No. 814,583. PATENTED MAR. 6, 1906.

F. J. BRIGGS.

APPARATUS FOR FEEDING ELECTROLYTIC CELLS.

APPLICATION FILED MAY 9, 1905.

3 SHEETS—SHEET 1.

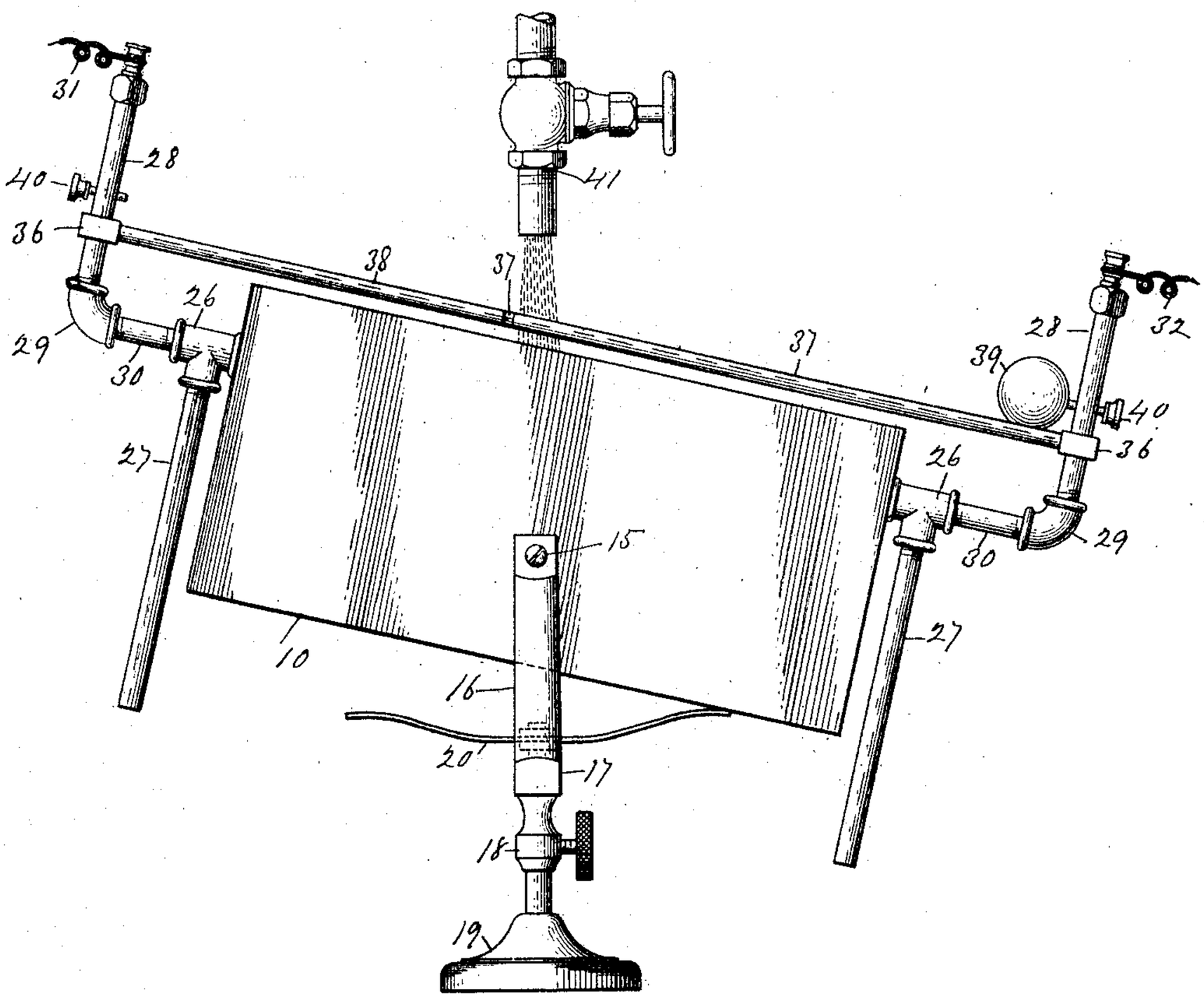

Fig 1

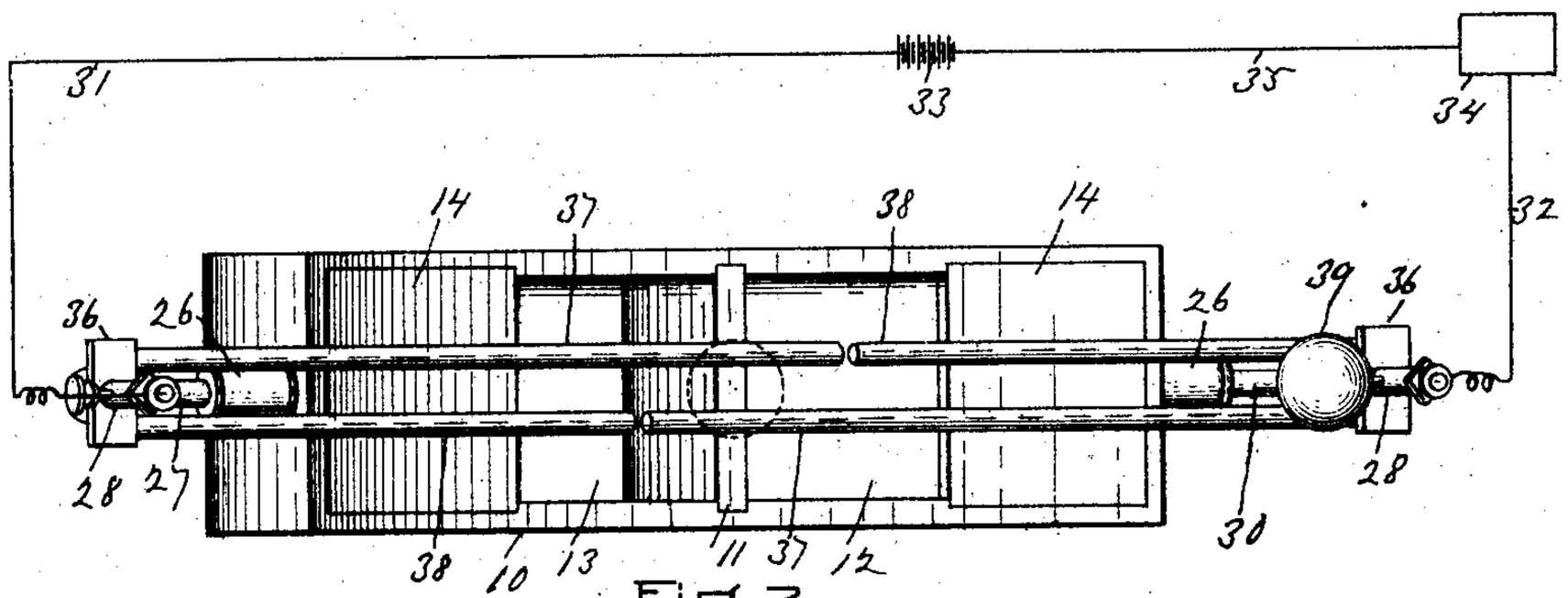

Fig 2.

WITNESSES
A. L. Hood
M. A. Atwood

INVENTOR
Frank J. Briggs.
By his Att'y.
Thomas W. Williams

No. 814,583. PATENTED MAR. 6, 1906.

F. J. BRIGGS.

APPARATUS FOR FEEDING ELECTROLYTIC CELLS.

APPLICATION FILED MAY 9, 1905.

3 SHEETS—SHEET 2.

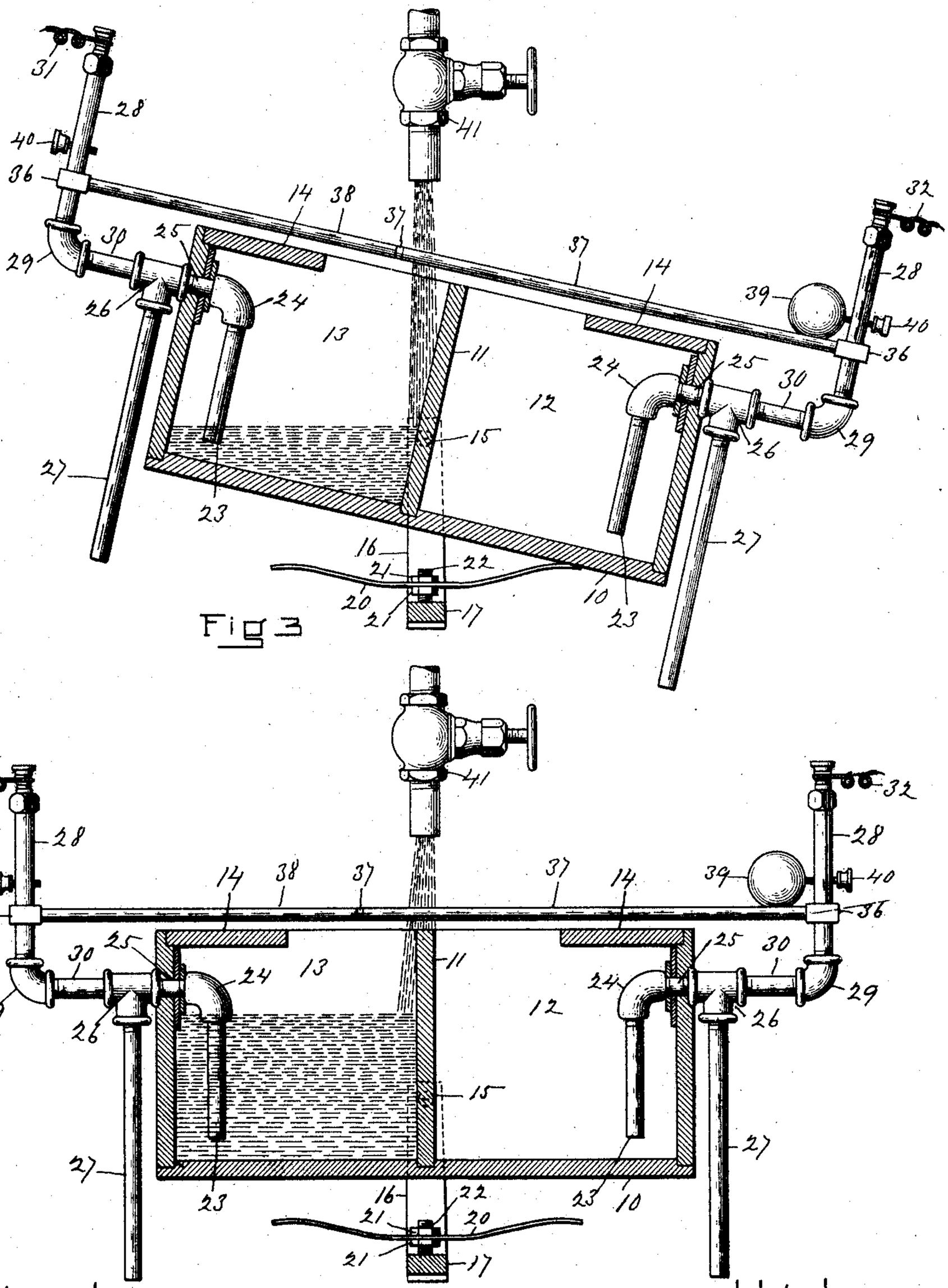

Fig 3

Fig 4

WITNESSES

A. L. Hood

M. A. Atwood

INVENTOR

Frank J. Briggs.

By his Atty.

Henry W. Williams

No. 814,583. PATENTED MAR. 6, 1906.

F. J. BRIGGS.

APPARATUS FOR FEEDING ELECTROLYTIC CELLS.

APPLICATION FILED MAY 9, 1905.

3 SHEETS—SHEET 3.

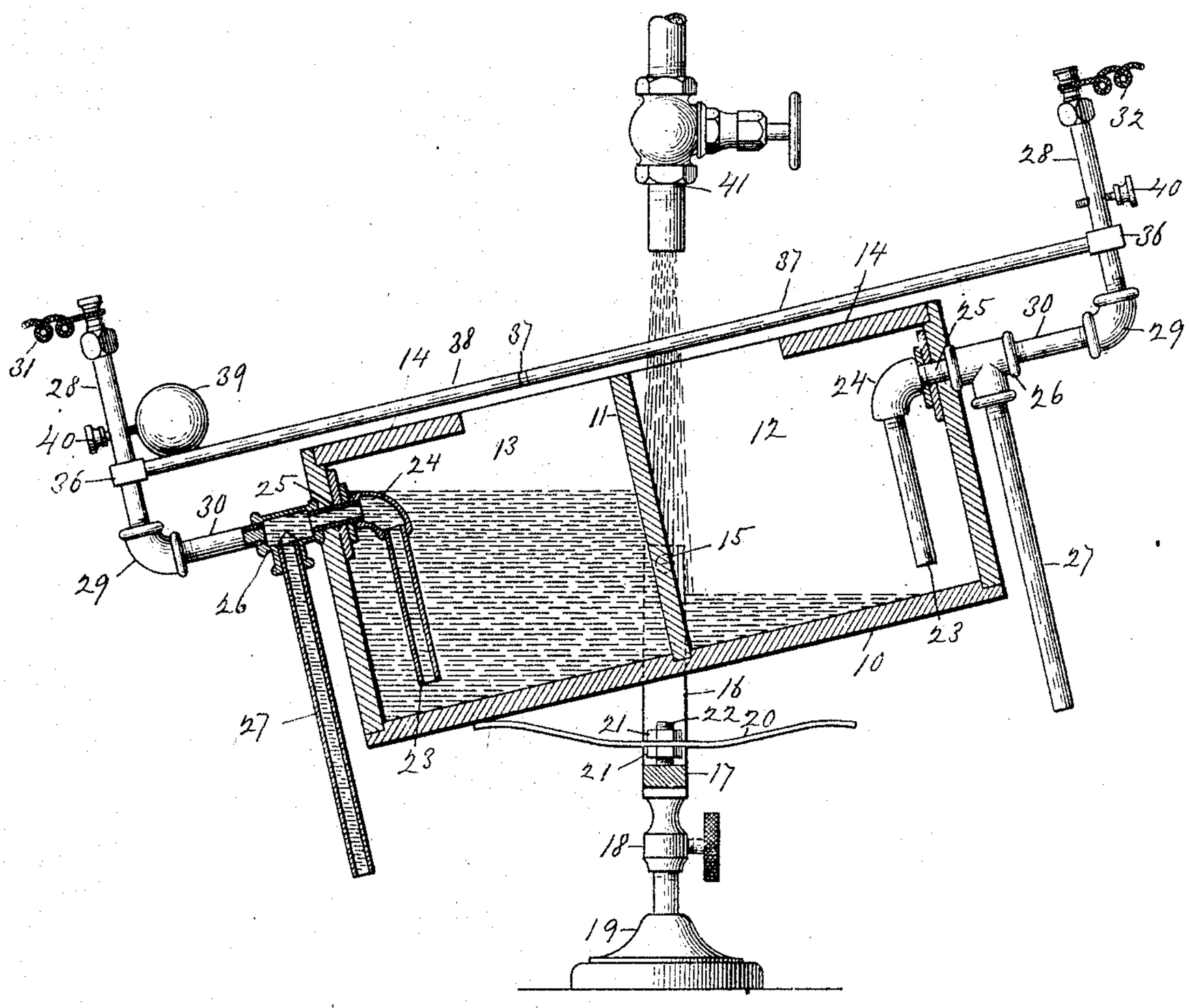

Fig 5

WITNESSES
A. L. Hood.
M. A. Atwood

INVENTOR
Frank J. Briggs.
By his Atty.
Henry Merriam

UNITED STATES PATENT OFFICE.

FRANK J. BRIGGS, OF EVERETT, MASSACHUSETTS.

APPARATUS FOR FEEDING ELECTROLYTIC CELLS.

No. 814,583. Specification of Letters Patent. Patented March 6, 1906.

Application filed May 9, 1905. Serial No. 259,587.

To all whom it may concern:

Be it known that I, FRANK J. BRIGGS, a citizen of the United States, residing in Everett, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Device for Feeding Cells in Electrolytic Apparatus, of which the following is a specification.

This is a device for feeding or supplying cells in an electrolytic apparatus—such, for example, as that described in Letters Patent of the United States numbered 727,889 and dated May 12, 1903—with salt water or similar liquid. In feeding cells with salt water in the ordinary manner the electricity follows the water to the tank and then grounds.

My invention has for its objects, first, to prevent the electricity from passing through the tank and grounding, and, second, to measure the water fed to the electrolytic apparatus, and thus by means of a connection with an ordinary register to enable the amount passing through my apparatus to be registered.

The nature of the invention is fully described in detail below and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my apparatus in its initial position—that is, with the water starting to enter one of its chambers. Fig. 2 is a plan view of the apparatus in the same position, a dotted line showing the position of the ball when it completes the electrical circuit. Fig. 3 is a view, partly in longitudinal vertical section and partly in side elevation, of the apparatus in the same position. Fig. 4 is a similar view showing the position of the apparatus balanced and just before the ball starts to roll. Fig. 5 is a similar view showing the apparatus tilted down on the opposite side from that indicated in the first three figures and siphoning out the liquid.

Similar numerals of reference indicate corresponding parts.

10 represents a tank made of slate, glass, or other insulating material, divided by a central vertical partition 11 into two chambers 12 and 13 equal in size and capacity. On opposite sides of the partition the top of this tank is open, while next its ends the tank may be provided, if desired, with coverings 14. This tank is pivotally supported at 15 by the upper ends of uprights 16, extending upward from the horizontal cross-piece 17, which is supported adjustably as to height by the tubular standard 18, extending up from a suitable pedestal or base 19. The tank is pivotally supported at a sufficient distance above the cross-piece 17 to allow of a spring 20 to be supported centrally and adjustably as to height between the pair of nuts 21 on a screw 22, which extends up vertically from the cross-piece. This spring is preferably a little depressed centrally, its end portions being raised and its extreme ends being bent slightly downward, and the spring is at such a height as to support the tank when it is tilted down in either direction, yielding a trifle as the tank strikes the end of the spring, and thus preventing undue jar.

In each of the chambers 12 13 there is located a substantially vertical pipe 23, which is connected by an elbow 24 with a horizontal pipe 25, extending through the end wall of the tank and connecting with a horizontal coupling 26, and a substantially vertical pipe 27 extends down from said coupling on the outside end of the tank to a point below the end of the pipe 23, the whole being adapted to constitute a siphon. A metallic post 28 extends up from an elbow 29, which connects it with the outer end of the preferably tubular rod 30, which connects said elbow with the coupling 26. These two standards are electrically connected by wires 31 and 32 with a battery 33 and a register 34, respectively, and said register is connected by the wire 35 with the battery. The battery and the register are shown diagrammatically in Fig. 2, as they are of ordinary construction. Each of these posts 28 supports a horizontal bracket or plate 36, and from each said bracket or plate there extends horizontally inward over the tank a pair of metallic rods 37 and 38, said rods in each pair being of unequal length, the rods 37 extending over and beyond the partition 11, while the rods 38 do not extend as far as the partition. Each rod 37 is in line with the opposite rod 38, and the inner end of said rod 37 is separated by a small space from the inner end of the rod 38. These rods constitute a track for a freely-rolling ball 39, said ball being adapted to roll from a suitable horizontal screw 40 in one of the posts 28 to a similar screw in the other post. Directly over the pivot 15 is a supply-pipe 41, and as said pivot is within or in line with the partition 11 it is evident that if the tank were perfectly balanced the supply-pipe would be di-

rectly over the upper edge of the partition. When the apparatus is in the position indicated in Figs. 1, 2, and 3 and also when it is in the position indicated in Fig. 5, the ball rests at the lowest end of the track, and as there are spaces between the inner ends of both rods constituting the track it is evident that the electrical circuit is broken; but should the ball be in the position indicated in the dotted line in Fig. 2 it would connect the two long rods 37 of the track, as said rods necessarily overlap, and hence the circuit would be made through said rods 37, brackets or plates 36, posts 28, wires 31, 32, and 35, and the register 34.

In practical operation, the apparatus being in the position indicated in Figs. 1, 2, and 3, water from the supply pours into the chamber 13, said chamber gradually filling, and the salt water of course rising in the pipe 23 therein at the same time. The ball is of such a weight that when the water reaches a point a little below the outlet-pipe 25 the weight of the water balances the ball and causes the end where the ball is located to tilt up to a horizontal position, as shown in Fig. 4. The tank, however, does not stop in this position, as the impetus swings it sufficiently beyond said horizontal position to start the ball rolling, so that in practice the ball rolls to the end containing the chamber which is being filled, and the tank tilts continuously and quite quickly from the position indicated in Figs. 1, 2, and 3 to that indicated in Fig. 5. Now when the tank reached a level position the water was just below the outlet, as shown in Fig. 4, and as it continued to tilt the water quickly entered said outlet and began to siphon through the pipe 25 and coupling 26 into and down through the pipe 27, which is connected in any suitable manner with a cell in an electrolytic apparatus. The air in the outlet-pipe having once been ejected or "broken," the salt water continues to flow out through the pipe 37, and as that end is tilted down the water from the supply flows into the opposite chamber 12 until the lowering of the water in the chamber 13 and the rising of the water in the chamber 12 operate in the same manner as above described and tilt the end containing the chamber 12 down until that end begins to siphon out and empty itself of water in the same manner as did the chamber 13. It will readily be seen that when the flow of water stops at either end of the tank the breaking of the stream breaks any electrical current which may follow the water, and thus grounding is stopped. It is also evident that every time the tank tilts, as soon as the ball reaches the position indicated in the dotted line in Fig. 2 it makes the circuit with the register, and the operation is registered in the ordinary manner. Hence a registry is kept of the number of times that the chambers empty themselves of water. In practice a chamber empties itself much more quickly than the opposite chamber fills, thus facilitating the tilting operation. The tilting of the tank continues and the chambers empty themselves alternately until the supply of water is shut off.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A device for feeding cells in electrolytic apparatus, comprising a pivotally-supported tank containing separated chambers or compartments on opposite sides of its pivotal support, siphon-pipes extending from the interior of each chamber to the exterior and adapted to be connected with a cell, a track supported by the tank, a ball on said track, and a water-supply located over the pivotal support of the tank, whereby when the tank is tilted down in either direction the supply of water enters the chamber which is tilted up.

2. A device for feeding cells in electrolytic apparatus, comprising a pivotally-supported tank containing separated chambers or compartments on opposite sides of its pivotal support, siphon-pipes extending from the interior of each chamber to the exterior and adapted to be connected with a cell, a track supported by the tank, a ball on said track adapted to roll freely from a position on one side of the pivotal support to the other side, means at opposite ends of the track for limiting the movement of the ball, and a water-supply located over the pivotal support of the tank, whereby when the tank is tilted down in either direction the supply of water enters the chamber which is tilted up.

3. A device for feeding cells in electrolytic apparatus, comprising a pivotally-supported tank containing separated chambers or compartments on opposite sides of its pivotal support, siphon-pipes extending from the interior of each chamber to the exterior and adapted to be connected with a cell, a track supported by said tank and extending from one side of the pivotal support to the other and consisting of two pairs of metallic rods extending from opposite sides of the pivotal support of the tank, the rods in each pair being of unequal length and the longer rod in each pair being opposite the shorter rod in the opposite pair and overlapping the longer rod in the opposite pair, a freely-rolling ball on said track, and a water-supply located over the pivotal support of the tank, said track making a portion of an electrical circuit, whereby as the tank is tilted down in either direction the supply of water enters the chamber which is tilted up, and the stream of water which is siphoning out through the opposite chamber is broken thus breaking any electrical current which is passing through said stream, and when the rolling

ball passes over the point at which the longer rods overlap it completes the electrical circuit of which said rods form a part.

4. A device for feeding cells in electrolytic apparatus, comprising a pivotally-supported tank containing separated chambers or compartments on opposite sides of its pivotal support, siphon-pipes extending from the interior of each chamber to the exterior and adapted to be connected with a cell, a track supported by said tank and extending from one side of the pivotal support to the other and consisting of two pairs of metallic rods extending from opposite sides of the pivotal support of the tank, the rods in each pair being of unequal length and the longer rod in each pair being opposite the shorter rod in the opposite pair and overlapping the longer rod in the opposite pair, a freely-rolling ball on said track, and a water-supply located over the pivotal support of the tank, said track making a portion of an electrical circuit containing a register, whereby as the tank is tilted down in either direction the supply of water enters the chamber which is tilted up, and the stream of water which is siphoning out through the opposite chamber is broken thus breaking any electrical current which is passing through said stream, and when the rolling ball passes over the point at which the longer rods overlap it completes the electrical circuit of which said rods form a part and registers the emptying of a chamber.

5. In a device for feeding cells in an electrolytic apparatus, a tank made of insulating material and provided with a central partition and containing chambers or compartments on opposite sides thereof, a pivotal support for said tank in line with the partition, a water-supply located directly over the upper edge of the partition when the tank is level, siphon-pipes extending from the interior of each chamber to points outside the tank and adapted to connect with a cell, a track comprising two pairs of metallic rods 37 and 38, the pairs of rods extending from opposite sides of the pivotal support of the tank and the longer rods 38 being in line with the shorter rods 37 and with their ends separated from the shorter rods by small spaces, supports for the outer ends of said rods extending from the siphon-pipes, and a metallic ball freely rolling on said track, said track making a part of an electrical circuit which contains a register, whereby when the ball reaches the center of the track it connects electrically the two longer rods 37 and completes said circuit.

6. In a device for feeding cells in electrolytic apparatus, the tilting tank 10 divided by means of a partition into two compartments 12 and 13, a standard pivotally supporting said tank, the pivotal support being in line with the partition, the spring 20 supported centrally by the standard and extending longitudinally under the tank, a water-supply located over the upper edge of the partition when the tank is level, and siphon-pipes extending from the interior of each compartment to a point outside the tank, substantially as and for the purpose set forth.

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

FRANK J. BRIGGS.

Witnesses:

HENRY J. HESZ,

E. STANTON BAKER.