

*J. Osborn,
Hydraulic Ram,*

Nº 7,932,

Patented Feb. 11, 1851.

Fig. 1.

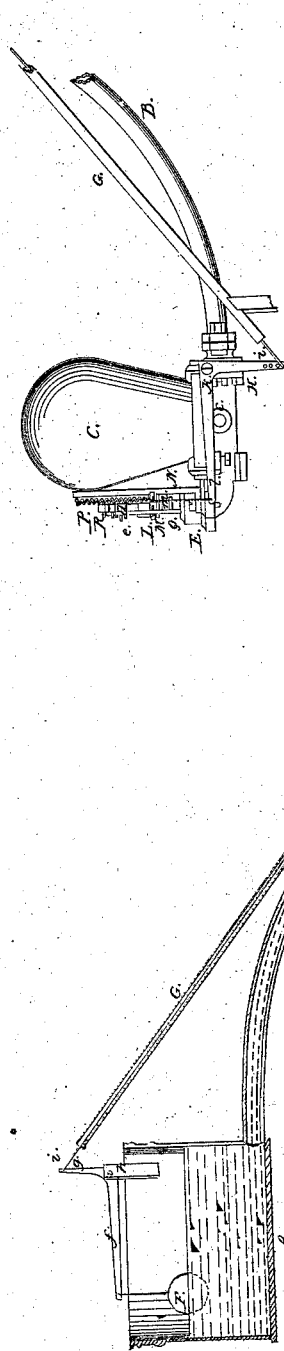


Fig. 2.

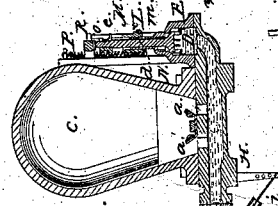


Fig. 3.

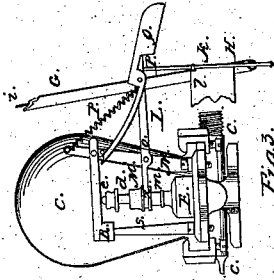
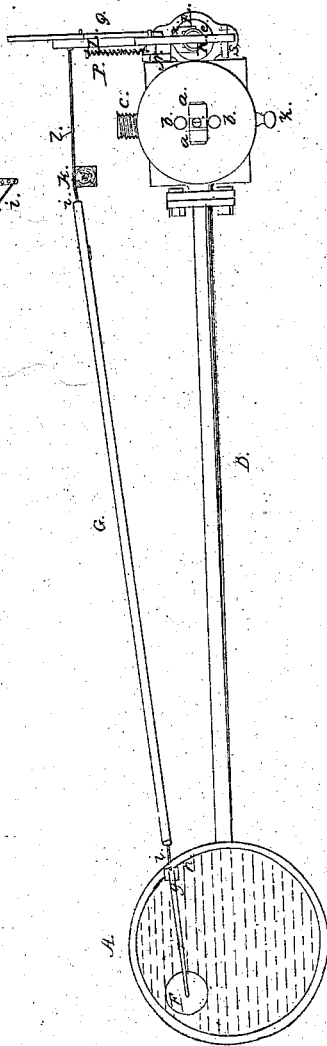


Fig. 4.



UNITED STATES PATENT OFFICE.

JOHN OSBORN, OF HAMDEN, CONNECTICUT.

OPERATING THE WASTE-GATE IN HYDRAULIC RAMS.

Specification of Letters Patent No. 7,932, dated February 11, 1851.

To all whom it may concern:

Be it known that I, JOHN OSBORN, of Hamden, in the county of New Haven and State of Connecticut, have invented new and useful Improvements in Hydraulic Rams; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, is a partial side elevation. Fig. 2, is a longitudinal section. Fig. 3, is a partial front or end elevation. Fig. 4, is a plan with the air chamber removed to show the interior valves and passages.

The same letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists in the application of a regulator acted upon by a float in the spring or source from which the water runs to drive the machine, which regulator increases or lessens the stroke of the "waste" valve or shuts it by means of levers or other means according to the rise or fall of the water in the spring or source, thus proportioning the use of the water to the quantity in the source, and it further consists in a self acting arrangement for opening the "waste" valve and thereby starting the machine when the water in the source is sufficiently high to use, after the ram has been stopped by a deficiency in the supply.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A, is a reservoir intended to represent a spring or any other source of water which may be used to drive the machine.

B, is the pipe through which the motive column descends.

C, is the air chamber of the ram.

D, is the "waste" valve opening inwards.

a, a, are the air chamber valves by which the water enters from the pipe B.

b, b, are the delivery passages through which the water is forced into the discharge pipes c, c.

d, is the "waste" valve spindle having a top or cap e, the valve D, moves up and down in the box E, and has outlets round its side by which the water passes when the valve is down or open.

F, is a float in the spring or source acting upon a lever f, having an arm g, and a fulcrum h. To the arm g, is attached a

wire cord or chain i i, passing through a pipe G, to protect it and may be buried in the ground.

H, is a lever having a fulcrum at k, and a long arm or leg l, the arm H, being attached to the wire i, i, and the arm l by a rod or wire to a lever L, whose fulcrum is at o, (see Fig. 3) the lever L is forked at x, and clasps the regulating slide M, which slides on the tubular projection m, of the valve box E, through which the valve spindle d, freely works.

N, is a bar on which is the fulcrum of the lever L, and hammer R.

P, is a coiled spring fastened to the bar N, and lever L.

Q, is a lever having its fulcrum on the lever L, and resting on a stop pin p, its inner extremity being notched or stepped and acting by the movement of the lever L, on the hammer R, which has its head supported upon an upright springing piece S, one only of the discharge pipes c, c, may be used and the other stopped or shut by a plug.

The operation is as follows: Water is raised through its momentum, by the arrangement (shown in the drawing) of the pipe B, air chamber C, valves a, a, and "waste" valve D, with their pertaining parts and which arrangement composes and is or may be the same as that forming what is called "Montgolfier's" or the usual "water ram" but in place of varying the weight on the "waste" valve D, according to the rise or fall of the water in the source, which is the ordinary manner of working; the valve D is made as usual to fall by its weight but has its stroke varied by a regulating slide M, which moves on m, and according to its position high or low, the degree of opening for the waste water valve D, is regulated by lessening or increasing the stroke of the valve spindle d, its cap e, falling on the top of the regulating slide M. The movement of the slide M, and consequent alteration in the stroke of the "waste" valve is produced through the lever L, acted upon by the float F, connected as described.

The float F, in falling as the water becomes low, working the lever f, g, wire i, i, and lever H, l, attached by rod to the lever L, which has its forked extremity x raised and with it the regulating slide M, which lessens as required the degree of opening or stroke of the "waste" valve d. In case of the water rising in the spring or source the

action is reversed, the spring P, serving to act upon the lever L, as the wire *i, i*, might not be sufficiently stiff to push without bending the lever H, the slide M, is lowered and the opening made larger for the escape of water through the "waste" valve, by increasing its stroke or allowing it to fall more, and when the water in the spring or source becomes too low for using the machine, the regulating slide M, is at its top stroke and the "waste" valve D, is shut, the top of the valve spindle-cap *e* being nearly at the level of the lower surface of the stale or arm of the hammer R, when down and by the movement of the lever L, the notched or stepped extremity of the lever Q, is brought to bear on the projecting pin under the fulcrum of the hammer R, and which in its movement raises the hammer; the "waste" valve D, during the deficiency of water resting by the cap *e*, on the regulating slide M, and thus prevents the machine from working; but as the water again begins to rise in the spring or source the hammer R, first raised is afterward released from the notched end of Q, by the motion of the lever L, the hammer descending and striking at its head the springing piece S, which yields sufficiently to allow of the hammer stale striking the cap *e*, and thereby causing the valve D, to fall as low as the sliding regulator M permits it, which is governed by the motion of L, acted upon by the float F, and the piece S, recovering by

its elasticity its original position or height, the top of the cap *e*, is prevented from touching or striking against the stale of the hammer R, during the regular operation of the machine. By these means the machine is made self acting and uses only so much water as the height or force of the spring or source is calculated to provide it with, varying its use of water more or less as the natural supply rises or falls and the ram stopping itself when the water may be considered too low for working, and again starting when the water is sufficiently high.

What I claim as my invention and desire to secure by Letters Patent is—

1. The use of the regulating slide M and nut or other similar arrangement in combination with the levers, wires, springs, rods, weights or other devices substantially similar to those described for adjusting the "waste" valve and operated on, and in connection with a float F, at the spring or source, which float rises and falls with the water.

2. I also claim the use of the hammer R, resting or falling on a springing piece S, for opening the "waste" valve D, or starting the hydraulic ram and worked as described or in any other similar manner.

JOHN OSBORN.

Witnesses:

PHILO S. BEERS,
LEVERETT HITCHCOCK.