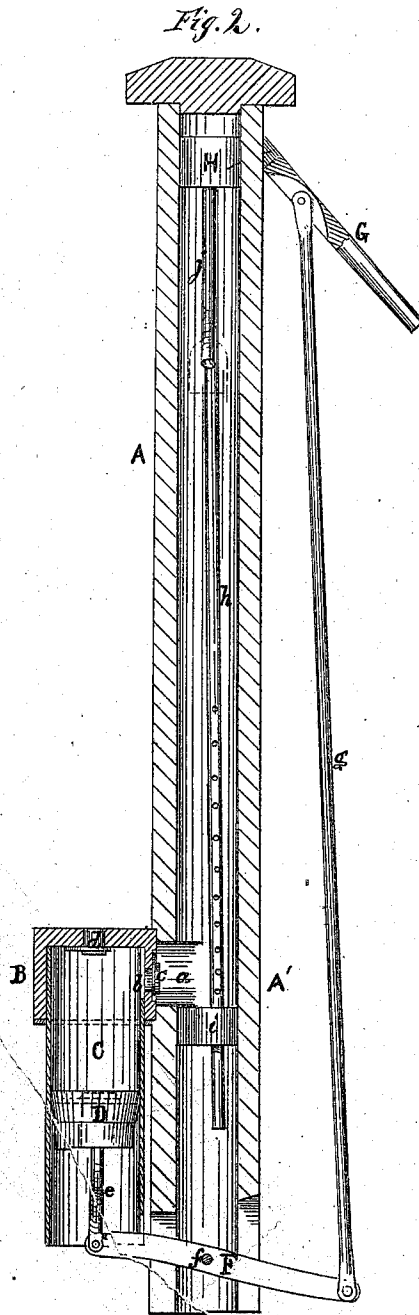
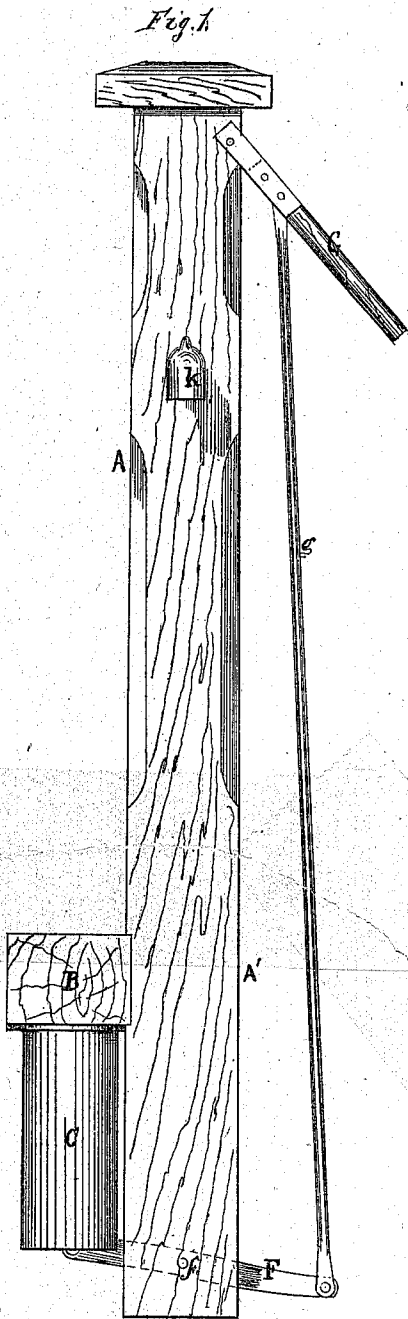


J. I. HURLBUTT.
PUMP.

No. 105,337.

Patented July 12, 1870.



Witnesses:
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Inventor.
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Att'y.

United States Patent Office.

JAMES I. HURLBUTT, OF NORWALK, OHIO.

Letters Patent No. 105,337, dated July 12, 1870.

IMPROVEMENT IN PUMPS.

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, JAMES I. HURLBUTT, of Norwalk, in the county of Huron and State of Ohio, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description thereof, sufficient to enable those skilled in the art to which my invention appertains to fully understand and to make and use the same, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 is a side elevation, and

Figure 2, a vertical central section of my improved pump.

This invention embodies an improvement in the construction and arrangement of the chest and cylinder in which the plunger works, and of the lever whereby said plunger is operated.

It also comprises the employment of a perforated tube, and an air-chamber within the pump-stock, whereby pressure is exerted on the elevated water, causing a steady and uninterrupted flow, the air being allowed to escape without breaking the stream, as will be hereinafter more fully described.

In the accompanying drawing, wherein similar letters of reference indicate like parts in the two figures—

A A' may represent the whole length of the pump-stock, the lower part A', with the chest B, being submerged in the water at the bottom of the well, while the upper part A is situated above ground.

The chest B is secured to the outside of the stock A', and communicates with the interior thereof by way of the opening a.

The orifice b, in the side of the chest at this point, is covered by a valve, c.

d represents the valve and opening in the chest, through which, when the latter is submerged, water is drawn into the chest by the action of the plunger D in the cylinder or barrel C, which communicates with the chest, as clearly shown in fig. 2.

The plunger D is provided with a yoke, e, to which is pivoted one end of the lever F.

This lever works on an axis or fulcrum, f, and moves in slots in the pump-stock and barrel, as shown.

The outer end of lever F is connected by one or more rods, g, with the pump-handle or hand operating lever G, situated at a convenient height above ground.

H represents an air-chamber situated within the pump-stock near its top, and communicating with a perforated tube, h, which extends down the inside of the pump-stock and through a plug, i, fitted therein at the lower side of the opening a, below which it opens.

j is another tube communicating with the air-chamber H, and bent or curved so that its lower end opens into the delivery-spout k of the pump.

The operation is as follows:

The upward motion of the operating-lever causes the descent of the plunger, whereby (the chest being entirely submerged) water is drawn in at the opening d and fills the barrel.

When the plunger ascends, it forces the water from the barrel into the pump-stock, from which it is discharged in a continuous stream at the spout k.

This continuous flow is the result of the employment of the air-chamber and tubes, as will be now described.

Were an air-chamber and tubes not employed, the bubbles formed by the action of the plunger in forcing water from the cylinder into the pump-stock, and gathering in the center of the column of water, would rise with the latter to the spout; and, the column breaking at this point, a portion of the bubbles would follow the water out at the spout, while the remainder would rise with that part of the column which ascends to the top of the pump, and return in bubbles to and out at the spout, causing a break in the stream of water.

When the air-chamber and tubes are employed, the air contained in the column of water in the stock finds its way into the long tube through the holes therein, and is forced up into the air-chamber (whence a portion of it escapes through the short bent pipe without breaking the stream) by the water, which, at the downward stroke of the handle, fills not only the pump-stock, but also the long tube and the air-chamber, up to a certain point, according to the pressure of air in the chamber.

As the handle is raised, the air in the chamber exerts a pressure on the water in the vertical tube, and forces it therefrom through the perforations, and the valves being closed, the water is made to run out at the spout.

The short bent tube being made smaller in diameter than the main tube, there always remains sufficient air in the chamber to force the air down in the tube and out at the holes therein, as just stated.

As the pressure of air on the water in the tube is naturally greater than on that in the well, the pressure is equalized by allowing the excess to escape from the tube by having the latter pass through a plug and left open below, as described, whereas, if the tube were closed at its lower end, there would be such a pressure of air on the valve as to cause the handle to fly back with a sudden jerk.

My pump has been fully tested with the air-chamber and tubes, and it is found that it will raise a given quantity of water with a saving of at least twenty per cent of the power which would be necessary with-

out the appliances mentioned, and with a continuous flow.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the air-chamber, perforated tube *h*, and tube *j*, arranged and operating substantially as described.

2. The improved pump herein described, having its essential features, viz., the submerged chest B, cylin-

der C, plunger D, and lever F, the air-chamber H, and tubes *j h*, and the hand-lever and connecting-rod G *g*, all constructed and arranged substantially as described, with the stock A A', and operating as set forth.

JAMES I. HURLBUTT.

Witnesses:

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