

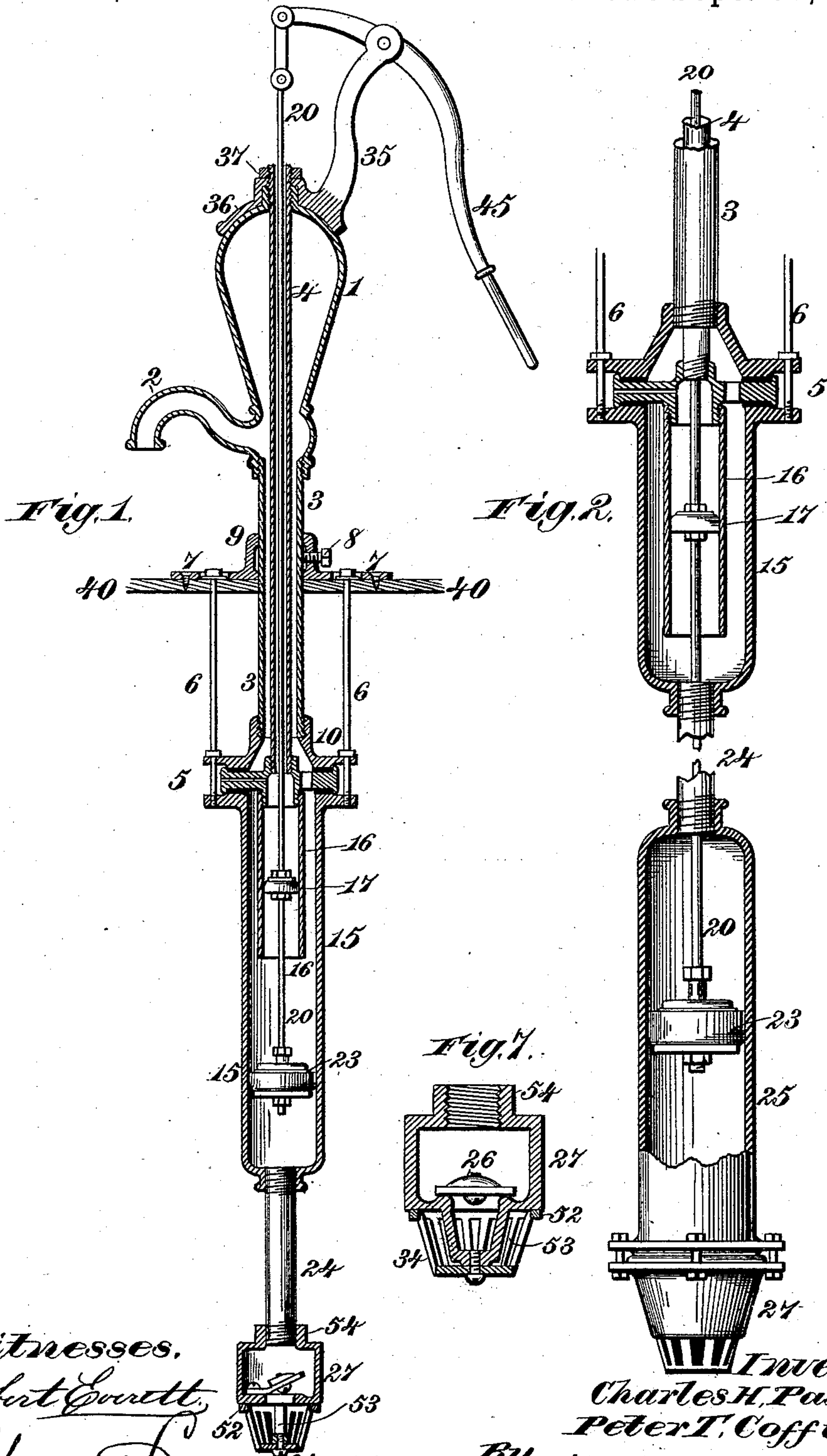
(No Model.)

2 Sheets—Sheet 1.

C. H. PAXSON & P. T. COFFIELD.
PUMP.

No. 305,955.

Patented Sept. 30, 1884.



Witnesses,
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

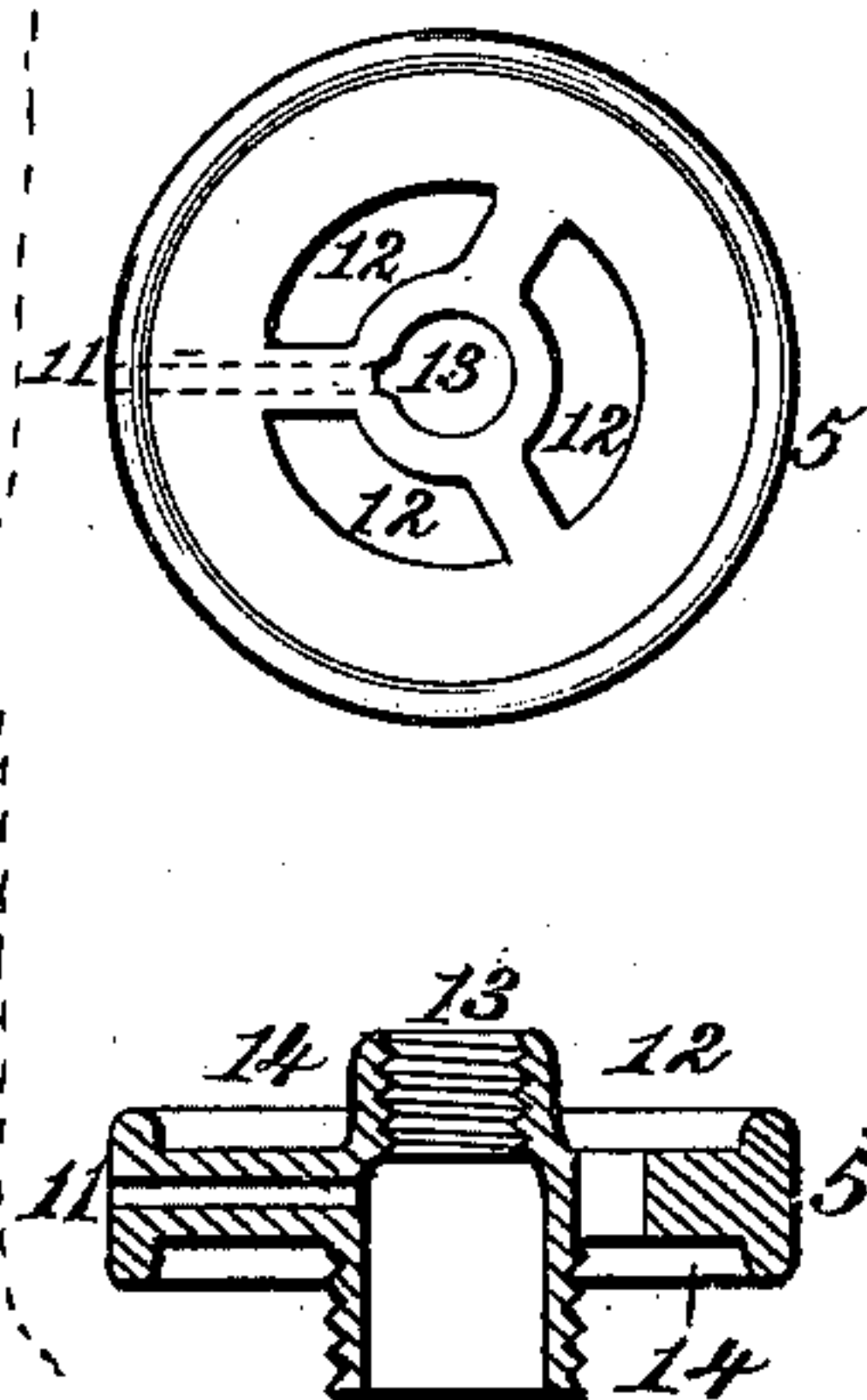


Fig. 4.

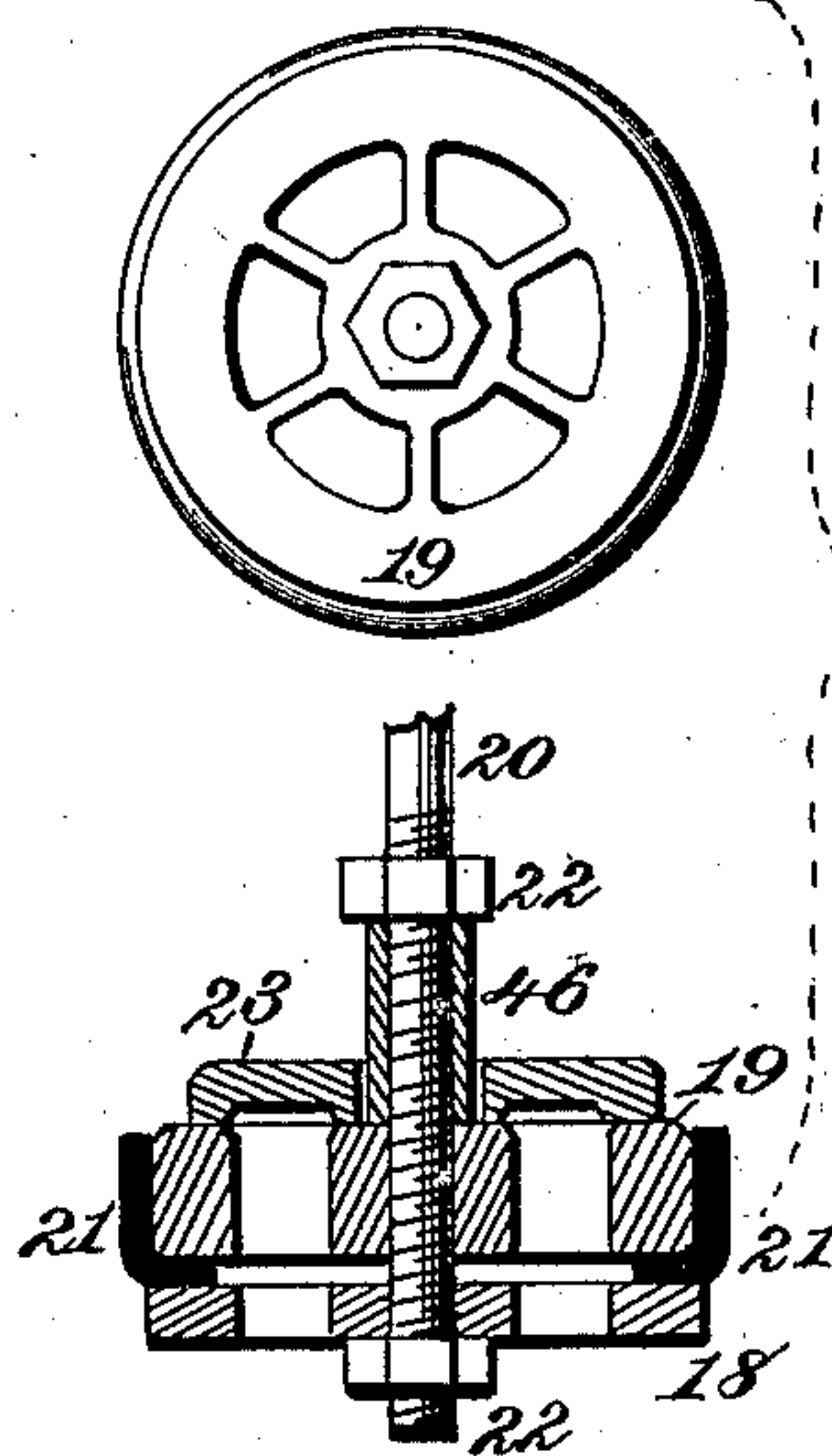


Fig. 5.

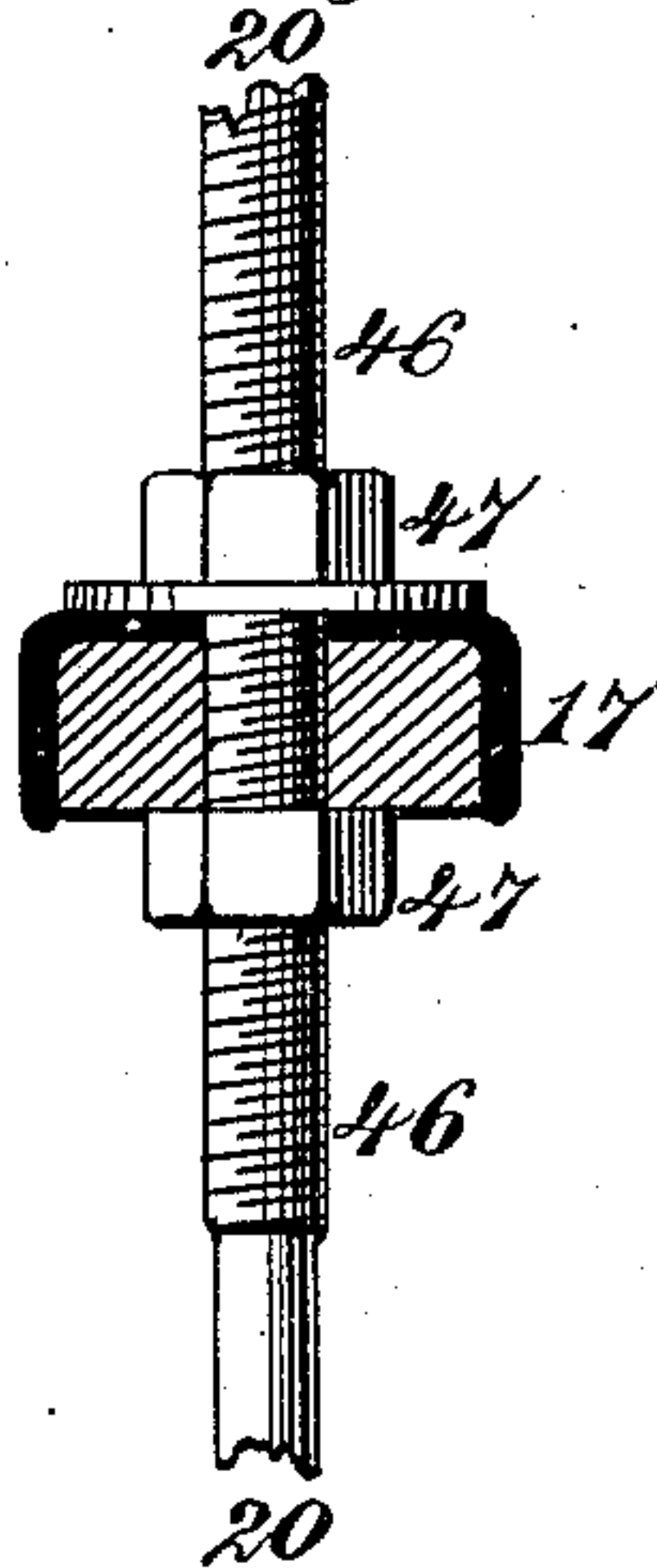
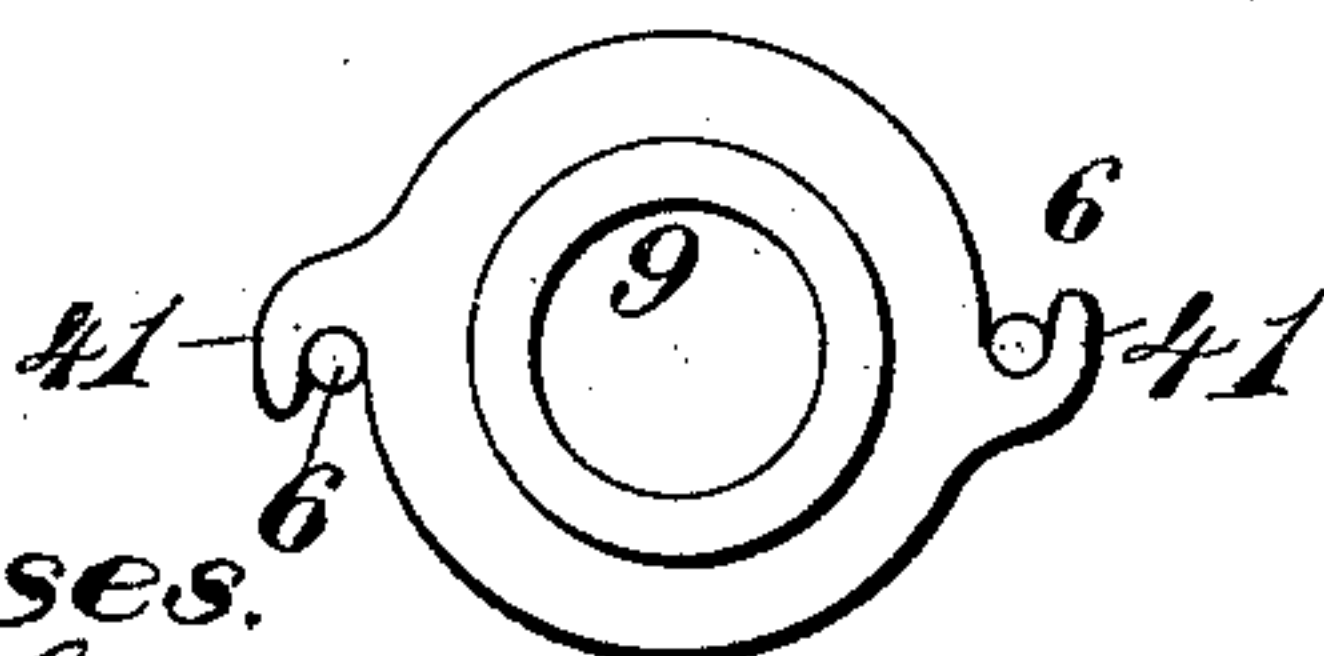


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES H. PAXSON AND PETER T. COFFIELD, OF NEW CARLISLE, OHIO
ASSIGNORS TO THE SUPERIOR MANUFACTURING COMPANY, OF SAME
PLACE.

PUMP.

SPECIFICATION forming part of Letters Patent No. 305,955, dated September 30, 1884.

Application filed January 3, 1884. (No model.)

To all whom it may concern:

Be it known that we, CHARLES H. PAXSON and PETER T. COFFIELD, citizens of the United States, residing at New Carlisle, in the county of Clark and State of Ohio, have invented new and useful Improvements in Pumps, of which the following is a specification.

The object of our invention is to so construct a pump that all parts thereof likely to be exposed to danger of freezing may be readily and thoroughly drained, and so that all parts of the pump above a dividing-diaphragm may be readily removed without disturbing the pump-cylinder proper and the parts below the diaphragm noted, and also to so construct the parts of the pump that they may be readily assembled to form the completed structure.

To these ends our invention consists in the construction and novel arrangements of the parts, as hereinafter described and claimed, and as illustrated in the drawings, in which—

Figure 1 is a view in section of a pump embodying our invention; Fig. 2, a partial section of a modified form; Fig. 3, a plan and a section of the diaphragm; Fig. 4, a plan and section of the lifting-bucket; Fig. 5, a sectional view of the force-piston. Figs. 6 and 7 are views of details.

1 is the ordinary air-chamber or head of the pump provided with spout 2. Attached to this air-chamber 1 and depending therefrom is an exterior tube, 3, forming the pump-stock and ending in the flange 10, to which is secured the flanged head of the cylinder 15. Between these flanges is secured a diaphragm, 5, into the center of which is secured the lower end of the tube 4, whose upper end is secured into the top of the air-chamber or head 1 at 37, the piston-rod 20, carrying and operating the buckets and valves passing therethrough. This diaphragm 5 is constructed, as shown in Fig. 3, as a flanged disk, the hub and flanges forming an annular recess, 14, for the reception and retention of proper packing. Its hub is provided with screw-threads or equivalent means of attachment, so that the cylinder 16 may depend therefrom and the tube 4

rise therefrom. It is provided with a central aperture, 13, communicating with 4 and 16, and a series of apertures, 12 12, communicating with 3 and 15, 3 leading into the air-chamber 1, so that the outer cylinder, 15, is connected therewith. From 13 an aperture, 11, is made through the web of the diaphragm leading directly out of the pump and into the well-hole. The apertures 12 are to permit the flow of ascending water and afford communication between the outer cylinder and air-chamber, while the apertures 11 and 13 allow of the downward flow of what water might be forced into and otherwise remain in the pipe or tube 4 after use of the pump. This permits of the escape of all water from the portions of the pump above the diaphragm, as it is evident that upon cessation of use of the pump the water remaining in the stock 3 will flow down through the apertures 12 below the diaphragm. To aid in this, the diaphragm should be placed below the freezing line or point in the well, as shown in Fig. 1, where 40 is supposed to be the well-cover or ground-line. The flanged head 10 of 3 and the flanged head of 15 are secured by the bolts 6 6, screw-threaded at their ends to take into the head of 15, and having nuts which take thereon above 10, so that the flanged heads with the intervening diaphragm 5 are firmly secured together in position. These bolts 6 are made of any desired length, passing up through the well-cover 40, so that the diaphragm, cylinder 15, and contained parts may be suspended within the well at any desired distance from the top 40. The heads of these bolts take into recesses formed in the sides of a plate, 7, by fingers or lugs 41, as clearly shown in Fig. 6. These fingers project in opposite directions, so that if 7 be turned in one direction the recesses encircle the bolts. If turned in the opposite direction, the bolts and recesses are released from each other, the bolts, recesses, and nuts upon the heads of the bolts forming practically a bayonet-joint. The plate 7 is formed with an upwardly-projecting collar, 9, for encircling the stock 3, through which collar passes a set

screw or screws, 8, which is or are adapted to take upon 3, holding it and the parts of the pump above 40 firmly in position, and at any desired height or distance above 40. Upon 5 loosening 8 and the nuts upon the heads of 6 6 the plates 7 may be turned from engagement with 6 6, and if then the rod 20 be also detached from the handle and the stock 3 (by unscrewing) from its flanged head 10, the 10 pump head and stock may be readily removed without disturbance of the other parts.

From the bolts 6 6 is suspended and supported the cylinder 15, within which is a short section of cylinder 16, depending from the 15 center of the diaphragm 5, while to cylinder 15 is attached the supply-pipe 24, of any requisite length, ending in the clack-valve cage or box 27. Into 15 and 16 and through 4 passes the piston-rod 20, attached in the 20 usual way to a handle or lever, 45, at its upper end. At its lower end the lifting bucket or valve 23 is attached, constructed as shown in detail in Fig. 4, wherein 19 is a spider-cylinder, an ordinary lift-valve, 23, and 18 a spider-follower, packing 21 being secured between 18 and 19, as shown. A sleeve, 46, 25 surrounds for a proper distance above the spider 19 the piston-rod 20, nuts 22 at the bottom of the rod 20 and at the top of the sleeve 30 respectively uniting the parts firmly together, while the upper nut 22 limits and controls the movement of the lift-valve 23.

Within the cylinder 16, and upon the piston-rod 20, is the piston 17, of usual construction. This piston is adjustable upon the rod 35 by means of a long screw-thread, 46, formed upon 20, locking-nuts 47 holding the piston upon the rod at any desired point.

At the bottom of the pump, connected in 40 one case to the supply-pipe 24, in the other to the cylinder 25, is the clack-valve cage or box 27. This clack-valve cage or box is made as shown in Figs. 1 and 7, wherein the valve cage or box is preferably cast in one piece, its 45 top being contracted into an opening, 54, screw-threaded for attachment to 24, while an inlet is left in the bottom to be controlled by the valve. Arms 53 project from the bottom on each side of the inlet, united below by a 50 cross-piece for the securing thereto of the screen. The entire cage and these screen-supporting arms are cast in one piece, so as to furnish a cage without a seam or joint, thus avoiding the use of packing and danger of leakage. 55 The screen or sieve 34 is cast in one piece with a solid base having fingers 53 rising therefrom and united by a rim, 52. A screw passes through the base, firmly attaching the sieve or screen to the clack-valve cage or box, so 60 as to prevent the passage therein of dirt or foreign matter, which might injure the valves. The valve is introduced into the cage through the upper opening, and secured to the inside of the base of the cage or box, so as to cover

and control the inlet. The handle 45, attached 65 as a lever to rod 20, is fulcrumed in an arm, 35, rising from a base, 36, constructed so as to fit over and form a hood upon the top 1. 36 has a central aperture, through which passes the upper end of 4, within which works 70 the rod 20. A nut, 37, takes upon the upper end of 4, which, when tightened up, binds 36 firmly in any desired position upon the top of 1, so that the relation of the handle 45 and spout 2 may be controlled and varied, it being 75 possible to place them at any such angle relatively to each other as the exigencies of any particular case or individual desires may dictate. When, however, the pump is intended for a very deep well, we may advantageously 80 modify the arrangement of parts without, however, departing from the spirit of the invention. Such modification is shown in Fig. 2, wherein the cylinder 15 is divided into two portions, 15 and 25, the supply-tube 85 24 being used to connect them, the clack-valve cage or box being then attached directly to the lower end of the bottom section, 25, which contains the lifting-bucket 23, while the upper section, 15, contains the supplementary 90 cylinder 16 and piston 17. It is of course evident that the lengths of the piston-rod and the supply-pipe are varied to meet the requirements of different depths of wells.

Having thus described our invention, what 95 we claim is—

1. In a force-pump, the combination of a pump-cylinder, an inner cylinder concentrically supported therein, an air-chamber connected with the exterior cylinder, and a diaphragm having apertures for the connection 100 of the parts, substantially as described.

2. In a force-pump, the combination of a central tube in a cylinder, a piston-rod working in said tube, an intermediate cylinder suspended to an apertured diaphragm that has an avenue of escape for purposes of drainage, 105 substantially as described.

3. In a force-pump, the combination of an exterior cylinder, a cylinder suspended therein, a central tube or pipe, a piston-rod working in said tube, an apertured diaphragm having an avenue of escape for purposes of drainage, and suitable pistons, the upper one of which is adjustable upon its rod, substantially 110 as described. 115

4. In a force-pump, the combination of the bolts 6 6, screwing into flanges of 15, a diaphragm, 5, flange 10, and plate 7, substantially 120 as described.

5. In a pump, a valve cage or box cast in one piece and provided with an inlet, an outlet, and with a screw-thread for attachment to the pump supply-pipe or cylinder, so as to avoid use of packing, and arms thereon to support, or adapted to support, a screen, 125 substantially as described.

6. The combination, with the piston-rod

having a screw-threaded lower end, of the lower nut 22, the spider 18, resting thereon, the spider-cylinder 19, the packing 21, held between the spider and spider-cylinder, the 5 sleeve 46, encircling the rod, the lift-valve 23, moving on the sleeve, and the upper nut 22, bearing on the upper end of the sleeve, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

CHAS. H. PAXSON.
PETER T. COFFIELD.

Witnesses:

J. C. BIGLER,
C. M. KING.