

J. Evens,
Pump Cylinder.

N^o 1615.

Patented May 25, 1840.

Fig:1.

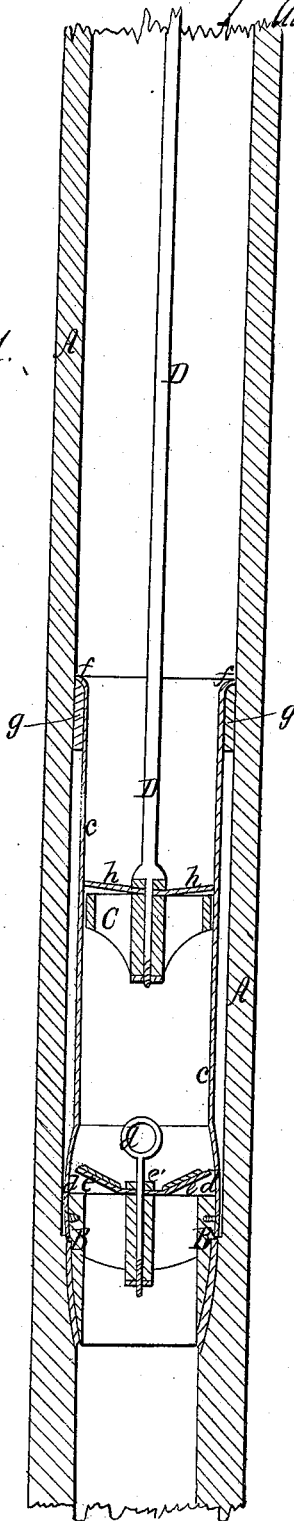
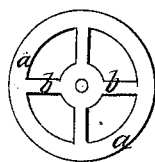


Fig. 2.



UNITED STATES PATENT OFFICE.

JOSEPH EVENS, OF LEBANON, OHIO.

PUMP.

Specification of Letters Patent No. 1,615, dated May 25, 1840.

To all whom it may concern:

Be it known that I, JOSEPH EVENS, of Lebanon, in the county of Warren and State of Ohio, have invented certain new and useful Improvements in the Manner of Constructing Valves or Boxes and Chambers of Pumps for Raising Water, by means of which improvements said pumps are rendered more effective than those in ordinary use; and I do hereby declare that the following is a full and exact description thereof.

Figure 1 in the accompanying drawing represents a vertical section of that part of the stock or body of the pump which contains the chamber and the upper and lower boxes or valves.

The stock A, A, is bored out in the ordinary manner, its diameter above the seat of the lower box being about one fourth of an inch greater than the largest part of said box to admit of its being easily pressed down to or raised from its seat. The diameter of the bore is then lessened, and it is so formed as to adapt it to the reception of said lower box. Both the boxes are made of cast metal in the form of wheels, having a rim, hub and arms, as shown in Fig. 2, which represents the face or upper side thereof.

B, is the lower box occupying its seat. The rim or tube which forms its exterior I ordinarily make about three and a half inches in length, and its diameter within nearly as great as that of the copper chamber, to be presently described. I thus provide for an unobstructed passage of the water through said box. Its rim, on the face of it, seen at *a, a*, Fig. 2, should be about half an inch thick. I make it cylindrical on its outside for the distance of about three fourths of an inch from the top, at which point I lessen its diameter by forming a shoulder of about an eighth of an inch, whence it tapers toward the bottom, so as to reduce its thickness to an eighth of an inch or less. This reduced tapered part is to be surrounded by leather or some other yielding substance, so that when forced down into its seat it shall fit perfectly water tight. The leather is to be attached to the tube by cement or otherwise, so that it may keep in its place when the box is removed; its edges where they meet should be attached together by sewing. The arms *b, b*, Fig. 2, of this box may be $\frac{3}{16}$ of an inch in thickness and an inch and a half in depth, thus giving to it

the strength necessary to its being driven down into or raised from its seat.

The chamber of my pump consists of a copper cylinder or tube *c, c*. The lower end of this tube, as at *d, d*, is enlarged and made to pass over and embrace the upper end of the lower box, as shown in the drawing. It should pass down upon it to the distance of from three fourths of an inch to an inch, fitting it closely, and being firmly attached to it by means of screws, pins, or otherwise. By this arrangement and connection the lower box and the copper chamber will be drawn out together when the box is to be removed. The upper end of the copper chamber is bent outward, so as to form a rim or flanch to fit the bore of the pump, as shown at *f, f*, and this upper end I also surround with a collar or band of leather, *g, g*, forming an elastic bearing between it and the wood and keeping it in place.

The valve of the lower box *e, e*, consists of a circular disk of leather confined down by a strip of metal *e'*, crossing its center and dividing it into two semicircles, which are stiffened on their upper sides by thicknesses of leather, plates of metal, or in any other suitable manner, this part of the structure not differing from the modes in common use. The eye or ring *d*, forms the upper part of a bolt which passes through the hub of the box and is confined thereto by a screw nut at bottom, thus affording the means of readily withdrawing and replacing the box and copper chamber.

The upper box or piston C, is constructed of cast metal in a manner similar to that of the lower box, consisting, like it, of a circular rim, arms, and hub, having a circular disk of strong sole leather on its upper surface to constitute the valve. I make the rim of this box and the arms each three sixteenths of an inch in thickness and about half an inch in depth; the hub seven eighths of an inch in diameter and an inch deep; the hole through it half an inch in diameter. These dimensions may of course be varied, but they are such as I have found to answer well in practice, giving sufficient strength and allowing ample water way. This upper box is about one fourth of an inch less in diameter than the copper tube in which it works. The piston rod or spear D, passes through a hole in the hub and through the center of the leather valve *h, h*, and is secured by a

screw nut at the bottom of the box. A shoulder or flanch is formed on the piston rod and bears upon the center of the valve. This leather valve is made to fit closely to the copper tube and serves the purpose both of a valve and of a piston. It may be strengthened on the upper side, if preferred, but good firm leather will not require this.

The copper tube may be from two inches and a half to four inches and a half in diameter, according to the depth of the well and other circumstances, I make it in general about two feet and a half long, so as to allow of a two foot stroke. In all cases I make the diameter of the bore of the pump less and the stroke longer than in ordinary practice.

By this construction I obtain several advantages over those of the common pump. The ample water way through the lower box gives great relief to the lift; the increased length of the stroke causes fewer openings and closings of the valves and a less frequent arresting of the momentum of the water. The manner of combining the copper tube and lower box gives security in the construction and facility in the repairs, and the manner of forming the upper valve, so as to operate both as a valve and as packing to the piston simplifies and considerably lessens

the friction of that part. With the common pump brake an eighteen inch stroke may readily be obtained in such a pump, and by forming the upper part of the piston rod into a rack and working it with a cog wheel and crank, as has frequently been done in other pumps, a stroke of two feet or more may be made.

Having thus fully described the manner in which I construct my pump and having also set forth some of the advantages derived from such construction, what I claim therein as constituting my invention and design to secure by Letters Patent, is—

1. The manner in which I have combined and constructed the copper tube, forming the chamber of my pump, with the lower box, or valve and seat thereof, as described, and for the purposes set forth.

2. I also claim the manner in which I have constructed the upper box, or valve and seat, as described; that is to say, the causing the leather disk which constitutes the valve not only to operate as a valve but also as a packing to the piston, substantially as set forth.

JOSEPH EVENS.

Witnesses:

W. D. MULFORD,
B. F. STOKES.