

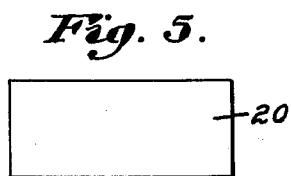
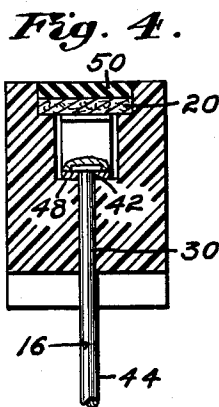
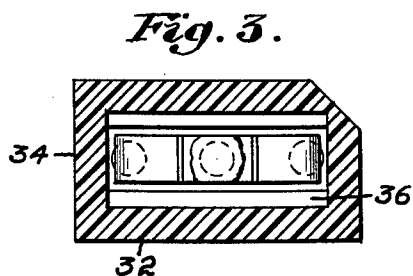
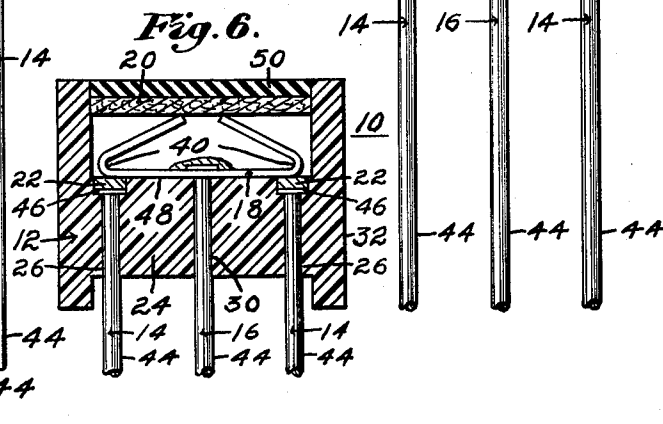
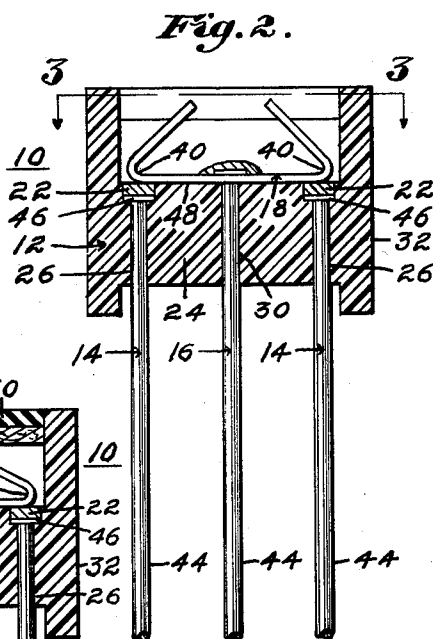
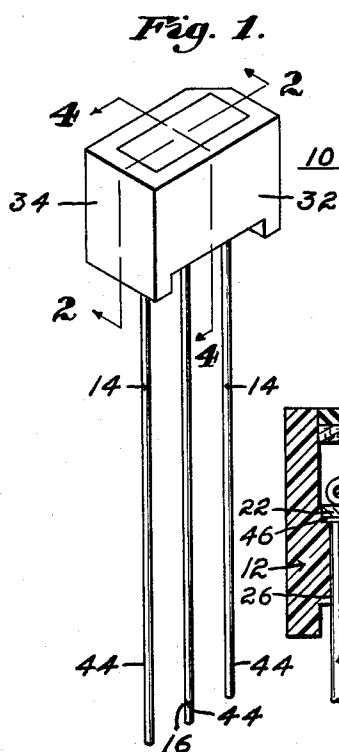
May 3, 1960

W. J. COYLE

2,935,665

SELENIUM RECTIFIER

Filed Sept. 8, 1958



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2,935,665

SELENIUM RECTIFIER

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3 Claims. (Cl. 317—234)

My invention relates to electrical rectifier assemblies and particularly to rectifiers employing asymmetric units of an imperfect conductor.

In rectifiers of this type, pressure of the conductors on the imperfect conductors must be kept at a constant amount. If the pressure exerted on the semi-conductors is increased there is a tendency for an increase to take place in the reverse current of the rectifier lowering its efficiency.

The primary object of this invention is to provide a resilient lead-in conductor which would exert at all times an even, unvarying pressure on the imperfect conductors.

Another object of the invention is to provide a spring like conductor which can not be loosened under normal operating conditions.

Other objects of this invention will, in part, be obvious, and will, in part, appear hereinafter.

In the drawing:

Fig. 1 is a perspective view of the rectifier assembly;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a section taken on line 4—4 of Fig. 1; and

Fig. 5 is a plan view of the cap.

Referring now to the drawings, the improved rectifier assembly 10 comprises an insulating rectilinear housing 12, three terminals consisting of two cathode leads 14 and an anode lead 16, a resilient spring conductor or contact 18, a plate or cap 20, and a semi-conductor (rectifying cell) 22.

The housing 12 comprises a rectangular base 24 having two circular recesses 26 with a recess aperture 28 formed axially in the bottom of the recess 26 through the base 24. A third aperture 30 is formed through the base 24 midway between the recesses 26 without being recessed. Integral with and at right angles to the edges of the base 24, there are two side walls 32 and two end walls 34 forming a box with the base 24. A shoulder 36 is formed in each of the end walls 34 as illustrated in Fig. 3.

The resilient spring conductor 18 comprises a comparatively long rectangular piece of conductive material, such as copper, whose terminal ends 38 are bent back upon themselves to form an elbow 40 and two converging legs 41. A conductor aperture 42 is formed in the conductor 18 midway between the two elbows 40 so that the conductor aperture 42 will be superimposed upon that lead-in aperture 30 when the conductor 18 is placed on the base 24. The three pig tails or leads numbered 14 and 16 are all constructed of conductive material and comprise a long, thin cylindrical tail 44 integrally capped by a comparatively flat circular head 46. A semi-conductor 22 is affixed to the head 46 of the cathode leads 14. In the preferred embodiment a selenium cell is used, however, any other semi-conductor such as germanium will work.

The cap 20 is a rectangular piece of non-conductive material formed to rest on the shoulders 36 and whose

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edges will bear against the walls 32 and 34 when engaged with the housing 12. Any type of non-conductive material may be used, however, in the preferred embodiment plastic was used.

To assemble the device 10, the tails 44 of the cathode leads 14, with their semi-conductors 22 attached, are passed through the apertures 28. The tails 44 are of sufficient length to extend a few inches beyond the base 24 after being forced through the apertures 28. The heads 46 bear against the bottom of the recesses 26 and the semi-conductors 22 extend a slight distance above the face 48 of the base 24. The tail 44 of the anode 16 is passed through the conductor aperture 42 so that the head 46 bears against the upper surface of the conductor 18. The head 46 of the anode lead 16 is then affixed to the conductor 18 by any of the numerous means available. In the preferred embodiment the said head and conductor are soldered together. For example, the head 46 may be formed to clip into the conductor 18. The tail 44 of the anode 16 is then passed through the aperture 30 until the conductor 18 bears against the semi-conductors 22. At this juncture, the terminal ends 38 of the conductor 18 extend slightly above the line of the shoulders 36. The cap 20 is placed on top of the terminal ends 38 of the conductor 18 forcing the legs 41 toward each other until the cap rests on the shoulders 36. When the cap 20 is engaged as set forth above, the conductor 18 is firmly pressed against the semi-conductors 22 forming a good electrical connection. The area between the walls 32 and 34 over the cap 20 is filled with potting compound 50 to hold the cap in place and seal the electrical connectors from outside dirt and moisture. Of course, the external dimensions of the housing 12 may be varied to suit different applications. The assembly will also work efficiently if only one cathode lead is used, since the axial force is equal along the contact points between the conductor and any number of semi-conductors.

Since certain other obvious modifications may be made in this device without departing from the scope of the invention, it is intended that all matters contained herein be interpreted in an illustrative and not in a limiting sense.

I claim:

1. An encapsulated rectifier assembly comprising terminal leads, a housing of non-conductive material, a resilient spring conductor in said housing having its terminal ends bent back upon themselves to form two elbows, an imperfect conductor in said housing of the class described having one portion sprayed with a metallic layer, and a means of transmitting electrical current to said spring conductor, a cap holding said conductor in assembly with said housing, said spring conductor exerting horizontal pressure on said imperfect conductor when said cap is placed in said housing.

2. An encapsulated rectifier assembly comprising a housing of non-conductive material having a cap, a rectifying cell of the class described, a resilient spring conductor having its terminal ends bent back upon themselves to form two U-shaped elbows, and a means of transmitting electrical current to said spring conductor, said spring conductor kept in contact with said rectifying cell through mechanical operation of the cap and the said terminal ends of the spring conductor.

3. An encapsulated semi-conductor rectifying assembly comprising a housing of non-conductive material, a resilient spring conductor in said housing having its terminal ends bent back upon themselves to form two elbows, three terminal leads, said leads consisting of an anode lead attached to said spring conductor between said elbows and two separate cathode leads, an imperfect

conductor in said housing of the class described having one portion sprayed with a metallic layer, a cap holding said conductor in assembly with said housing, said spring conductor exerting horizontal pressure on said imperfect conductor when said cap is placed in assembly with said housing. 5

References Cited in the file of this patent

UNITED STATES PATENTS

2,707,252	Peter et al.	Apr. 26, 1955
2,853,662	Woods	Sept. 23, 1958
2,879,458	Schubert	Mar. 24, 1959

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

May 3, 1960

Patent No. 2,935,665

William J. Coyle

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 63, for "operation" read -- cooperation --.

Signed and sealed this 25th day of October 1960.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents