

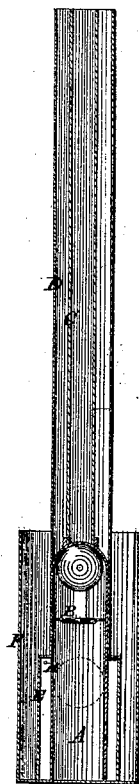
*T. J. Lovegrove*

*Oil Pump*

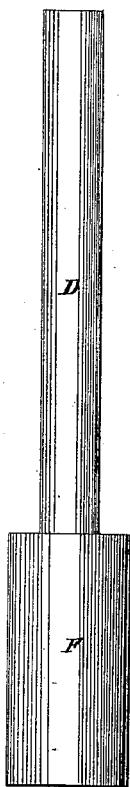
*N<sup>o</sup> 51,602.*

*Patented Dec. 19, 1865.*

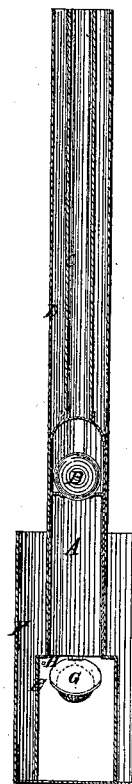
*Fig 2.*



*Fig 1.*



*Fig 3.*



*Witnesses:*

*J. P. Peyton.*  
*J. L. Kuester.*

*Inventor:*

*T. J. Lovegrove*  
*By Nathaniel*  
*Att'y*

# UNITED STATES PATENT OFFICE.

THOMAS J. LOVEGROVE, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN PUMPS FOR DEEP WELLS.

Specification forming part of Letters Patent No. 51,602, dated December 19, 1865.

### *To all whom it may concern:*

Be it known that I, THOMAS J. LOVEGROVE, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Pumps for Artesian Wells; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a view of my pump in elevation. Fig. 2 is a central vertical section with the piston depressed; and Fig. 3 is a central vertical section with the piston elevated.

It sometimes happens in sinking artesian wells that volumes of gas are forced through the tube with a velocity sufficient to raise the valves of ordinary pumps, and thus prevent them from operating to raise the liquid contents of the well, and it is the object of my invention to render the pump effectively operative in artesian wells with however much force the gas may escape; and to this end my invention consists, first, in placing a shield or case, with a closed bottom, upon the working barrel within and at the bottom of the well; second, in placing vertical valves in the sides of the shield; and, third, in perforating the shield with one or more openings to insure the regular working of the valve.

A hollow piston or plunger, A, carrying a suitable valve, B, is vibrated by the pump-rod C, which may be tubular, if desired, with a pipe, D, inserted in the artesian well. At its lower end the pipe D terminates in a shield, E, placed within the cylinder F, which is placed at the bottom of the well, and is of nearly the diameter of its bore. The shield E may be square or round, and has valves on its vertical sides, one of which is shown at G, and a small puncture or opening, H, communicating with the cylinder F, and this cylinder and the shield E are both closed at the bottom by screw-plugs or in any other suitable manner that will form a tight joint to prevent the entrance of gas or liquids into the cylinder or shield through the bottom of either.

When thus constructed and inserted to the bottom of the well the operation of my pump will be effective and in the following manner: The liquid in the well rises above the upper edge of the cylinder and keeps it always full—

or, in other words, the top of the cylinder is below the level of the liquid in the well, which is therefore filled from the top—and when the piston is raised the vertical valve in the sides of the shield is raised or opened, and the liquid flows from the cylinder through the vertical valve into the shield, and when the piston is depressed the vertical valve is closed, and the plunger-valve opens and permits the liquid in the shield to rise above it, to be lifted by the next ascent of the pump-rod, and as all this motion of the liquid begins below the level of its surface it is almost unmixed with gas, for the specific gravity of the liquid being greater than that of the gas the former will sink into the cistern, while the latter will rise and ascend through the well to its top.

To render the working of the vertical valves in the shield with absolute precision, I leave a small opening in the wall of the shield, through which a portion of the liquid returns to the cistern from the shield on the downstroke of the piston, and this always keeps a sufficient pressure on the outside of the valve to secure its opening with certainty on the upstroke of the piston to permit the flow of the liquid from the cistern to the interior of the shield.

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

1. Placing an inclosed shield within the cistern, substantially as and for the purpose set forth.

2. The vertical valves in the cistern, when arranged, substantially as described, to operate in the manner set forth.

3. Puncturing the valved shield substantially in the manner described, for the purpose set forth.

4. The combination of the shield, constructed substantially as described, with the cistern, when both are closed at the bottom, and with the piston and vertical valve, all arranged and operating substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

T. J. LOVEGROVE.

Witnesses:

HENRY BALDWIN, Jr.,

JOS. C. <sup>his</sup> X CLIVE.  
mark.