

No. 832,780.

PATENTED OCT. 9, 1906.

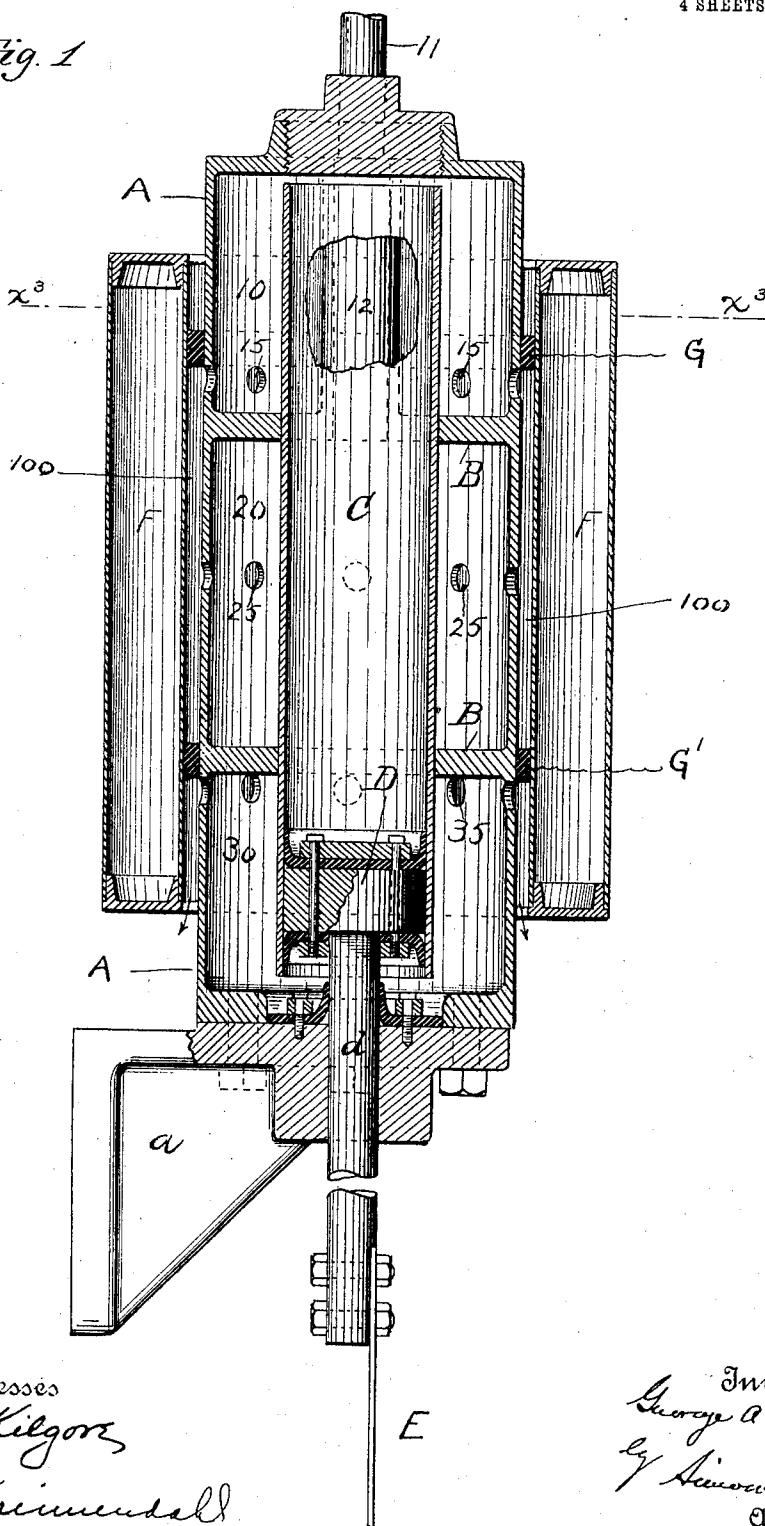
G. A. CUTTER.

FLUID PRESSURE ACTUATED MECHANISM FOR CONTROLLING GATES,
VALVES, &c.

APPLICATION FILED FEB. 14, 1903.

4 SHEETS—SHEET 1.

Fig. 1



Witnesses

B. F. Kilgore

A. H. Himmendall

Inventor

George A. Cutter

By Himmendall and Hatt
Attorneys

No. 832,780.

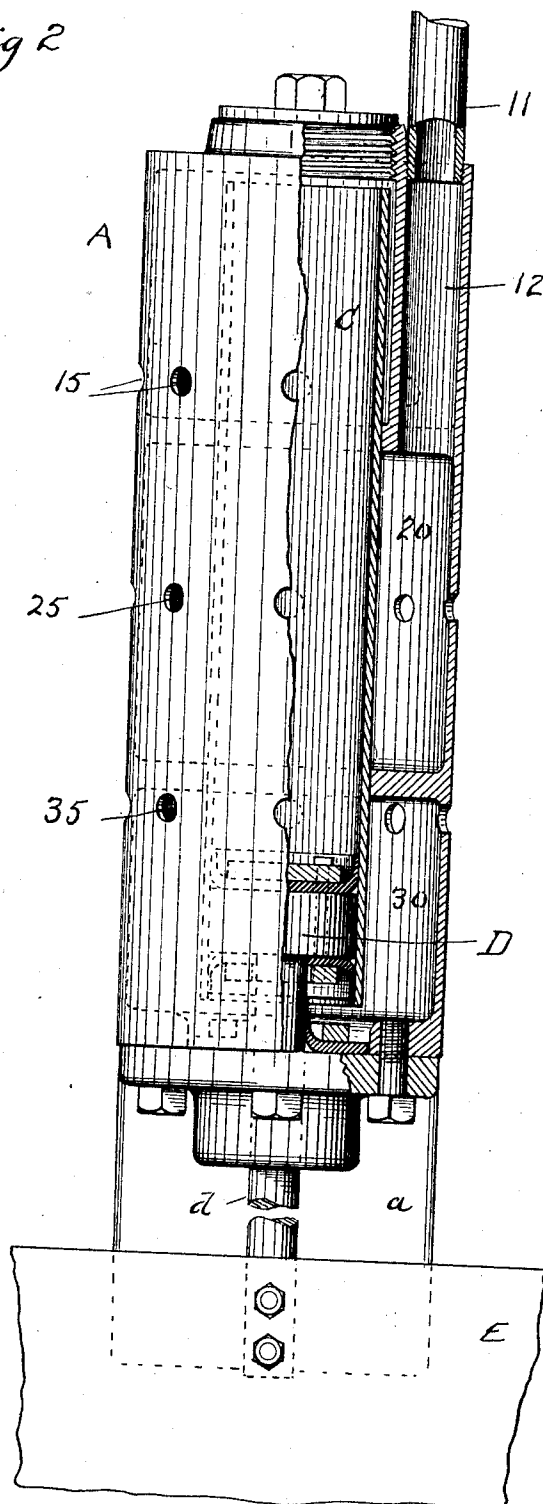
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4 SHEETS—SHEET 2.

Fig 2



Witnesses
W. F. Kilgore

H. Bremerdahl

Inventor
George A. Cutter

J. H. H. H. H.
Attorneys

No. 832,780.

G. A. CUTTER.

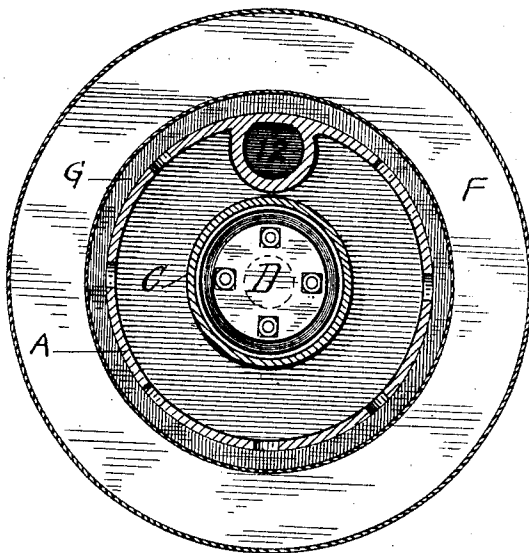
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4 SHEETS—SHEET 3.

Fig. 3



Witnesses
C. F. Kilgore

A. H. Remondahl

Inventor
G. A. Cutter

J. H. H. H. H.
Attorneys

No. 832,780.

G. A. CUTTER.

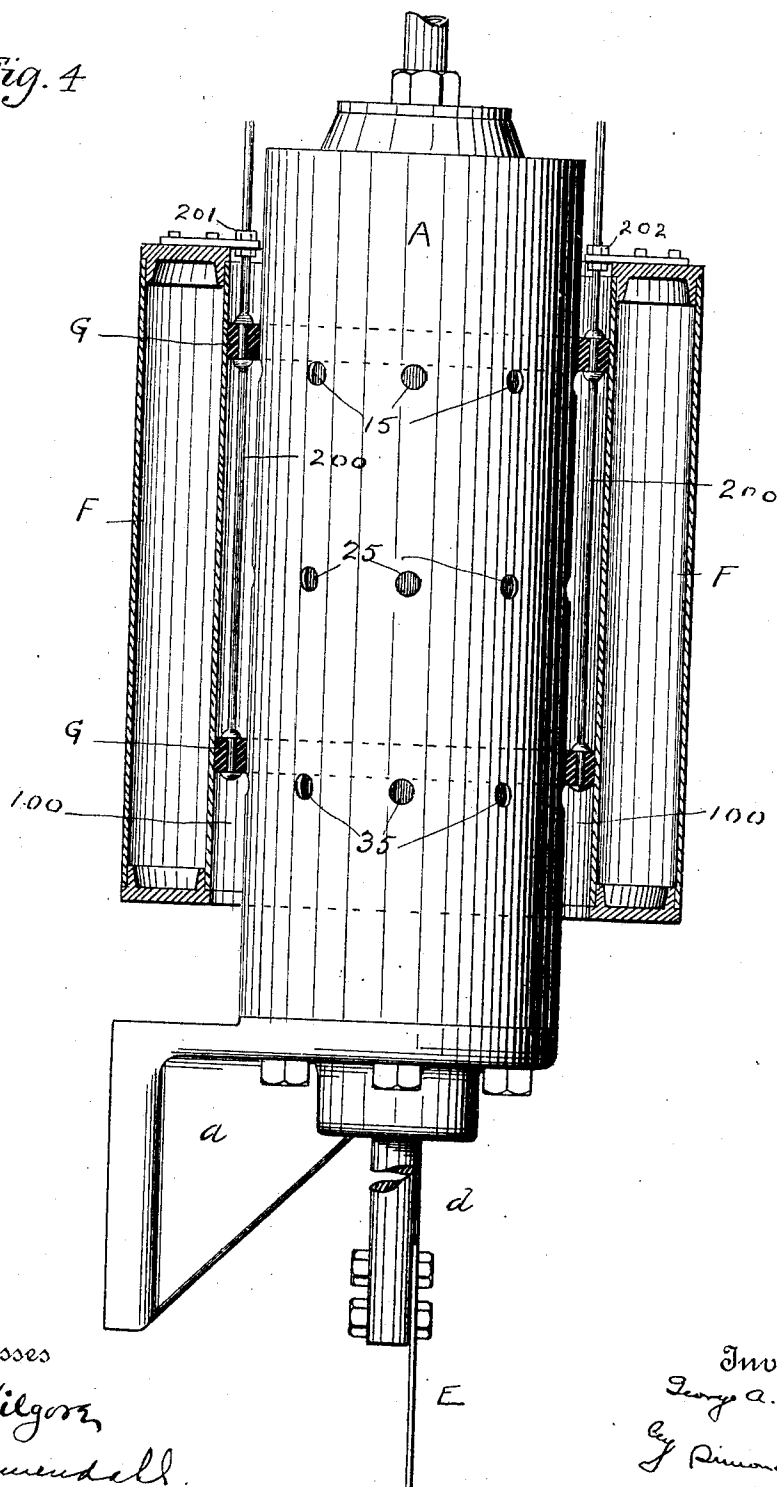
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4 SHEETS—SHEET 4.

Fig. 4



Witnesses

W. F. Kilgore
J. H. Wendell

Inventor

George A. Cutter
By J. P. Howard
Attorney

UNITED STATES PATENT OFFICE.

GEORGE A. CUTTER, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR TO IMPROVED PAPER MACHINERY COMPANY, OF CASTINE, MAINE, AND NASHUA, NEW HAMPSHIRE, A CORPORATION OF MAINE.

FLUID-PRESSURE-ACTUATED MECHANISM FOR CONTROLLING GATES, VALVES, &c.

No. 832,780.

Specification of Letters Patent.

Patented Oct. 9, 1906.

Application filed February 14, 1903. Serial No. 143,339.

To all whom it may concern:

Be it known that I, GEORGE A. CUTTER, a citizen of the United States of America, residing at Nashua, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Fluid-Pressure-Actuated Mechanism for Controlling Gates, Valves, &c., of which the following is a specification.

As indicated by the title, the object of this invention is to provide means for controlling—that is to say, opening and closing—valves or gates, which means are actuated by fluid-pressure.

My invention was conceived in connection with the manufacture of pulp-treating machinery, where such a device is of great utility in order to keep the water in the tank at practically a constant level.

The device consists of a valve attached to the piston-rod of a piston moving in a cylinder. The admission to the cylinder of the fluid which actuates the piston is controlled by a float.

I will now proceed to describe my invention in detail as constructed for use in pulp-treating machinery, reference being had to the accompanying drawings, wherein—

Figure 1 is a central vertical section of the preferred form of my device. Fig. 2 is a side elevation looking from the right of Fig. 1 with some parts broken away and others in section to illustrate the construction, the float being removed. Fig. 3 is a sectional plan view of the device on the line $x^3 x^3$ of Fig. 1. Fig. 4 is a view of a modification.

In pulp-treating machines, as is well known to those skilled in the art, a suitable tank is provided to hold the pulp, which is held in suspension in water. In this tank a roll revolves and picks up the pulp upon its periphery in the form of a sheet. A considerable amount of water is taken up with the pulp, and consequently the supply of liquid in the tank must be replenished in order to maintain the efficiency of the machine, and it is preferable that the amount of liquid in the tank should be continually the same, so that at all times the roll is submerged to the same extent.

In order to maintain a uniform supply of liquid in the tank, a well is formed, generally by partitioning off a small portion of the

tank, and this well is in communication with the tank through a suitable port or opening, which port is provided with a suitable valve. This well is fed from a suitable source of supply.

As applied to pulp-treating machinery my device is designed to control the movement of this valve. It is located in the tank proper and submerged in the liquid in such manner that when the supply is normal the float will operate to close the valve. As the supply in the tank decreases the float drops and the valve opens, admitting the liquid into the tank until such time as the normal supply is reached, when the float rising closes the valve.

To more particularly describe my invention in its preferred form, A in Figs. 1, 2, and 3 denotes a cylindrical shell, which is supported in an upright position in any suitable manner, as by the bracket *a*. This shell is divided into three compartments 10 20 30 by webs B. Through the walls of the shell in each compartment are openings 15 25 35. The central chamber 20 is in communication with a source of water-supply, which is provided for actuating the piston. As shown in the drawings, the water is brought from its source by the pipe 11, which discharges into the chamber 12, isolated from the chamber 10 and opening into the chamber 20. The cylinder C is supported by the webs B, as is clearly shown in Fig. 1, and is open at the top and bottom, thus being in communication with the chambers 10 and 30. In this cylinder is a piston D of any desired construction, and attached to the piston-rod *d* is the gate or valve E. The float F surrounds the cylindrical shell A. Between the float and the shell are the packing-rings or gaskets G G', which make a water-tight connection with the surface of the shell, but permit the float to move up and down on the shell.

The operation of this preferred form of the device is as follows: Water coming through the pipe 11 and the chamber 12 passes into the cylindrical chamber 20 and out through the openings 25 into the space 100. The gaskets G G' are located at distances from one another equal to the distance between the openings 15 35 and act substantially as valves for said opening. The float being in the position shown in Fig. 1 indicates that the wa-

ter from the supply-well has filled the tank to its normal level. Communication is established between the space 100 and the chamber 10 through the openings 15 closing the valve. It will be seen that the water coming in through the pipe 11, chamber 20, out of the openings 25, into the space 100, will pass through the openings 15 over the upper end of the cylinder C, forcing the piston down to the position shown in Fig. 1, and thus closing the valve and cutting off the supply to the tank. If the liquid in the tank falls below the normal, the float will drop, cutting off communication between the chamber 10 and the space 100 and opening communication between the space 100 and the chamber 30. Then the water passes from the pipe 11 into the chamber 20 and out at the opening 25, moving through the openings 35 into the chamber 30 and into the lower end of the cylinder C, acting upon the piston and raising the valve to admit water to bring the supply in the tank back to normal. As soon as the supply becomes normal the float moves to the position shown in Fig. 1 and the valve is closed. The packing-rings or gaskets G G' may be connected by the rods 200, these rods at their upper ends passing through plates on the top of the float and being threaded to receive the nuts 201 202. By this arrangement it will be seen that the packing-rings may be adjusted with reference to the float itself. This adjustment of the rings permits of maintaining the same level for liquids of different specific gravities and insures uniformity in the operation of the machine.

I have illustrated and described only the simpler embodiments of this invention. I am aware that it is applicable for use in connection with many of the arts and with the constructions shown and described and is susceptible of a great variety of changes and modifications in order to adapt the principle to different conditions, and I wish it to be understood that the following claims are intended to cover any and all such modifications coming within the spirit of my invention.

I claim as my invention—

1. In a device of the class specified a cylinder, a gate or valve connected to a piston which is adapted to move therein under the influence of a fluid-pressure, said piston, a shell having connections with the ends of said cylinder, a float surrounding said shell and provided with valves coacting with ports in the walls thereof to determine the direction of flow of the actuating fluid and connections between said shell and a source of fluid-supply.

2. In a device of the class specified, a cylinder, a gate or valve connected to a piston which is adapted to move therein under the influence of a fluid-pressure, said piston, a shell supporting said cylinder, connections from said shell to said cylinder, a float surrounding said shell and provided with valves

coacting with ports in said shell to determine the direction of flow of the actuating fluid and connections between said shell and a source of fluid-supply.

3. In a device of the class specified an open-ended cylinder, a gate or valve connected with a piston which is adapted to move therein, a shell surrounding and supporting said cylinder, said shell having a plurality of compartments one of which is connected with a fluid-supply, and means for controlling the flow of fluids to the other compartments and to said cylinder, substantially as described.

4. In a device of the class specified a cylinder, a gate or valve connected to a piston which is adapted to move therein under the influence of a fluid-pressure, a shell surrounding and supporting said cylinder, said shell being divided into compartments, openings through the walls of the shell into the several compartments, and means for opening and closing said openings.

5. In a device of the class specified a cylinder, a gate or valve connected with a piston which is adapted to work therein, a shell supporting said cylinder and divided into three or more chambers, openings through the walls of said shell into the several chambers, a float surrounding said shell, gaskets forming a water-tight seal between the shell and the float and adapted to act as valves for the openings into two of the chambers in the shell, and connections from a source of supply to the central chamber in the shell.

6. An open-ended cylinder, mechanism connected with a piston which works therein, a shell supporting said cylinder, said shell being divided into a plurality of chambers, the ends of said cylinder opening into the upper and lower chamber, apertures through the walls of said shell opening into each of the chambers, a float surrounding said shell, gaskets secured to the float and forming a water-tight connection with the shell and acting as valves for the openings into the upper and lower chamber in the shell, and connection from a suitable source of supply to the central chamber, substantially as described.

7. The shell divided by horizontally-disposed webs into three sections, a cylinder supported by said webs and having its ends open and in communication with the upper and lower chambers, openings through the walls of the shell into each chamber, a float surrounding the shell and adapted for movement lengthwise thereof, gaskets carried by the float and forming water-tight connections with the shell, said gaskets being spaced to close the openings into the upper and lower chambers at the same time, connection between the central chamber and a suitable source of supply, a piston adapted for movement in said cylinder, and devices connected with and moved by said piston.

8. In a device of the class specified a cylinder, a gate or valve connected with a piston which is adapted for movement therein, a shell supporting said cylinder, valve-ports through the walls of said shell, a float surrounding said shell, valves for said ports, and means for adjusting the position of said valves.

9. In a device of the class specified a cylinder, a gate or valve connected with a piston which is adapted to move therein, a shell supporting said cylinder, valve-ports through

the walls of said shell, a float surrounding the shell, packing-rings between the float and the shell, said rings adapted to act as valves for said ports, and means for adjusting the position of said packing-rings.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE A. CUTTER.

Witnesses:

B. A. PEASE,

L. H. OTIS.