C. H. DUWELIUS & H. CRIVEL.

Pump.

No. 204,958. Patented June 18, 1878.

Fig. 1.

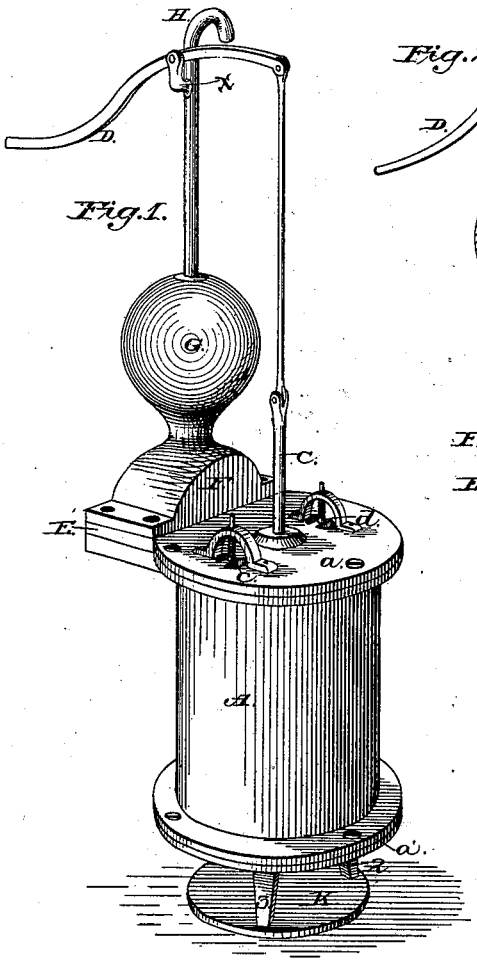


Fig. 2.

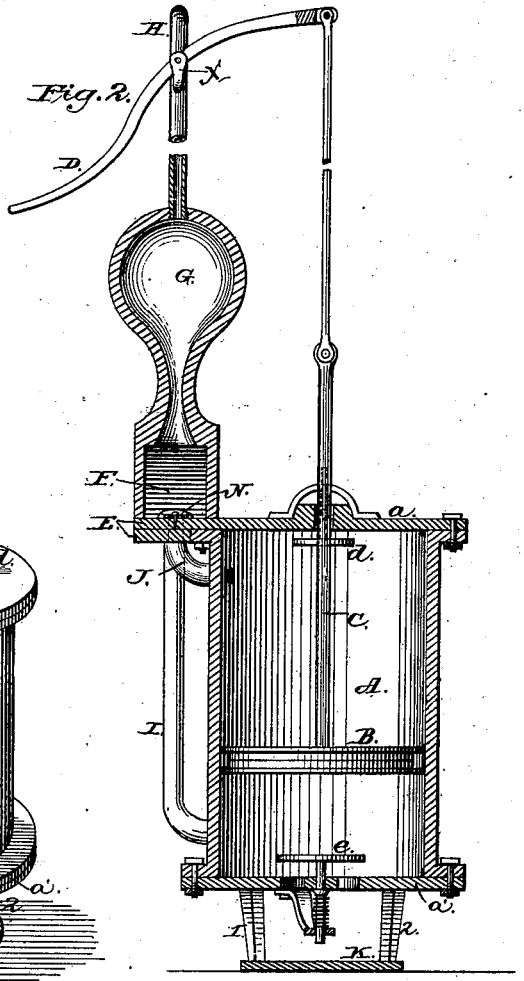
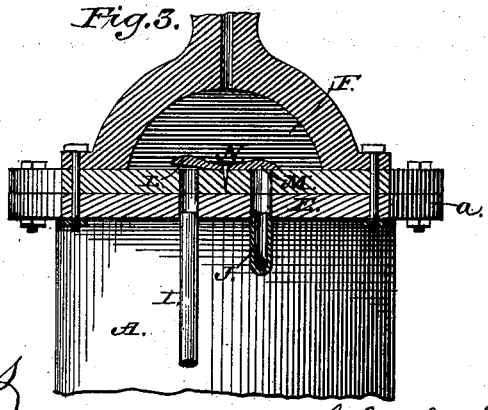


Fig. 3.



Attest:

W. J. Dennis

Charles Crivel

Inventors:

Charles H. Duwelius

Henry Crivel

UNITED STATES PATENT OFFICE

CHARLES H. DUWELIUS AND HENRY CRIVEL, OF RICHMOND, INDIANA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **204,958**, dated June 18, 1878; application filed October 1, 1877.

To all whom it may concern:

Be it known that we, CHARLES H. DUWELIUS and HENRY CRIVEL, of Richmond, Wayne county, Indiana, have invented certain new and useful Improvements in Pumps; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the drawings which accompany this specification and form a part of the same, and to the letters of reference marked thereon.

Figure 1 is a perspective view of the pump in form. Fig. 2 is a vertical sectional view across the center of the cylinder. Fig. 3 is a sectional view, showing the pipes entering into water-chamber, and the manner of securing said water-chamber to the projection on the main cylinder.

To enable those skilled in the art to make and use our said invention, we will proceed to describe the same.

In Fig. 1, A is a cylinder, of any required size, properly bored out to admit of the working of a piston-head, B, Fig. 2, which is attached to and operated by a piston-rod, C, connected with an ordinary pump-handle, D, or other suitable device. The cylinder A is provided with close-fitting heads *a a'*, through the upper one of which, *a*, the piston-rod works in a stuffing-box of ordinary construction.

The upper end of the cylinder A is made extending out from the perpendicular surface in the form of a lug, E, which serves to support the water-chamber F and the air-chamber G, also the delivery-pipe H and supply-pipes I and J, the pipe I conducting the water from the bottom of the cylinder A to the water-chamber F, and the pipe J conducting the water from the upper part of the cylinder to the water-chamber. The orifices of these pipes, where they enter the water-chamber, are provided with valves formed on the ends of a single piece of metal, so shaped that when it is vibrated on its center bearing the openings of the pipes I and J are alternately opened and closed by the pressure of the water.

The upper cylinder-head *a* is provided with two or more valves, composed of circular pieces having flat surfaces, fitting the inner surface of the cylinder-head, and provided with stems working in guides, as shown at C *d*, Fig. 1. The valve-stems are provided with spiral springs, the action of which serves to restore the valves to their proper positions. The lower cylinder-head *a'* has a valve, *e*, of similar construction, for the admission of water into the cylinder from the bottom.

The delivery-pipe H may be curved at the upper end so as to form a spout, and is provided with a curved lug, as a bearing for the pump-handle D. 1 2 3 are legs, which are secured to a circular bottom piece, K, serving as a base or foundation for the support of the cylinder A.

The operation of our pump is as follows: The cylinder A is submerged in water and filled, the piston is forced downward, the valve *e* is closed, and the water forced up through the supply-pipe I into the water-chamber F, opening the vibrating valve L at the orifice of the pipe I, and closing the corresponding valve M at the orifice of the short supply-pipe J, and thus forcing the water up through the delivery-pipe H. During this operation the upper portion of the cylinder has been filled through the valves *c d*, and as the piston is raised the piston-head exerts an upward pressure, closing the valves *c d*, and forcing the water through the supply-pipe J, opening into the water-chamber F. The vibrating valve M is opened at the orifice of the pipe J, while the corresponding valve L is closed, and thus the water in the upper portion of the cylinder is delivered into the water-chamber F and to the delivery-pipe H. During this operation the lower portion of the cylinder has again been filled through the valve *e*, and the successive strokes of the piston produce a continuous stream through the discharge-pipe H, with a velocity proportioned to the speed and power given to the piston.

When the pump is at rest, the springs on the valve-stems release the valves from their seats in a measure sufficient to allow the water, by its gravity, to return from the discharge or delivery pipes to the cylinder A, thus leaving the pipes all empty, and obviating any danger from freezing.

In this arrangement it will be seen that no wood is required, and no water stands in the pipes.

The valves L and M are a part of each end of an angular or knee-shaped lever, which has a rocking motion, its fulcrum being its center. This angular or knee-shaped lever N is the operating agent in opening and closing the valves L and M.

It will be observed that we form our air and water chambers, which rest or find support in the lug E, extended from the flange of the cylinder A, of a single piece or cast of metal, which gives to this feature of our pump a neat and cheap construction, which precludes the necessity for packing, excepting in the one joint at the base.

Being aware that pumps have been constructed with pipes connecting the main cylinder with the water-chamber on either side of the piston, we make no claim to this feature, broadly.

We are also aware that the double rocking valve L M is old, and do not claim this.

Having thus fully described our said improvement, what we claim as new, and desire to secure by Letters Patent, is—

In a double-acting pump, the independent tubes J and I, above and below the piston B, in combination with cylinder A and water-chamber F on the extension E, as and for the purpose set forth.

CHARLES H. DUWELIUS.
HENRY CRIVEL.

Witnesses:
W. T. DENNIS,
CHARLES LEROI.