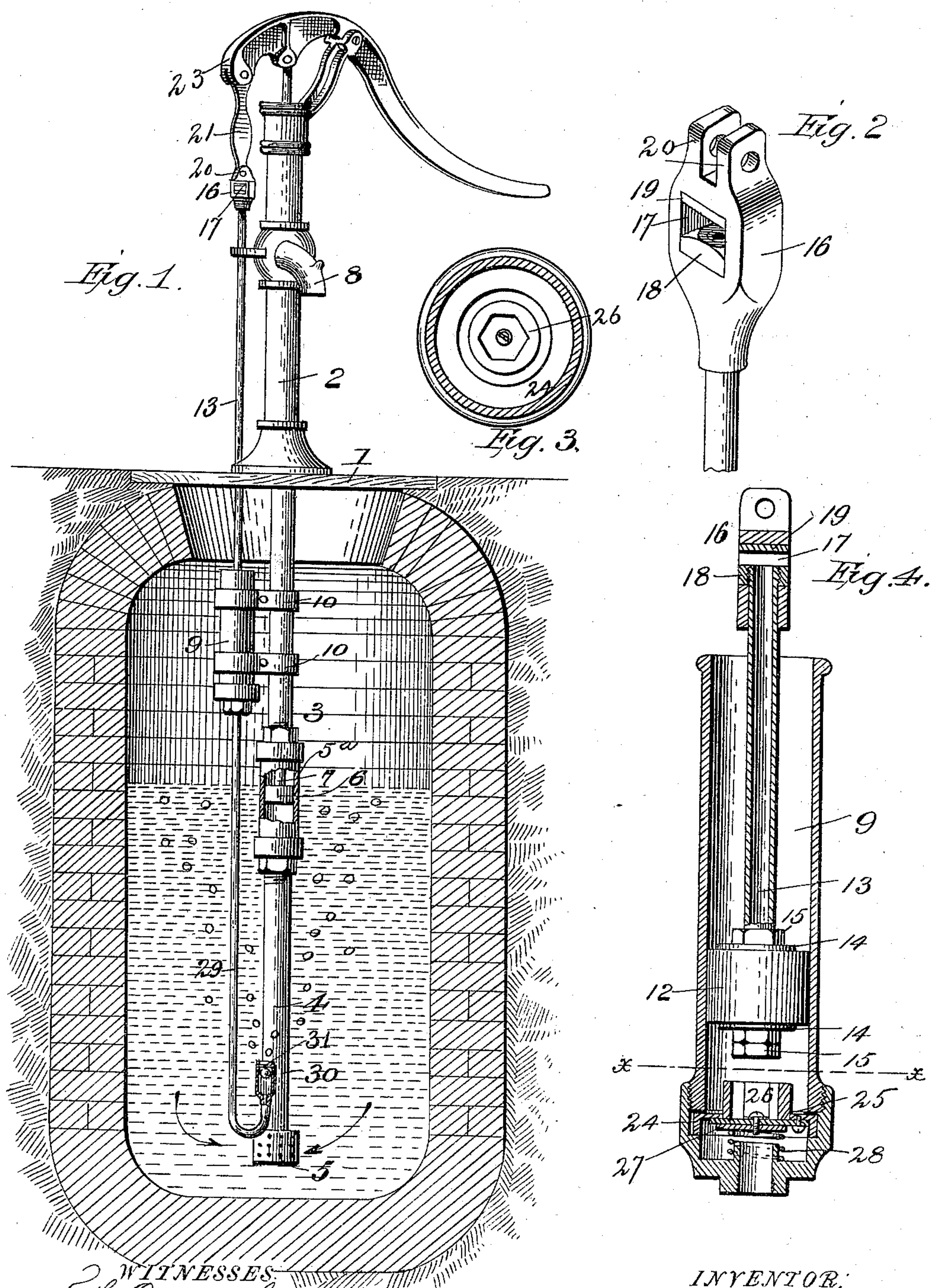


(No Model.)

W. W. NORMAN.  
PURIFYING PUMP.

No. 542,530.

Patented July 9, 1895.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

WILLIAM W. NORMAN, OF ALLENVILLE, MISSOURI.

## PURIFYING-PUMP.

SPECIFICATION forming part of Letters Patent No. 542,530, dated July 9, 1895.

Application filed March 16, 1895. Serial No. 541,983. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM W. NORMAN, a citizen of the United States, and a resident of Allenville, in the county of Cape Girardeau and State of Missouri, have invented certain new and useful Improvements in Purifying-Pumps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in what are known as "purifying-pumps," in which air is forced through the water contained in a well or cistern for the purpose of purifying the same.

The invention is designed more particularly as an improvement upon the pump shown and described in Letters Patent granted to G. W. and J. L. Horn August 2, 1892, No. 480,096; and it consists in the novel features of construction and combination of parts, hereinafter fully described and specifically pointed out in the claim.

In the accompanying drawings, Figure 1 represents a longitudinal sectional view of a pump constructed in accordance with my invention, showing the same as it appears when in use. Fig. 2 is a detail perspective view of the cage. Fig. 3 is a horizontal section on the line  $x x$ , Fig. 4. Fig. 4 is a longitudinal section of the air-cylinder.

In the said drawings, the reference-numeral 1 designates the pump-platform, adapted to close or cover the mouth of a well or cistern, and 2 an ordinary lift-pump supported thereby, provided with a lift-pipe 3 and suction-pipe 4, connected, respectively, with the upper and lower ends of a plunger-chamber 5<sup>a</sup>. The lower end of pipe 4, which extends to near the bottom of the well or cistern, is provided with a perforated cap 5.

The numeral 6 designates the pump-plunger, 7 the pump-rod, and 8 the spout.

The parts so far described form no part of the present invention and may be of any ordinary or suitable construction.

The numeral 9 designates an air-cylinder, preferably of brass, secured to the pipe 3 by means of bands 10, in which works a

plunger or piston 12, consisting of a cylindrical block of india-rubber or other similar material having a central aperture through which passes the lower end of a vertical tube 13, said plunger being confined thereon by washers 14 and nuts 15. The upper end of this tube passes through an aperture in the pump-platform and is connected with a cage 16, consisting of a metal block having an aperture in its lower end, through which the said tube loosely passes. This block is also formed with a rectangular opening 17, in which is located a nut 18 on the end of said tube, and which nut is adapted to strike against a valve 19, of leather or other suitable material, on the downstroke of the plunger and close said tube. At its upper end the block is formed with two legs 20, to which is pivoted an extension 21 of the pump-handle 23. The pump-rod is also connected with this handle.

In the lower part of the air-cylinder is a diaphragm 24, having a central opening and an upwardly-extending boss, having an angular bore corresponding in shape and size with the nuts on the lower end of the tube 13, so that they will fit therein and be held against rotation when it is desired to compress the plunger between the washers, so as to cause the plunger to swell and closely fit in the air-cylinder, as hereinafter described. Located below this diaphragm is a vertically-movable valve 27, consisting of a circular plate or disk which rests on a coiled spring 28, supported by the lower end of the air-cylinder.

Connected with the lower end of the air-cylinder is a pipe 29, which extends to near the bottom of the well or cistern and having its lower end turned upwardly and provided with a spherical or ball valve 30. A rod 31 limits the upward movement of this valve.

The operation will be readily understood. By operating the handle 23 the pump-rod is alternately raised and lowered, so as to raise the water in the ordinary manner. As said handle is depressed, the tube 13 will be elevated by the nut 18 and cage 16 and the upper end of the said tube opened, allowing air to enter the cylinder below the plunger, the coiled spring 28 closing valve 27, and ball-valve 30 closing by gravity. By now elevat-



ing the pump-handle the upper side of nut 18 will strike the valve 19, closing the end of pipe or tube 13 and causing the air to be forced down pipe 29 into and through the body of water contained in the well, valves 27 and 30 being opened by the pressure. By this means the water is purified and rendered fit for drinking and household purposes.

In case the plunger, from wear or other causes, should fit too loosely in the cylinder it can be tightened or expanded against the side thereof, without removing it therefrom, by engaging the nuts on the lower end of tube 13 in the annular opening of the boss 26 and then rotating the said tube, which will cause the plunger to be compressed between the washers and expanded radially.

Having thus described my invention, what I claim is—

In a pump of the character described, the

combination with the air cylinder, the pipe connected therewith having a gravity valve, and the diaphragm located in said cylinder formed with a central boss having an angular bore, of the vertically movable tube provided with a nut at its lower end adapted to engage with said angular bore, the plunger through which said tube passes, and confined between said washers, the cage connected with the pump handle provided with a valve, and the nut on the end of said tube fitting and working in an opening in said cage; substantially as specified.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM W. NORMAN.

Witnesses:

PETER LEHNER,

JAMES F. McLAIN.