

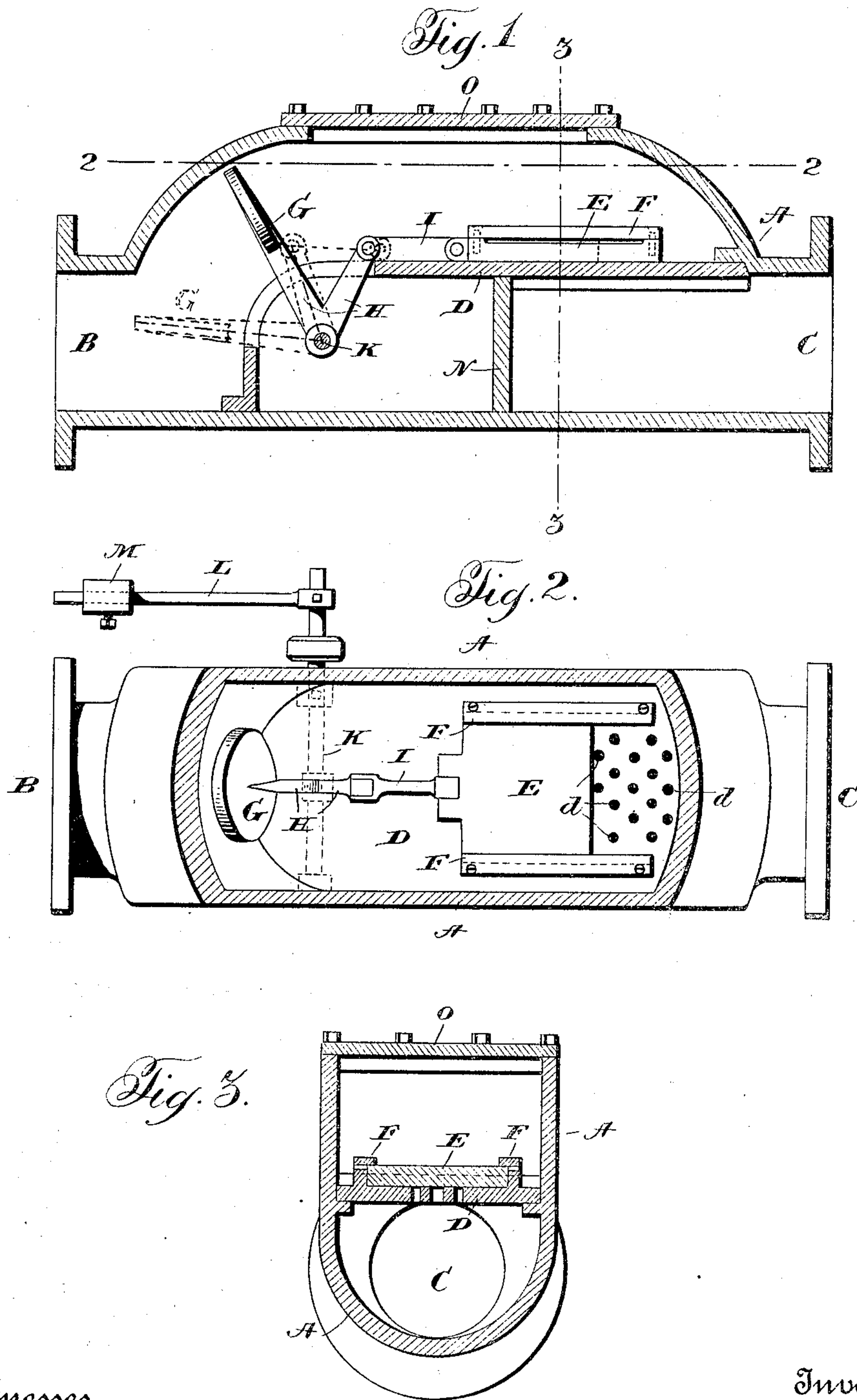
No. 793,536.

PATENTED JUNE 27, 1905.

W. T. McCORMICK.

AUTOMATIC CONTROLLER FOR FILTERS, &c.

APPLICATION FILED APR. 18, 1905.



Witnesses

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AUTOMATIC CONTROLLER FOR FILTERS, &c.

SPECIFICATION forming part of Letters Patent No. 793,536, dated June 27, 1905.

Application filed April 18, 1905. Serial No. 256,251.

To all whom it may concern:

Be it known that I, WILLIAM THOMAS McCORMICK, of Charlotte, in the county of Mecklenburg, and in the State of North Carolina, have invented a certain new and useful Improvement in Automatic Controllers for Filters, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a controller embodying my invention. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1, and Fig. 3 is a cross-section on the line 3 3 of Fig. 1.

The object of my invention is to automatically regulate the area of an opening for the discharge or outlet of water or other liquid, so that the quantity of liquid discharged will be constant without regard to variations in the head at the source of supply of the liquid. Thus in the use of filters the effluent therefrom varies according to the condition of the filter-bed, the water flowing from the filter under greater pressure when the filter-bed is thoroughly cleaned and, of course, diminishing in pressure as the filter-bed becomes clogged or dirty, and yet it is desirable to have a uniform or unvarying flow of water regardless of the condition of the filter.

A device for the purpose stated to be satisfactory must be simple, positive in its action, and adjustable to work under varying heads or pressure in the filter or other source of supply which is to be controlled, and my special aim has been to provide a device having these characteristics; and to this end my invention consists in the automatic controller having the construction substantially as hereinafter specified and claimed.

The mechanism which I have selected for illustrating an embodiment of my invention was designed for controlling the effluent from a filter, and it has a casing A, having at one end a water-inlet B and at the opposite end a water-outlet C, it being constructed at these ends so that it may be connected with the effluent-piping of the filter. Extending longitudinally of the casing A and dividing it into longitudinal chambers is a partition D,

one end of which reaches to the water-outlet C, while the other does not extend to the water-inlet B, but near such end curves on the arc of a circle, so that between it and the top of the casing there extends a curvilinear passage from the water-inlet B into the chamber in the upper part of the casing A. The portion of the partition D nearest the water-outlet C is provided with numerous holes or ports *d* for the passage of water flowing into and through the chamber above said partition to and through the outlet C, and slidably mounted above the partition D, so that it may close or open a greater or less number of ports *d*, is a slide-valve E, which is held to its seat and guided by guides F at opposite sides thereof. By means of the valve E the number of holes or ports through which water may pass to the water-outlet of the controller, and consequently the quantity of water passing through such outlet, may be varied.

For automatically moving the slide-valve E according to the head or pressure in the filter or other source of supply of water or liquid I provide between the water-inlet B and the ports *d* a device that is operated according to the head or pressure of the water flowing into and through the water-inlet B and connect the same with the slide-valve, so that when the pressure is greatest the slide-valve will be moved to close a greater or less number of ports and when the pressure is diminished to open a greater or less number of ports, according to the pressure. Said device consists of a diaphragm, (shown in the form of a disk G,) which is carried by a lever H, and it is situated so that it is exposed to the pressure of the water as it flows from the outlet B into and through the curvilinear space extending therefrom to the chamber in the casing above the partition D on its way to the outlet C. The lever H is a bell-crank lever, and its other arm is connected by a lever or pitman I to the slide-valve E. The bell-crank lever H is keyed to a horizontal shaft K, located concentric with the center of the curved portion of the partition D, and the latter is suitably slotted for the passage through it of the arm of the lever into the water-passage of the controller. In the op-

eration of my device the diaphragm plays in the curvilinear path of the current of water from the inlet B, and enough space exists around said diaphragm to permit the passage
5 of a volume of water equal to the full capacity of the ports or holes d , so that it is always assured that enough water shall be delivered to the latter equal to the capacity of the holes or ports.

10 It is essential that a device to answer the purposes of my invention shall be adjustable, so that the maximum flow of water through the outlet C may be secured at a greater or less pressure of the water as it enters the
15 water-inlet B, and to render my device so adjustable I employ a weight or other device which may be adjusted so that more or less pressure will be required to control the movement of the diaphragm, and hence the move-
20 ment of the slide-valve. I illustrate in the drawings a weight provided for this purpose, which is connected to the diaphragm by extending the shaft I to the outside of the casing A through a suitable stuffing-box and
25 applying to the extended portion of the shaft an arm L, on which the weight M is slidably mounted, so that it may be shifted nearer to or farther from the shaft.

To prevent the passage of water through
30 the slot in the partition D directly to the outlet C, a partition N is employed that extends from the bottom of the casing A to the partition D. To give access to the interior of the casing A for the purpose of assembling
35 the parts or giving access to them for repair or cleaning the interior of the casing, a hand-hole is provided in the top of the casing, which is closed by a cap or plate O.

With the weight M set so that the dia-
40 phragm G will be lifted when the pressure of the water entering the inlet B is a predetermined amount it will be seen that when such pressure is reached and when it is exceeded the diaphragm will be raised and the slide-
45 valve D moved to close a greater or less number of the ports, according to the extent of movement of the diaphragm G, which will of course depend upon the pressure of the water thereon, and when the diaphragm has been
50 so moved and there ensues a diminution of the pressure the diaphragm, aided by the weight, will descend and retract the slide-valve from the ports or openings, and thus uncover the same, and by increasing the num-
55 ber of ports or holes through which the water may pass an added volume of water may pass to the outlet C to compensate for the flow under the diminished pressure. Thus by varying the number of openings or ports ac-
60 cording to the variation of the pressure so that when the pressure is highest a small volume of water can pass to the water-outlet and when the pressure lowers a greater vol-

ume of water can pass to the water-outlet a uniform discharge or efflux of water may be
65 maintained.

I of course do not limit myself to the precise form of parts illustrated in the drawings nor to any particular material for making them. The diaphragm G, for example, may
70 be of brass, rubber, aluminium, or other material.

Having thus described my invention, what I claim is—

1. In a means for automatically control-
75 ling the discharge of fluids, the combination of a suitable casing having inlet and outlet openings, a partition in the casing between said openings, perforated for the passage of
80 a fluid, a slide-valve on said partition movable over the perforated part thereof, and a part connected with said valve to move the same in the path of and operated by the cur-
85 rent from the inlet-opening to the outlet-opening.

2. In a means for automatically control-
ling the discharge of fluids, the combination of a suitable casing having inlet and outlet
90 openings, a partition in the casing between said openings, perforated for the passage of a fluid, a slide-valve on said partition, movable over the perforated part thereof, and a
95 swinging diaphragm connected with said valve and in the path of the current from the inlet-opening to the outlet-opening.

3. In a means for automatically control-
ling the discharge of fluids, the combination of a casing having inlet and outlet openings,
100 a partition extending longitudinally through the same from the outlet-opening and near to the inlet-opening, a diaphragm movable in the space between the portion of said partition
105 near the inlet-opening and the casing, a slide-valve movable over a perforated portion of said partition, and a lever to which the dia-
110 phragm and the slide-valve are connected.

4. In a means for automatically control-
ling the discharge of fluids, the combination of a casing having inlet and outlet openings,
110 a partition extending longitudinally through the same from the outlet-opening and near to the inlet-opening, a diaphragm movable in the space between the portion of said partition
115 near the inlet-opening and the casing, a slide-valve movable over a perforated portion of said partition, a lever to which the diaphragm and the slide-valve are connected, a shaft to
120 which said lever is attached, an arm on the shaft, and a weight adjustable on said arm.

In testimony that I claim the foregoing I
have hereunto set my hand.

WILLIAM THOMAS McCORMICK.

Witnesses:

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JAMES F. HILL.