No. 636,304. Patented Nov. 7, 1899.

A. VOSMAER.

APPARATUS FOR EFFECTING SILENT ELECTRICAL DISCHARGES.

(Application filed Mar. 30, 1898.)

(No Model.)

Fig. 1.

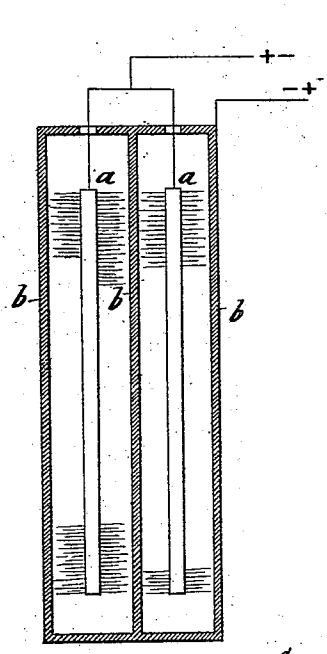


Fig. 2.

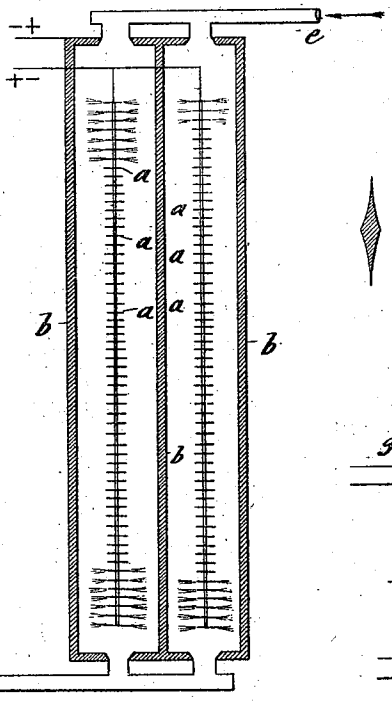


Fig. 2a.

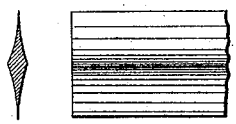


Fig. 3.

Fig. 4.

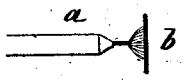


Fig. 5.

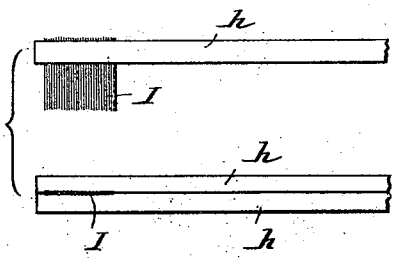
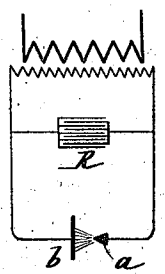


Fig. 6.



Witnesses
G. S. Kennedy.
Frank L. Ober

Inventor
Alexander Vosmaer
by Wm. A. Rosenbaum
Atty.

UNITED STATES PATENT OFFICE.

ALEXANDER VOSMAER, OF HAARLEM, NETHERLANDS.

APPARATUS FOR EFFECTING SILENT ELECTRICAL DISCHARGES.

SPECIFICATION forming part of Letters Patent No. 636,304, dated November 7, 1899.

Application filed March 30, 1898. Serial No. 675,673. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER VOSMAER, a subject of the Queen of the Netherlands, residing at Haarlem, in the Kingdom of the Netherlands, have invented certain new and useful Improvements in Apparatus for Effecting Silent Discharges, of which the following is a specification.

This invention relates to apparatus for effecting silent electric discharges.

In the various technical application of silent electrical discharges obtained by means of an electric current of high tension and of low intensity, notably in electrochemical processes—such, for instance, as the molecular decomposition of gases and vapors—it has hitherto been usual to employ either a dielectric or a high resistance in order to avoid the formation of sparks or voltaic arcs. The reason of such complications was that dischargers fitted with points against points, which is the simplest form of apparatus for effecting silent discharges, always caused very great difficulties. The shape of the dischargers (points against points) resulted in producing a flow spreading largely in the middle of the polar distance. One was therefore compelled to increase the distance between the points of same polarity of such an apparatus in order to avoid their reciprocal disturbance. On the other hand the pointed shape of the dischargers favored the production of sparks or voltaic arcs and the polar distance had to be increased or the tension kept lower, and as a result the economic efficiency was reduced.

Now my invention has for its object to facilitate the flow of electricity to the same degree with the apparatuses fitted with points against points, but has at the same time the special and novel purpose of reducing the polar distance to a minimum, the resistance diminishing therewith and allowing the use of a very high tension current, thus reducing to a minimum the risks of sparking or of production of voltaic arcs.

My invention consists, essentially, in the combination, in an apparatus for effecting silent discharges, of peculiarly-mounted pointed dischargers, forming one pole of the apparatus, with one or more even plates forming the second pole and arranged against said dischargers without the interposition of a dielectric.

In the annexed drawings, Figures 1 and 2 represent, conventionally, vertical and horizontal sections of an apparatus constructed according to my invention. Fig. 2ª shows a section and side view of the knife-edge discharger. Figs. 3 and 4 show the difference existing between the spreading of the flow obtained with my improved apparatus and that obtained with an apparatus fitted with points working against points. Fig. 5 is a modification of the knife-edged dischargers shown in Figs. 1 and 2; and Fig. 6 is a proposed plan of connection which offers a great advantage, as hereinafter explained, when using very high tension transformers.

Referring to Figs. 1 and 2 of the annexed drawings, the knife-edged dischargers *a a* effect the flow of electricity against the plates *b b*. All the blades of the knife-edged dischargers are connected in parallel with one pole of a transformer and all the plates *b* in the same manner with the other pole. The air to be ozonized, for instance, enters from one side *e*, escaping on the other side *s*. The dischargers and the plates are of steel, copper, brass, aluminium, or any other suitable metal.

It must be noted that this apparatus can be applied to high-tension continuous currents as well as to alternating currents of any frequency and to Hertz currents. In this latter case the apparatus is furnished with a Leyden jar in shunt and an air-gap in series. It is obvious that with this arrangement care must be taken to provide harmony between the capacity, self-induction, frequency, &c.

As shown by Figs. 3 and 4 of the annexed drawings, the spreading of the flow does not take place in my invention between two stems presenting the maximum of diversion in the middle of the polar distance. It presents, on the contrary, the maximum of diversion at the base against the even plate *b*. Fig. 4. It is obvious that in this condition the polar distance between the plate *b* and the knife-edged dischargers *a* may be less in amount than that which must exist between the points *g*, Fig. 3. The idle space is consequently reduced to a minimum, the resistance is considerably lower, and the economic

efficiency increased without fear of sparking, as is the case with the old form of apparatus.

Although the dischargers hereinbefore referred to are specified as being in the shape of knife-edged blades, it will be obvious that the same results may be obtained with dischargers formed with a number of points arranged close to each other in a suitable support *h*, as shown by Fig. 5. In this case the flow of electricity is facilitated by the pointed and toothed edge of the discharger, which works advantageously against the plate.

As hereinbefore explained, my improved apparatus has for its special object to reduce the risks of sparking or of production of voltaic arcs. Although this result is completely obtained by my invention, above described, it is advisable when using very high tension-transformers to provide the apparatus with a condenser R in shunt, as illustrated by Fig. 6, said condenser destroying the self-induction of the transformer and coöperating efficaciously to avoid the production of voltaic arcs.

Having described my invention, I claim—

In an apparatus for effecting silent electrical discharges, a discharger consisting of a plurality of metal pins clamped between strips of metal, in combination with a flat or even plate against which the pins of said discharger are directly presented, and suitable electrical connections for the discharger and plate.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALEXANDER VOSMAER.

Witnesses:

NIKOLAS COURDIS HENDRIK VERDAM,

ABRAHAM BARTHOLOMEUS KRUGT.