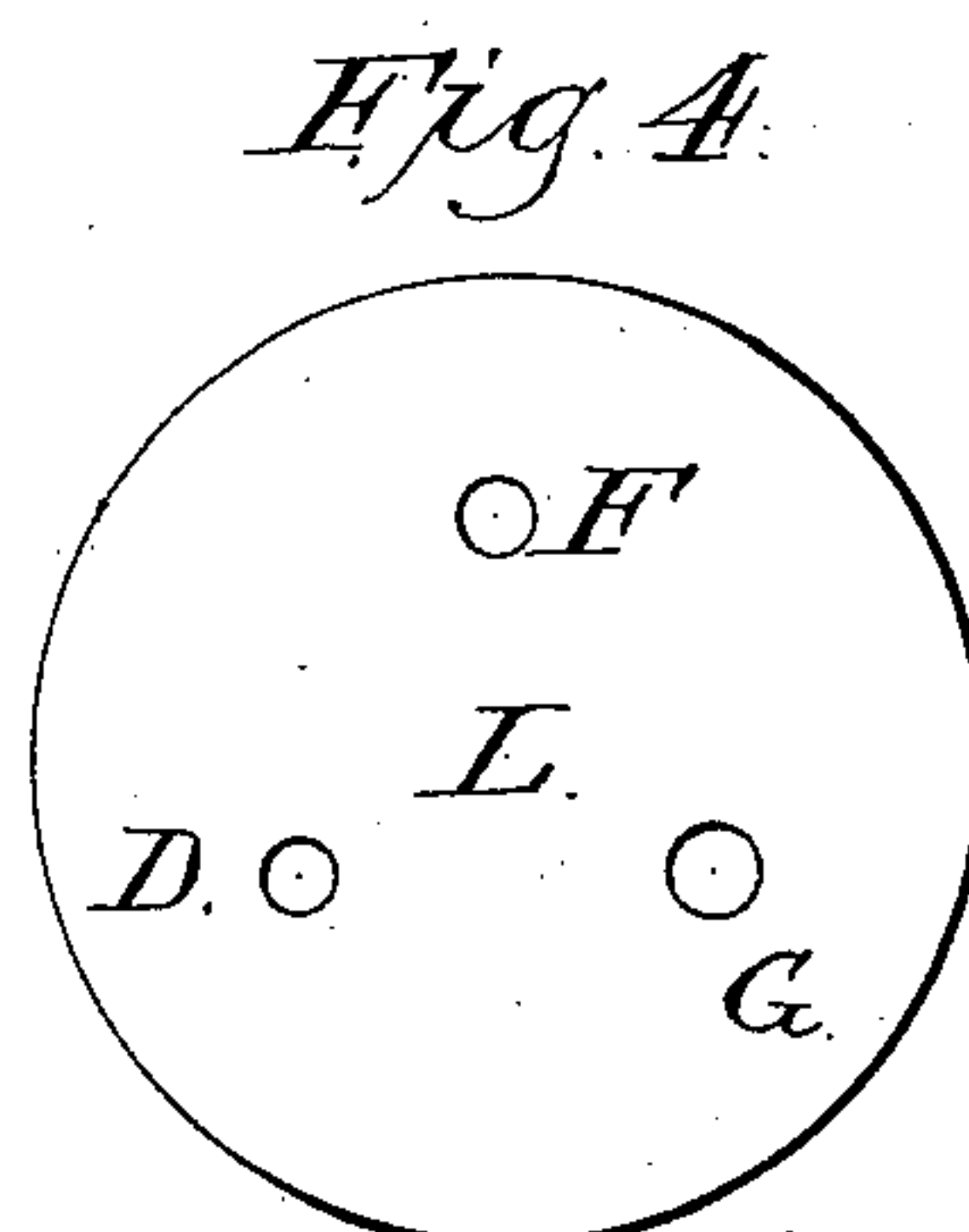
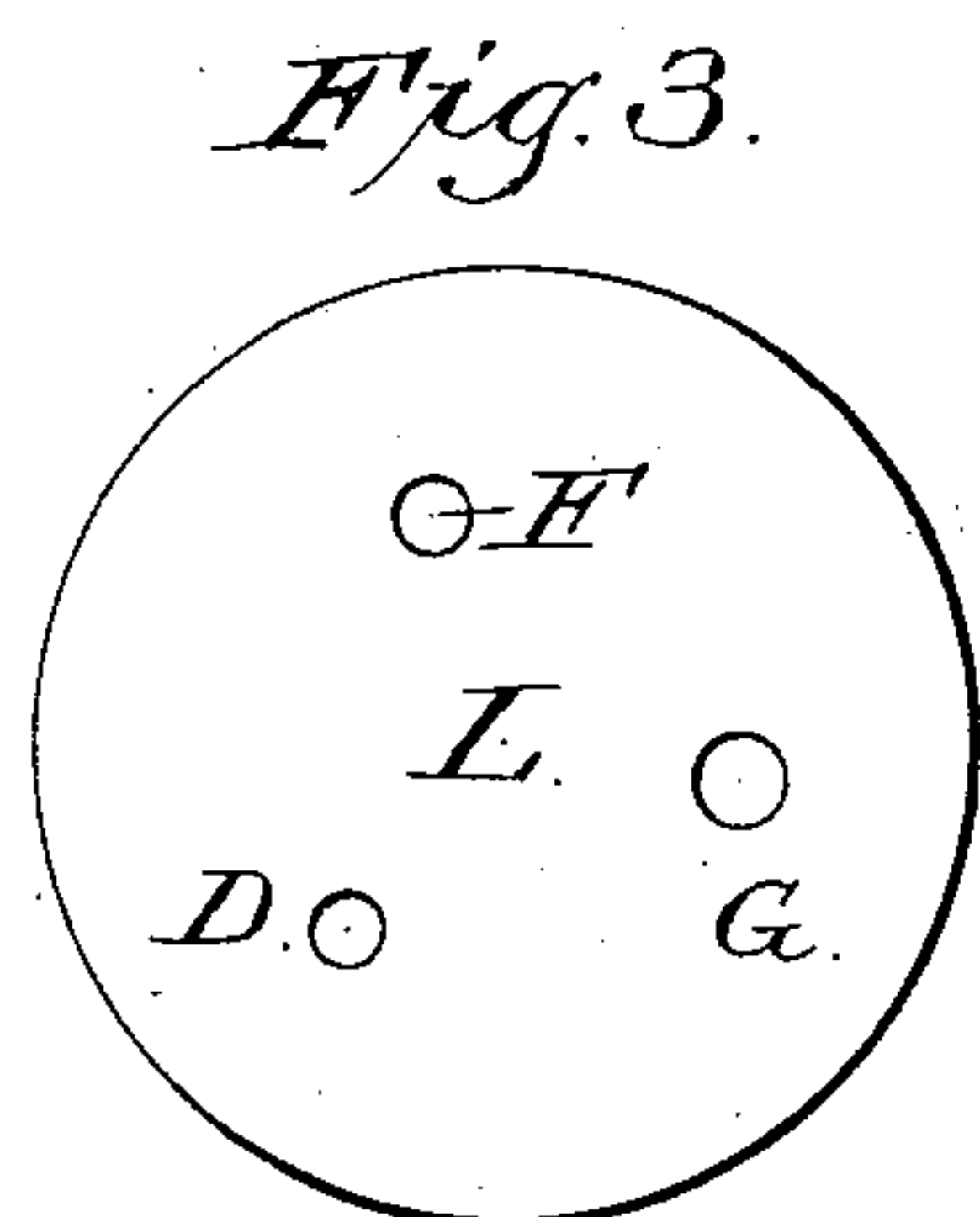
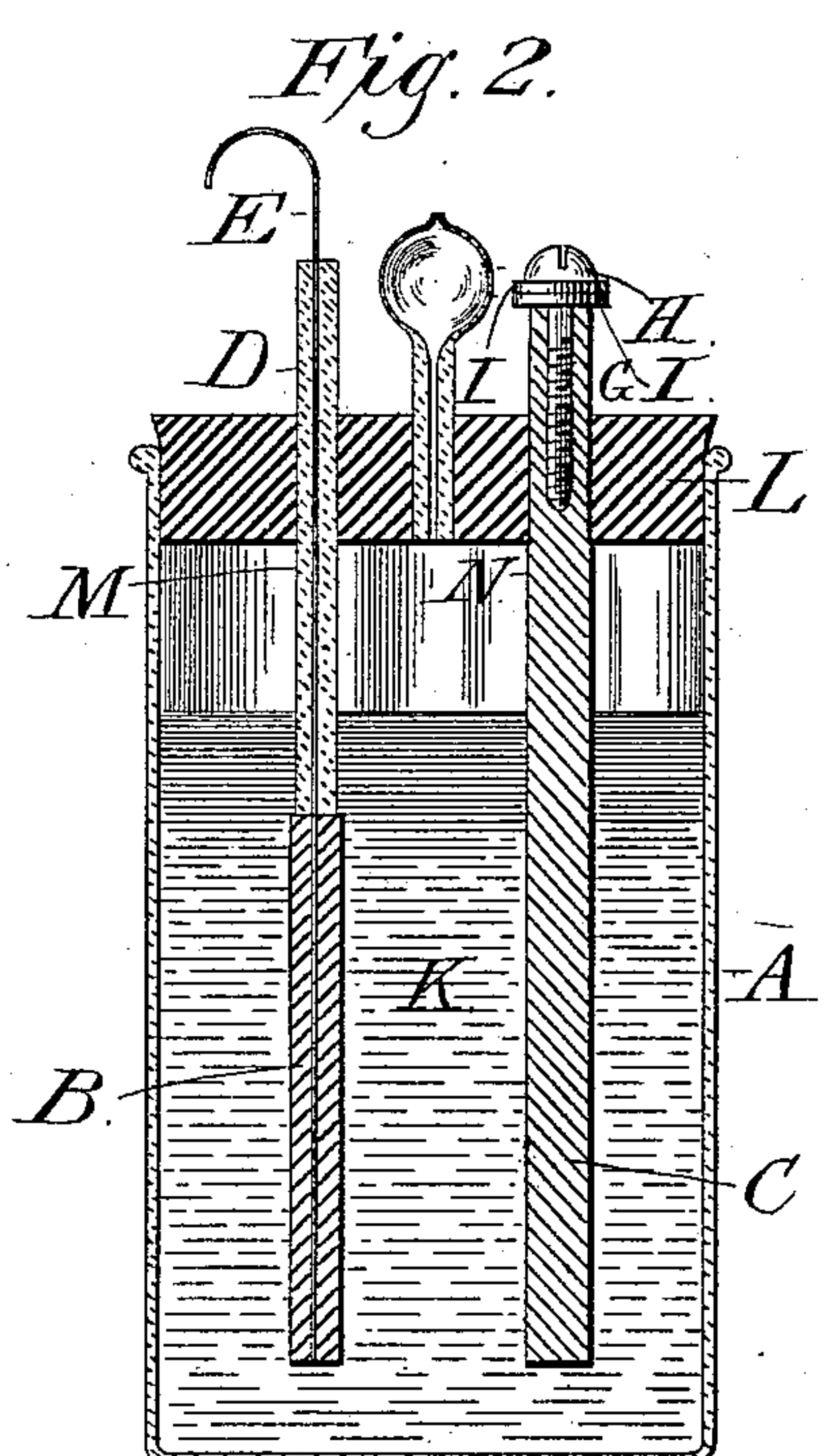
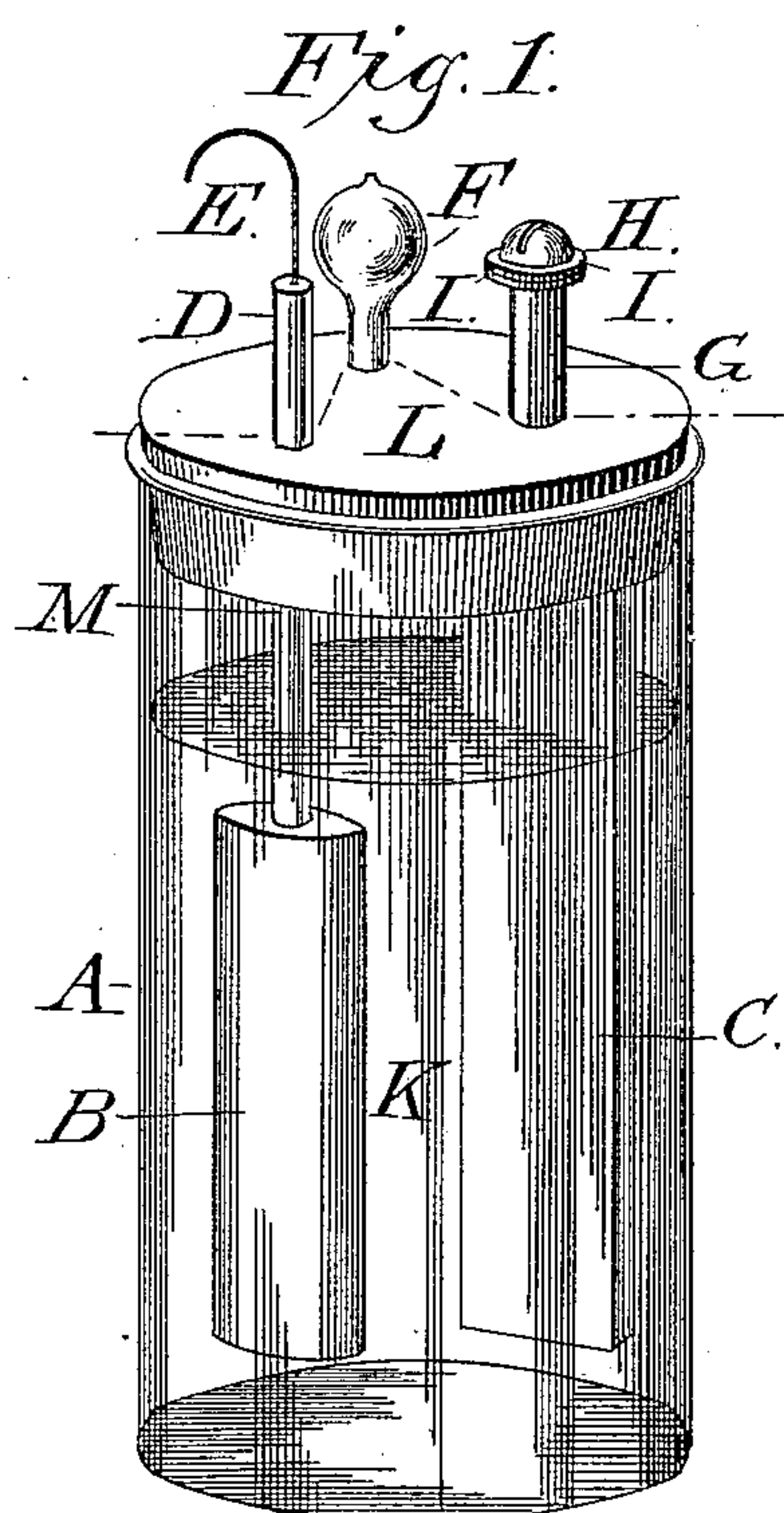


(Model.)

P. S. HAYES.
CHLORIDE OF SILVER BATTERY.

No. 282,634.

Patented Aug. 7, 1883.



Witnesses:

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J. L. Wildman

Inventor;

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By J. J. Hayden, Atty.

UNITED STATES PATENT OFFICE.

PLYMMON S. HAYES, OF CHICAGO, ILLINOIS.

CHLORIDE-OF-SILVER BATTERY.

SPECIFICATION forming part of Letters Patent No. 282,634, dated August 7, 1883.

Application filed October 21, 1882. (Model.)

To all whom it may concern:

Be it known that I, PLYMMON S. HAYES, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Chloride-of-Silver Batteries; and I do hereby declare that the following specification is a true, clear, and complete description of my invention, and that it will enable others skilled in the art to which it appertains to make and use the same.

The object of my improvement is to prevent the gradual exhaustion of the chloride-of-silver battery, when not in use, through the connection of the poles of the battery by the liquid from the battery adhering to the lower surface of the stopper or conveyed through it by permeation, and to prevent the formation of sulphide of silver on the silver wire which forms the positive pole of the battery, and to make the battery portable. These results I claim to have fully accomplished by my invention, which is illustrated by the accompanying drawings, viz.—

Figure 1 showing a perspective view, and Fig. 2 showing a vertical sectional view, Figs. 3 and 4 showing horizontal or top views.

Similar letters refer to similar parts in each.

My invention consists of the insulating glass tube D, extending from the top of the chloride-of-silver plate B through one of the three perforations in the stopper L and above the same a convenient length for practical use. Through this insulating glass tube a fine silver wire, E, passes and is carefully cemented therein, extending from the top of the chloride-of-silver plate B, which is submerged in the battery-fluid K, through the insulating glass tube D, and above the same a sufficient length for practical use. The insulating glass tube D thoroughly covers the silver wire E, which, from its connection with the chloride-of-silver plate B, forms the positive pole of the battery and prevents the positive and negative poles M and N from connection by action of the battery-fluid K by its adherence to the under side or permeation through the stopper L. The insulating glass tube D also prevents the silver wire E from coming in contact with the stopper L, and prevents it from being acted upon by the sulphur contained therein when a rubber stopper is used. The insulating glass tube D further-

more stiffens or supports the silver wire E and renders the silver-chloride plate B less liable to come in contact with the zinc plate C, by the bending of that part of the silver wire E below the stopper L from the weight of the chloride-of-silver plate B on receiving a sudden jar or from falling on its side, than if the insulating glass tube were wanting.

To carry my invention into effect I take a wide-mouth glass vessel of suitable size (see Fig. 1, A A) and fit into it a rubber cork or other suitable stopper, perforated in three places with holes of proper caliber, forming the points of an equilateral triangle far enough distant from the periphery of the stopper for the purposes intended, which are as follows, viz: Through one of these perforations of the stopper L a capillary glass tube, F, with a small bulb near its upper extremity, is inserted, reaching through and terminating with the under surface of the stopper L, which is to operate as a vent for the escape of gas, if any should be generated in the battery, the opening being too small, however, to allow the battery-fluid to escape or run through it, even if the battery should fall upon its side or be turned upside down, and without which vent the battery-fluid would be forced around the poles of the battery M and N, which pass through the stopper L or between it and the sides of the vessel or cell. Through another of these perforations in the stopper L the negative pole N of the zinc plate C passes. Through the third or remaining perforation the insulating glass tube D, which I particularly claim as my invention or improvement, passes, inclosing the silver wire E, which connects with and passes through the full length of the chloride-of-silver plate B and through the insulating glass tube D a sufficient length for the uses intended, said insulating glass tube D extending below the surface of the battery-fluid K and completely insulating the silver wire E down to the point where it enters and passes through the full length of the chloride-of-silver plate B.

The battery-fluid K consists of about two per cent. of solution of sodium chloride, or the same quantity of ammonium chloride, and ninety-eight per cent. of distilled water.

The zinc plate C is made of rolled zinc of suitable length, breadth, and thickness, the upper end turned down to the proper size to admit its

passing from the underneath side of the stopper L, and extending a suitable distance above the upper surface of the stopper L, on the apex of which is fitted a screw, H, which passes through the small copper washers I and I, which answers the purpose of a "binding-post" for connecting the wire of the negative pole N.

The chloride-of-silver plate B consists of perfectly pure chloride of silver fused on a wire of pure silver, E, the wire extending through the full length of the plate B, and of sufficient length above the upper end of the plate B to extend through the insulating glass tube D, and of sufficient additional length for practical use.

Where a rubber stopper is used all that part of it remaining above and outside the mouth of the jar or cell A should be varnished to prevent the exhalation of sulphur from the rubber.

A chloride-of-silver battery is one of exceedingly constant electro-motive force. It occupies but a comparatively small space. The battery-fluid contains no free acid. The silver chloride furnishes a constant supply of chlorine when the battery is in use, and this supply of chlorine continues until all the sil-

ver chloride is converted into pure metallic silver, at which time the battery is exhausted and has to be supplied with a new battery-fluid and a new silver-chloride plate. The life of a battery of this description is of much longer duration than any other now in use.

The form of the battery above described is applicable to any use where a galvanic battery of considerable electro-motive force is required in a small space and in a portable form, and where the work to be done is through a conductor or conductors of high resistance.

What I claim as my invention or improvement in a chloride-of-silver battery, and desire to secure by Letters Patent of the United States, is—

The combination, in a chloride-of-silver battery, of the glass tube D, inclosing the silver wire E, which connects with the silver plate B and the capillary glass tube F, with a small bulb near its upper extremity, substantially as described.

PLYMMON S. HAYES.

Witnesses:

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