H. S. HARCOURT.

AUTOMATIC GATE FOR PULP BOXES.

APPLICATION FILED MAY 16, 1914.

1,123,124. Patented Dec. 29, 1914.

Fig. 1.

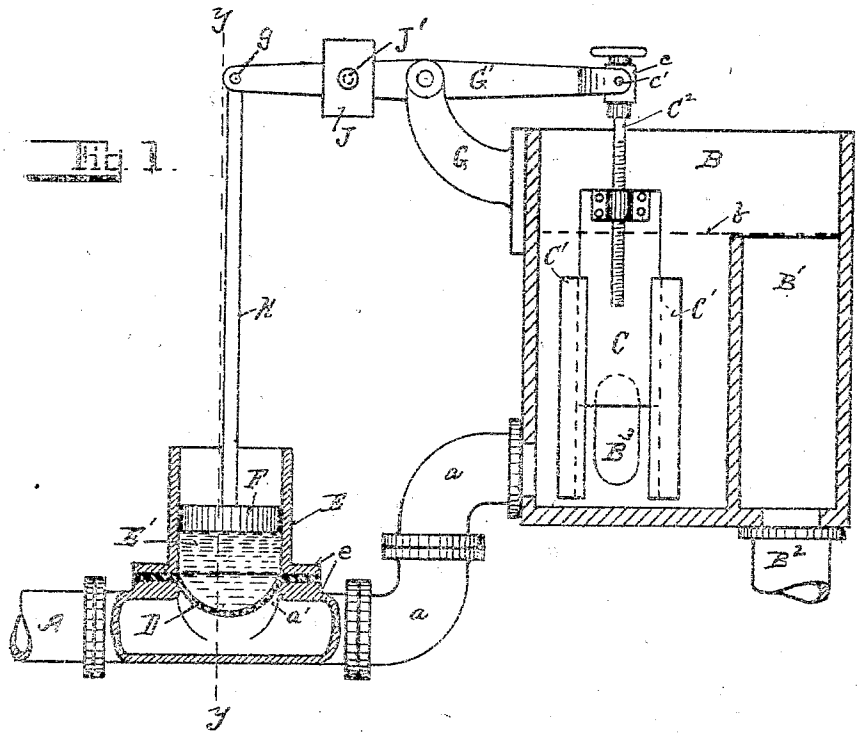
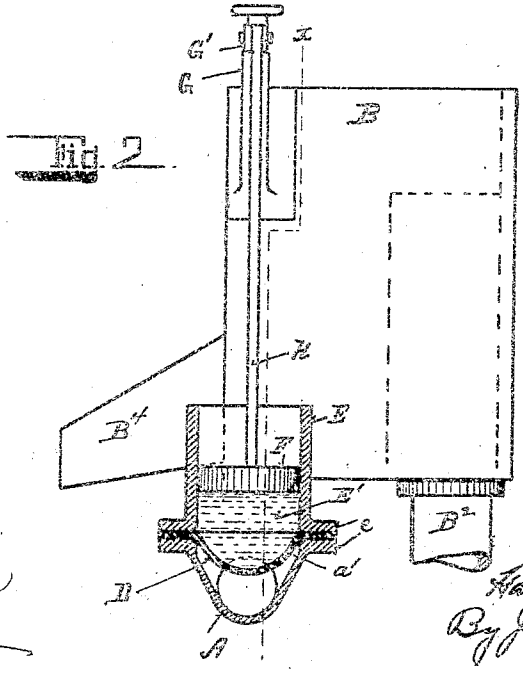


Fig. 2.



Witnesses.

C. E. Myers

R. R. Hutchese

Inventor.

Harry S. Harcourt

By J. G. H. W. Stanger

Atty.

UNITED STATES PATENT OFFICE.

HARRY S. HARCOURT, OF ERIE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO SAMUEL D. MYERS, OF ERIE, PENNSYLVANIA.

AUTOMATIC GATE FOR PULP-BOXES.

1,123,124. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed May 16, 1914. Serial No. 839,134.

To all whom it may concern:

Be it known that I, HARRY S. HARCOURT, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Gates for Pulp-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to paper making machinery, and particularly to that portion thereof which is designed to convey the prepared pulp from the source of supply to the screen machine, and has for its object the providing of automatic mechanism adapted to control the flow of prepared pulp into the screen machine, which will be actuated by the consistency of the pulp.

As is well known, the pulp from which paper is manufactured, is beaten up with water, water being added until the mass is smooth and creamy, when it is pumped into a box adjacent to the intake end of the screen machine, from which it is allowed to flow into the machine in a sufficiently large stream to manufacture paper of the desired thickness; and it is also well known that pulp having less water therein, flowing through a certain sized opening onto a screen which is traveling at a given speed, will make thicker paper than when more water is in the pulp. It is also well known that in preparing pulp it is very difficult to get the proportion of fiber and water always the same.

The features of my invention will appear in the specification and claims, and are illustrated in the accompanying drawings, in which:—

Figure 1, is a view partially in side elevation and partially in vertical section, on the line *x*—*x* in Fig. 2. Fig. 2, is a view partially in elevation and partially in section on the line *y*—*y* in Fig. 1.

In these drawings A, indicates a pulp supply pipe leading from a supply pump (not shown) through which pipe the pulp is pumped into a pulp box B. This pulp box B, is provided with an over-flow B′, from which over-flow a pipe B^2, leads back to the source of supply (not shown), so that the level of the pulp within the box B, may always be as indicated by the broken line *b*, thereby maintaining a uniform pressure within the box B. The box B, is provided with an opening B^3, through which the pulp runs from the box B, on to the spout B^4, (see Fig. 2) and therefrom on to the screen machine (not shown). The opening B^3, is controlled by means of a gate valve C, suitably mounted in ways C′, and is ordinarily opened and closed by the manually operated screw C^2.

In carrying out my invention I provide a section of the pipe A with bends *a*, *a*, therein, for the purpose of creating resistance to the passage of pulp therethrough, and I provide an opening *a*′, in the pipe A, which I close by means of the flexible diaphram D, and place thereon a cylinder E, securing the same to the pipe A, by means of suitable flanges *e*. I then place upon the diaphram D, within the cylinder E, a quantity of liquid E′, of the nature that will not have a deleterious effect upon the diaphram D. I then place within the cylinder E, a piston F, which rests upon the liquid E′. Secured upon the side of the pulp box E, I place a bracket G, upon the upper end of which is pivoted a lever G′, and to one end of said lever G′, the valve operating screw C^2, is suspended by means of the pivoted block *c*, which is pivoted in the end of said lever G′, by means of the pivot *c*′. A piston-rod H, is secured in the piston F, and extends upwardly and is pivoted to the opposite end of the lever G′, by means of the pivot *g*. Slidably secured upon the lever G′, is a weight J, which may be moved along said lever G′, and secured in any position desired, by means of the set screw J′, so as to counter balance the valve and screw mechanism C and C^2.

In operation, the screw C^2, is operated to permit pulp to flow through the opening B^3, and the pump (not shown) presses the pulp through the pipe A, into the box B, in sufficient quantity to maintain the level of said pulp substantially as indicated by the broken lines *b*, in Fig. 1. Should the pulp become a little thicker than when the gate C, was first opened, more pressure will be required to force it through the pipe A, and around the bends *a*, *a*, therein, and conse-

quently the pressure will act to force the diaphragm D, upward, and thereby through the liquid E′, in the cylinder E, force the piston F, upward in the cylinder E, and thereby, through the piston-rod H, and lever G′, will sufficiently close the opening B^3, and maintain it so, while the thicker pulp is being supplied to the box B; thus reducing the volume of pulp passing through the opening B^3, to the screen machine, while not reducing the amount of fiber being supplied through said opening. When, however, the pulp passing through the pipe A, becomes thinner, the resistance caused by the bends *a*, *a*, in said pipe, becomes less, and the pressure in said pipe is correspondingly reduced, which permits the piston F, to move downwardly and the gate valve C, to move upwardly, thereby allowing the greater quantity of pulp to pass through the opening B^3. It is, of course understood, that the traveling screen of the paper making machine, travels at a uniform speed and that when the pulp is thick, it is necessary to reduce the size of the stream from the box B, and when it becomes thin, to increase the size of the stream; this my invention is designed to automatically do.

Having thus shown and described suitable mechanism for carrying out my invention so as to enable others to construct the same, what I claim as new, and desire to secure by Letters-Patent, is:—

1. In an apparatus of the character described, a pulp box having an opening through which pulp may flow to a paper making machine, a gate to control said opening, a pipe for supplying pulp to said box, cylinder and piston mechanism communicating with said pipe adapted to be actuated by pressure within said pipe, and mechanism operated by said piston adapted to actuate said gate, substantially as set forth.

2. In an apparatus of the character described, a pulp box having an opening through which pulp may flow to a paper making machine, a gate to control said opening, a pipe for supplying pulp to said box leading thereto, and mechanism adapted to be actuated by changes of pressure within said pipe to control said gate, substantially as set forth.

3. In an apparatus of the character described, a pulp box having an opening therein through which pulp may flow to a paper making machine, a gate to control said opening, a pipe for supplying pulp to said box and piston and lever mechanism adapted to be actuated by changes of pressure in said pipe to control the action of said valve, substantially as set forth.

4. In an apparatus of the character described, a pulp box having an opening through which pulp may flow to a paper making machine, a valve therefor, and mechanism actuated by changes of the consistency of pulp supplied to said box to actuate said valve to control the flow of pulp through said out-flow opening, substantially as described.

5. In an apparatus of the character described, a pulp box having a discharge opening, a valve for said opening, a supply pipe leading to said box, an opening therein, a diaphragm closing said opening, a cylinder secured against said diaphragm, a piston in said cylinder, a liquid element between said diaphragm and said piston, a lever, a hand-screw suspended in one end of said lever and connected with said valve, and a piston rod secured to said piston and pivoted to the opposite end of said lever, substantially as set forth.

6. In an apparatus of the character described, a pulp box having a discharge opening, a valve for said opening, a supply pipe leading to said box, an opening therein, a diaphragm closing said opening, a cylinder secured against said diaphragm, a piston in said cylinder, a liquid element between said diaphragm and said piston, a lever, a hand-screw suspended in one end of said lever and connected with said valve, an adjustable weight on said lever, and a piston-rod secured to said piston and pivoted to the opposite end of said lever, substantially as set forth.

7. In an apparatus of the character described, a pulp box having a discharge opening through which pulp may flow to a paper making machine, a gate to control said opening, a pipe leading to said box for supplying pulp thereto, means in said pipe adapted to obstruct the flow of thick pulp therethrough, and mechanism adapted to be actuated by changes of the consistency of the pulp passing through said supply pipe to control said gate, substantially as set forth.

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

HARRY S. HARCOURT.

Witnesses:
H. M. STURGEON,
S. D. MYERS.