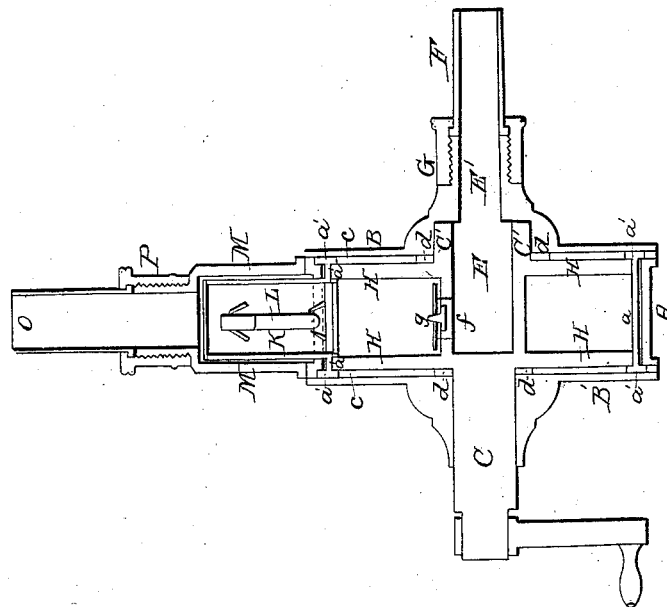
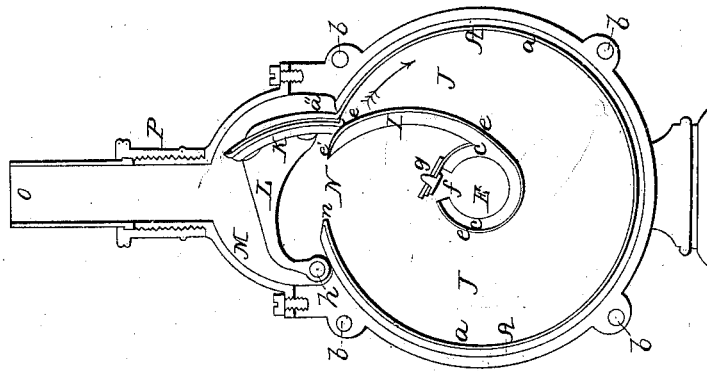


S. A. Lee.

Rotary Pump,

No. 2,236,

Patented Sept. 4, 1841.



UNITED STATES PATENT OFFICE.

SAMUEL A. LEE, OF BOSTON, MASSACHUSETTS.

CONSTRUCTION OF ROTARY PUMPS FOR RAISING WATER AND OTHER FLUIDS.

Specification of Letters Patent No. 2,236, dated September 4, 1841.

To all whom it may concern:

Be it known that I, SAMUEL A. LEE, of Boston, in the State of Massachusetts, have invented an Improved Rotary Pump for Raising Water from Wells and other Reservoirs and for Forcing it to Such Height as May be Required; and I do hereby declare that the following is a full and exact description thereof.

10 The outer part of this pump consists of a stationary drum of cast-iron, or other metal, which is to be placed firmly upon any suitable stand. Within this drum there is a central shaft, which is sustained by the
15 two heads of the drum, said heads forming the bearings within which said shaft revolves. Attached to this shaft there are two disks, or round plates, of metal, which, when in place, stand respectively, at the distance of about an eighth of an inch from the heads of the drum, and their edges reach to within about the same distance of the interior of its periphery. The space between these disks, constitutes the chamber into
20 which the water is to enter from the reservoir, and from which it is to be forced by the revolution of the shaft and disks, and by the action of a cam and valves, so constructed and arranged as to effect that object. A band, or lining, of leather is contained within the periphery of the drum, extending around it, and covering its whole width; the edges of this band of leather, are received and confined between the heads of the drum and its periphery, and extend,
35 also, between the disks and the heads, in such manner as to constitute a packing between said disks and the two heads, allowing the disks to revolve freely within said packing, which fills the space of about an eighth of an inch, above noticed, which space is left for that purpose. There are two rings of leather, also between the two heads of the drum and the revolving disks,
45 which are placed close to, and embrace the revolving shaft, and constitute a packing between the disks and the heads of the drum, in that part of the apparatus. The water is to enter the chamber of the pump through the revolving shaft, which is made hollow for that purpose, being bored out from one end to a depth which shall cause said opening to extend within the shaft to the line of the farther side of the chamber between the
55 two disks. A water way is then cut from said hollow shaft into the chamber, and

this water way is covered by a valve within the chamber; which valve, when closed, will prevent the return of any water from the chamber into the lower supply pipes.

60 Between the two revolving disks, constituting the sides of the pump chamber, there is a cam consisting of a curved piece of metal which extends from the shaft to the edges of the disks, and which fills the space
65 between these disks, extending from one of them to the other. The convex side of this cam is covered with leather, which extends to its outer edge, and there comes into contact with the rim of leather which lines the periphery of the drum; this cam might be
70 denominated a revolving piston, as it serves to draw the water from the reservoir, and to force it up to the point where it is to be delivered. The convex side of this cam, or revolving piston, serves to raise a valve,
75 which when not so raised, occupies the chamber, and forms a partition across it, extending from the shaft to its outer rim, and which when raised up by the cam, to allow it to pass, is received within a semi-circular valve chamber on the upper side of the drum, from which chamber the pipe proceeds through which the water is to be forced. This valve is made in the form of
85 a segment of a circle, and is governed in its motion by a joint pin which is in the center of its curvature. The edges of this valve are leathered so as to cause it to work watertight between the sides of the chamber of
90 the pump, and those of the semi-circular valve chamber above the drum.

In the accompanying drawings, Figure 1, is a vertical section through the middle of the pump in the plane of its sides, and Fig. 95 2, a vertical section through its axis.

A, A, is the periphery of the stationary drum; B, B', the two heads of the drum; C, C, the revolving axis, which may be turned by the winch D. The part C, of the axis passes through the head B', and
100 the part C', C', is received in a recess in the head B, which forms its bearing.

E, is the hollow, or tubular, part of the axis, the opening from which is continued
105 through the head B, as seen at E'. The tube F, is connected to the head B, by means of a coupling box, and forms the communication, by means of pipes, with the reservoir from which the water is to be raised.

110 H, H, are the disks attached to, and revolving with, the axis.

a, a, is the band of leather which forms the lining of the periphery of the stationary drum, and which, expanding out at its edges, forms a packing at *a', a'*, between the heads of the drum and its periphery, where it is held firmly by the screws which, passing through the holes *b, b*, confine these parts together; this leather extends, also, into the space *c, c*, between the heads and the revolving disks, and forms a packing to the latter; *d, d*, are leather rings occupying said space around the axle, and these constitute the packing necessary in this part.

I, is the cam, or revolving piston, which moves around in the drum, in the direction of the arrow. This cam fills the space between the two heads; at its inner end it is attached to the shaft, and its outer passes in contact with the leather band *a, a*. A strap, or band, of leather *e, e, e*, is shown as covering its convex side and extending around the axle *C, C*; it will operate well, however, if leathered at its outer end *e'*, only.

J, J, is the chamber of the pump, into which the water is admitted from the tubular part *E*, of the axis through a lateral opening *f*, furnished with a valve *g*, opening outward. In Fig. 1, this valve is represented as open, to show it the more distinctly, but in the position which the cam *I*, is shown as occupying, the valve *g*, would be closed. *K*, is a curved valve, having an arm *L*, projecting back from it and working upon a joint pin at *h*, which is in the center of the curvature of the valve. This valve is shown as received within a semi-circular chamber *M, M*, on the top of the drum; there is an opening at *N*, from the chamber *J*, into the semi-circular chamber *M*, for the passage of water, and to admit of the working of the valve *K*; the leather *a*, which forms the lining of the periphery of the drum, and which is cut to admit of the opening *N*, is not separated from the other portion, but is carried up at the edge of the opening *N*, as shown at *a''*, so as to cover the face of the valve *K*. This valve is leathered at its edges and fits closely against the sides of the disks, and those of the semicircular chamber. *O*, is an ascend-

ing pipe, which is shown as attached to the chamber *M*, by a coupling box *P*.

The following is the operation of the pump. Suppose the cam *I*, to have passed sufficiently far around, in the direction of the arrow, to have cleared the valve *K*, that valve would then descend, and its lower edge would come into contact with the axis *C*, and form a complete partition across the chamber *J*; the passing around of the cam *I*, would then tend to create a vacuum, which would cause water to flow into the chamber through the opening *f*, from the space *E*, keeping the valve *g* raised. The water previously contained in the chamber *J*, between the convex side of the cam *I*, and the opening *N*, will at the same time be forced through that opening, and be made to ascend the pipe *O*, an additional supply flowing in through *f*, until the end of the cam arrives at the edge *n*, of the opening *N*, at which period it will have begun to raise the valve *K*, when it passes this edge the weight of the column of water in *O*, will close the valve *g*, and the flow of water will cease, until the cam has lifted the valve *K*, so as to cause it to be entirely within the chamber *M*, and has passed it, so as to allow said valve to fall, when the action of the pump in raising water will be resumed, and continued, as above described.

Having thus fully shown the manner in which I construct my rotary pump, and explained the operation thereof, what I claim therein as of my invention, and desire to secure by Letters Patent, is—

The manner in which I have constructed, arranged and combined, the hollow, revolving shaft, the revolving disks and cam, or piston, attached thereto, and the segmental valve *K*, with the chamber into which it is raised by the cam *I*, in the manner set forth, so that these parts, with their appendages, will coöperate with each other in producing the intended effect, substantially as described.

SAMUEL A. LEE.

Witnesses:

THOS. P. JONES,
JOSEPHUS ECHALS.