(No Model.)

J. T. HORTON.

HYDRAULIC FEED FOR WOOD PULP MACHINES.

No. 481,174. Patented Aug. 23, 1892.

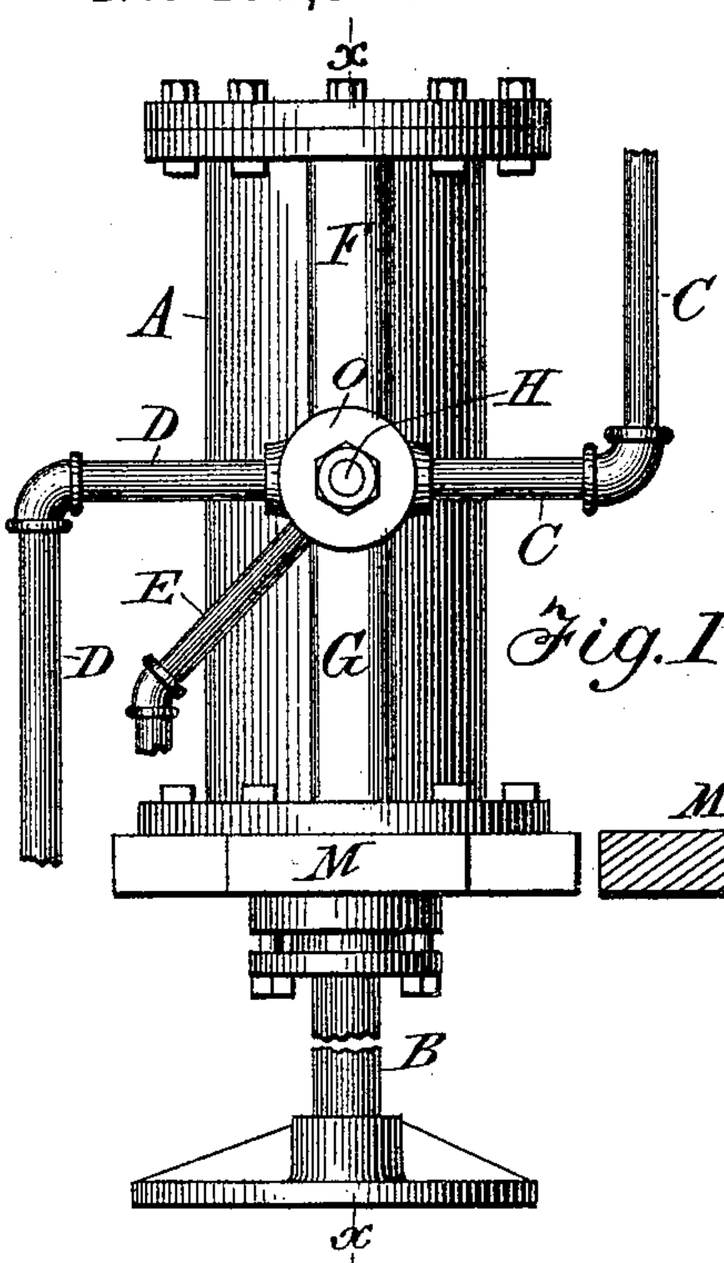

Fig. 1.

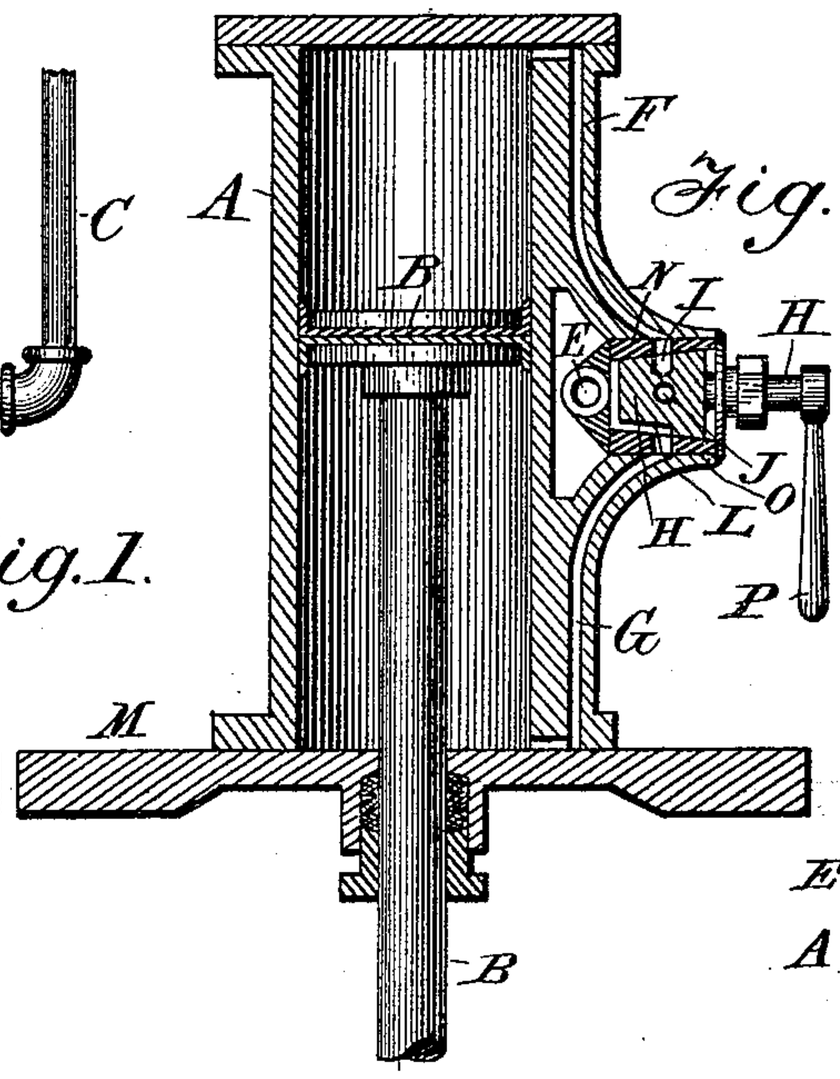

Fig. 2.

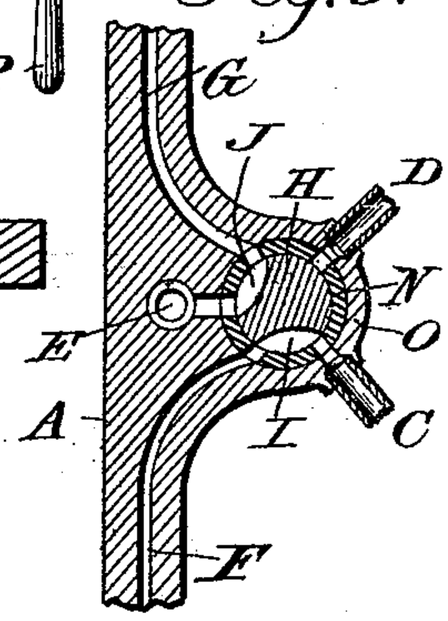

Fig. 5.

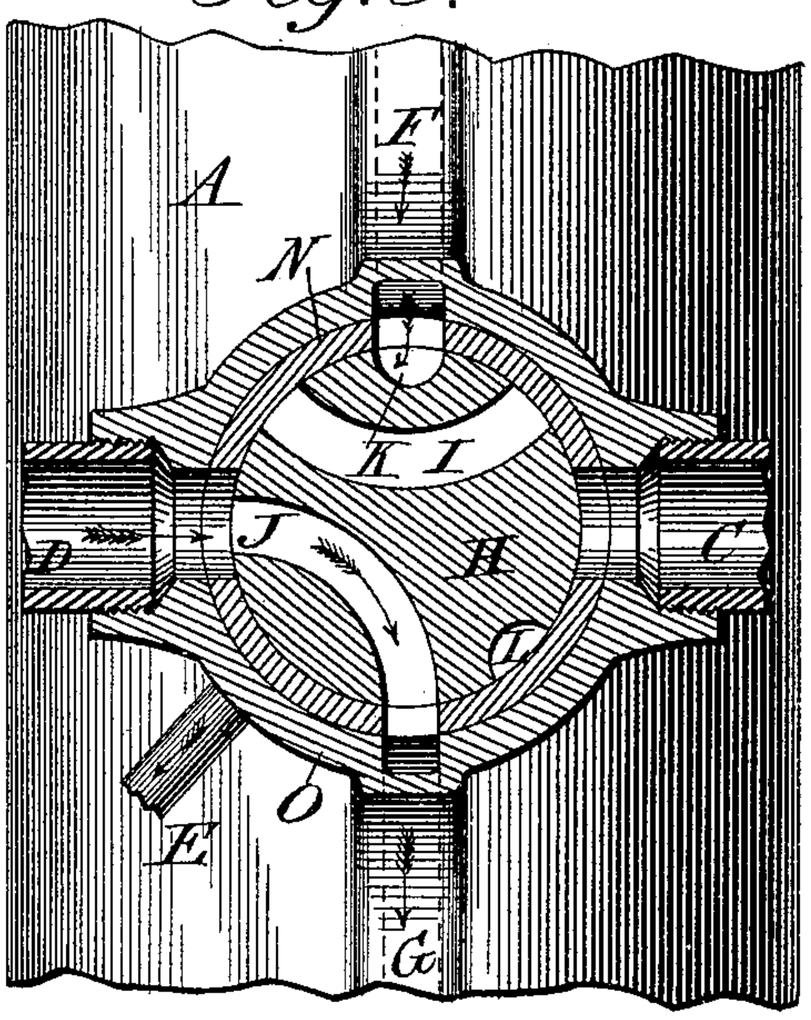

Fig. 3.

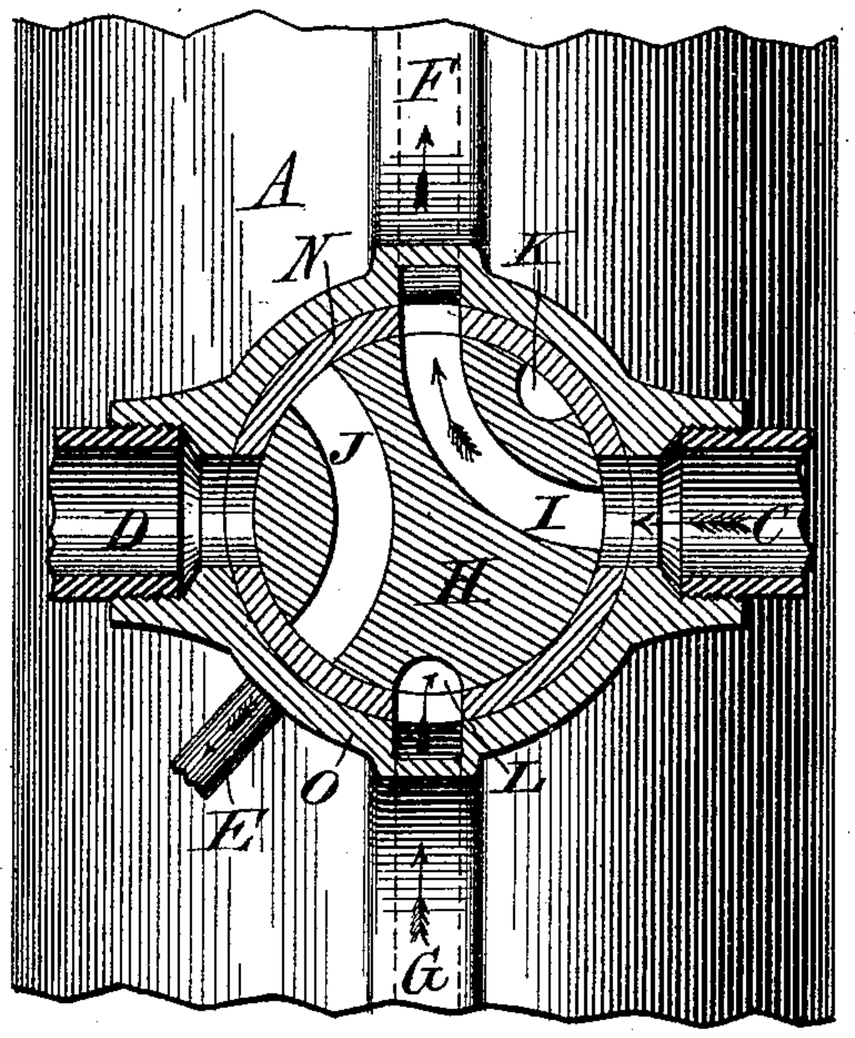

Fig. 4.

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HYDRAULIC FEED FOR WOOD-PULP MACHINES.

SPECIFICATION forming part of Letters Patent No. 481,174, dated August 23, 1892.

Application filed April 24, 1890. Renewed February 15, 1892. Serial No. 421,634. (No model.)

To all whom it may concern.

Be it known that I, JOHN THEODORE HORTON, a citizen of the United States, residing at Lowville, in the county of Lewis and State of New York, have invented a new and useful Improvement in Hydraulic Feed for Wood-Pulp Machines, of which the following is a specification.

My invention relates to improvements in applying pressure to hyraulic cylinders on wood-pulp grinders or any other machine where two, three, or more cylinders are supplied with pressure from the same source at the same time independent of each other, the piston doing its work in one direction only, the reverse being the return stroke.

The object of my improvements is to secure a uniform pressure on each individual piston when forcing against the stock-blocks and the using of power at high pressure from the hydraulic pump for forcing down only, the return of the piston being accomplished by the use of pressure from another pump at a much lower head, thus preventing the dropping of the pressure on other cylinders supplied from the same pump, as is the case when the same pressure from the hydraulic pump is used both to force down and return the piston. In my invention the pressure from the different pumps, being unequal, is controlled and regulated by the use of one valve or cock. I attain these results by the use of the mechanism illustrated in the accompanying drawings, and in which—

Figure 1 is a side view of the cylinder and its connections. Fig. 2 is a vertical section through Fig. 1 on line *x x*. Fig. 3 is an enlarged transverse section through the valve, showing the arrangement of the parts and their position when the pressure from main pipe is shut off and the piston is making the return stroke. Fig. 4 is a view of the same, showing position when the piston is feeding down to work. Fig. 5 is a sectional view of a modified form of the valve.

Similar letters refer to similar parts in all the figures, and in which—

A indicates the cylinder, mounted on cross-head M for bolting to the machine.

B is the piston and rod with plunger on the bottom end, Fig. 1, for forcing the wood to the stone.

C is the supply-pipe from the pump for forcing the piston against the work.

D is the pipe from auxiliary pump for raising the piston to the top of cylinder.

E is the discharge or waste-water pipe.

Cylinder A is bored out at O to receive the brass bushing N, which is forced into place, making a perfectly-tight joint. The bushing is bored out tapering and has holes in its sides to correspond with the cylinder-ports F and G and supply-pipes C and D, as shown in Figs. 3 and 4. The valve H is fitted to brass bushing N. The ports I and J in valve H are cored and are so arranged that when port I connects pipe C and cylinder-port F port J from the other pump is closed, the exhaust from under side of piston B passing out through cylinder-port G, down through groove L in valve H, and back to tank through waste-pipe E, as shown in Figs. 2 and 4. When the piston has reached the end of the cylinder, the valve H is brought to position shown in Fig. 3 by handle P, Fig. 2, which connects pipe D from auxiliary pump and cylinder-port G and brings groove K in valve H opposite cylinder-port F. The pressure from pump through pipe C is thus shut off and piston B is raised by pressure from pipe D, and the water in the top end of cylinder A is exhausted through cylinder-port F, down through the groove K, and out at waste-pipe E. By using this combination the pressure from pipe C is only used to force the piston B against wood on stone in hydraulic machines, and by shutting off pressure from pipe C and using water from pipe D from another pump to return piston B the pressure on other cylinders supplied from the same pump which supplies C is kept steady and does not allow the machine to change speed, as is the case when water from pipe C is used to raise as well as force down piston B. When that is done, while piston B on one cylinder is returning the pressure on all the other connected cylinders is allowed to drop until piston B gets to the top and begins its return stroke. Where a number of machines are supplied from the same pump, while one piston is being raised the other cylinders are partially relieved of pressure until the said piston gets to the end of its stroke, and while the return stroke is being made the machines

will "speed up," making an uneven quality of product, and in some cases causing serious injury to both machines and attendants. As a partial protection against these evils an arrangement called an "accumulator" has been attempted; but it is both expensive and unreliable. Where a natural or static pressure is obtainable from a head of water sufficient for the purpose, this may take the place of pumps.

In Fig. 5 I show a section plan of a modification of the two-way valve-plug, in which there is an opening in the brass bushing N, corresponding with the exhaust-port E, and the plug H has full openings I and J, (instead of covered channels, as in the other figures,) these openings serving alternately as pressure and exhaust ports I, connecting, as the case may be, feed-pipe C and the pressure-port F, while J gives exit from the cylinder-port G into exhaust E, and by partial rotation of plug H port J in the same connects pressure-pipe D with the port G, while I connects port F with the exhaust E.

I claim—

In a hydraulic feed for wood-pulp grinders, the combination, with a pressure-cylinder having passages connected with the opposite ends, of two independent water-supply pipes, a single water-discharge pipe, and an interposed four-way valve adapted to connect one of the passages with the proper supply-pipe and the remaining passage with the discharge-pipe, substantially as and for the purpose set forth.

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