

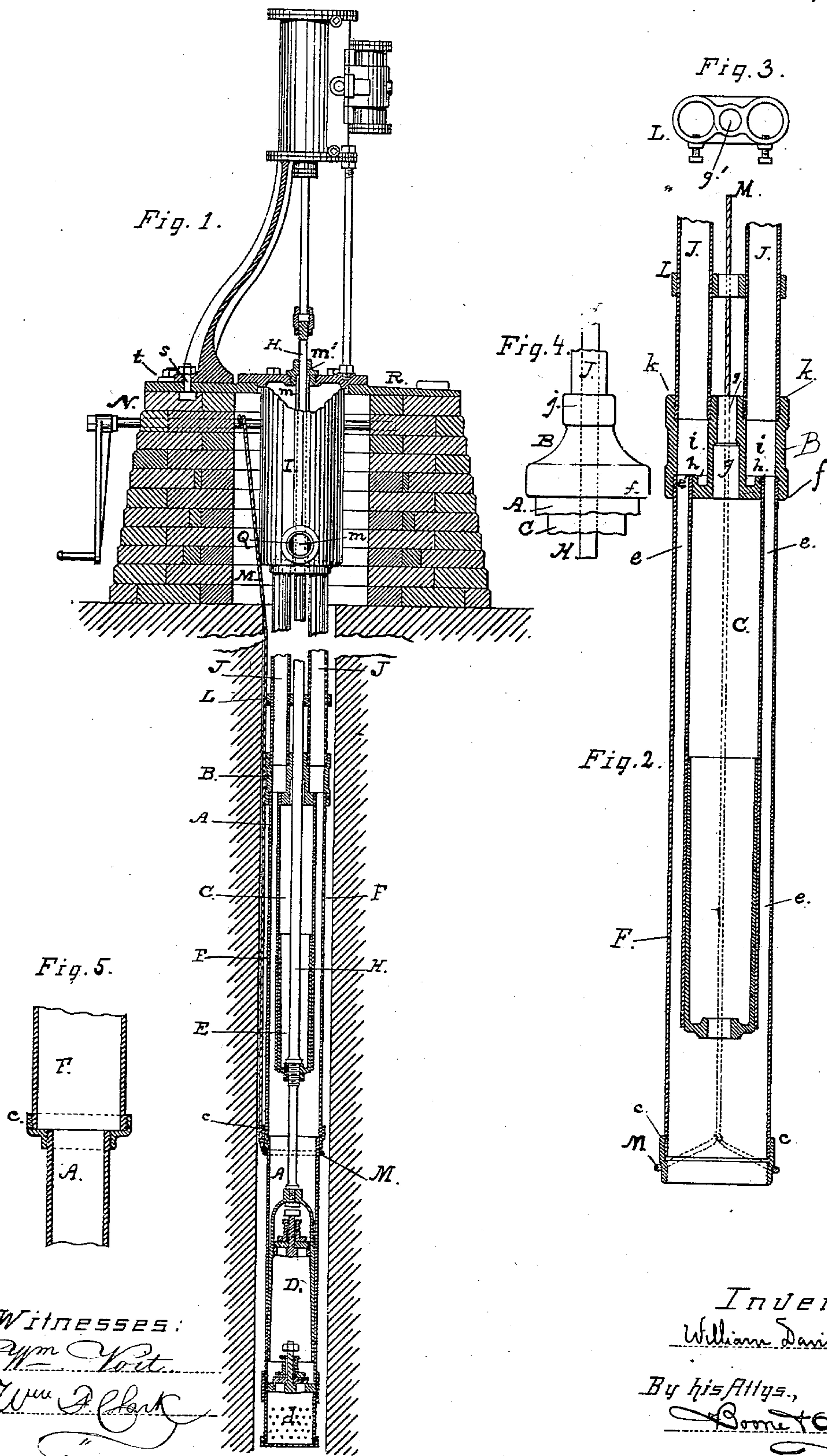
(No Model.)

W. D. HOOKER.

DEEP WELL PUMP.

No. 259,394.

Patented June 13, 1882.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## DEEP-WELL PUMP.

SPECIFICATION forming part of Letters Patent No. 259,394, dated June 13, 1882.

Application filed September 27, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM DAVIS HOOKER, of Oakland, in the county of Alameda and State of California, have made and invented certain new and useful Improvements in Deep-Well Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

My invention relates to improvements in deep-well bucket-plunger pumps for use in Artesian or bored wells.

Referring to the accompanying drawings, Figure 1 shows an elevation of my improved pump, partly in section. Fig. 2 is an enlarged view of the pump, showing the plunger and water-way. Fig. 3 is a top view or plan of the yoke. Fig. 4 is a side view of the head or enlarged chamber. Fig. 5 shows the coupling between the two sections forming the barrel of the pump.

A represents the pump-barrel, containing the valve-bucket, the plunger, and the water-way leading into the head or discharge-chamber B. I make this barrel of two sections or lengths of tube, secured together by a screw-threaded coupling, c. The lower section contains the valve-bucket D, and has a perforated or strainer end, d, of the usual construction. The upper section F of the barrel contains the cylinder C, which forms the plunger-chamber, and between the inner cylinder C and outer cylinder, F, is the annular space e, forming the water-way of the barrel. The upper ends of these two cylinders are screwed into the end of the head B, that constitutes the discharge-chamber. The lower section of this pump-cylinder is made of a diameter to conform to the size of the bucket employed, but the upper section is made as much larger in diameter as I desire to increase the area of the plunger, and still maintain the proper size of the water-way.

In pumps of this character, where they are worked in wells of very great depth, the weight and length of pump-rod is often a serious objection and a drawback in working the pump successfully, and various means and devices have been devised and employed to counterbalance the rod and obtain a uniform movement. I have found, however, that by increasing the relative area of the plunger in this kind of

pump, according to the length or weight of the pump-rod being used, I am enabled to balance the rod in an accurate manner, and cause it to work as evenly and smoothly on the downward as it does on the upward stroke. For this purpose I increase the diameter of the upper section as much larger than the diameter of the valve-bucket chamber as I find it necessary to increase the area of the plunger, so that while preserving the size of the water-way I obtain a larger surface of the plunger-head to act against the body of water in the pump-cylinder on the downstroke of the pump-rod. This mode of balancing the pump-rod by increasing the relative area of the plunger and its plunger-chamber, enables me to dispense with all devices of weights and levers to relieve the working-engine, and when employed in connection with my construction of pump without stuffing-boxes, gland, and packing at any point around the pump-rod, I am enabled to raise water from a well of very great depth of bore, with a comparatively small amount of power.

The head B has a rim, f, to receive the end of the upper section of the barrel, and a central socket-opening, g, for the pump-rod to work through. Around this aperture is a flange, h, for securing the inner cylinder, C, that surrounds the plunger and forms its chamber. The annular space e connects with the space i in the head through the openings e' e', while at the top are the sockets k, one on each side of the pump-rod aperture g, to receive the discharge-pipes J J. From this head the pipes J, in sections of suitable length, united by couplings, extend upward in a regular manner, side by side, to the surface of the ground, where an air-chamber, I, or a common receiver for both pipes, is provided.

Between the two pipes J J, at suitable distance apart, I fix yokes or cross-bars L L, that serve to tie together and brace the two pipes and also to guide the pump-rod H as it moves up and down in the space between the pipes, each yoke being secured at the ends to the pipes on each side of the rod H, and having an aperture, g', in the center for the rod to work through. This construction gives a light yet very strong and rigid frame to support the pump-barrel and guide its pump-rod; and it



affords such ready and convenient access to the parts in putting down the pump that a very great length of pump-rod and discharge-pipe can be placed and accurately adjusted to  
 5 work smoothly and with the least amount of friction. Besides the advantage in putting the sections of pipes and pump-rod together possessed by this construction of double discharge-pipes and guides, the improvement  
 10 greatly reduces the cost of production and gives better opportunity for inspection of the pump-rod, so that the pump can be kept in good working condition.

Between the pipes J J, I obtain, also, a  
 15 space to carry down alongside of the pump-rod a chain or cable, M, Fig. 2, which I attach at the lower end to the pump-barrel, near the bottom, and then fasten the upper end to a winding shaft or axle, N, held in bearings  
 20 across the well at the surface, so that by means of a crank on the end of this axle the entire pump can be easily and rapidly raised up out of the hole and the sections removed, as required, for inspection, repairing, or cleaning,  
 25 and as readily lowered into position for work.

In setting up and operating my improved deep-well pump I prefer to carry the ends of the discharge-pipes J J into the bottom of an air-chamber, I, which is set into a brick-work  
 30 structure provided as a foundation for the engine, and then to lead therefrom a conducting-pipe, Q, out through the side. The top plate, R, has the base or pedestal of the engine held on it by a swivel or center bolt, s, at one side  
 35 of the center, besides the usual fastening-bolts, t, one on each side of the central bolt, and by removing these the engine can be swung round to one side off from the opening over the well, and the pump-structure is then readily raised up  
 40 by means of the axle and chain M. Bearings

for this axle are provided in the foundation beneath the bed-plate R, and by making this device a part of the pump-structure it is always ready at hand and in condition for use  
 45 to raise the pump out of the well for cleaning or repairs. The pump-rod H, where it passes through the air-chamber, works through a tube, m, and out through a guide, m', in the top of the chamber, so that no glands, packing, or stuffing-boxes are required at any part of  
 50 the air-chamber.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The discharge-chamber B, having the rim  
 55 f to receive the outer cylinder, F, and the flange h for the plunger-cylinder C, with the water-way e between them, the central socket, g, for the pump rod, and the two sockets k k for the ends  
 60 of the discharge pipes.

2. The submerged bucket-plunger pump, the barrel of which is formed of the two cylinders A F, inclosing the valve-bucket D and plunger, and providing the water-way e between them, having the two separate discharge-  
 65 pipes leading vertically upward from the water-way of the barrel to the surface, and connected with the air-chamber I at the top, and the yokes L, connecting or tying the said discharge-pipe at intervals, and having guide-  
 70 apertures for the pump-rod, and the pump-rod H, supported and guided in and by the guide-sockets g m', substantially as set forth.

In witness whereof I have hereunto set my hand.

WILLIAM DAVIS HOOKER.

Witnesses:

EDWARD E. OSBORN,  
 W. F. CLARK.