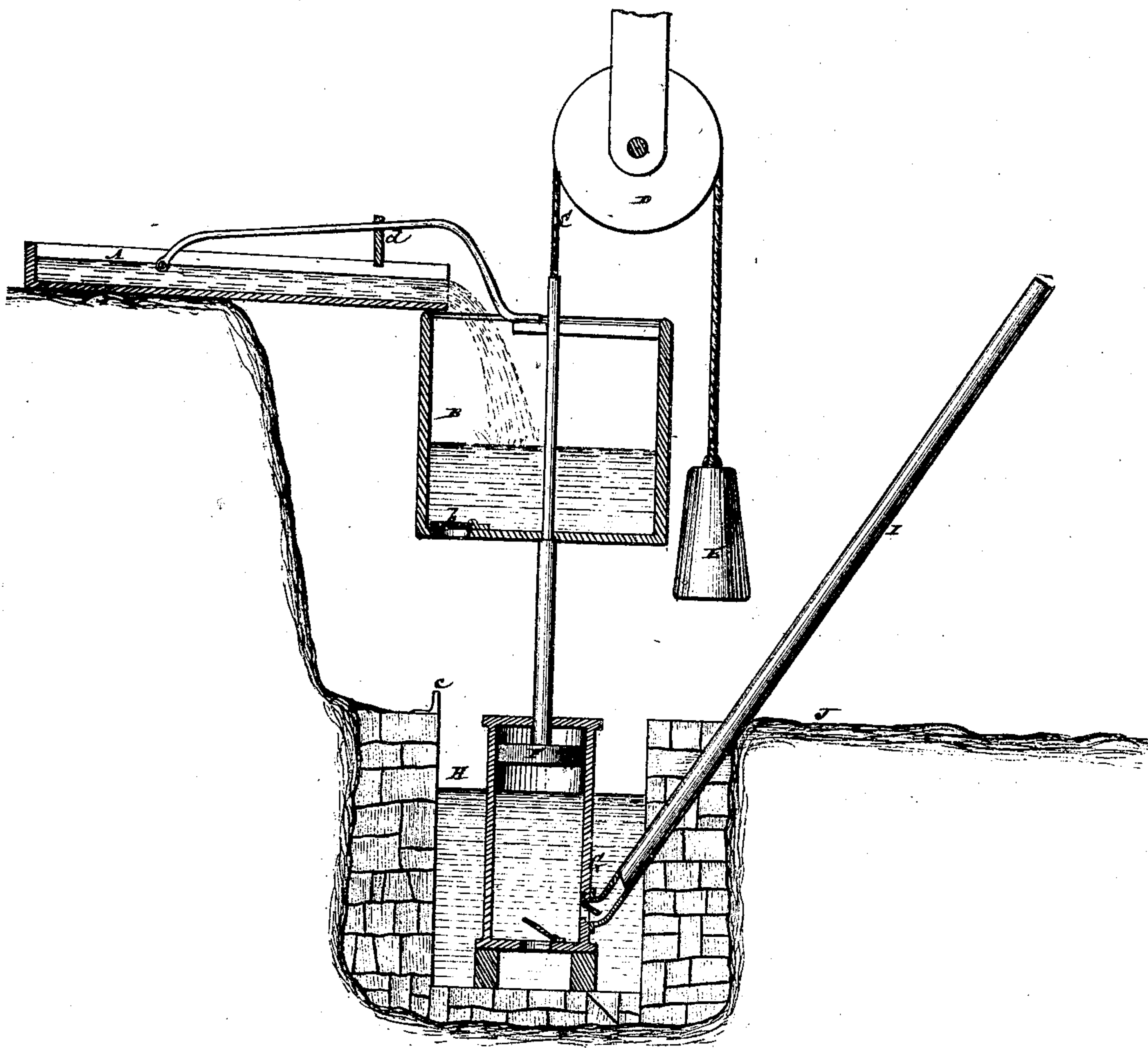


G. H. Herring,
Hydraulic Apps.
No. 111,536. *Patented Feb. 7. 1871.*



Witnesses:
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GEORGE H. HERRING, OF DURAND, ILLINOIS.

Letters Patent No. 111,536, dated February 7, 1871.

IMPROVEMENT IN HYDRAULIC APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, GEORGE H. HERRING, of Durand, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Apparatus for lifting or Forcing Water and other Fluids, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and which represents a sectional elevation of an apparatus constructed in accordance with my invention.

My invention, which I designate a self-acting force-pump, is mainly designed for forcing water in large or small quantities to an altitude above the level of a running stream or fall by the power of the latter as derived from the weight of the water in an accumulative manner, by causing the stream to supply a tank capable of rising and falling under the control of a counter-balance, and so that the tank after it has received a certain load or charge of water overcomes the counter-balance and descends and automatically discharges itself into a well or chamber that has arranged within or connected with it a force-pump, the plunger of which is operated by the tank, said pump drawing the water from the well into its barrel and discharging it therefrom alternately by or during the movement of the tank, as the latter is controlled in its down-stroke by the weight of the water within it, and in its up-stroke after having discharged its contents by the action of the counter-balance.

Referring to the accompanying drawing—

A represents a running stream or trough receiving water from a head or fall, the height or depth of which may be varied, or the supply may be obtained from a spring.

B is the power-tank or receiver, into which the water from the trough A enters.

This tank is suspended by a rope or chain, C, arranged to pass over a pulley, D, and having attached to its opposite end a counter-balance, E, which is of sufficient weight to elevate the tank, when empty, and with it the plunger F or working mechanism of the pump G.

Said tank is fitted with a valve, *b*, opening inward, or that is kept closed while the tank is receiving water, and which is only required to be opened toward the close of the down-stroke of the tank.

H is a well, in which the plunger G is placed, and

I, the discharge-pipe from the pump, leading to any desired height or distance.

J is an overflow for surplus water from the well.

Water accumulating from the stream in the receiver B causes the latter to descend, and with it the plunger F, so as to force out the water from the pump-barrel up to the discharge-pipe I.

As the tank and plunger, however, approach the end of their down-stroke, the valve *b* comes in contact with a stop or lifter, *c*, which opens said valve

and allows the water to run out of the tank B into the well H, from which the pump draws its supply during each up-stroke of the plunger.

The up-stroke of the tank and plunger is produced by the action of the counter-balance E after the tank has discharged its load, as described; and after the commencement of the down-stroke of the tank, until toward the close of its up-stroke again, water is cut off from entering the tank by means of a gate, *d*, which is lifted or opened by the tank toward the close of the top stroke of the latter, and remains open till the tank is sufficiently loaded to begin its succeeding down-stroke.

In this way is an automatic action kept up without the aid of wheels or complicated gearing, and a portion of the water furnished by the stream may be forced to any desired height above the level of the stream, this result, too, being irrespective of the head or fall, variation in which will only affect the velocity at which the apparatus works or quantity of water delivered in a given time.

The pulley D it is preferred to make of such a shape that the tank will descend with an accelerated motion, so as to insure its descent and opening of the valve *b*, and said accelerated motion afterward made available, through the operation of the counter-balance, to carry up the tank with sufficient force to open the gate *d* for a fresh supply to the receiver or tank.

In cases where a high head of water is available, then instead of the pump-plunger being connected in a direct manner by rod with the power-tank, the connection may be made through the intervention of a lever.

Likewise, if desired, two pumps may be used with a power-tank to each, and a beam or lever connecting them, so that they act in common, and alternately in reverse directions, and operate each as a counter-balance to the other, thereby dispensing with a separate counter-balance or weight.

What is here claimed, and desired to be secured by Letters Patent, is—

1. A pump, the piston of which is operated in its down-stroke by the weight of water in a tank connected or supported on the piston-rod, said tank being provided with a valve so arranged as to be opened by coming in contact with a projection, *c*, to cause said tank to discharge its contents into a well or reservoir, in combination with a counter-balance, by which said piston is raised when the contents of the tank are discharged.

2. Combination and arrangement of the tank B, provided with a valve, *b*, the pump G, and its piston F, cord or chain C, pulley D, counter-balance E, and flume-gate *d*, for operation as herein described.

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Witnesses:

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