(No Model.)

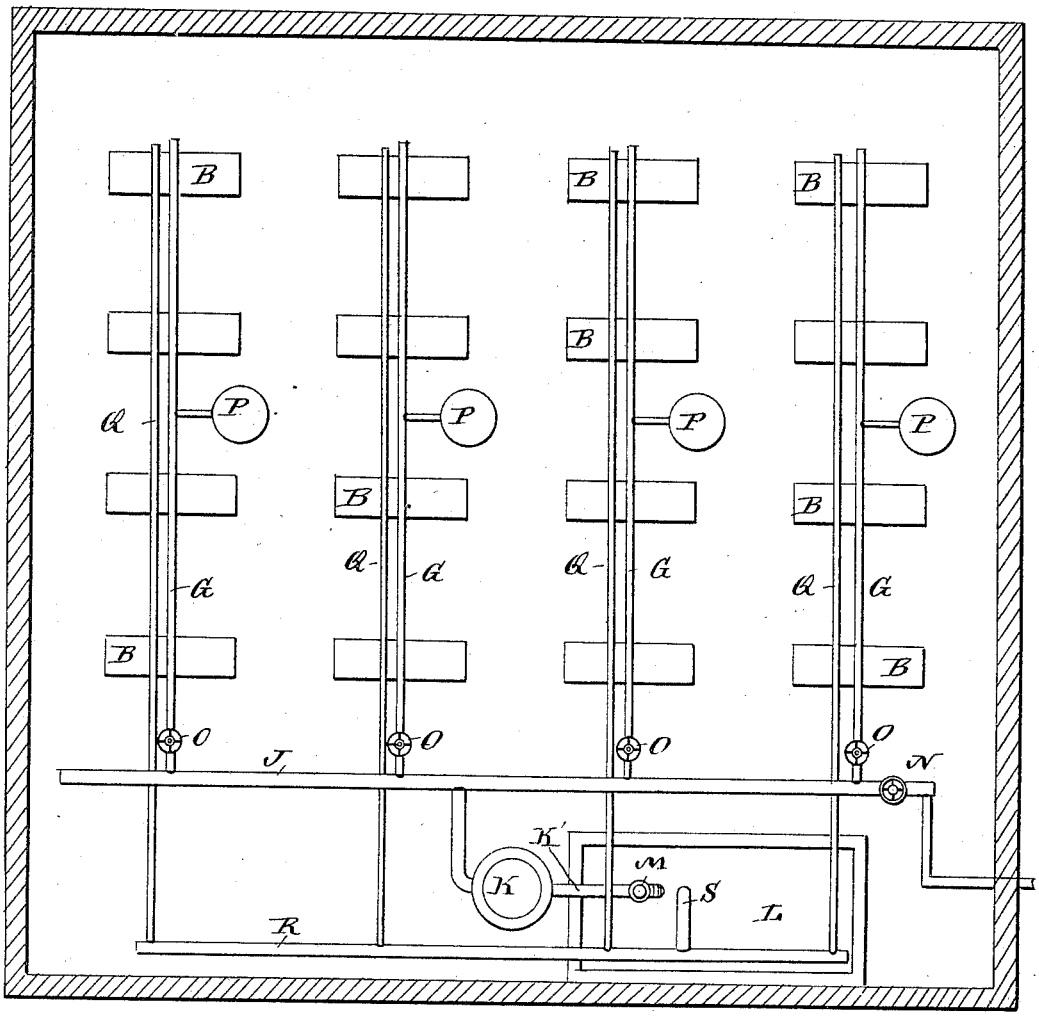
2 Sheets—Sheet 1.

W. CURTIS.

WOOD PULP MACHINERY.

No. 342,074. Patented May 18, 1886.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

W. CURTIS.

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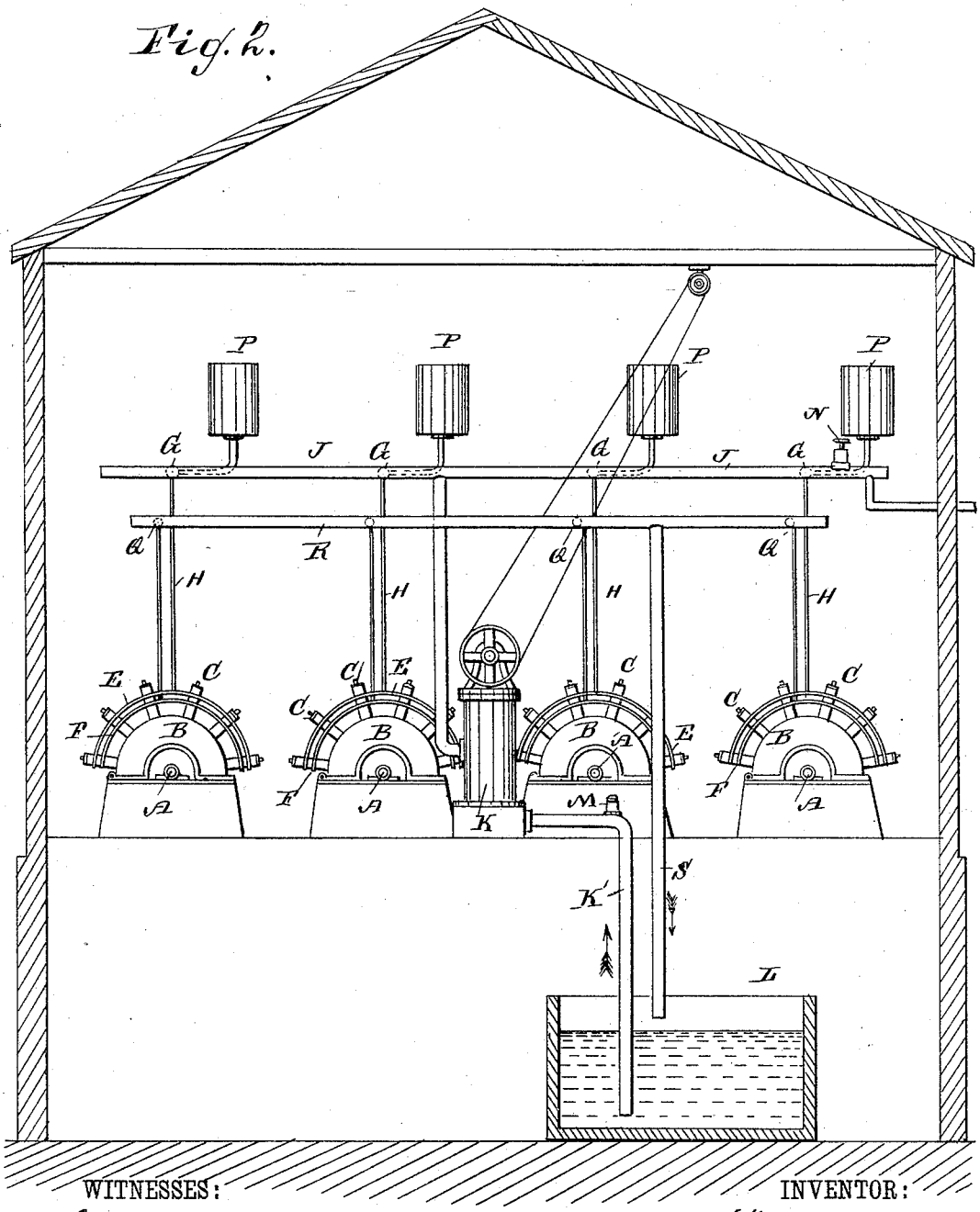
No. 342,074. Patented May 18, 1886.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WARREN CURTIS, OF CORINTH, NEW YORK.

WOOD-PULP MACHINERY.

SPECIFICATION forming part of Letters Patent No. 342,074, dated May 18, 1886.

Application filed December 4, 1885. Serial No. 184,672. (No model.)

To all whom it may concern:

Be it known that I, WARREN CURTIS, of Corinth, Saratoga county, and State of New York, have invented a new and useful Improvement in Wood-Pulp Machinery, of which the following is a full, clear, and exact description.

This invention relates to wood-pulp machinery in which the block-pressers are operated by cylinder and piston presses; and the object of my invention is to provide certain new and useful improvements in the devices for supplying the said presses with air and water under pressure, for the purpose of insuring perfect working of the said presses and to prevent the water from affecting them injuriously.

The invention consists in the construction and combination of parts and details, as will be fully described and set forth hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a plan view of my improved wood-pulp-machinery plant. Fig. 2 is an end view of the same, parts being in section.

I provide a series of shafts, A, and on each a series of wood-pulp stones are mounted, each being surrounded by a casing, B, on which the presses C are mounted, which press the blocks of wood against the stones. On each casing a pipe, E, is provided, which conducts water, or air and water under pressure, into the cylinders of the several presses on that casing, and on each casing a pipe, F, is also provided, which conducts the exhaust-water, or air and water, from the several cylinders.

Over each set of casings B, on one shaft A, a main pipe, G, for conducting the water, or air and water under pressure, extends, and is connected by the pipes H with the several pipes E, conducting the water under pressure to the several cylinders.

The several pipes G are all connected with a pipe, J, which in turn is connected with a force-pump, K, or with a water-reservoir, or with any other suitable water-forcing device.

In case the pump K is provided, which arrangement is preferred, the suction-pipe K′ extends to the tank L or any other suitable water-receptacle. In this case the said suction-pipe K′ is provided with a cock, M, which can be opened more or less, so that at each stroke of the pump more or less air is drawn into the suction-pipe and is mixed with the water raised by the pump—that is, the pump does not deliver water alone, but a mixture of water and air. The same result may be obtained by providing two pumps—one for pumping air and the other water—both pumps operating at the same time and pumping into the same tube. The pump used is of such capacity that it can pump more water, or water and air, than is required, and thus produces not only the desired pressure, but an excess of water, or air and water under a pressure, exceeding that required.

The pipe J and the pipes G are closed at their ends, so that none of the air or water under pressure can escape, and at one end of the pipe J, I provide the relief-valve N, which can be adjusted for a certain desired pressure.

When there is such an excess of air or water that the pressure in the pipes G and J and the pipes on the casings connected with them is greater than desired, the water or air raises the relief-valve and permits so much air or water, or both, to escape as is necessary to bring the pressure in the pipes G and J and those connected with them to the desired degree below that at which the relief-valve is set, which should be in excess of that needed to operate all or any of the presses for pressing the blocks. I also provide a pressure-regulating valve, O, in each pipe G, near the connections of the said pipes with the main pipe J, by means of which valves the pressure of the air and water in each pipe G can be regulated to any degree below that in the main pipe. For example, if one of the machines or sections of machines grinds a softer wood, or in case the grinding-surface is sharper than ordinarily, or if under certain conditions the quality of the fiber requires less power, the pressure required on such machine will be less than the ordinary pressure, and this pressure can easily be reduced. On the other hand, in case some of the machines or sections of machines connected with said main pipe grind a harder wood, or the stones are somewhat dulled, a greater pressure will be required.

An air-tank, P, is connected with each pipe

G, and in said tanks the excess of air can accumulate, thus insuring a sufficient supply of air for the water that passes into the pipes E.

The pipes F of each set of casings on one shaft A are connected with a pipe, Q, extending over the said casings, and the several pipes Q are connected with the pipe R, from which a pipe, S, leads to the tank L, or conducts the water out of the building.

If water alone is used to operate the presses, the several valves, &c., in the cylinders will be jarred and racked in a very short time to such an extent that they will be useless, and the frames of the machines or the stones will be liable to be broken, especially if the stones get out of true, as the water-pressure is rigid and positive, and does not permit the parts to yield. To prevent this I have provided the device for mixing the water with air, as the air forms a cushion and causes the hydraulic presses to work without any jar or undue strain.

A greater or less number of wood-pulp machines may be arranged in the manner described.

The semicircular casings over the pulp-stones, and on which the block-pressers are held, and the semicircular pipes extending over the rims of the said casings and connected to the main supply-pipes, form no part of the present invention, the same forming the subject-matter of another application of even date with this and numbered 184,722.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a press, of a pipe for conducting water under pressure to the same, and of an air-tank connected with the said pipe, substantially as herein shown and described.

2. The combination, with a press, of a pump for forcing water into the said press, a suction-tube connected with the said pump, and of an air-cock on the suction-pipe, substantially as herein shown and described.

3. The combination, with a press, of pipes for conducting water to the same, and of an air-cock on one of said pipes for the purpose of drawing air into the said pipes and mixing it with the water in the pipes, substantially as herein shown and described.

4. The combination, with a series of wood-pulp machines, of presses on the same, pipes for conducting water, or air and water under pressure, into the said presses, and of air-tanks connected with the said pipes, substantially as herein shown and described.

5. The combination, with a wood-pulp machine provided with presses for pressing the wood blocks on the stone, of a pipe for conducting water, or air and water under pressure, to the said presses, and of a relief-valve in the said pipe, substantially as herein shown and described.

6. The combination, with a wood-pulp machine provided with presses for pressing wood blocks on the stone, of a pipe for conducting water, or air and water under pressure, to the said presses, and of a pressure-regulating valve in the said pipe, substantially as herein shown and described.

7. The combination, with a pulp-machine having cylinder and piston presses, of devices for conducting air and water under pressure into said presses, substantially as herein shown and described.

8. The combination, with a series of wood-pulp machines provided with presses for pressing the wood blocks on stones, of the pipe J, for conducting water under pressure, the pipes G, connected with the pipe J and conducting the water to the series of machines, a relief-valve in the pipe J, and a pressure-regulating valve in each pipe G, substantially as herein shown and described.

9. The combination, with a number of groups of wood-pulp machines, of the water-conducting pipes G and Q, the pipe J, connected with the pipes G, and the pipe R, connected with the pipes Q, and pump or other water-forcing device connected with the pipe J, substantially as herein shown and described.

WARREN CURTIS.

Witnesses:
OSCAR F. GUNZ,
C. SEDGWICK.