

(No Model.)

E. R. HANNA & H. M. HOUSEHOLDER.
PUMP.

No. 557,812.

Patented Apr. 7, 1896.



Witnesses
Charles Ford
[Signature]

Inventors

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UNITED STATES PATENT OFFICE.

ERNEST R. HANNA AND HARLEY M. HOUSEHOLDER, OF CONCORDIA,
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PUMP.

SPECIFICATION forming part of Letters Patent No. 557,812, dated April 7, 1896.

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To all whom it may concern:

Be it known that we, ERNEST R. HANNA and HARLEY M. HOUSEHOLDER, citizens of the United States, residing at Concordia, in the county of Cloud and State of Kansas, have invented a new and useful Pump, of which the following is a specification.

Our invention relates to pumps of the class in which the water is acted upon by air under pressure; and the objects in view are to provide a simple, inexpensive, and efficient construction and combination of parts whereby worn or otherwise inoperative valves may be replaced without dismounting or lifting the pump, and, furthermore, to provide simple and improved means for regulating the air-inlet opening of the cylinder to control the amount of air admitted.

Further objects and advantages of the invention will appear in the following description, and the novel features of construction will be particularly pointed out in the appended claim.

In the drawings, Figure 1 is a vertical section, partly in elevation, of a pump constructed in accordance with our invention. Fig. 2 is a detail vertical section of a portion of the cylinder, on the line 2 2 of Fig. 1, to show the construction of the means for controlling the admission of air to the cylinder.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a receptacle consisting of a foot-casting provided with an inlet-chamber 2 and a main chamber 3, the latter communicating at its upper end with a pipe or conductor 4, which communicates with the interior of the pump-stock casting 5, having a spout 6. Located in the main chamber 3 is a valve-seat 7, the opening of which is less in diameter than the pipe or conductor 4, and arranged upon said seat is a ball or spherical valve 8, which is preferably of rubber and is smaller in diameter than the bore of the pipe or conductor 4, whereby when said valve becomes worn or inoperative it may be removed through the pipe and through the pump-stock and replaced by a new valve. In order to facilitate this removal and replacement, an opening 9 is formed in the top of the pump-

stock and is fitted with a plug 10, the removal of a valve being accomplished by means of a spear inserted through the pump-stock and the pipe.

The passage 11, which communicates with the opening in the valve-seat 7, extends vertically downward through the casting and then laterally to communicate with the inlet-chamber 2, said inlet-chamber being provided in its bottom with a water-inlet opening 12, above which is arranged a valve-seat 13, surmounted by a valve 14, this valve also being preferably of rubber and being of smaller diameter than the bore of the air-tube 15, which communicates at one end with the top of the inlet-chamber and at the other end with the cylinder 16. In said cylinder operates a plunger 17, having a stem 18, which projects through a suitable guide-opening in the top of the cylinder and is connected to an operating-handle 18. Said operating handle or lever is fulcrumed upon a swinging link 19, supported by a frame 20, which rises from the pump-stock. A cap 21 of the cylinder is removable to allow communication with the interior thereof, and as the valve which is seated in the inlet-chamber is of less diameter than the bore of the air-tube 15 said valve may be replaced upon the removal of the cylinder-cap in a manner similar to that described in connection with the valve which is seated in the main chamber of the receptacle 1.

The air necessary for operating upon the water admitted through the inlet-opening to the inlet-chamber is supplied to the cylinder through an air-inlet opening 22, formed in the lower end of the cylinder and provided with an inwardly-opening valve 23, which is adapted to close to prevent the air from being exhausted through said inlet-opening, and arranged in operative relation with the inlet-opening to control the amount of air admitted is a slide 24, fitted in guides 25 and adapted to partly close the opening when the amount of air admitted is greater than necessary to secure the proper operation of the pump.

A feature of considerable importance to be noted is the manner in which the pump is constructed, it being noted that the same essentially comprises two castings and two

pipes connecting these castings. The foot-casting 1 has already been particularly referred to, but at this point attention is directed to the formation of the pump-stock casting 5. By referring to the drawings it will be noted that the pump-stock casting 5 is provided with a vertical discharge-passage 5^a, closed at the top by the plug 10, having fitted into its lower end the upper end of the pipe 4 and communicating with the discharge-spout 6 of the pump. In addition to being provided with the vertical discharge-passage 5^a, the pump-stock casting 5 is also formed directly at one side of said vertical passage 5^a with an integral hollow cylindrical portion hereinbefore designated as the cylinder 16, with which coöperates the plunger 17 and the air-regulating slide 24 already described.

By reason of the construction emphasized it will be obvious that the pump is constructed of as few parts as possible, while at the same time providing for the best possible arrangement and disposition of the pump-stock and the cylinder 16 to insure a convenient operation of the pump with the least possible degree of friction.

This being the construction of the apparatus, it will be seen that in operation the water flows into the inlet-chamber through the water-inlet opening, and therefore when the plunger is forced downward the air which has previously been admitted to the cylinder forces the water in the inlet-chamber through the lateral passage into the main chamber beyond the valve 7, which prevents it from returning. If bubbles appear at the top of the water, it is an indication that too much air is admitted to the cylinder and that the slide should be arranged to reduce the size of the air-inlet opening.

The deeper the well in which the improved pump is employed the smaller in proportion will be the air-tube, and in such case the lower ball will be made smaller than the upper

ball, and, inasmuch as the conductor 11 will be of increased size, the upper ball will be made larger to prevent it from passing through the conductor.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is—

In a pump of the class described, the combination with a foot-casting having separate communicating valved main and inlet chambers 3 and 2 respectively; of a pump-stock casting arranged in vertical alinement with and above the foot-casting and provided with a vertical discharge-passage, and at one side of said vertical discharge-passage with an integral cylinder portion, said cylinder portion being provided in its lower end with a separate air-inlet opening, a slide adjustably fitted to the pump-stock casting over the lower end of said air-inlet opening, a plunger arranged to reciprocate within the cylinder portion of the pump-stock casting, an air-tube communicating at its lower end with the inlet-chamber of the foot-casting and fitted at its upper end in the lower end of said cylinder at one side of said air-inlet opening, and a water-discharge pipe communicating at its lower end with the main chamber of the foot-casting and fitted at its upper end in the lower end of the vertical discharge-passage of the pump-stock casting, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

ERNEST R. HANNA.
HARLEY M. HOUSEHOLDER.

Witnesses:
W. H. SAVARY,
JOHN W. SHEAFOR.