

C. HODGKINS.

Improvement in Water Rams.

Fig. 2.

Fig. 1.

No. 119,764.

Patented Oct. 10, 1871.

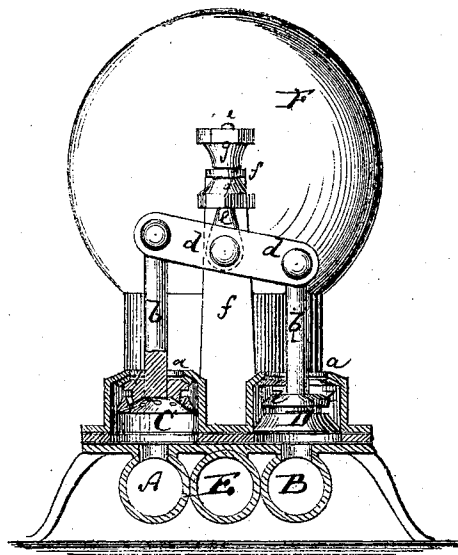
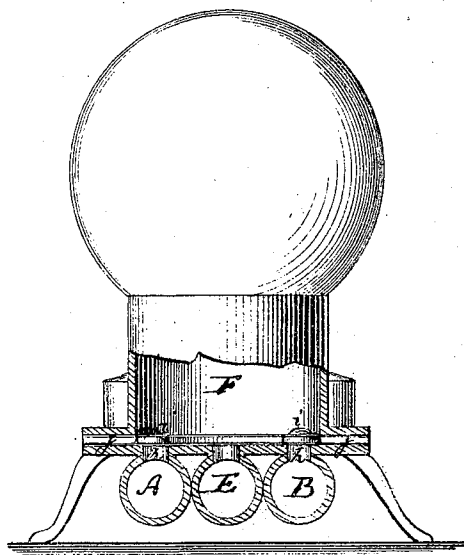


Fig. 3.

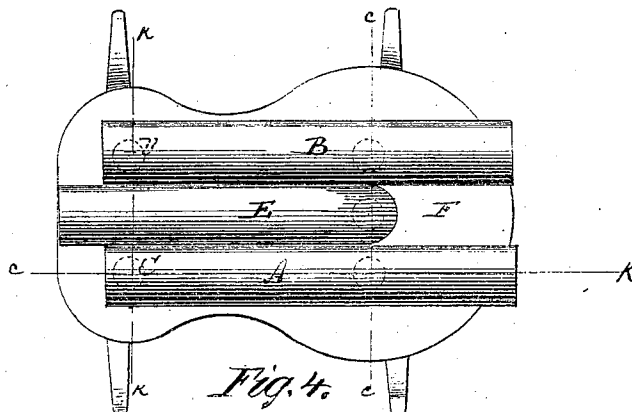
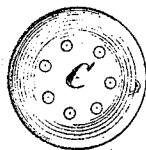


Fig. 4.



Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

CHRISTOPHER HODGKINS, OF MARLBOROUGH, NEW HAMPSHIRE.

IMPROVEMENT IN WATER-RAMS.

Specification forming part of Letters Patent No. 119,764, dated October 10, 1871.

To all whom it may concern:

Be it known that I, CHRISTOPHER HODGKINS, of Marlborough, in the county of Cheshire and State of New Hampshire, have invented an Improved Hydraulic Ram; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a vertical transverse section of my improved hydraulic ram, showing it cut through the air-chamber on the plane of the line *c c*, Fig. 3. Fig. 2 is a vertical transverse section of the same through the force-valves, the line *k k*, Fig. 3, indicating the plane of section. Fig. 3 is a bottom view of the same. Fig. 4 is a longitudinal section on the line *c k*, Fig. 3, and Fig. 5 is a detail face view of one of the force-valves.

Similar letters of reference indicate corresponding parts.

This invention has for its object to increase the efficiency of hydraulic rams by making them continuous in operation; and consists chiefly in the application to one ram of two force or conducting-pipes whose force-valves are connected so that the closing of one will cause the opening of the other, and vice versa. The invention also consists in a new form of force-valves and manner of applying and making them adjustable, all as hereinafter more fully described.

A B in the drawing are two water-supply pipes, leading from a suitably-elevated reservoir to the ram. Near their lower ends are the force-valves C and D applied to these pipes so as to close the apertures *a* when raised, but open them when lowered. The stems *b b* of the valves C D are pivoted to the ends of a beam, *d*, which is at the middle pivoted to a vertical pin, *e*, held in a stationary arm, *f*. The pin *e* is suspended from the arm *f* by means of nuts *g g*, and can be adjusted vertically so as to let the valves down more or less, and thereby regulate the power of the ram and control the escape of water at every stroke. E is the discharge-pipe, situated between the pipes A B, and extending from the bottom of the air-chamber F, with which the pipes A B also communicate by apertures *h h*. These are closed by check-valves *i i*, which may be formed on the same piece *j*, of annular leather, which forms the packing of the air-chamber. The valves C D are

perforated near their edges, and have each a projecting shoulder, *l*, above the ring of perforations. This facilitates their being raised by the water, which passes up through the apertures and acts on the shoulder *l* to crowd the valves against their seats.

When the valve D of the pipe B is open, *i. e.*, lowered, as in Fig. 2, the water rushes out through said valve and closes it, thereby opening the valve *i* of the pipe B in the air-chamber for the reception, in the latter, of the water from such pipe B, and the subsequent discharge thereof through the pipe E. The same motion of the valve D serves, however, also to open the valve C in the pipe A, and causes action in the latter until, by the closing of C, the valve D is again opened, and so forth. Thus, by having two drive or supply-pipes, I gain continuous action and produce an automatic operation of the valves C D, dispensing, thereby, with the use of springs or weights that are used in single rams for lowering such valves. This also does away with considerable useless resistance, as the raising of the valve not only is not obstructed by the spring or weight but, in fact, actually utilized in lowering its mate and opening the other drive-pipe.

This ram will always start itself whenever water is let on, owing to the absolute obedience of the valves C D to pressure, which requires less accumulated force for closing said valves than the lowering appliances hitherto necessary. Another advantage of my improved ram is that it cannot be stopped by dirt, since one side will close and wash the dirt out from the other side; and that a change of temperature will not affect it, while ordinary valves must have their weight changed in cold and warm weather.

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

1. A hydraulic ram, provided with two supply-pipes, A B, which communicate with the same air-chamber F and discharge-pipe E, substantially as specified.

2. The double valves C D of a hydraulic ram, when suspended from one beam, *d*, so that the closing of one will open the other, and vice versa, as specified.

3. The drive-valve of a hydraulic ram, when perforated, and provided with the projecting shoulder *l* above the ring of perforations, as and for the purpose specified.

4. The air-chamber F of a hydraulic ram, provided with three apertures and two check-valves to communicate with two supply-pipes and one discharge, as set forth.

5. The beam *d*, holding the two valves C D, and made vertically adjustable, substantially as and for the purpose herein shown and described.

6. The combination of the pipes A, B, and E

with the air-chamber F, valves *i i*, C, and D, and beam *d*, all arranged to operate substantially as herein shown and described.

CHRISTOPHER HODGKINS.

Witnesses:

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