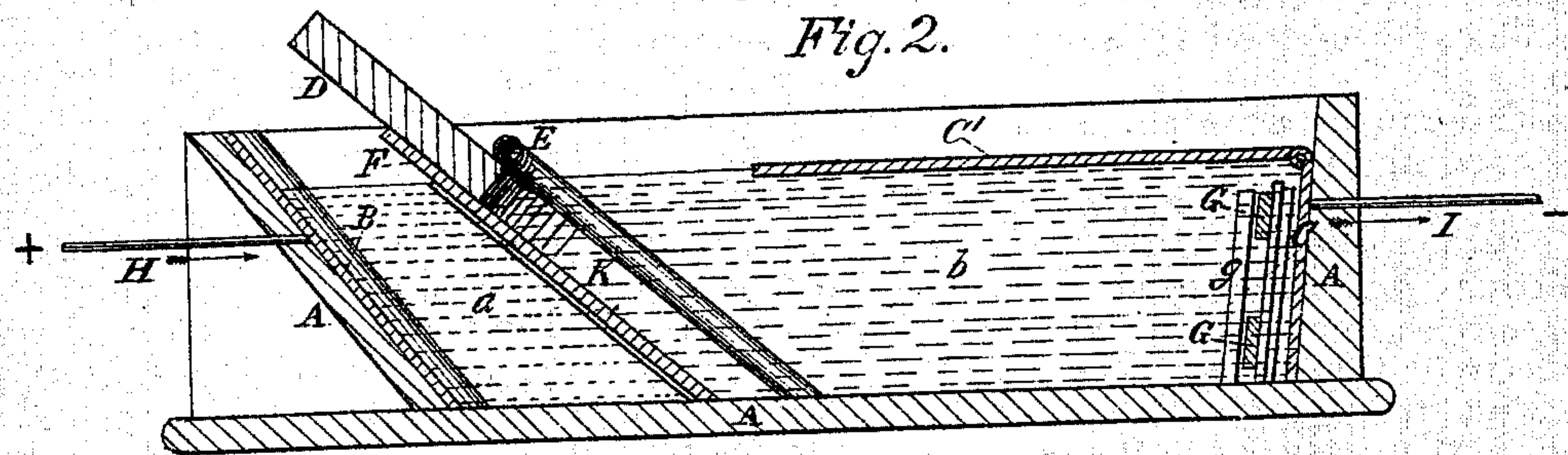
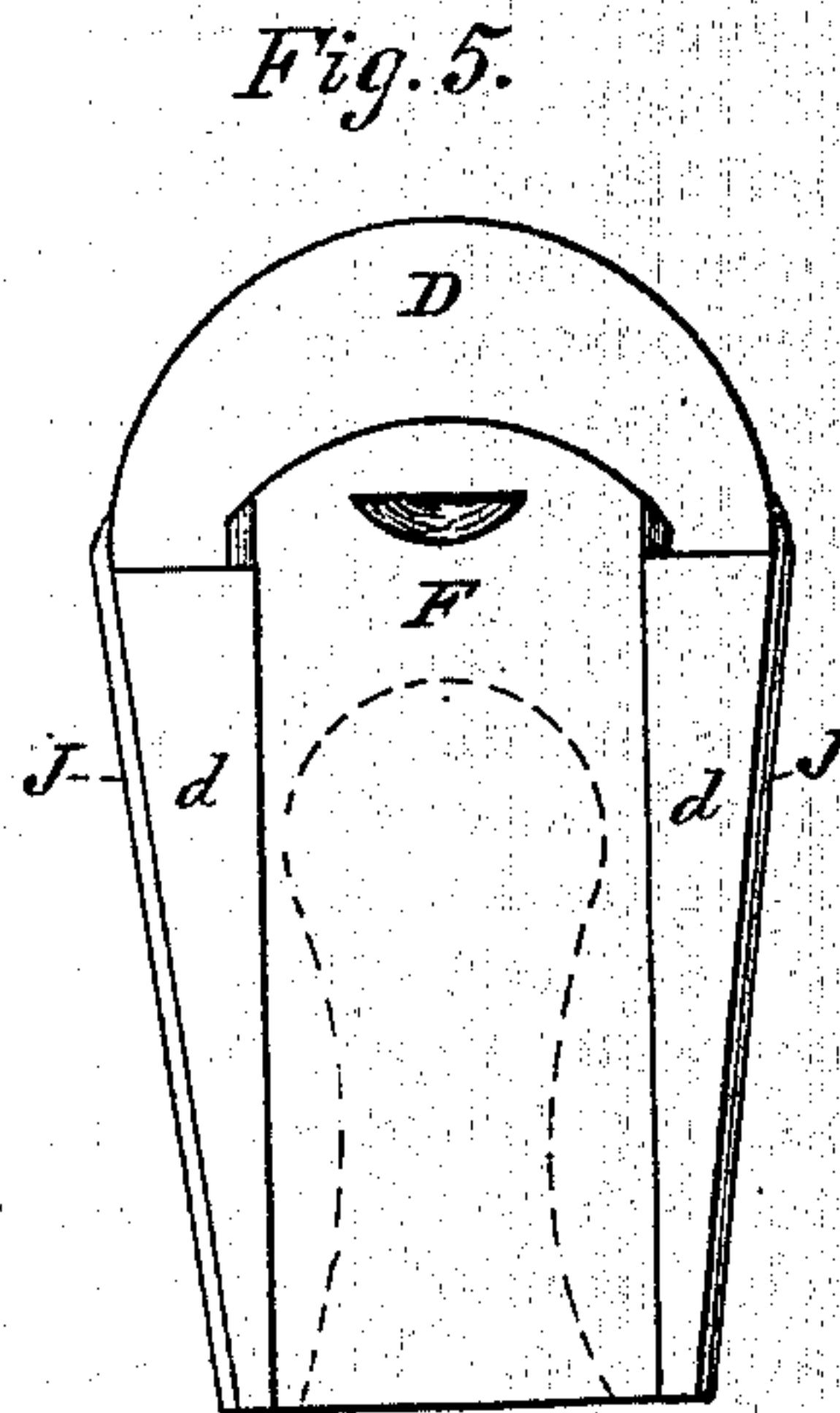
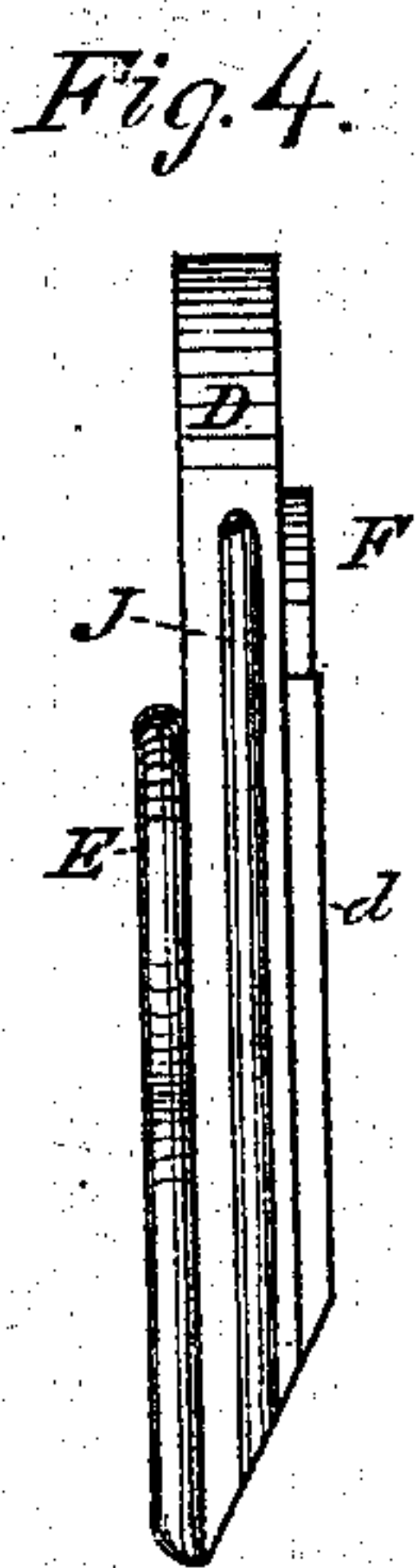
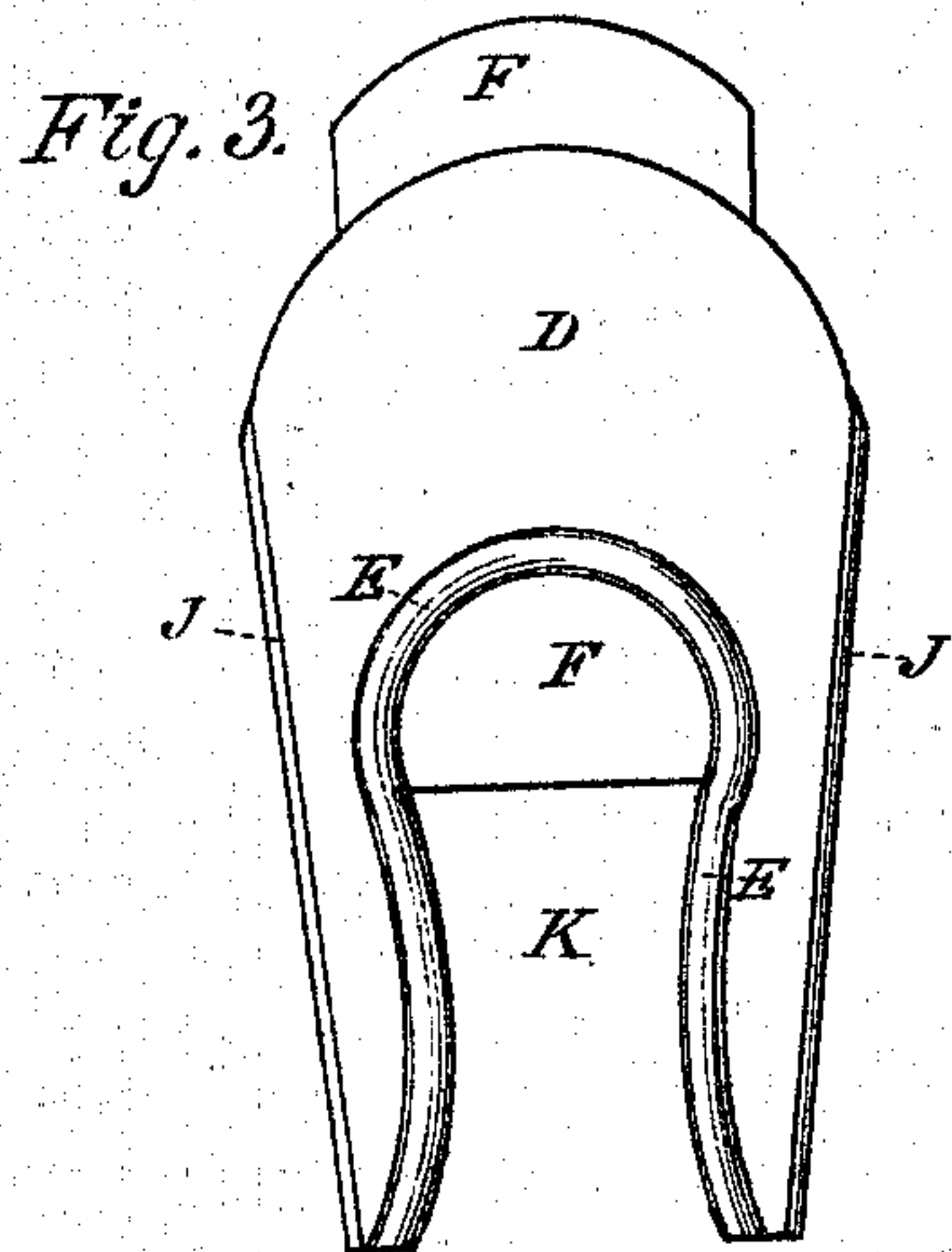
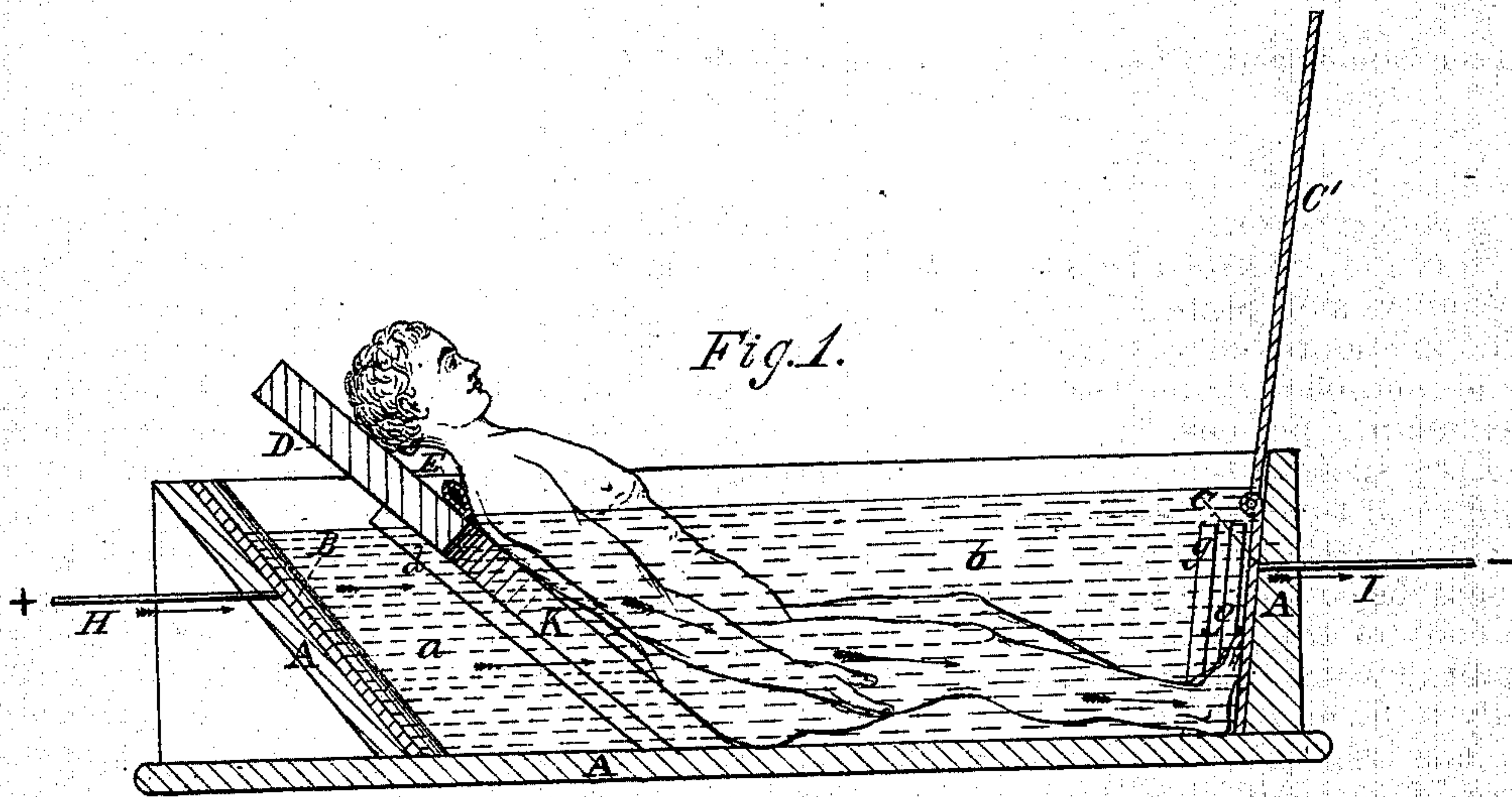


S. RUSSELL, Jr.  
Electro-Medical Bath-Tubs.

No. 139,819.

Patented June 10, 1873.



Witnesses:  
Charles M. Higgins.  
Arthur C. Fraser.

Inventor:  
Saul Russell, Jr.  
Per Burke & Fraser atty



# UNITED STATES PATENT OFFICE.

SAMUEL RUSSELL, JR., OF NEW YORK, N. Y.

## IMPROVEMENT IN ELECTRO-MEDICAL BATH-TUBS.

Specification forming part of Letters Patent No. **139,819**, dated June 10, 1873; application filed March 17, 1873.

*To all whom it may concern:*

Be it known that I, SAMUEL RUSSELL, Jr., of the city, county, and State of New York, have invented an Improved Electro-Medical Bath-Tub and method of administering remedies and extracting poisons, &c., of which the following is a specification:

It is the object of this invention to produce an electro-medical bath-tub in which the electric current shall be compelled to pass directly through the body of the patient to complete the circuit, and in which a much less quantity of the remedy to be administered may be required than has been heretofore, and which shall be more effective in its operation than any heretofore produced. It consists in the combination, with a bath-tub, of a dividing and insulating diaphragm or partition, dividing and insulating one portion of the tub from the other, and in the construction of said diaphragm. It consists, also, in the arrangement of electrodes at each end of the bath-tub, and in forming one part of one of said electrodes fixed and the other part hinged or movable; and in a removable insulating foot rest or rail in combination with the bath-tub.

In the drawing, Figure 1 is a longitudinal section of my improved bath-tub with a patient shown within it, and represented as in operation, administering remedies. Fig. 2 is a like view with the parts in a different position. Fig. 3 is an elevation of the front side of the dividing diaphragm. Fig. 4 is an elevation of the edge or end of the same, and Fig. 5 is a like view of the back side of said diaphragm.

As represented in the drawings, A A, Figs. 1 and 2, is the bath-tub, which is formed of any non-conducting substance, such as wood, porcelain, or other suitable material, at each end of which are arranged metal plates B C C', forming the electrodes. The lower portion C of the electrode C C' is fixed permanently to the tub, while the upper and larger portion C' is hinged to the lower portion C, as shown, and is thus movable, and may be placed in a vertical or horizontal position, as required. The upper portion C' may be perforated or formed of wire-netting, if desired. In front

of the plate C are secured vertical guides *g g*, Figs. 1 and 2, in which a removable foot-rest, G, is placed and held when required, and against which the patient places his feet when required. The diaphragm D is formed with a central opening, K, Figs. 1, 2, and 3, which should be of a shape that will best conform to the outline of the back of the human body, and may be made to include the neck and head, if desired; or this opening may be made to conform to any other portion of the human body. Surrounding this opening is secured an air-cushion, E, or other yielding and elastic packing, against which the patient rests his back, as shown in Fig. 1. At the opposite or back side of the diaphragm D, and tightly covering the opening K, a sliding gate or valve, F, is arranged in upright guides *d d*, Figs. 4 and 5, shown fully withdrawn in Fig. 1, partly withdrawn in Fig. 3, and fully closed in Figs. 2, 4, and 5. At each side or edge of the diaphragm, and on the under edge, if required, are secured rubber strips J J, Figs. 3, 4, and 5, which form a water-tight joint between the sides of the diaphragm and the tub, so that when the diaphragm is in the proper position in the tub, with the gate F closed, or the back of the patient pressed against the cushion E, the tub is then divided into two water-tight compartments, *a b*, Figs. 1 and 2, having no communication with each other mechanically. The diaphragm is separable from the bath-tub, and movable horizontally therein, so that it may be adjusted to suit the size or length of the patient to be operated upon; and different diaphragms may be used or provided to suit persons of different ages or sizes, or diaphragms may be provided to suit any particular part of the human body. The sides of the bath-tub are divergent, corresponding with the shape of the diaphragm, so that the latter, when adjusted to any position in the tub, can not be moved therefrom or displaced by the weight or pressure of the patient exerted thereon. A sheet of rubber with an opening therein to correspond with any desired part of the body, or with perforations, may be placed before the opening in the diaphragm, and substituted for the air-cushion



E. The plates or electrodes B and C, Figs. 1 and 2, are connected with the battery by the wires H and I.

In Fig. 1 the parts of the bath are arranged for administering remedies, while in Fig. 2 the parts are arranged for reversed action.

In administering remedies the operation is as follows: The tub is first filled to a proper height with water at a suitable temperature, and the diaphragm then adjusted to the proper position in the tub to suit the size of the patient, with the gate F tightly closed, the diaphragm thus dividing the tub into two compartments, *a b*, Figs. 1 and 2.

The medicated solution containing the remedy to be administered is then placed in the compartment *a* and thoroughly mixed with the water therein, and the plate C' is placed out of the water in the position shown in Fig. 1; and if the substance to be administered be either mineral or alkaline, the plate B is connected, by the wire H, with the positive pole of a galvanic battery, and the plate C, by the wire I, with the negative pole. The patient then enters the compartment *b*, and places his feet against the plate C and his back before the opening K in the diaphragm, pressing his back against the air-cushion E surrounding the opening, which, being very elastic, will at once conform to the shape of the body and fit closely thereto, and prevent communication between the chambers *a* and *b*. The gate F is then withdrawn, permitting the medicated solution in *a* to come in contact with the patient's body, and the electric circuit closed, the current flowing in the direction of the arrows, as shown in Fig. 1. The feet of the patient being pressed against the plate C, his body becomes the negative electrode and receives the substance to be administered as it is conducted by the electric current from the solution in the compartment *a* to the negative electrode, the absorbing power of the skin being increased by the action of the electric current thereon. Acids are administered in the same manner as minerals or alkalies, except that the current is made to pass in the opposite direction. When the patient has been sufficiently treated the gate F is closed, which breaks the electric circuit and also prevents mechanical communication between the chambers *a* and *b*, after which the patient may remove his back from the cushion E and leave the bath.

In particular cases the parts of the bath are arranged as shown in Fig. 2. The insulating foot-rest G is placed in the guides *g g*, as shown, and, after the proper solutions, which will vary with the substance to be extracted, are placed in the compartments *a b*, the patient enters the compartment *b* and places his feet against the foot-rest G, and his back against the diaphragm, in the same manner as before described. The plate C' of the neg-

ative electrode is then placed horizontally over, but not touching, the patient's body, and below or upon the surface of the liquid in the compartment *b*, as shown. The gate F may then be withdrawn and the circuit closed, the current flowing in the direction of the arrows. The separation of the feet from contact with the electrode C permits the current of electricity to pass through the body and a portion of the solution in *b* before reaching that electrode, and the hinged plate C', resting on the liquid, and being placed over the patient, as in Fig. 2, causes the current as it leaves the body to be diffused therefrom at all points, and thus prevent a painful sensation in any one part of the body by a concentrated flow of electricity therefrom. It will be readily seen that as the electric current, as it leaves the plates B or C, cannot pass through the sides of the bath-tub or through the diaphragm, they being non-conductors, or from liquid to liquid in the compartments *a b*, as they are completely separated by the diaphragm and the back of the patient, it is, consequently, compelled to pass directly through the conducting body of the patient, which thus forms virtually a part of the electric circuit, or one of the electrodes. As the chamber *a* is a small one, but a small quantity of the liquid containing the remedy to be administered is required to fill it, which thus obviates the necessity of using the large quantities of liquids heretofore required. As the surface of the liquids in both compartments of the bath-tub will generally be on a level, very little pressure will, consequently, bear upon the joints of the diaphragm, which it will thus be an easy matter to keep tight.

I claim as my invention—

1. In an electro-medical bath-tub the diaphragm D, provided with an opening, K, substantially as and for the purpose herein set forth.
2. In combination with the opening K, the cushion E or its equivalent, and gate F, substantially as set forth.
3. In combination with the diaphragm D, the packing-strips J J, substantially as shown and described.
4. In combination with the diaphragm D, the electrodes B C, arranged at opposite ends of the bath-tub, as set forth.
5. In an electro-medical bath-tub the hinged plate C', substantially as shown and described.
6. In combination with the diaphragm D the removable foot-rest G, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

SAM'L RUSSELL, JR.

Witnesses:

CHAS. M. HIGGINS,  
ARTHUR C. FRASER.