

(No Model.)

B. F. CALDWELL.

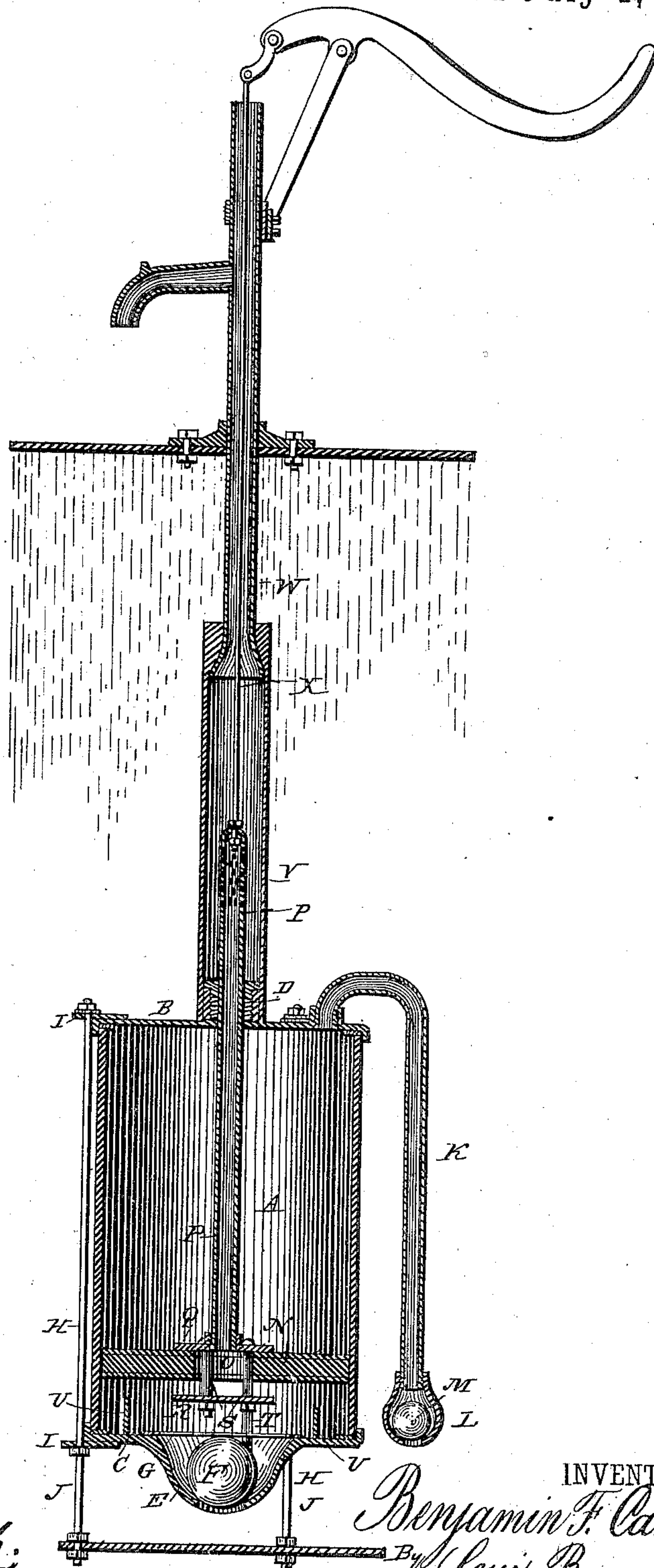
2 Sheets—Sheet 1.

PUMP.

No. 301,336.

Patented July 1, 1884.

Fig. 1.



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2 Sheets—Sheet 2.

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Fig. 3.

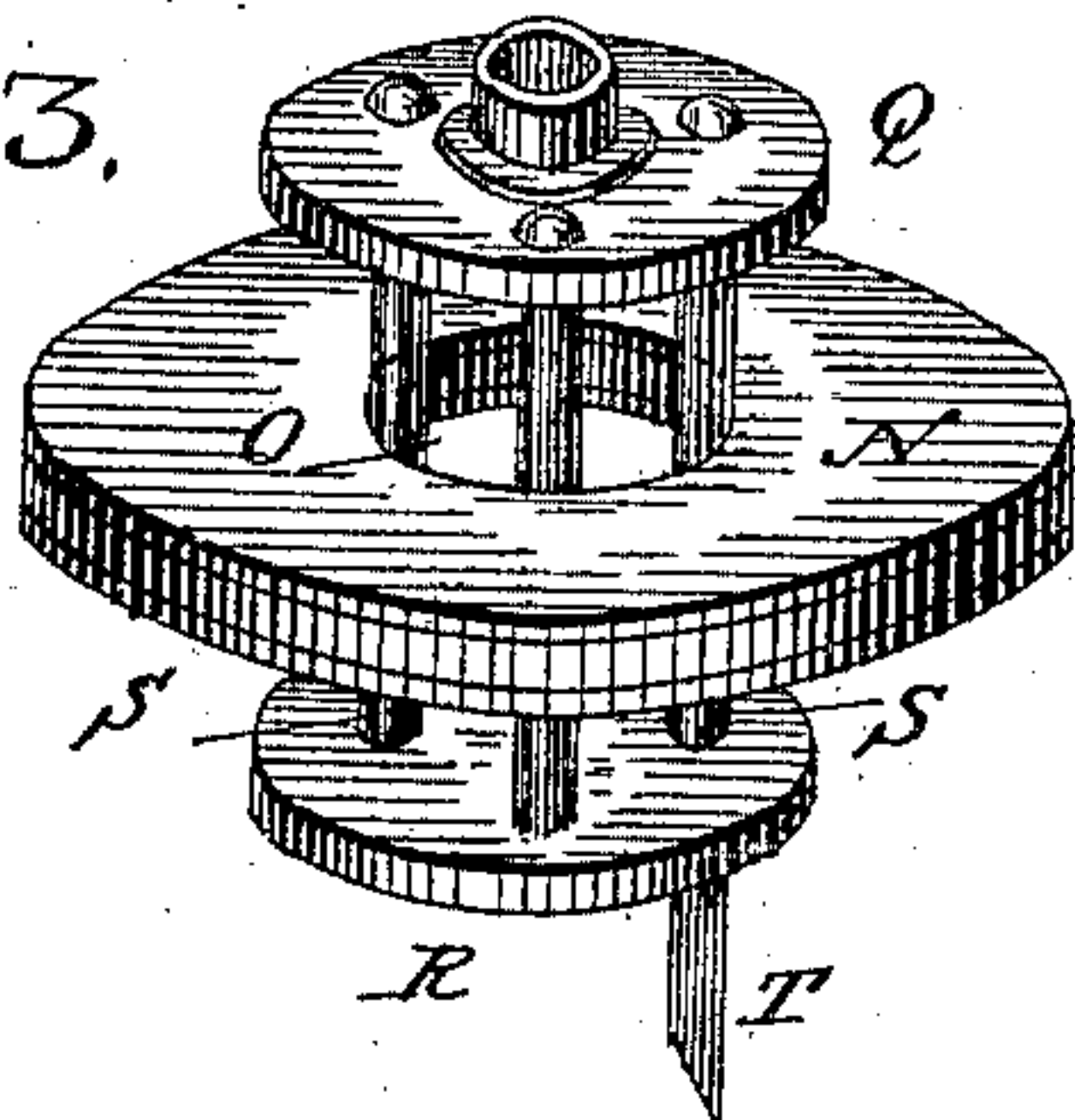


Fig. 4.

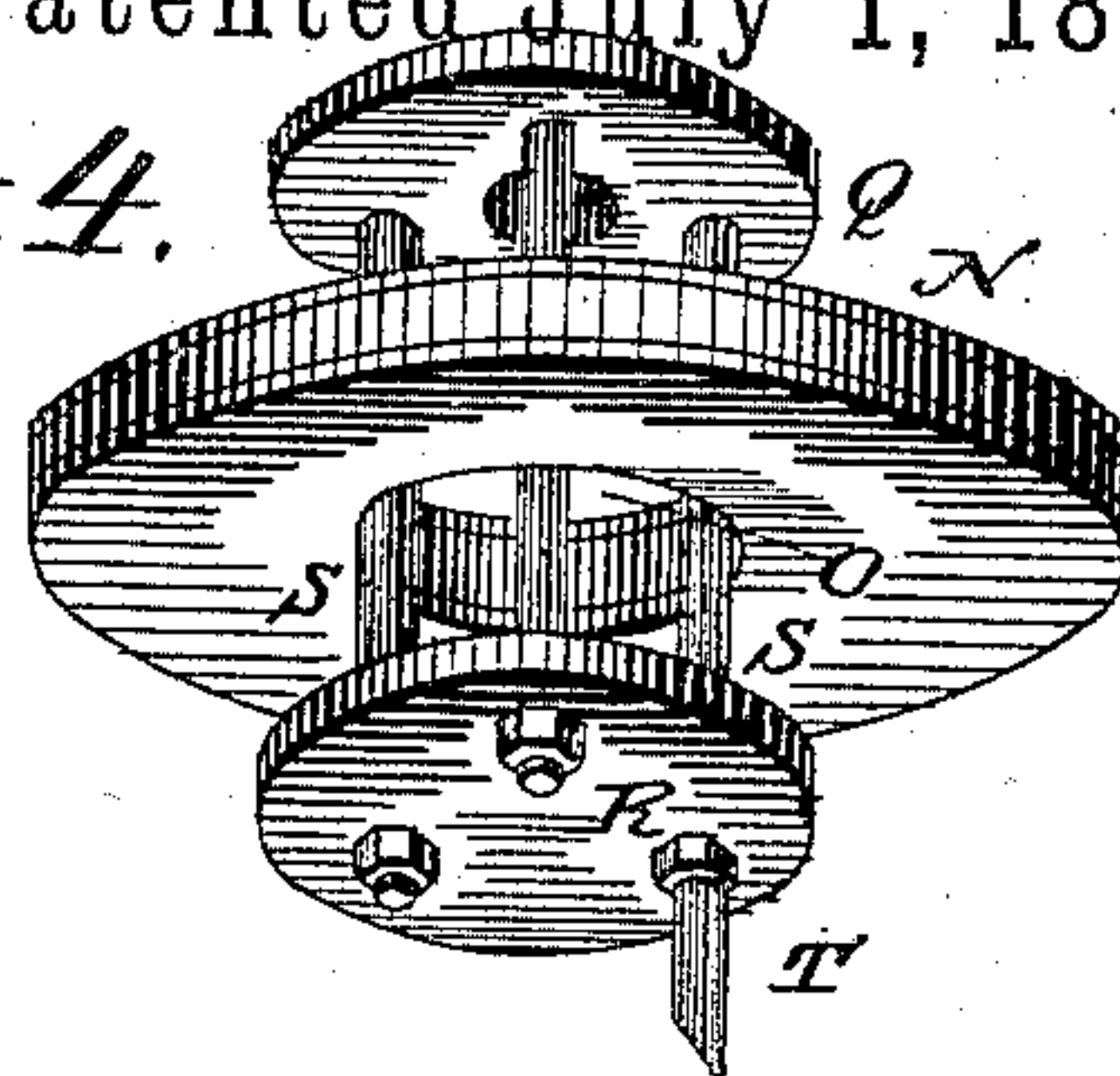
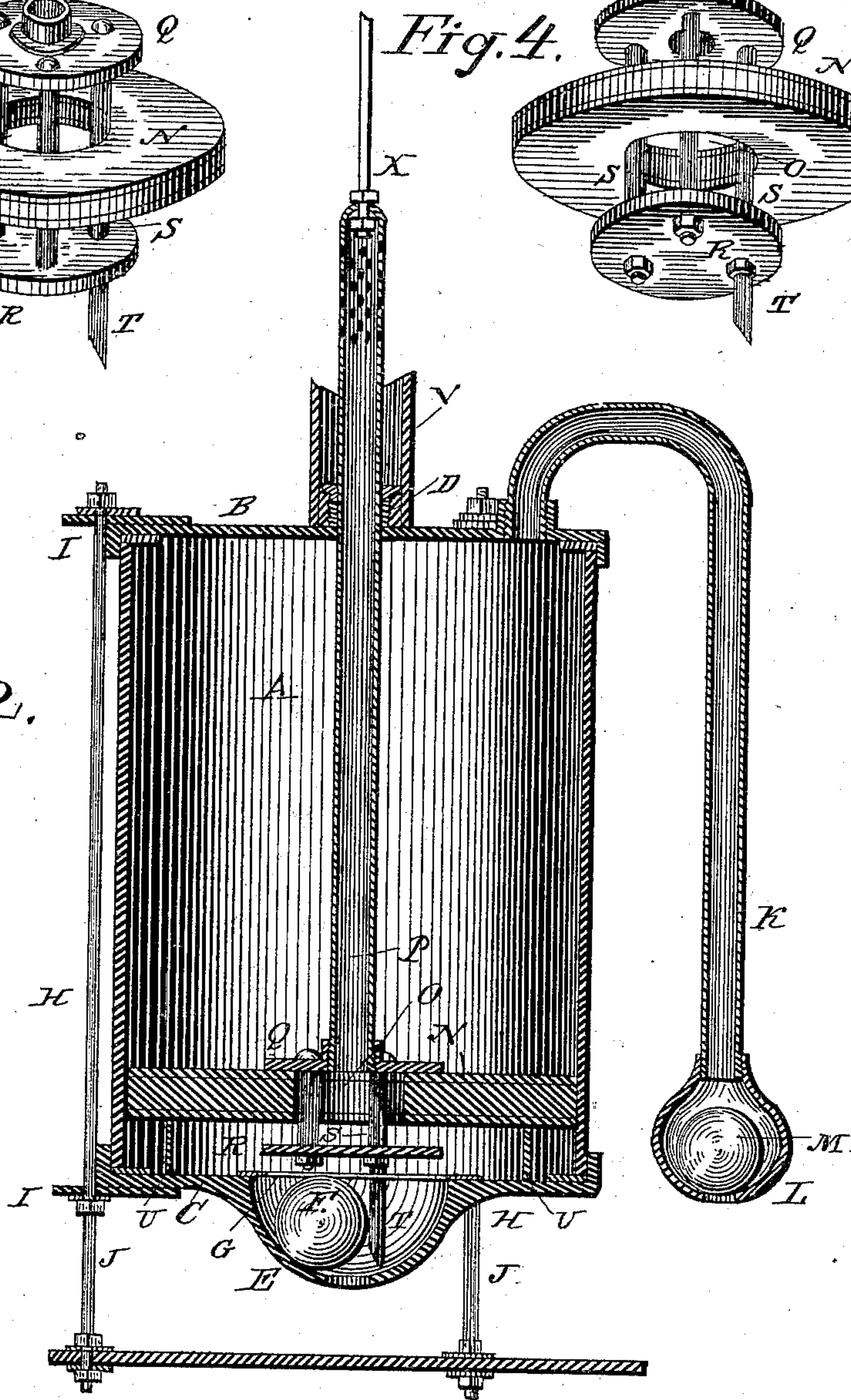


Fig. 2.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. CALDWELL, OF ROCKVILLE, MISSOURI.

PUMP.

SPECIFICATION forming part of Letters Patent No. 301,336, dated July 1, 1884.

Application filed November 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. CALDWELL, of Rockville, in the county of Bates and State of Missouri, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description of my invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a vertical sectional view of my improved pump, showing it in position in the well. Fig. 2 is a similar view of the pump-cylinder on an enlarged scale. Fig. 3 is a perspective view of the plunger or piston seen from the top, and Fig. 4 is a similar view of the same seen from the bottom.

Similar letters of reference indicate corresponding parts in all the figures.

My invention has relation to combined lift and force pumps having hollow piston-rods; and it consists in the improved construction and combination of parts of the same, as hereinafter more fully described and claimed.

In the accompanying drawings, the letter A indicates the pump-cylinder, which is provided with an upper and lower head, B and C, the upper one, B, of which forms a central stuffing-box, D, while the lower one, C, forms a central downwardly-pointing funnel-shaped valve-seat, E, upon which a ball-valve, F, plays, which is prevented from being drawn off its seat by a transverse rod, G, spanning the top of the valve-seat. The heads rest upon the ends of the cylinder with suitable packing interposed, and are held in place, bearing against the ends of the cylinder, by means of rods H passing through laterally-projecting ears I upon the heads, and provided with nuts at their ends bearing against the ears, and the lower ends of the rods are extended downward, forming feet J, which serve to raise the lower head from the bottom of the well when the pump is placed upon the bottom of the same. A bent or curved pipe, K, passes with its upper end into an opening in the upper head of the cylinder, opening into the same, while its lower end reaches to the same level as the bottom head, and forms an enlargement or valve-

seat, L, in which a ball-valve, M, plays, which will allow water to be drawn up through the pipe.

N is the piston, which has a central circular perforation, O, of larger diameter than the hollow piston-rod P, which opens with its lower end in the center of a circular disk, Q, which covers the central perforation of the piston, and is connected with a similar disk, R, by means of a number of rods, S, slightly longer than the thickness of the piston, which disk is upon the under side of the piston, the rods passing through the central perforation in the annular piston, which plays upon the rods between the disks. A pin or bolt, T, projects from the under side of the lower disk, and has its lower end cut off obliquely, so that when the piston is pushed down to the bottom of the cylinder the pin will push the ball-valve at the bottom of the same to the side, allowing the water to run out of the cylinder, and a number of bolts or pins, U, project upward from the bottom head of the cylinder, and serve to raise the annular piston, when it is pushed down, from bearing with its under side against the upper side of the lower disk, which closes the central aperture in the piston, and thus allows the water in the hollow piston-rod to escape into the lower end of the cylinder, from whence it will run out through the ball-valve. A tube, V, of a larger diameter than the hollow piston-rod, is secured at its lower end to the stuffing-box in the upper head of the cylinder, and extends upward the length of the hollow piston-rod and the length of the stroke of the same, when it is connected to the lower end of the pump-tube W, which may be of any length, and which is provided at its upper end with a suitable outlet-spout. The upper end of the hollow piston-rod is open, and is attached to the lower end of the solid piston-rod X, the upper end of which is attached to a pump-lever or any other means for reciprocating it.

It will be seen that as the piston-rod is reciprocated the downstroke will force the annular piston upward, closing access of the water in the upper portion of the cylinder into the hollow piston-rod, while it will allow the water in the lower portion of the cylinder to pass up through the piston-rod, and at the same time

the downstroke of the piston will draw the water through the bent pipe into the upper portion of the cylinder. When the piston now is raised, the force or resistance of the water will force the piston down upon the lower disk, opening free passage for the water in the upper portion of the cylinder into the piston-rod, while at the same time the water is drawn into the lower portion of the cylinder through the ball-valve in the bottom of the same, the water thus passing up through the hollow piston-rod in a continuous stream.

It will also be seen that when it is freezing the water may all run out of the pump-tube, the hollow piston-rod, and the cylinder by pushing the piston down to the bottom of the cylinder, when the pin upon the lower disk will open the ball-valve, and the pins in the bottom of the cylinder will raise the annular piston, allowing the water to pass out of the piston-rod as well as out of the cylinder; and by raising the piston-rod sufficiently to raise the upper disk upon its end above the annular piston, while the beveled pin still continues to hold the ball aside from its seat, the water in the pump-cylinder above the piston may pass through the central aperture in the same and out through the bottom valve.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the cylinder having a ball-valve at its lower end with a piston having a pin having a beveled lower end upon its under side, adapted to push the ball to a side when the piston is pushed to the bottom of the cylinder, as and for the purpose shown and set forth. 35

2. The combination of a cylinder having an inlet-valve at the bottom, and having a number of upwardly-projecting pins in the bottom, a hollow piston-rod having two disks at its lower end, secured at a distance apart, and opening between the two disks, and an annular piston playing between the disks, as and for the purpose shown and set forth. 40 45

3. The combination, in a pump, of the outlet-tube, the hollow piston-rod forming the outlet-pipe for the pump, having apertures at its upper end, and opening into and reciprocating in the outlet-tube, and the solid piston-rod secured to the upper end of the hollow piston-rod, and reciprocating in the outlet-tube, as and for the purpose shown and set forth. 50

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses. 55

BENJAMIN F. CALDWELL.

Witnesses:

E. L. BOREING,
J. M. BOREING.