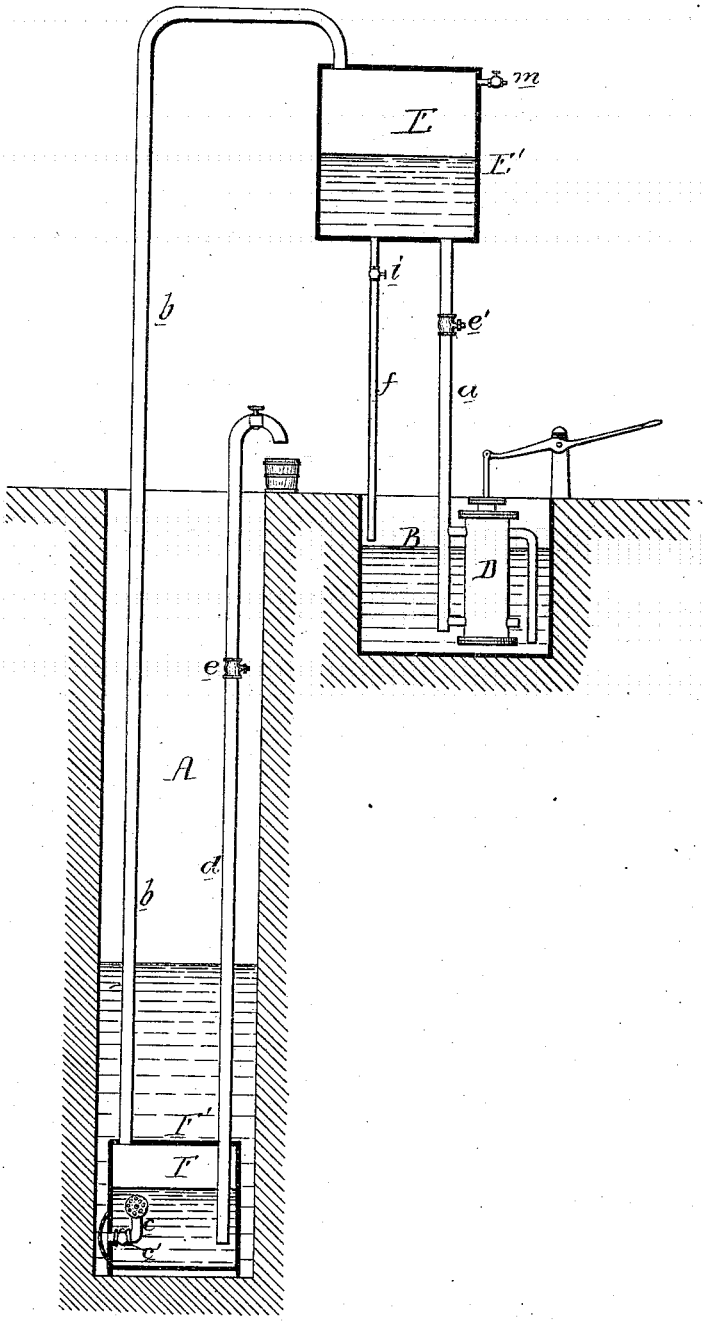
J. E. NALE.

PUMPING APPARATUS FOR WELLS.

No. 193,541. Patented July 24, 1877.



Jesse E. Nale
by his Attorneys
Howson and Son

Witnesses.
Henry Howson Jr.
John K. Rupertus

UNITED STATES PATENT OFFICE.

JESSE E. NALE, OF MOORESTOWN, NEW JERSEY.

IMPROVEMENT IN PUMPING APPARATUS FOR WELLS.

Specification forming part of Letters Patent No. **193,541**, dated July 24, 1877; application filed March 29, 1877.

To all whom it may concern:

Be it known that I, JESSE E. NALE, of Moorestown, Burlington county, New Jersey, have invented a new and useful Improvement in Pumping Apparatus for Wells, of which the following is a specification:

The object of my invention is to construct a pumping apparatus adapted to the raising of water from deep wells or other remote sources of supply, an object which I attain in the following manner, reference being had to the accompanying drawings, the figure in which represents in section my improved pumping apparatus.

A represents a well, near the bottom of which is a casing, F′, inclosing a chamber, F, into which the water in the well can enter through an inlet, *c*, having a valve, *c′*, opening inward. With the top of the chamber F communicates a pipe, *b*, through which air or steam under pressure may be admitted to the said chamber F, and a pipe, *d*, having a check-valve, *e*, opening upward, extends from the lower portion of the chamber to the top of the well.

When the chamber F is filled with water the admission of air or steam under pressure to the same causes this water to rise in the pipe *d* and escape from the top of the same into any suitable receptacle, the escape of water through the inlet-pipe *c* being prevented by the valve *c′*.

Adjacent to the well A is a pit, B, containing water for supplying a pump, D, of any suitable construction, the discharge-pipe *a* of this pump having a check-valve, *e′*, and communicating with the lower portion of a casing, E′, inclosing a chamber, E, the upper portion of which communicates with the pipe *b*. A pipe, *f*, having a stop-valve, *i*, extends from the chamber E to the pit B, and the upper portion of said chamber is furnished with a cock, *m*.

The operation of the device is as follows: Suppose the chamber F to be filled with water, and the chamber E with air, the valve *i* and cock *m* being closed. The operation of the pump D causes water to enter the chamber E, and, as it rises, to compress the air in the upper portion of the same. Through the medium of the pipe *b* this pressure is exerted upon the water in the chamber F with the result before described. This operation is continued until the chamber E becomes filled with water, when the working of the pump is discontinued, and the valve *i* and cock *m* opened. Air is thus allowed to enter the upper portion of the chamber E, and the water passes from the same through the pipe *f* into the pit B. When the chamber E is empty the valve *i* and cock *m* are closed, and the apparatus is again in working order.

By the use of a pump, D, and a chamber, E, in which the water from the said pump D acts as a piston to compress the air which serves to force the water from the well, I am enabled to dispense with that accurate fitting of pump piston and valves which would be required if the pump were applied directly to the well.

I claim as my invention—

The combination of the pump D, compression-chamber E, and chamber F, with the connecting-pipes *a* and *b*, and discharge-pipe *d*, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JESSE E. NALE.

Witnesses:

HERMANN MOESSNER,

HARRY SMITH.