J, H. DUCK.

Pump for Deep Wells.

No. 168,462. Patented Oct. 5, 1875.

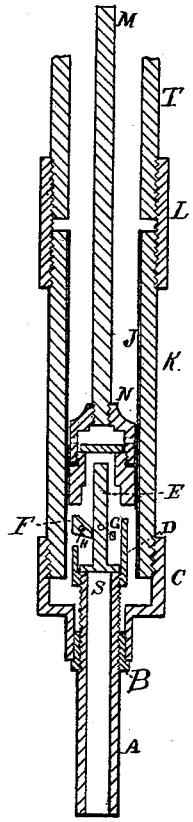

Fig. 1.

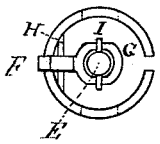

Fig. 2.

Witnesses:
G. L. Chapin.
O. H. Adix.

Inventor:
John H. Duck.

UNITED STATES PATENT OFFICE.

JOHN H. DUCK, OF ELGIN, ILLINOIS.

IMPROVEMENT IN PUMPS FOR DEEP WELLS.

Specification forming part of Letters Patent No. **168,462**, dated October 5, 1875; application filed June 4, 1875.

To all whom it may concern:

Be it known that I, JOHN H. DUCK, of Elgin, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Pumps for Deep-Well Tubing, of which the following is a specification:

This invention relates to an improvement in pumps for deep wells, and more especially for wells formed by placing tubes in the earth.

The nature of the present invention consists in a reduced pipe extended through a reducing-coupling and into the main pipe, in combination with a valve-cylinder attached to the reduced pipe, and with a valve whose stem extends above the cylinder, and a trip-lever pivoted to the cylinder, whereby water may be elevated in the usual manner, and the contents of the pipe be returned downward to clean the valves and open a water-course by bringing the handle of the pump up, so that the suction-valve will be opened by the stem of the check-valve, and the latter be opened by the case of the suction-valve coming in contact with said trip-lever. This pump is designed for deep wells, and more especially for drive-wells, in which the valves are to be placed in position after the main pipe has been driven and the screens affixed thereto; hence the importance of the peculiar construction of the parts. Water-courses fill by a continuous flow of water toward the screens, and I have discovered that by allowing the entire column of water in the main pipe to return downward into the water-veins the latter will be opened.

I know that devices have been used to empty surface-pumps to prevent frost. I therefore do not claim the return of water down through pipes, irrespective of the means employed.

In the drawings, Figure 1 is a vertical central section of my improvement as attached to a tube-well. Fig. 2 is an enlarged top view of the valve-cylinder, valve, and trip-lever.

A represents an induction-pipe of a tube-well, which is coupled to a pipe, K, by a thimble, C and B. To the top end of this pipe is attached, by a screw-thread, a valve-cylinder, D, which is smaller than the tube K, as shown at Fig. 1. A valve, S, with stem E, is fitted to work in this cylinder; and to provide means for opening the valve by the piston N a lever, F, is pivoted to the cylinder D at H, and is provided with a loop, G, through which the stem passes. A pin, I, being put through the stem E above the loop, holds the latter in place. (See Fig. 2.) Any other suitable fastening, however, may be substituted for the pin. The lever F projects over the cylinder D far enough to be carried down by the piston N, when necessary to open the valve S, and allow the water to pass down and clean the valve of any sand or foul substance there may have lodged thereon, and to clear the water-courses. To accomplish this the valve N must be brought down farther than when pumping water, so that the case of the suction-valve will come in contact with the trip-lever F, and the stem E will come in contact with the suction-valve and open both valves, and permit water, by its gravity, to flow back into the water-courses.

My pump differs from the pump patented to Ashur Burr, May 1, 1866, inasmuch as he has no valve-cylinder or trip-lever combined with the valve-stem by a loop, and pivoted to the valve-cylinder; nor has he a reduced pipe or a reducing-coupling. It also differs from the patent for pumps granted to August Richard, February 7, 1860, in that I have a valve-cylinder inclosing the periphery of the check-valve, and a valve-stem running through a looped trip-lever, whereby the valve is brought back, after each upward flow of water, flat upon its seat. Richard has not this construction, nor a reducing-coupling, the combinations being different in principle and mode of operation.

To form a perfect piston-cylinder the tube K, or any suitable section thereof, is lined with brass or other non-corrosive metal, J, and secured there by solder or otherwise, so that the piston will operate smoothly, and so that it can be readily removed through the pipe T.

The operation of my improved pump is similar to that of other pumps as regards the movement of the piston N, a lever being attached to the top end of the rod M to give a fourteen or sixteen inch stroke when a two-inch tube, K, is employed.

To operate the trip-valve F G the piston N must be lowered farther than is done by the ordinary stroke. This is accomplished by

giving the operating-lever a steep incline on the down-stroke of the piston.

I claim as new—

In combination, the cylinder D and valve S, with its stem E projecting upward through a loop in the trip-lever G, pivoted to said cylinder, whereby the lever acts as a guide for said stem, and the cylinder forms a guide for the valve S, as shown and described.

JOHN H. DUCK.

Witnesses:
O. H. ADIX,
G. L. CHOPIN.