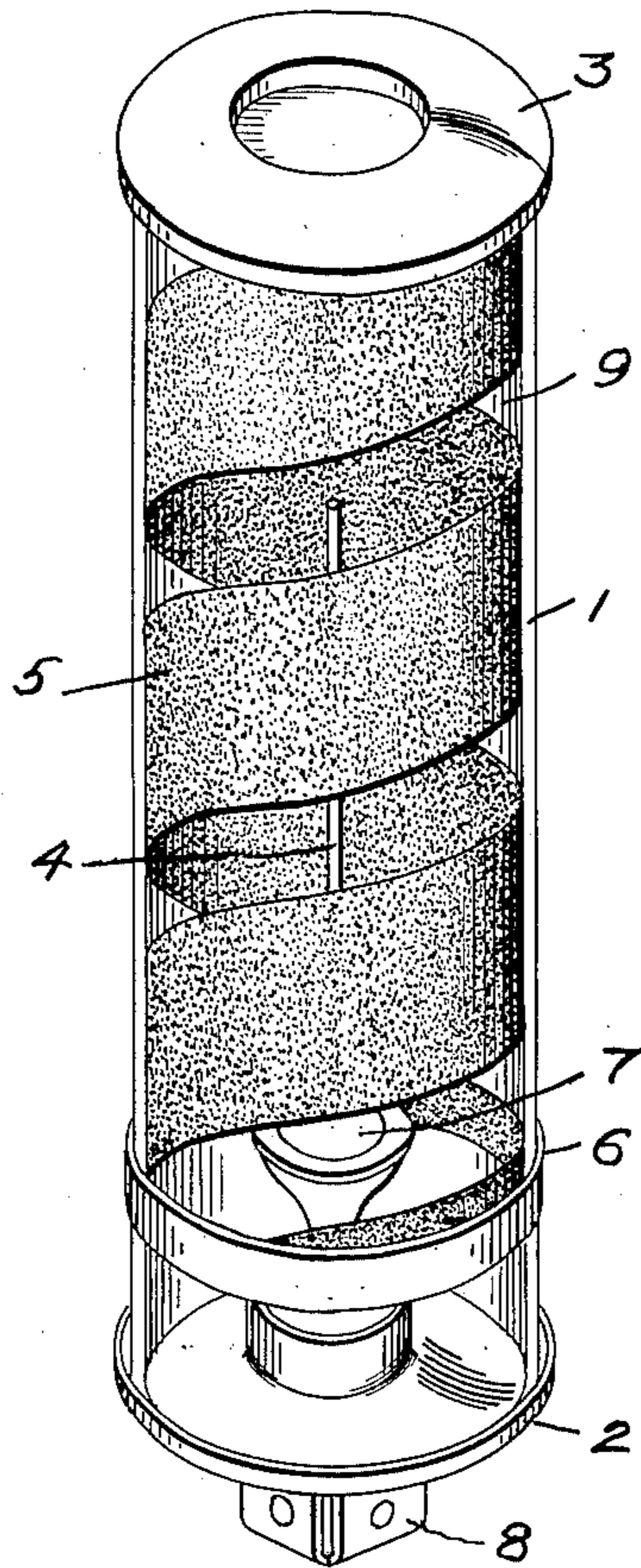


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CATHODE FOR PHOTOCELLS
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CATHODE FOR PHOTOCELLS

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8 Claims. (Cl. 313—102)

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This invention relates to improvements in cathodes for photo-cells, and particularly to a non-directional cathode-on-glass photo-sensitive-cell.

The primary object of this invention is to provide a photo-sensitive-cell that is sensitive to light coming from all directions of a 360° arc. To accomplish this object, the cathode may be formed in a continuous helix which is photo-sensitive through 360°.

Another object of this invention is to provide a photo-sensitive-cell that is simple and economical to manufacture.

A further object of this invention is to improve the method of making a photo-electric-cell whereby it will be sensitive to light coming from all directions of a 360° arc.

Other objects and advantages of this invention will become apparent as the discussion proceeds and is taken in connection with the accompanying drawing, in which the figure shows a perspective view of my photo-sensitive-cell.

Referring now to the drawings, the numeral 1 designates a tubular glass envelope provided with terminal seals 2 and 3, respectively. The terminal seals 2 and 3 may be of any desired metal and shape, but preferably should be of a metal which lends itself satisfactorily to making a metal-to-glass seal. The terminal seals 2 and 3 likewise are sealed to the envelope 1 in any conventional manner, as by heating by high frequency current or the like. The terminal seals are then annealed to the envelope, and the tube processed by methods well-known in the art.

Axially disposed within the envelope 1 and connected to the terminal seal 2 in any desired manner is a wire anode 4, although any suitable form of anode may be used. Formed or deposited on the inner wall of the envelope 1 is a cathode 5 which is in the form of a helix, as shown. The cathode 5 is connected either to the terminal seal 3 or to a cathode connector 6 in any desired manner, whichever is used as a contact for the cathode 5.

It has been found most satisfactory to deposit the cathode on the envelope and to connect the cathode 5 to the terminal seal 3 by the method more specifically described and shown in my co-pending application Serial No. 34,604, filed June 23, 1948, entitled Photocell and Method of Making the Same, now Patent No. 2,538,588, granted January 16, 1951. This cathode 5 is herein shown as being on the wall of the envelope and comprises a plurality of deposited

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layers in the form of a helix. However, it may be a helical strip of metal foil affixed to the glass envelope 1 or may be a helix made of a rigid metal strip separated from the glass wall of the envelope 1 and supported entirely by the terminal seals 2 and 3 and the cathode connector 6, or by the glass wall.

Within the envelope 1 is a pill which contains caesium or other sensitizing material, and the end of the terminal seal 2 is provided with the usual tubulation protector 8.

It has been found in practice that a very satisfactory cathode can be formed by first depositing a coating of several layers of metal such as silver or the like in the manner more particularly shown and described in my above-designated co-pending application. The layers of silver or other metal are first deposited or painted over the entire inner surface of the envelope 1 and over a portion of the terminal seal 3, which is sealed to the envelope 1 before the layers of silver are deposited or painted thereon. Next, a strip 9 in the form of a spiral is cut away from the deposited coating of silver layers, from the top to the bottom of the silver coating as shown. The helix 5 will thus be left on the tube. The width of the spiral strip, that is cut away from the silver layers may vary with different tubes and under different conditions, but it has been found preferable in practice that the width of the spiral be such as to expose approximately one-half of the total area inside the envelope 1.

If the cathode 5 is connected to the connector 6, the terminal seals 2 and 3 may be sealed to the envelope 1 after the spiral strip 9 has been cut from the silver layers.

After the metal coating has been deposited on the envelope 1 and the spiral strip of material removed therefrom, or the metal helix has been placed in the envelope 1, the terminal seal 2 is sealed to the glass envelope, the tube is evacuated and baked in any conventional well-known manner, the sensitizing material is liberated from the pill 7 and is deposited on the helical strip to render the cathode photo-sensitive.

As will be seen from the foregoing description and explanation of the method of making the same, there is then produced a photo-sensitive-cell which is sensitive to light rays coming from all directions of a 360° arc.

It is to be understood that various modifications in form and materials used, as well as

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steps of assembly, may be made without departing from the spirit of this invention.

I claim:

1. A cathode for a photo-sensitive-cell having an envelope, comprising a layer of silver in the form of a continuous helix deposited on said envelope and a layer of light-sensitive material coated on the silver layer to form said cathode.
2. The method of making a cathode for a photo-sensitive-cell having a tubular envelope, comprising depositing a coating of metal on said envelope, removing a spiral strip from said metal coating extending the length of said coating thereby leaving a strip of metal on the envelope in the form of a helix, and depositing a layer of light-sensitive material on the metal strip remaining on the envelope.
3. The method of making a cathode for a photo-sensitive-cell having a tubular glass envelope, comprising depositing a coating of silver on said envelope, removing a spiral strip from said silver coating extending the length of said coating, thereby leaving a strip of silver on the envelope in the form of a helix, and depositing a layer of light-sensitive material over the silver remaining on the envelope.
4. A photo-sensitive cell comprising an envelope, an anode, a continuous helical cathode on the inner surface of said envelope, said cathode comprising a layer of conductive material coated on the inner surface of said envelope in the form of a spiral and having a light sensitive surface, the anode being elongated continuously throughout the major portion of the length of the helical cathode and approximately at the axis thereof.
5. A non-directional photo-sensitive cell comprising a tubular envelope, an anode, a continuous helical cathode on the inner surface of said envelope, said cathode comprising a plurality of layers of conductive material coated on the inner surface of said envelope in the form of a spiral and having a light sensitive coating, the anode being elongated continuously throughout the major portion of the length of the helical cathode and approximately at the axis thereof.
6. A photo-sensitive cell comprising an envelope

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having an aperture therein, a terminal seal cap closing the aperture in said envelope, a continuous helical cathode on the inner surface of said envelope, said cathode comprising a layer of conductive material coated on the inner surface of said envelope in the form of a spiral and extending at least partially over the terminal seal cap, said coating material having a light-sensitive surface.

7. A non-directional photo-sensitive cell comprising an envelope having an aperture therein, a terminal seal cap closing the aperture in said envelope, a continuous helical cathode on the inner surface of said envelope, said cathode comprising a plurality of layers of conductive material coated on the inner surface of said envelope in the form of a spiral and extending at least partially over the terminal seal cap, and a coating of light sensitive material deposited on said spiral layers of conductive material.

8. A non-directional photo-sensitive cell comprising a tubular envelope, terminal seal caps closing the ends of said tubular envelope, an anode connected to one terminal seal cap, and a continuous helical cathode on the inner surface of said envelope, said cathode comprising a layer of conductive material coated on the inner surface of said envelope in the form of a spiral and extending at least partially over the terminal seal cap at the opposite end of the tube to which the anode is connected, and a coating of light sensitive material deposited on said layer of conductive material.

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