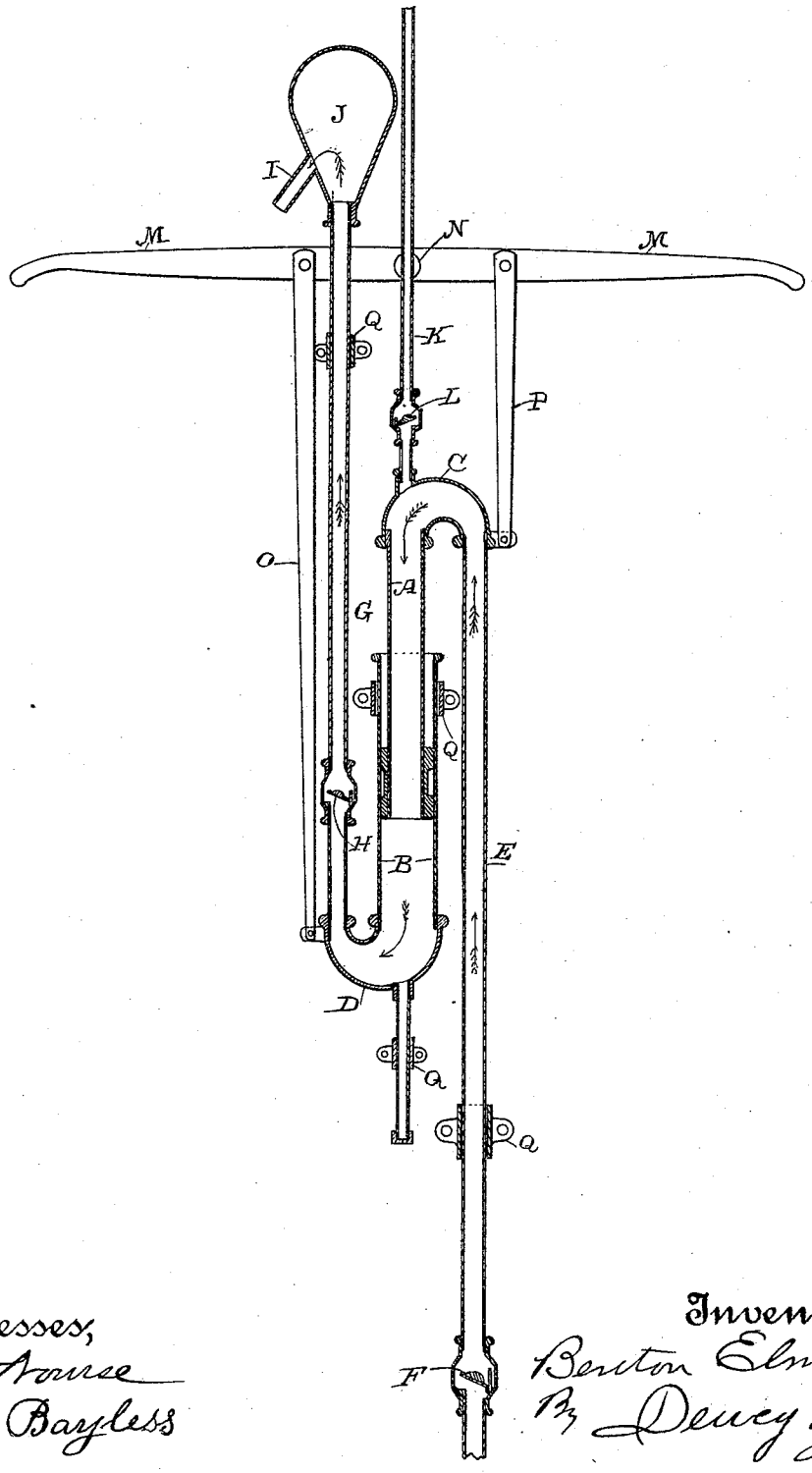
(No Model.)

B. ELMORE.

PUMP.

No. 496,683. Patented May 2, 1893.



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UNITED STATES PATENT OFFICE.

BENTON ELMORE, OF BIGGS, CALIFORNIA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 496,683, dated May 2, 1893.

Application filed January 4, 1893. Serial No. 457,280. (No model.)

To all whom it may concern:

Be it known that I, BENTON ELMORE, a citizen of the United States, residing at Biggs, Butte county, State of California, have invented an Improvement in Balance-Pumps; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a pump apparatus in which the body of the water to be raised is divided in such a manner that the weights upon each side approximately balance each other; and it consists in certain details of construction which will be more fully explained by reference to the accompanying drawing, in which the figure is a sectional view of a pump embodying my invention.

The pump consists of two sections A and B, one of which, A, is fitted with a suitable packing and adapted to slide within the section B. Both these sections are hollow, the section A having at its upper end a semicircular elbow C and the section B having in its lower end a semicircular elbow D. The elbow C is connected with a suction pipe E which extends downward into the water which is to be raised. In the pipe E, at any suitable or desired point, is fixed an upwardly opening check valve F, which prevents any water above the valve from again returning downward. The bent elbow D of the section B is connected with a pipe G which extends upward to the point of delivery. Within the pipe G is fixed a check valve H which also prevents any return of water downward within this pipe. At the upper end of the pipe G is a discharge pipe I and an air chamber J to equalize the flow of water. From the top of the elbow C extends a small air pipe K having within it a check valve L, and this allows any accumulation of air in the top of the elbow C to escape through the small pipe K. This pipe also slides freely through a fixed collar, and thus serves as a guide to the pump section in its movements.

M is a lever fulcrumed as shown at N, midway between the vertical lines of the pipes G and E, and one side of this lever is connected by means of a rod O with the elbow D, or other suitable part, so that when the lever is moved, the section B of the pump will be reciprocated. The other side of the lever is similarly connected by a rod P with the elbow C, or other suitable point, so that the reciprocation of this side of the lever will cause the section A of the pump to be reciprocated, and in the opposite direction to the first section. The section P carries with it the pipe G, and the section A carries with it the pipe E. These pipes and movable parts pass through guides Q fixed at suitable points to insure steadiness in their vertical movements.

The operation of the pump will then be as follows:—When the right end of the lever M is depressed, the pipe E and the section A are forced downward, and the left end of the lever and the section B are moved upward. The apparatus being full of water, the valve F will be closed, and the water which is contained in the sections A and B will be forced outward and upward through the valve H and the pipe G by reason of the movement of the parts A and B toward each other, which diminishes the area containing the water, in proportion to the length of the stroke. When the movement of the lever M is reversed and the parts A and B are drawn apart, the vacuum produced will close the valve H, and will open the inlet valve F, thus drawing into the pipe E a body of water sufficient to fill the space caused by the separation of the pump sections. It will be seen that by this construction the water contained in the inlet pipe E and the outlet pipe G will approximately balance, so that whatever the size and length of these pipes, if they are nearly equal, the amount of power necessary to operate the pump will be only about what is necessary to lift the body of water which is drawn in and discharged at each stroke. The air pipe K is of very small diameter having only sufficient size to allow the escape through the valve L of any air which may accumulate from time to time within the upper bend of the elbow C, and the check valve L within this pipe closes when the section A moves upwardly so as to draw water into the lower end of the pipe E, so that the water cannot return through this pipe. The peculiar form and connection of the two sections of the pump are such that the water is delivered into the top of the pump and a siphonic action is produced when the vacuum is formed by the separation of the two to fill the pump chamber.

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

1. A pump consisting of the sections A B having the semicircular elbows C and D, and the suction and discharge pipes E and G connected therewith, one of said sections fitting and reciprocating within the other and acting as a plunger, check valves in each of the pipes, a lever fulcrumed centrally between the pipes, and connecting rods extending from the lever to each of the pump sections upon opposite sides of the fulcrum point whereby they are simultaneously reciprocated to and from each other, substantially as herein described.

2. A pump consisting of the hollow sections A and B, one of which is fitted to act as a plunger and move within the other, semicircular elbows at the top and bottom of these sections respectively, suction and discharge pipes connected with these elbows, extending upwardly and downwardly parallel with each other, and having upwardly opening check valves in them, a lever fulcrumed centrally, and connected with the suction and discharge pipes by connecting rods whereby said pipes and the pump sections are reciprocated in opposite directions, and a supplemental air discharge pipe opening from the top of the upper elbow having a check valve therein, substantially as herein described.

3. A pump consisting of the sections A and B reciprocating one within the other and having the semicircular elbows C and D at the upper and lower ends respectively of the sections, suction and discharge pipes connected with these elbows and containing upwardly opening check valves, a centrally fulcrumed lever connected upon opposite sides of its fulcrum point with the two sections whereby they are caused to reciprocate in opposite directions, an air escape pipe with an upwardly opening check valve connected with the top of the upper elbow, guide collars through which this pipe and the suction and discharge pipes reciprocate in parallel lines substantially as herein described.

In witness whereof I have hereunto set my hand.

BENTON ELMORE.

Witnesses:
S. H. NOURSE,
J. A. BAYLESS.