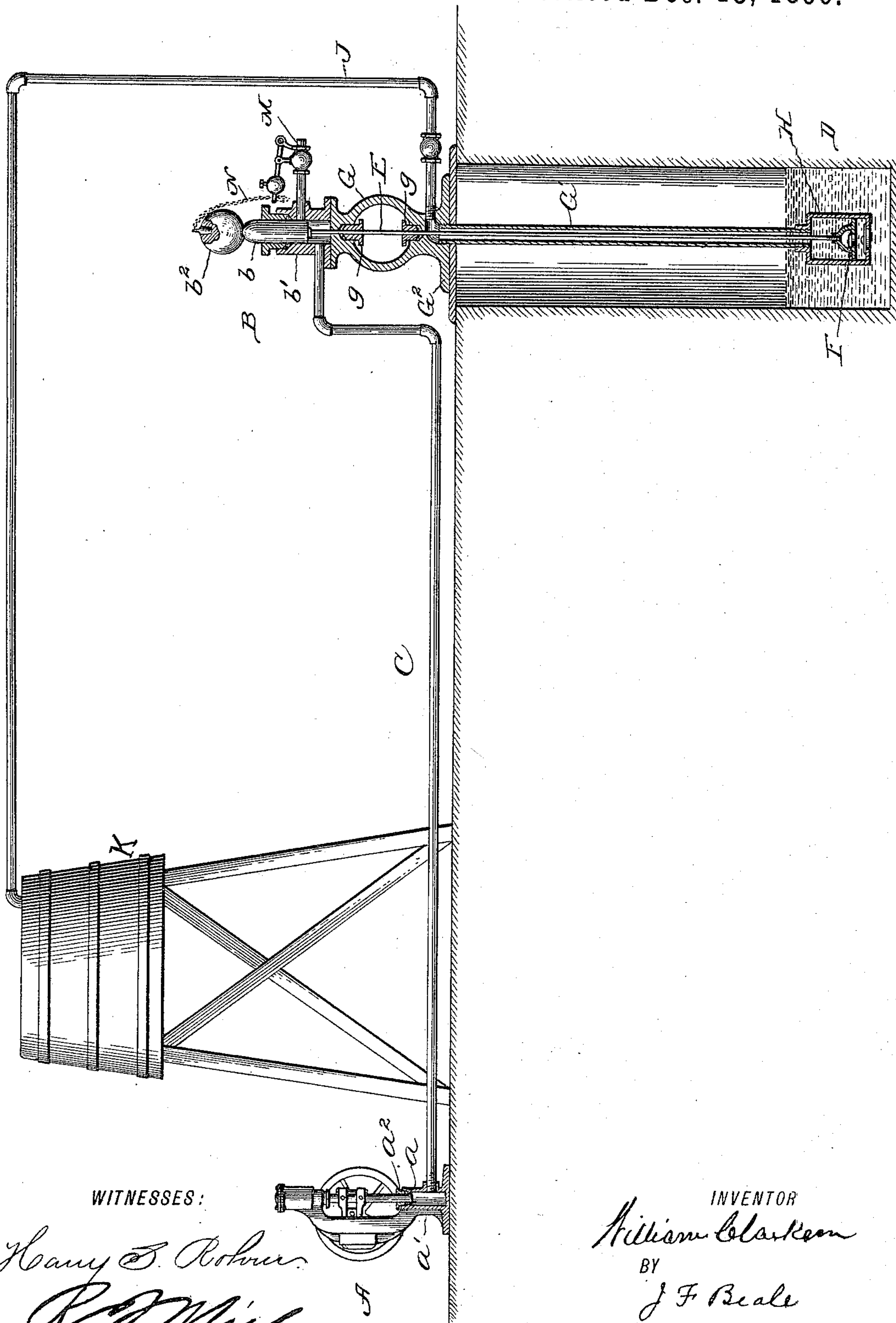


(No Model.)

W. CLARKSON.
PUMP.

No. 572,962.

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WITNESSES:

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SPECIFICATION forming part of Letters Patent No. 572,962, dated December 15, 1896.

Application filed March 4, 1896. Serial No. 581,771. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CLARKSON, a citizen of the United States, residing at Cleburne, in the county of Johnson and State of Texas, have invented certain new and useful Improvements in Pumps; 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 ap-
10 pertains to make and use the same.

My invention relates to that class of pumps for lifting and conveying water from a long distance and from deep or shallow wells or other source of supply.

15 The object of my invention is to provide an economical system for conveying water from a distant supply to a factory or other place having power.

It is also my object to provide an improved
20 pumping-ram of simple and economical construction, dispensing with the use of valves, located above the water supply, and adapted to be operated by a single-acting pump or specially-constructed driving-ram located at
25 a distance.

It is also my object to provide means whereby the pressure exerted upon the liquid in the pressure-pipe is alternately high and low, the high pressure being utilized to elevate
30 the pump-rod, giving a rapid upstroke, and the low pressure to lower said rod gradually and insure a return flow of the liquid in the pressure-pipe.

In the accompanying drawing, forming a
35 part of this specification, I show my improved system of pumping and the arrangement of the driving-ram and pumping-ram and the pressure-pipe connecting them.

Referring more particularly to the drawing, A denotes a driving-ram, B a pumping-ram, and C denotes a hydraulic pipe connecting said rams.

D denotes the well or source of liquid supply.

45 The driving-ram, as shown, is a single-acting one, operated by steam or other power and located at a factory or power-station. It is provided with a water chamber or cylinder a , opening into the pipe C, and operated with
50 plunger a' . a^2 denotes a stuffing-box for said plunger.

The pumping-ram consists of a cylinder b' ,

provided with a weighted plunger b and communicating with the pipe C and cylinder a . Said plunger projects above the cylinder b' 55 and is provided with a weight b^2 . b^3 denotes a stuffing-box for said plunger.

E denotes a sucker or lift rod secured to plunger b and connecting the same with a suitable piston F in a pump-barrel H. 60

G denotes a standard or yoke to which cylinder b' is attached. $g g$ are stuffing-boxes to pack the lift or sucker rod working through said standard; G', a pipe connecting the base G² of said standard with the pump-barrel. 65

J denotes a delivery-pipe for conveying water or other liquid to the reservoir K.

It will be noted that the cylinder b' , standard G, pipe G', and barrel H are placed in vertical alinement. The cylinder, standard, 70 and base G² are preferably cast in one piece. Both in the driving-ram and pumping-ram, as well as their communicating pipe, I dispense entirely with the use of valves and valve-cages, and thereby simplify the cost of
75 construction and remove all impediment to the full ingress and egress of the liquid in both cylinders and pipe and reduce the loss of power which would otherwise follow from friction and interrupted flow. The stuffing-
80 boxes a^2 , b^3 , and $g g$ are so arranged that they are accessible and may be readily packed.

M denotes a safety-valve located at the upper part of the cylinder b' below the packing-recess. 85

N denotes a chain connecting the safety-valve lever with the weight b^2 .

O denotes a pipe provided with a stop-valve 90 o for filling the cylinder a and connecting-pipe C.

The operation is as follows: The plunger in the water-chamber a being raised and the plunger in the chamber b' being lowered water is fed into the pipe O until the chamber a and pipe C are filled. The driving-ram A is then 95 set in motion. As the plunger a' is forced down, the water in chamber a and the column of water in pipe C is forced against and raises the plunger b in pumping-ram B, lifting the same with its superincumbered weight 100 and elevates the lift-rod E and operates the pump-valve F. The water in the well is thus lifted up through pipe G' and conveyed through the outlet-pipe J and check-valve

into the supply-pipe and reservoir. It is evident that as the plunger a' is raised the weighted plunger b will fall and force the water in the cylinder or chamber b' back through
5 the pipe C into cylinder a , and at the same time lowers the lift-rod and valve F. By connecting the pressure-pipe to the lower end of cylinder b' I utilize the high pressure to
10 elevate the sucker-rod, while the low or return pressure in said pipe is effected by the weighted plunger b . The result is a quick powerful upstroke, utilized to elevate the water from the well, and a gradual downstroke, which allows an easy descent of the sucker-
15 rod, avoiding pressure or crowding of the pump-valve upon the receding water in the pump-barrel. It is evident that the cubic contents of the two chambers or cylinders are not necessarily equal, and if it is desired to
20 increase or diminish the length of stroke of the pumping-ram plunger its cylinder could be made of smaller or greater diameter and of greater or shorter length, as necessity required.

25 The object of the safety-valve M is to prevent the hydraulic pressure from driving the plunger b out of its cylinder in case too much water is supplied in the hydraulic pipe, and is important especially where the driving-
30 ram is operated at a long distance from the

pumping-ram. It is so arranged that before the plunger b can reach the top of the chamber b' the chain N will lift the safety-valve lever and relieve the pressure. The safety-valve also serves the purpose of an air-outlet
35 when the pipe C is being filled. It is evident that the water in pipe C and cylinders a and b' is used continuously back and forth, and in case of leakage can be readily supplied through the pipe O. Oil may be used instead
40 of water.

Having shown and described my invention, what I claim, and desire to secure by Letters Patent, is—

In a pump having a driving-ram and pump-
45 ing-ram, connected by a pressure-pipe, the combination of the upright cylinder b open at its upper end and provided with a safety-valve, a vertically-acting plunger entering the open end of said cylinder and projecting
50 above the same, means for connecting said safety-valve and the projecting end of said plunger, and a pump or sucker rod attached to said plunger.

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

WILLIAM CLARKSON.

Witnesses:

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