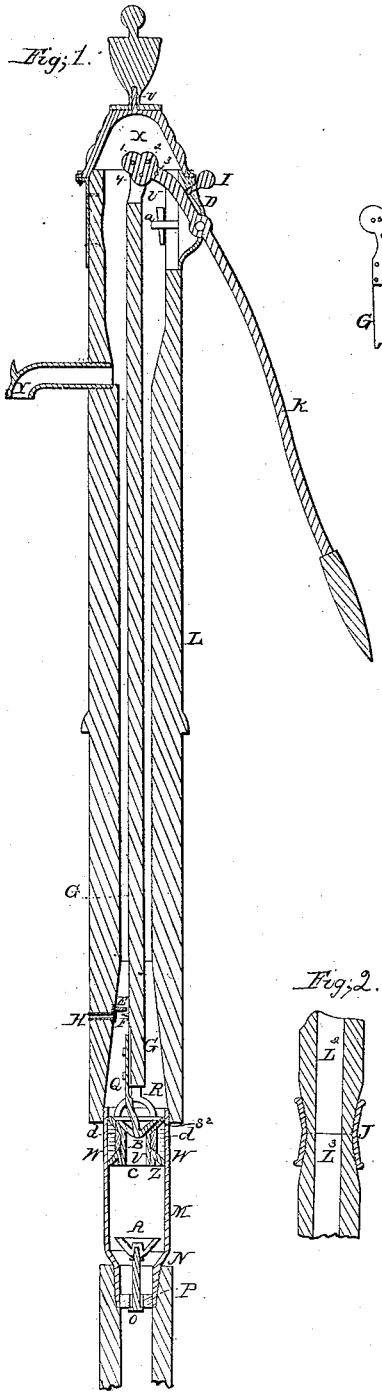
A. Thayer,

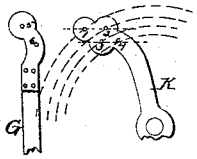
Pump Lift,

No. 2438. Patented Feb. 1, 1842

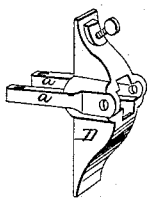
Fig; 1.



Fig; 5.

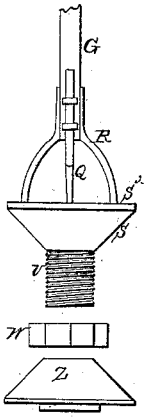


Fig; 4.



Fig; 2.

Fig; 3.



UNITED STATES PATENT OFFICE.

AUGUSTUS THAYER, OF CHATHAM, NEW YORK.

CONSTRUCTION OF PUMPS.

Specification of Letters Patent No. 2,438, dated February 1, 1842.

To all whom it may concern:

Be it known that I, AUGUSTUS THAYER, of Chatham, in the county of Columbia and State of New York, have invented a new and useful Improvement in the Construction of Pumps, called "Thayer's Improved Suction and Force Pump," which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a vertical section. Fig. 2 is a section at one of the joints showing the form of the double tapered ring and manner of uniting the logs. Fig. 3 the parts of the piston separted. Fig. 4 perspective view of the fulcrum box of the pump handle. Fig. 5 section of the ends of the rods and handle showing their form and manner of perforating the same.

Similar letters refer to corresponding parts.

The improvement is principally in the construction of the piston C, box of the pump handle D, safety valve E, adjustable screw I, double tapered screw ring J for uniting the ends of the pump logs, &c., manner of connecting the lever or pump handle and piston rod.

The pump stock L, handle K, cylinder M and piston rod G are made in the usual manner. The lower valve A is made of a composition of tin, zinc, antimony and bismuth, funnel shaped, or like an inverted hollow cone, having a stem O with a broad head projecting downward from said valve and passing through an opening in a horizontal cross bar P in the lower or smaller end of the cylinder, the head being below said bar and striking against the same when the valve is lifted by the water, said head preventing its rising too high, the valve when down, or shut, resting in a seat N of a corresponding shape formed in said smaller end of the cylinder. On the outside of said cylinder a screw is formed for screwing into the upper end of the pump stock leading to the well or spring. The outer or inclined surface of the valve A is covered with leather under which a washer is placed resting on a shoulder of the stem. The valve B of the piston is made in the same manner as the valve A just described, except that its stem Q is projected upward therefrom and passed through loops on the side of the piston rod in which it slides as the valve rises and falls the stem and loops being made of such material as will not rust.

The piston C is composed of two hollow frustums of cones S, Z, with their smaller ends placed toward each other, the lower one being made to approach the upper one for the purpose of pressing a ring *d* of packing placed betwen the inclined surfaces horizontally against the inside of the cylinder in which the piston works for the purpose of tightening the same when worn by means of a male screw on the outside of a hollow cylindrical tube or shank V projecting downward from the small end of the upper section of the piston and entering a female screw in the center of the lower section Z which is turned on said hollow screw shank in the manner of a circular conical nut. The packing consists of a ring of wooden blocks W made wedge shaped on the upper and under ends and concave on the inner sides and convex on the outer sides the ends being of the same angle as the sides of the sections of the piston which is about 45 degrees this ring of segment blocks, when the sections are opened or extended, are put together in the manner of a circular arch. Around this ring of segment blocks is put a ring of leather *d* or other suitable flexible packing. When the sections of the piston approach each other, the blocks, of course, recede from each other and form a larger circle and press the packing outward, by the inclined surfaces of the sections pressing against the inclined surfaces of the blocks. The piston is open for the water to pass through by reason of the screw shank, before described, being perforated or made hollow. The upper section of the piston forms the seat of the upper valve, or valve B. The piston is fastened to the piston rod by means of forked rods R or plates and rivets or screws. The seat S^2 is made of corresponding shape with that of the outside of the valve B fitted thereto.

The upper end of the piston rod G is made of iron and flattened, rounded, and bent over toward the handle in which end are made two apertures 5, 6, for the insertion of the bolt or pin which connects the rod with the pump handle or brake in the end of which are two sets of corresponding apertures, the two upper apertures 1, 2, of the brake or handle are in a horizontal line when the handle is in the position represented in the

drawing and the two lower apertures 3, 4, are also in a horizontal position and parallel with the others.

By forming and perforating the upper end of the piston rod in the manner described the leverage of the handle may be increased or diminished by shifting the connecting pin without causing the piston to rise higher in the cylinder, or the cog on the piston rod to approach nearer to the escape valve, the piston, however, will descend farther into the cylinder by increasing the length of the distance from the fulcrum to the pin, and less, in decreasing it, the piston rod working freely without touching the sides of the pump. In laying down the points for the apertures in the end of the lever strike four concentric circles from the fulcrum the handle standing at about 50 degrees. Then draw two parallel lines horizontally through these circles and the intersecting points will be the places for the holes for the connecting pin which connects the handle and piston rod.

The fulcrum of the lever is contained in a cast iron box D made in the following manner. It is made straight and flat on its perpendicular side next the pump stock into which it is fitted in a mortise or cavity of corresponding shape being secured by two horizontal parallel arms *a* inserted into mortises in the pump and extending into the bore of the pump where they are keyed fast by keys U passed through mortises in the arms inside the pump. The outside of this casting or box is made convex and through its thickest portion a mortise or cavity is made to admit the pump handle or brake and ears or trunnions projecting from the sides thereof which exactly fit said opening and when the joints are properly packed they will be completely water tight and suitable for forcing the water to elevated places. The trunnions or round ears turn in corresponding apertures in the sides of the box, the joints of which being also packed. The best mode is to have the handle to turn on a round pin as a fulcrum inserted through the box and handle and fixed permanently in the box. This construction of box prevents the introduction of any substance that would injure the pump as well as preventing the escape of the water. Besides having the action on the packing near the fulcrum of the lever which is easily overcome instead of at a distance therefrom through the stuffing box in the head of an ordinary cylinder.

A female screw is made in the upper part of the casting or box at an angle of about 45 degrees into which is inserted a thumb screw I against whose point the pump handle strikes when the piston is raised for arresting the upward movement of the piston rod and thus preventing the cog F on said piston rod acting on, and opening the escape valve E when not required to be opened as in the summer season. But in the winter when there is danger of the water in the upper part of the pump freezing and thus rendering it useless, the said screw is receded which allows the piston rod and cog to rise higher when the said cog will strike the safety valve and open it and let off the surplus water in the pump through a horizontal tube H leading from the interior to the exterior of the pump and closed by said valve which is made right angled the lower or vertical limb closing the tube and the upper or horizontal limb forming the arm against which the cog strikes. The pivot on which this valve moves passes through the angle into ears of a plate which is cast with the tube and forms part thereof the tube being inserted from the inside. The safety valve is inserted in the pump stock above the chamber and below the reach of frost. In cold weather it is only necessary to recede the aforesaid screw then when the pumping ceases the long arm of the lever or handle descends being the heaviest, bringing the short arm against said screw and raising the piston rod, the cog acting on the valve and holding it open while the water in the pump runs out through the tube.

A cast iron hollow cap X is screwed on the top of the pump forming an air chamber to equalize the stream of water when the pump is used as a force pump—one of the screws by which said cap is secured passing through the flange of the same into a female screw in the aforesaid cast iron box D and other screws into knees or right angled plates fastened to the sides of the pump—the joints being packed to render them water tight. A screw *v* is cast on the top of the cap to which the urn is secured. The spout Y has a screw cut on each end, one of which being screwed into the pump stock and the other to the hose or conveying pipe. The ends of the logs are united in the following manner instead of being let into each other by screws or otherwise. The ends are slightly tapered and screwed into a metallic ring J of less diameter at the center than at the ends having a screw formed on the inside gradually increasing in diameter from the center toward the ends into which the ends of the logs are screwed until they meet, or nearly meet, at the center of the ring which will render the joint very strong and close without the danger of the logs splitting no other ring being necessary than said double tapered screw ring.

The cylinder or chamber is composed of 8 parts of zinc 4 parts of antimony 4 parts of tin and 2 parts of bismuth making a substance nearly as hard as cast iron and not liable to rust.

The wood of the pump is slightly charred

inside and also on the outside below the platform, which will prevent the adhesion of slime &c. and the injurious effect on the water arising therefrom and will have a tendency to cleanse it of impurities and preserve the wood from decay.

The pump may be placed so as to draw the water over eminences or hills (not exceeding 30 feet high) from springs or wells at any required distance therefrom and forced to any desired height.

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

1. The construction of the piston with two hollow cones having a water way and valve in their center, connected by means of a male and female screw cut upon said cones in combination with the expanding wedges or packing, the whole being constructed and operating as set forth.

2. The mode of letting off the water in the upper part of the pump by means of the right angled valve arranged and operated in the manner before described.

3. The mode of connecting the logs by means of the double tapered screw ring as described.

4. The arrangement of the adjustable screw I for preventing the cog of the piston rod acting on the safety valve when not required to be opened as described.

5. Method of connecting the lever and piston rod for increasing or diminishing the leverage and descent of the piston without increasing its ascent as described.

AUGUSTUS THAYER.

Witnesses:
WATERMAN LIPPITT,
RANSOM WINANS.