No. 808,351. PATENTED DEC. 26, 1905.

L. DION.

DEVICE FOR CONTROLLING THE FLOW OF FLUIDS AND OTHER MATERIALS

APPLICATION FILED MAR. 25, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

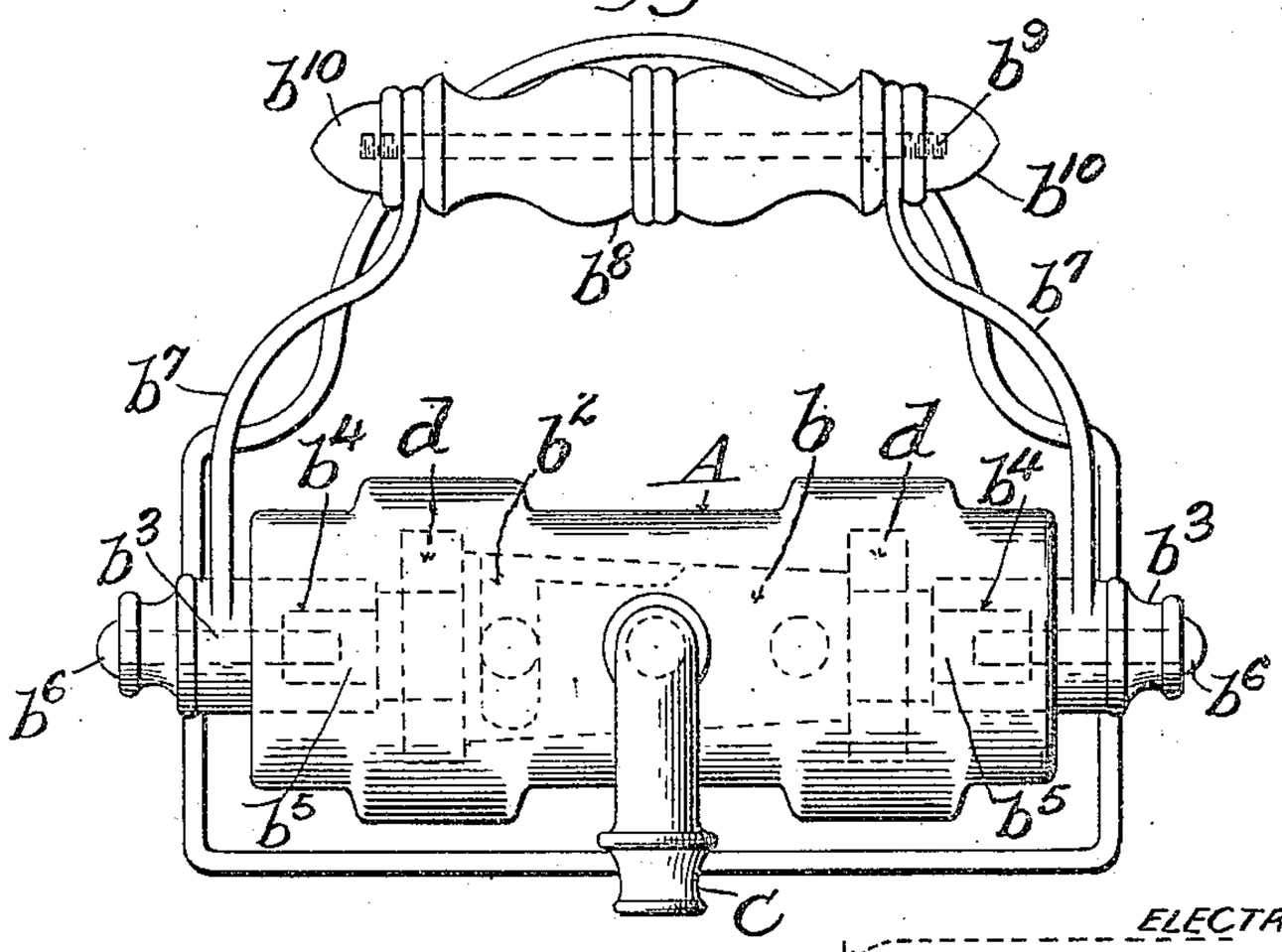
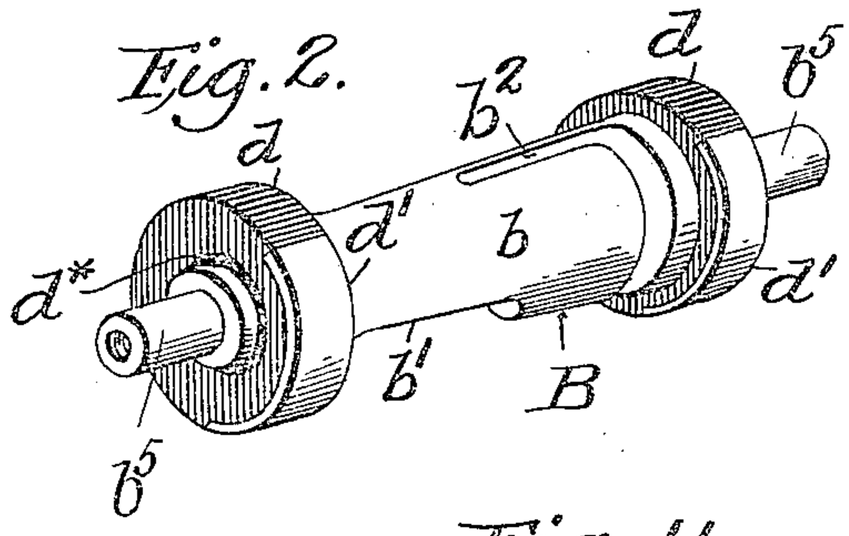


Fig. 2.



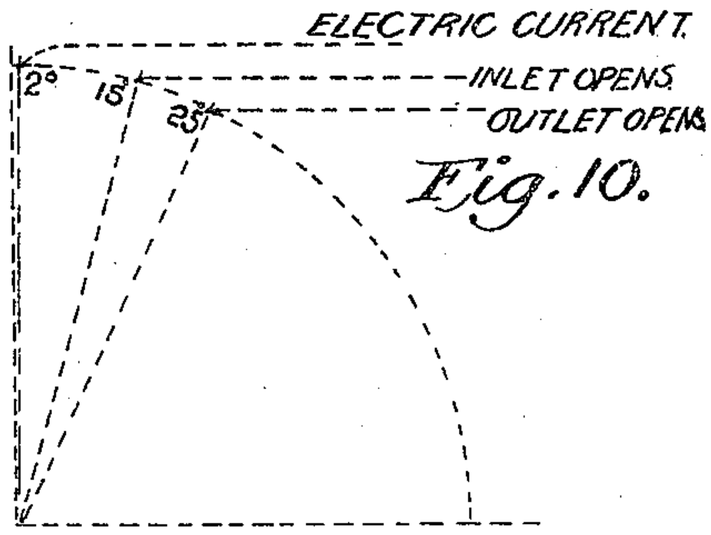
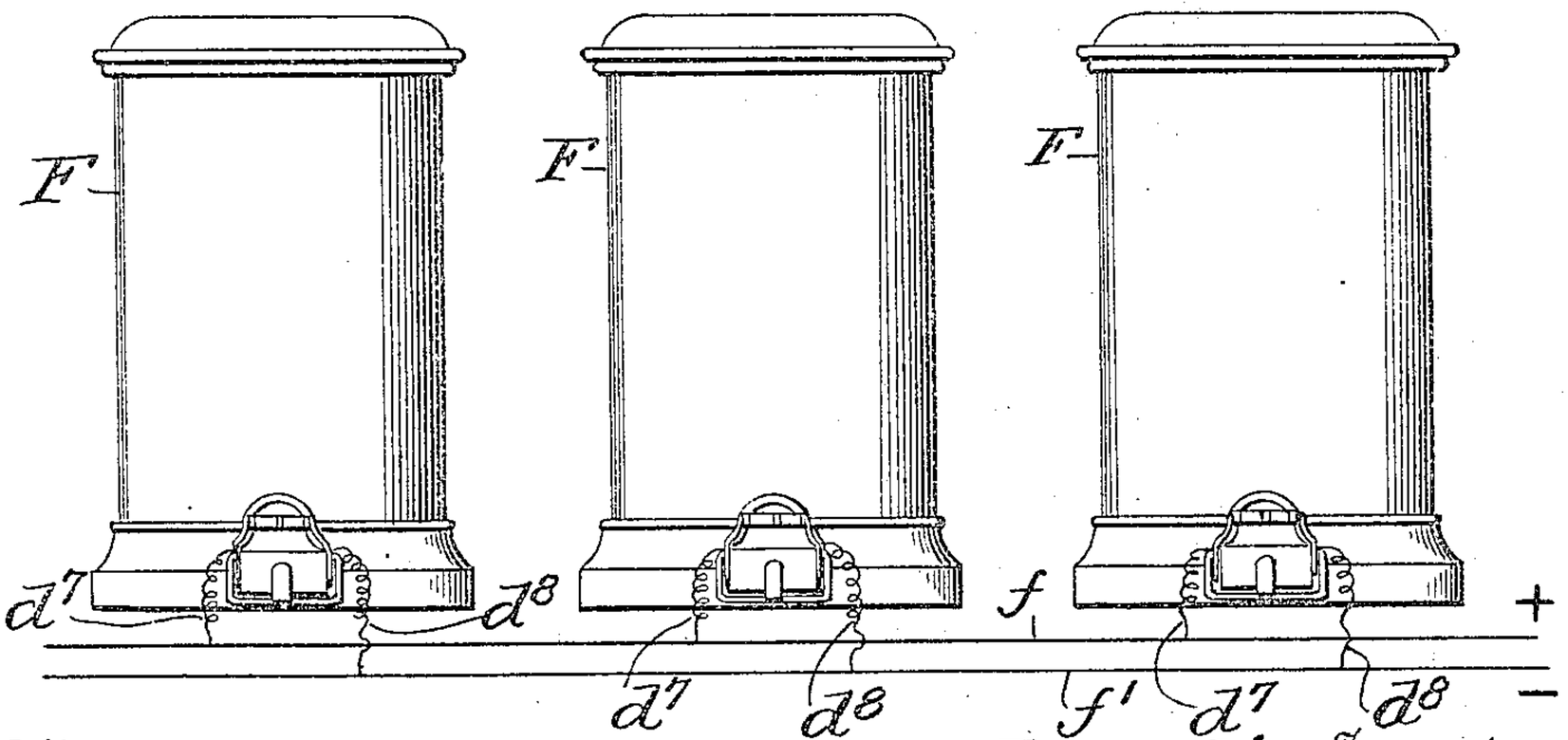


Fig. 10.

Fig. 11.



Witnesses
James F. Duhamel,
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Léon Dion, Inventor,

By his Attorney
Wm. F. Wheaton,

No. 808,351. PATENTED DEC. 26, 1905.

L. DION.

DEVICE FOR CONTROLLING THE FLOW OF FLUIDS AND OTHER MATERIALS.

APPLICATION FILED MAR. 25, 1905.

2 SHEETS—SHEET 2.

Fig. 9.

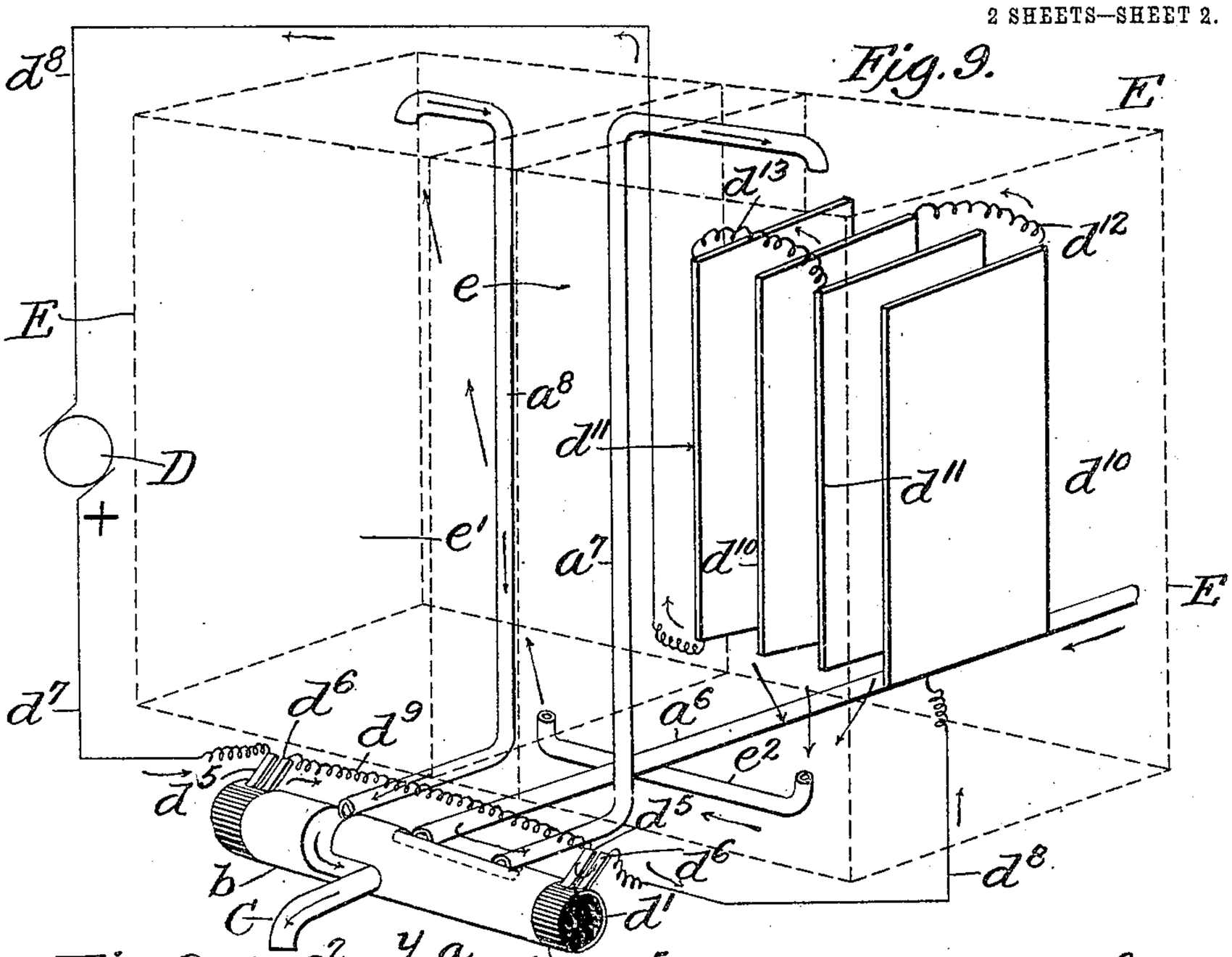


Fig. 3.

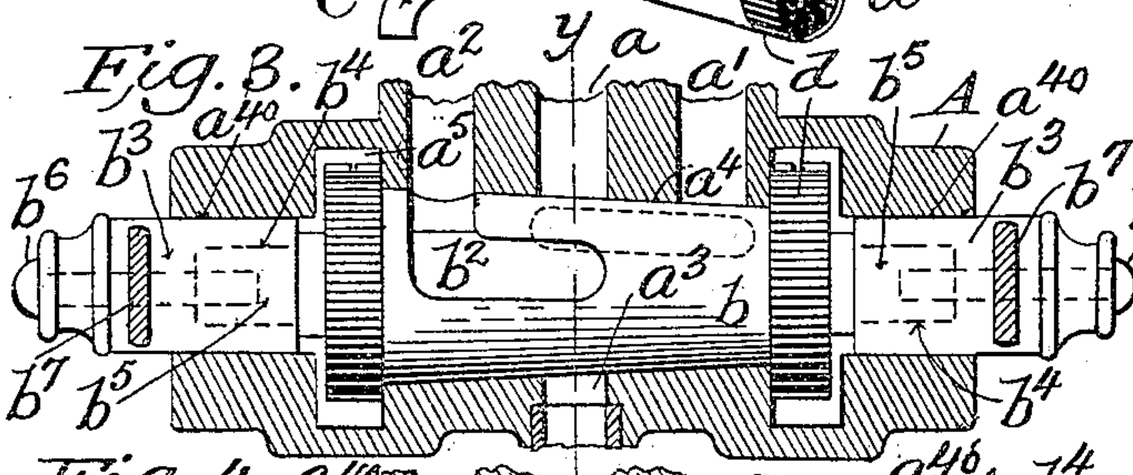


Fig. 6.

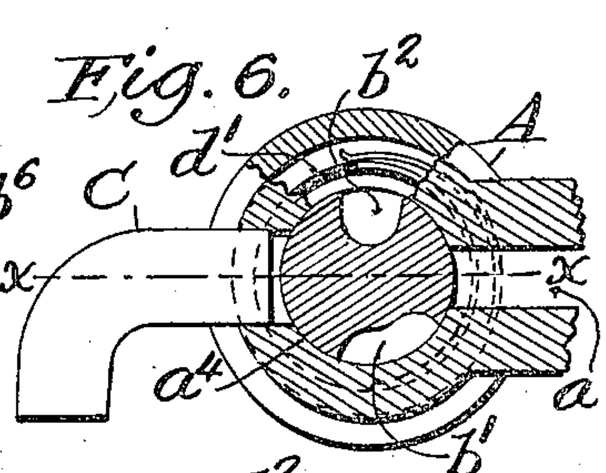


Fig. 4.

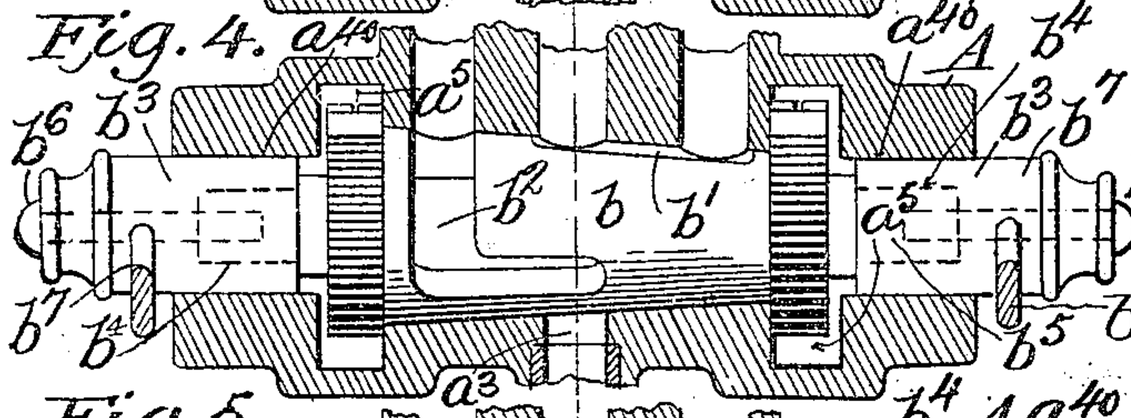


Fig. 7.

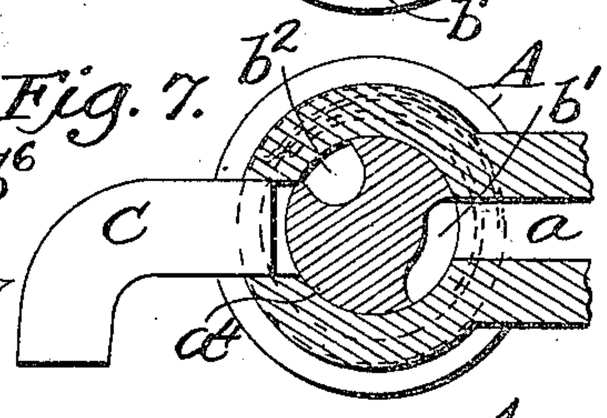


Fig. 5.

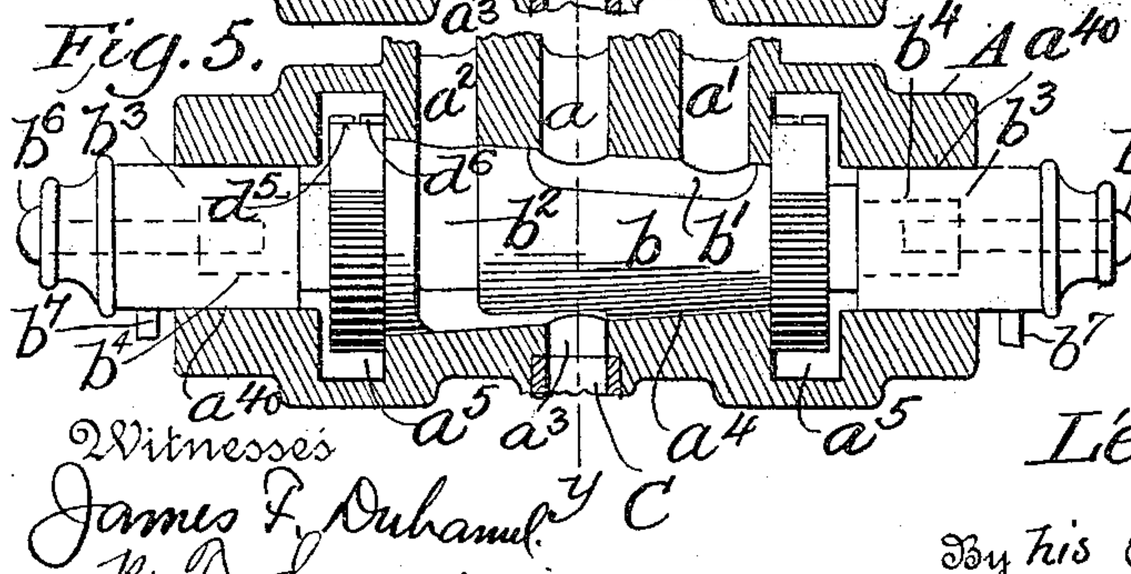
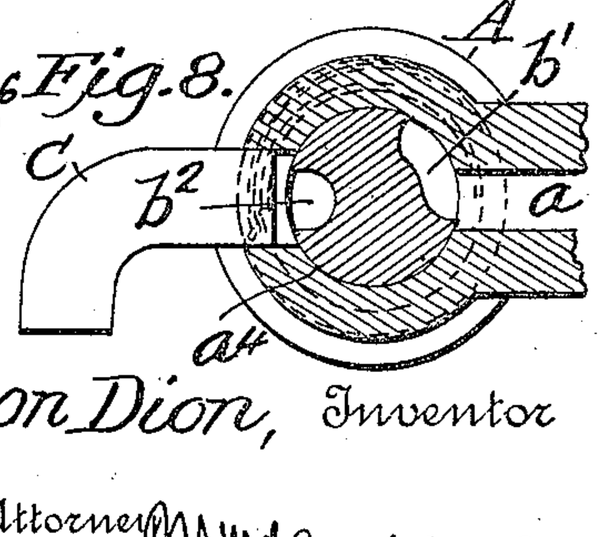


Fig. 8.



Witnesses
James F. Duhamel.
R. F. Sweeny.

Léon Dion, Inventor

By his Attorney W. W. H. Wheeler.

UNITED STATES PATENT OFFICE.

LÉON DION, OF WILKESBARRE, PENNSYLVANIA, ASSIGNOR TO THE AMERICUS ELECTRO-HERMETIC COMPANY, OF WILKESBARRE, PENNSYLVANIA, A CORPORATION OF ARIZONA TERRITORY.

DEVICE FOR CONTROLLING THE FLOW OF FLUIDS AND OTHER MATERIALS.

No. 803,351. Specification of Letters Patent. Patented Dec. 26, 1905.

Application filed March 25, 1905. Serial No. 252,070.

To all whom it may concern:

Be it known that I, LÉON DION, a citizen of the United States, and a resident of Wilkesbarre, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Devices for Controlling the Flow of Fluids and other Materials, of which the following is a specification.

My invention relates to those forms of device which are employed for controlling the flow of a fluid or other materials along pipes and other conductors and are commmonly known to the art as "valves" or "faucets," as they are respectively applied at different points along the pipe or other conductor or at the discharge end thereof, the object of the invention being to provide a device of this character which while simple in construction and efficient in operation shall at the same time permit of the control of the flow of water or other fluid and of a current of electricity along appropriate conductors in proper relationship to one another.

To these ends the invention consists, first, in the means for starting, stopping, and controlling the flow of water or other liquid along its conductor or conductors; second, in the means for starting, stopping, and controlling the flow of a current of electricity along its conductor or conductors in proper relationship to the starting, stopping, and controlling of the flow of water along its conductor or conductors, and, third, in various other constructions and combinations of parts, all as will hereinafter more fully appear.

In the specific form of the invention which I have selected for purposes of illustration I have shown the invention as embodied in a faucet that is applied in connection with a water-purifier for domestic and other purposes and as adapted to control not only the flow of water to the purifier and the discharge of the water therefrom, but also the flow of a current of electricity to a series of electrodes by which to properly energize or electrify the water when delivered within the tank; but while shown as applied in connection with apparatus of that character the invention is not restricted thereto, as it is obvious that the same may be employed in connection with other forms of valves and with pipes or conductors that are made use of with other appliances outside of water-purifiers.

In the drawings which form a part of this specification, Figure 1 is a front elevation of a faucet constructed in accordance with my invention; Fig. 2, an isometric projection of the plug or rotating member of the faucet detached; Figs. 3, 4, and 5, sectional views of certain of the parts of the faucet detached, taken in the plane $x\ x$ of Fig. 6, the plug or rotating member with portions of the brushes and the discharge-nozzle shown in elevation and broken away and the plug or rotating member shown in slightly-different positions in the different figures; Figs. 6, 7, and 8, transverse sections thereof, taken in the plane $y\ y$ of Figs. 3, 4, and 5 with the plug or rotating member in the positions it respectively occupies in these last-mentioned figures; Fig. 9, a diagrammatic view illustrating the faucet as connected with a purifier having a plurality of chambers and appropriate electrodes and showing also a connecting-circuit and source of electric supply with certain of the parts omitted and the faucet adapted to control not only the flow of the water to and from the chambers, but also the electric current thereto; Fig. 10, a diagrammatic view illustrative of the successive angular distances the plug or rotating member of the faucet has to be moved to enable the faucet to perform its various functions, and Fig. 11 a front elevation of a number of vessels or purifiers arranged side by side and showing the connection by means of which the respective faucets are connected in circuit with the leads from a source of electric supply.

In all the figures like letters of reference are employed to designate corresponding parts.

A indicates a valve-casing, and B a plug or movable member arranged in connection therewith. The casing A is or may be constructed in any appropriate form to adapt the valve to its intended use, and in the form of the invention shown in the drawings it is provided with ports a, a', a^2, and a^3, of which the ports a and a^2 are induction-ports and receive the fluid or other material flowing inward to the valve, while the ports a'

and a^3 are eduction-ports and serve to discharge the fluid or other material therefrom. As thus equipped the ports a, a', and a^2 are preferably located in rear of the axis of the plug or movable member B in a line parallel therewith, while the port a^3 is located on the opposite side of that axis or at any other suitable point and receives the inner end of a nout or nozzle C, through which the fluid or other material passing through the valve is discharged. The plug or movable member B, on the other hand, is preferably constructed with a tapering body portion b, which is rotatively fitted within a correspondingly-shaped recess or socket a^4, formed within the casing A transversely of its head, and is provided with elongated ports b' and b^2, of which the port b', in the form of a straight longitudinal groove in the surface of the plug or movable member, is made of a sufficient length to connect the ports a and a' in the casing A when brought into proper relationship to them, while the port b^2 is made in the form of an L-shaped groove with one of its arms extending partially around the plug or movable member and with the other arm extending longitudinally thereof for the proper distance to connect the ports a^2 and a^3 of the casing when brought into proper relationship to them. As thus constructed these ports b' and b^2 are located at a less angular distance apart around the axis of the plug or movable member B than is the port a^3 from the ports a, a', and a^2 to permit of the ports b' b^2 being brought into operative relationship to the ports a, a', and a^2 before the straight longitudinally-disposed portion of the port b^2 is brought into similar relationship to the port a^3, as shown in Figs. 4 and 7; but while thus disposed the port b' is made of a sufficient breadth to permit of the straight longitudinally-disposed portion of the port b^2 being brought into operative relationship to the port a^3 without the port b' being removed from operative relationship with respect to the ports a and a', as shown in Fig. 8. With the parts constructed as thus explained and the plug or movable member in the position shown in Figs. 3 and 6, the ports a, a', a^2, and a^3 in the casing A are all closed and the flow of any fluid or other material through the faucet is prevented. Upon rotating the plug or movable member a certain distance to the left in Fig. 6, however, the port b' therein will be brought opposite and in operative relationship to the ports a and a', and the free end of the circumferentially-extending portion of the port b^2 brought into operative relationship with the port a^2, as shown in Figs. 4 and 7, in which relationship the fluid or other material supplied to the port a will flow or pass along to the port a', where it will be discharged, and any fluid or other material supplied to the port a^2 will enter the port b^2, but without being discharged therefrom. The plug or member B being in the position thus explained, a further rotation of the plug or movable member in the same direction to a certain distance will bring the longitudinally-disposed portion of the port b^2 into operative relationship to the port a^3 without carrying the free end of its circumferentially-disposed portion out of operative connection with the port a^2 or the port b out of operative relationship with respect to the ports a and a', as shown in Figs. 5 and 8. In this position the valve or faucet is fully opened and the fluid or other material flowing inward through the port a will pass along the port b' and be discharged through the port a', while the fluid or other material passing inward through the port a^2 will flow along the port b^2 and be discharged through the port a^3 and through the snout or discharge-nozzle C secured therein. With the parts in this position the closing of the valve or faucet and the interruption of the flow of the fluid or other material may be effected by rotating the plug or movable member in an opposite direction, or to the right in Figs. 3 to 8, when the longitudinally-disposed portion of the port b^2 will first be carried out of operative relationship with respect to the port a^3, as shown in Figs. 4 and 7, after which the port b' in turn will be carried out of operative relationship with respect to the ports a and a', as shown in Figs. 3 and 6, when the valve or faucet will be closed and the flow of the fluid or other material through the same prevented.

For rotating the plug or movable member B in the socket a^4 any appropriate means may be adopted. I prefer, however, to employ for this purpose the hubs b^3, which are rotatively fitted in suitable orifices a^{40}, formed in the opposite ends of the head of the casing A, and are provided at their inner ends with sockets b^4, which receive the reduced extremities b^5 of the plug or movable member B, to which they are fixedly held by appropriate screws b^6, passing axially through the hubs and engaging at their free end with suitable threaded orifices formed in the latter. As thus arranged each of these hubs b^3 is provided with an arm b^7 extending therefrom and, bent inward and then outward, is connected at its outer free end with the upper free end of the other by a rod or handle b^8 and a threaded rod b^9, which latter extends through both arms and through the rod or handle and is provided at its opposite ends with appropriate nuts b^{10}, as shown. By this arrangement, as will be seen, the arms b^7, with the rod or handle b^8, form a bail by which the rotation of the plug or movable member B may be accomplished by swinging this bail downward or upward as the opening or the closing of the valve or faucet may be required.

With the parts for regulating the flow of the fluid or other material through the device there are also employed means by which the flow of a current of electricity may be controlled. In the form of the invention which I have selected for purposes of illustration these means consist of a disk or disks *d*, which is or are preferably constructed of some material that is a good conductor of electricity and is or are provided on its or their periphery or peripheries throughout a portion of its or their circumference or circumferences with a sheet or sheets of non-conducting material *d'*. In some instances but a single one of these disks will be employed. I prefer, however, to employ two and to locate them in appropriate chambers a^5 in the heads of the casing A at opposite ends of the tapering portion *b* of the plug or movable member B upon the extending end portions thereof, to which they are fixedly secured, whereby to insure of their positive movement therewith, suitable insulating material being interposed between them and the plug upon which they are supported when required, as shown at *d**. With each of the disks arranged as thus explained are provided a pair of brushes d^5 and d^6. These brushes are located side by side in a suitable chamber formed within the casing A, with the brush d^5 when a single disk *d* is employed adapted to be connected with one pole of a source of electric supply—as, for instance, with the + pole thereof—by a conductor d^7 and with the brush d^6, similarly adapted for connection with the — pole of such source of supply by a conductor d^8. When, however, a disk *d* is employed at each end of the tapering portion *b* of the plug or movable member B, I prefer to connect the brush d^5 of one disk with one pole of the source of electric supply—as, for instance, with the + pole—by a conductor d^7, the brush d^6 of the other disk *d* to the opposite or — pole thereof by a conductor d^8, and to connect the brush d^6 of one disk with the brush d^5 of the other by a conductor d^9, and this is the arrangement I prefer in practice, as thereby greater certainty of action is insured than when but a single disk is adopted. As thus connected under either of the arrangements specified whenever the conducting surface or surfaces of the disk or disks *d* is or are brought beneath and in contact with the brushes d^5 and d^6 by a rotation of the plug or movable member B in the required direction any electric current traveling along the conductor d^7 will be free to pass through the brushes and the disk or disks *d* and thence to the point of application and source of supply along the conductor d^8. The flow of the current having been thus initiated will be continued as long as the current is supplied and the conducting surface or surfaces of the disk or disks are beneath and in contact with the brushes, but will be interrupted immediately the currrent ceases to be supplied or the non-conducting surface or surfaces *d'* of the disk or disks is or are carried beneath them by a rotation of the plug or movable member D in the required direction. The control of the electric current being thus accomplished by the rotation of the plug or movable member B, its flow and interruption with respect to the flow and interrupton of the water or other fluid or material through the valve or faucet will be determined by the relationship in which the rear end or ends of the non-conducting surface or surfaces *d'* on the disk or disks *d* is or are placed with respect to the ports in the plug or movable member B. In the drawings I have shown the rear end or ends of the non-conducting surface or surfaces so disposed with respect to the ports *b'* and b^2 in the plug or movable member B that when the valve or faucet is closed, as in Fig. 6, and no passage-way is open through it this rear end or these rear ends extends or extend to a slight distance beneath the brushes d^5 and d^6, and in this position the flow of the electric current is interrupted. Upon rotating the plug or movable member slightly to the left in that figure to the distance indicated by the angle marked "2°" in Fig. 10 the rear end or ends of the non-conducting surface or surfaces will be carried from under the brushes d^5 and d^6 and the conducting surface or surfaces carried beneath and in contact with them, when the electric circuit will be established and the electric current allowed to flow. The conducting surface or surfaces of the disk or disks having been thus brought beneath the brushes is or are constructed of sufficient length to permit of its or their remaining beneath and in contact with them during the further successive rotation of the plug or movable member B to the distance indicated by the respective angles marked "15°" and "25°" in such Fig. 10, in the former of which positions the port *b'* in the plug or movable member B will be brought opposite the inner ends of the ports *a* and *a'*, which will then be connected, as shown in Figs. 4 and 7, while in the latter the longitudinally-disposed portion of the port b^2 will be brought in operative relationship to the port a^3, as shown in Figs. 5 and 8, and the valve or faucet will then be open to the flow of the water or other fluid or material that it is desired to have pass through it. The valve or faucet being thus opened may be closed by returning the plug or movable member to its original position by rotating it to the right in Fig. 6, the result of which will be to first remove the longitudinally-disposed portion of the port b^2 from operative relationship with the port a^3, as shown in Figs. 4 and 7, next to carry the port *b'* out of operative relationship to the ports *a* and *a'*, and next to carry the rear end or ends of the non-conduct-

ing surface or surfaces beneath the brushes d^5 and d^6, when the ports in the movable member B will be carried out of coincidence with the ports in the casing, the electric circuit broken, and the flow of the water or other fluid or material and the flow of the electric current thereby successively interrupted.

As thus constructed a valve or faucet is provided which is adapted for general application in connection with all forms of apparatus or receptacle in which the flow of water or other fluid or material to and from them is required at the same time that the flow of a current of electricity is also controlled, and in Fig. 9 I have shown the device applied in connection with a water-purifier to control both the flow of water to and from the water-receptacle and the flow of a current of electricity to a series of electrodes employed in connection with such purifier. In this figure, E indicates in dotted lines a tank for the reception and storage of the water, the same being preferably constructed with two chambers or compartments which are respectively designated by the letters e and e' and which are connected near their bottom by a pipe or passage-way e^2, extending between them, through which the water is free to flow from one to the other. Within the chamber or compartment e, as thus connected with the chamber or compartment e', is arranged a group of electrodes which is composed of a series of positive or + members d^{10} and a corresponding negative or − series d^{11}. These electrodes are preferably, though not necessarily, constructed in the form of rectangular or other appropriately-shaped plates and are arranged side by side with the positive or + members between and alternating with the negative or − members, in which relationship the positive or + members are all connected by suitable conductors d^{12} and the negative or − members all similarly connected by appropriate conductors d^{13}. With the members composing each of the series of electrodes thus separately connected the positive and the negative series in their entireties are connected with the respective brushes d^5 and d^6 and to the positive and negative poles of the source of electric supply D by the conductors d^7 and d^8, before referred to, whereby to be brought into electrical connection with them and be energized when a current is passing through such brushes. While the positive and negative series of electrodes are thus electrically connected with the source of electric supply and with the respective brushes d^5 and d^6, the port a in the casing A is connected with the source of water-supply—as, for instance, with a water-main (not shown)—by a pipe a^6, which leads thereto and which in the arrangement shown in the drawings passes through the lower portion of the tank E from one to the other. The ports a' and a^2 in such casing, on the other hand, are respectively connected with the chambers or compartments e and e' by pipes a^7 and a^8, of which the pipe a^7 leads inward from the port a' through the walls of the tank, thence upward to near the top of the chamber or compartment e, thence inward over the electrodes, and has its free end bent downward whereby to discharge the water supplied through the pipe a^6 downward upon and between the electrodes, when the plug or movable member B is so rotated as to bring the port b' into proper relationship to the inner ends of the ports a and a' to connect them, as shown, for instance, in Figs. 4, 7, and 9, while the pipe a^8 leads from the port a^2 in the casing A inward through the walls of the tank E to the interior of the chamber or compartment e', with its inner free end terminating near its top or other convenient point, and serves to discharge the water contained in such chamber or compartment, when the plug or movable member B is so adjusted as to bring the circumferentially and longitudinally disposed portions of the port b^2 therein into respective coincidence with the inner ends of the ports a^2 and a^3, as shown, for instance, in Figs. 5, 8, and 9.

With the valve or faucet connected with the chambers or compartments e and e' and with the respective sources of water and electric supply, as above explained, and the valve or faucet closed and its ports in the positions shown in Figs. 1, 3, and 6 the flow of the water therethrough and the flow of the electric current are both interrupted and suspended and no water and no electric current is being discharged or consumed. When, however, it is desired to withdraw any portion of the contents of the tank E, the plug or movable member B of the valve or faucet will be rotated to the left in Figs. 6 to 8 to the proper extent to effect the purpose by swinging downward its operating bail or handle, the result of which will be that the electric circuit will first be established and the electric current allowed to flow to and across between the electrodes to properly electrify the water admitted to the tank, the flow of the water from its source of supply to the tank next allowed, and, finally, the discharge of the water from the tank permitted, as the rear end or ends of the non-conducting surface or surfaces d' of the disk or disks d are successively carried from beneath the brushes d^5 and d^6, the port b' is brought opposite the inner ends of the ports a and a', and the longitudinally-disposed portion of the port b^2 brought opposite the inner end of the port a^3. The desired portion of the contents of the tank having been withdrawn, its further discharge and flow with the flow of the electric current will be interrupted by returning the plug or movable member B to its original position by rotating it in an opposite direction through its bail or

handle, when the longitudinally-disposed portion of the port b^2 will be carried out of coincidence with the inner end of port a^3, the port b' out of registry with the inner ends of the ports a and a', and the rear end or ends of the non-conducting surface or surfaces beneath the brushes d^5 and d^6.

While in Fig. 9 I have shown a source of electric supply as exclusively employed in connection with a single receptacle or purifier, it is to be understood that this is merely illustrative and that instead of an individual source of electric supply being employed in connection with each receptacle or purifier a single source of supply may be employed in connection with a plurality of them, and in Fig. 11 I have illustrated such an arrangement. In this figure, F indicates the receptacles or purifiers, of which there are three shown, and f and f', respectively, indicate the negative and positive leads extending from and returning to the common source of electric supply, (omitted from the drawings, but which may be a dynamo or other appropriate generator.) To the leads thus provided the brushes d^5 and d^6 of each of the receptacles or purifiers are connected, the connection between the brush d^5 of each and the negative lead f being the conductor d^7, extending between them, while the connection between the brush d^6 of each and the positive lead f' is the conductor d^8, which in turn likewise extends between them, as is shown.

From the foregoing it will thus be seen that I produce a device for controlling the flow of fluids and other materials, which while simple in construction and operation may be employed not only to control the flow of such fluids or other materials to and from receptacles of various kinds, but also to control the flow of a current or currents of electricity at the same time as well.

While in the drawings I have shown and in the above have described the best means contemplated by me for carrying my invention into practice, I wish it distinctly understood that I do not limit myself strictly thereto, as it is obvious that modifications may be made in its various parts and still be within the spirit of the invention.

Having now described my invention and specified certain of the ways in which it may be carried into practice and applied, I claim and desire to secure by Letters Patent of the United States—

1. A device for controlling the flow of fluids and electric currents, consisting of a casing which is provided with a plurality of pairs of coöperating induction and eduction ports, a movable member arranged in connection with the casing and provided with ports that are adapted to be brought one after another into, and, in a reverse order, carried one after another out of operative relationship to the ports in the casing as the movable member is moved in the required direction, and an electric circuit maker and breaker arranged in connection with the casing and the movable member, whereby to permit of both the flow of the fluid or other material and of the electric current through the device and of the interruption of the flow as may be desired, substantially as described.

2. A device for controlling the flow of fluids and electric currents, consisting of a casing provided with a socket and a plurality of pairs of coöperating induction and eduction ports, a rotatable plug or member arranged in such socket and provided with ports for coöperating one after the other with their respective coöperating induction and eduction ports in the casing and with both electricity-conducting and electricity-non-conducting surfaces, and brushes for coöperating with such surfaces and adapted for connection with appropriate electric conductors, substantially as described.

3. A device for controlling the flow of fluids and electric currents consisting of a casing provided with a socket, chambers at the ends of such socket, and with ports a, a', a^2, and a^3, of which ports a, a' and a^2 are arranged on one side of the axis of the socket and the port a^3 near the opposite side thereof, a rotatable plug or member arranged within such socket and provided with ports b' and b^2 formed in its surface, and with a disk on each of its ends that is equipped with an electricity-non-conducting surface throughout a portion of its periphery, brushes for coöperating with these disks and adapted for connection with appropriate electric conductors, and an electric conductor extending across from the brushes of one disk to the brushes of the other, substantially as described.

4. In a device for controlling the flow of fluids and other materials, the combination, with a casing constructed with a plurality of pairs of coöperating induction and eduction ports, of a movable plug arranged in connection with such casing and provided with ports for coöperation with those in the casing, whereby when the plug is moved in one direction it will first open a portion and then the whole of the induction and eduction ports in the casing, and when moved in the opposite direction will first close a portion and then the whole of such ports in a reverse order, substantially as described.

5. In a device for controlling the flow of fluids and other materials, the combination, with a casing provided with a socket and with ports a, a', a^2 and a^3, of which the ports a, a' and a^2 are located on one side of the axis of the socket and the port a^3 is located out of line with the first-mentioned ports around such axis, of a rotatable plug arranged in such socket and provided in its surface with

both a straight longitudinal-disposed port b' and an L-shaped port b^2, substantially as described.

6. A mechanism for controlling the flow of water or other fluids to and from, and the flow of an electric current to, a vessel or other receptacle, constructed with coöperating ports or passage-ways and a circuit maker and breaker, whereby when the mechanism is actuated in one direction a current of electricity is first caused to flow to such vessel or receptacle to electrify the contents thereof, the flow of the water or other fluid to such vessel or receptacle is next permitted, and the discharge of the water or other fluid from such vessel or receptacle is next allowed, and when the mechanism is actuated in the opposite direction these three several operations are successively suspended in a reverse order, substantially as described.

In witness whereof I have hereunto set my hand this 18th day of March, 1905.

LÉON DION.

Witnesses:

WM. H. APPLETON.

R. F. SWEENY.