

April 25, 1939.

O. GEISLER ET AL

2,156,054

DRY RECTIFIER

Filed July 24, 1937

FIG. 1

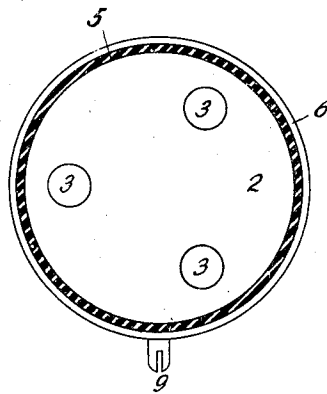
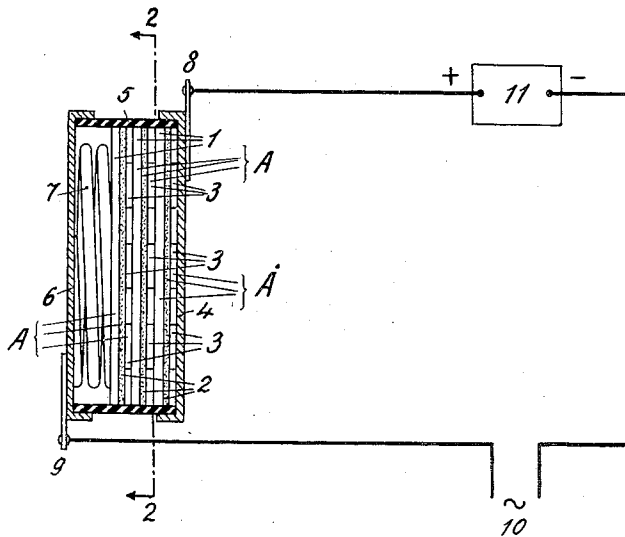


FIG. 2

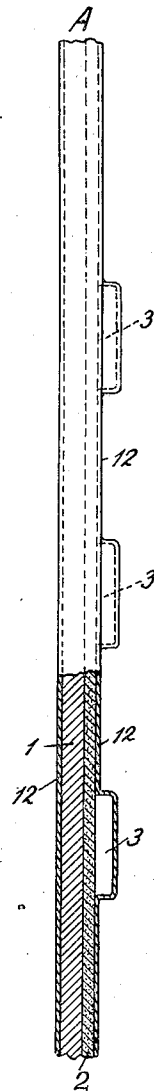


FIG. 3

Inventor:
Ottmar Geisler
and
Heinrich Herrmann
by *R. C. Hopgood*
Attorney

UNITED STATES PATENT OFFICE

2,156,054

DRY RECTIFIER

Ottmar Geisler and Heinrich Herrmann, Nurem-
burg, Germany, assignors to Süddeutsche Ap-
parate-Fabrik G. m. b. H., Nuremberg, Ger-
many

Application July 24, 1937, Serial No. 155,431
In Germany August 3, 1936

4 Claims. (Cl. 175—366)

Metal dry rectifiers are known whose effective area is very small. They are employed if rectifiers of greater areas are not suitable, on account of their comparatively high self-capacity, or if very small currents of high voltage are to be rectified.

It is well known to produce rectifier discs or units, which in most cases are assembled in an insulating tube, by punching them out from a plate provided with the rectifying semi-conductor layer.

Rectifiers as provided by the invention are likewise manufactured in this way, but have certain advantages over the known devices, as will be understood from the following description, reference being had to the accompanying drawing in which

Fig. 1 is a partially sectioned view, drawn to a much enlarged scale, of a rectifier according to the invention and also shows the wiring diagram of a circuit therefor. Fig. 2 represents a section on line 2—2 of Fig. 1. Fig. 3, drawn to a still larger scale, is a side view of part of a plate from which the rectifier units are cut by punching.

As shown in Fig. 1 the rectifier chosen as one example comprises three units A which each consist of a metal disc 1, a semi-conductor layer 2 and three metal projections 3 provided on layer 2. The projections 3 of the unit A shown on the left in Fig. 1 are bearing against the disc 1 of the middle unit A, whose projections 3 in their turn rest against the disc 1 of the unit A represented on the right in Fig. 1. The projections 3 of this third unit A bear against a metal cap 4 arranged to close a cylindrical casing 5 at one end thereof. A second such cap, 6, is disposed on the other end of the casing 5. The caps 4, 6 may be held on casing 5 by frictional contact or may be fastened thereto by a cement free of water, or may be secured on casing 5 in any other suitable manner. Casing 5 is of an insulating material that may be a high melting glass, and contains the units A. Located in the casing 5 is also a helical spring 7 disposed between cap 6 and the units A. Spring 7 causes the projections 3 and discs 1 to bear with the necessary contact pressure against each other and also affords the contact pressure necessary between cap 4 and those projections 3 which are in engagement therewith. Cap 4 has a soldering tab 8 while cap 6 is fitted with a soldering tab 9.

10 denotes an alternating current source whose energy is converted by the rectifier in continuous currents intended for a current-consuming device 11 of any kind.

The projections 3 being arranged in three-cornered relation prevent the units A from assum-

ing an oblique position and thus contacting with each other at their edges, causing short-circuits to occur in this way. In the known arrangements these short-circuits can occur because the units thereof have only one such projection, thus failing to support each other. The supporting action provided by the invention will be most perfect if the projections 3 are arranged in symmetrical distribution.

In this way rectifiers have been manufactured which are adapted for several 1000 volts with some milliamperes load.

Instead of providing three units A, as shown, any suitable or desired number thereof may be assembled. Furthermore rectifiers comprising units of the novel construction may be included in circuits different from that represented in Fig. 1 by way of example. In order to adapt the rectifiers for circuit arrangements of a certain well known kind, contact discs fitted with soldering tabs may be disposed between the units A.

Rectifiers of the construction here disclosed may be comprised in circuit arrangements of the kind known as Graetz connection.

The units A, which as described consist of the parts 1, 2, 3, are in accordance with the invention manufactured as follows.

To a metal plate 1, Fig. 3, for instance an iron plate, a semi-conductor layer 2, consisting in well known manner of selenium or cuprous oxide, for instance, is applied by melting or is produced thereon in any suitable way and then is made to undergo thermal or other influences, as may be necessary. On this layer the metallic projections 3 are formed by any one of the well known processes usually employed for forming rectifier counter-electrodes, for example, by die-casting, and they are produced in groups each of which at least comprises three such projections arranged in triangular relation, as shown in Fig. 2. The body thus obtained is coated with a varnish. The coat of varnish is designated 12. From this blank discs of the desired size, having a diameter of 8 to 9 millimetres, for instance, and carrying a group of the projections 3, are cut by punching.

The coat of varnish 12 prevents the semi-conductor layers 2 from being injured at their edges by this punching operation. However this coat is so thin as to be removed from the projections 3 when assembling the units A, parts 3 and 1 or 4 thus being caused to make metallic contact with each other.

What is claimed is:

1. A method of manufacturing dry-rectifier units which consists in applying a semi-conductor

layer to a metal plate, then providing this layer with metal projections arranged in groups, and finally cutting the blank formed of such plate, layer and metal projections, into portions each comprising one of these groups.

5 2. A method according to claim 1, in which the metal projections are produced by die-casting.

3. A method according to claim 1, which comprises coating the said blank with a varnish.

4. A method according to claim 1, which comprises arranging the metal projections of each group in symmetrical relation to each other.

OTTMAR GEISLER.

HEINRICH HERRMANN.