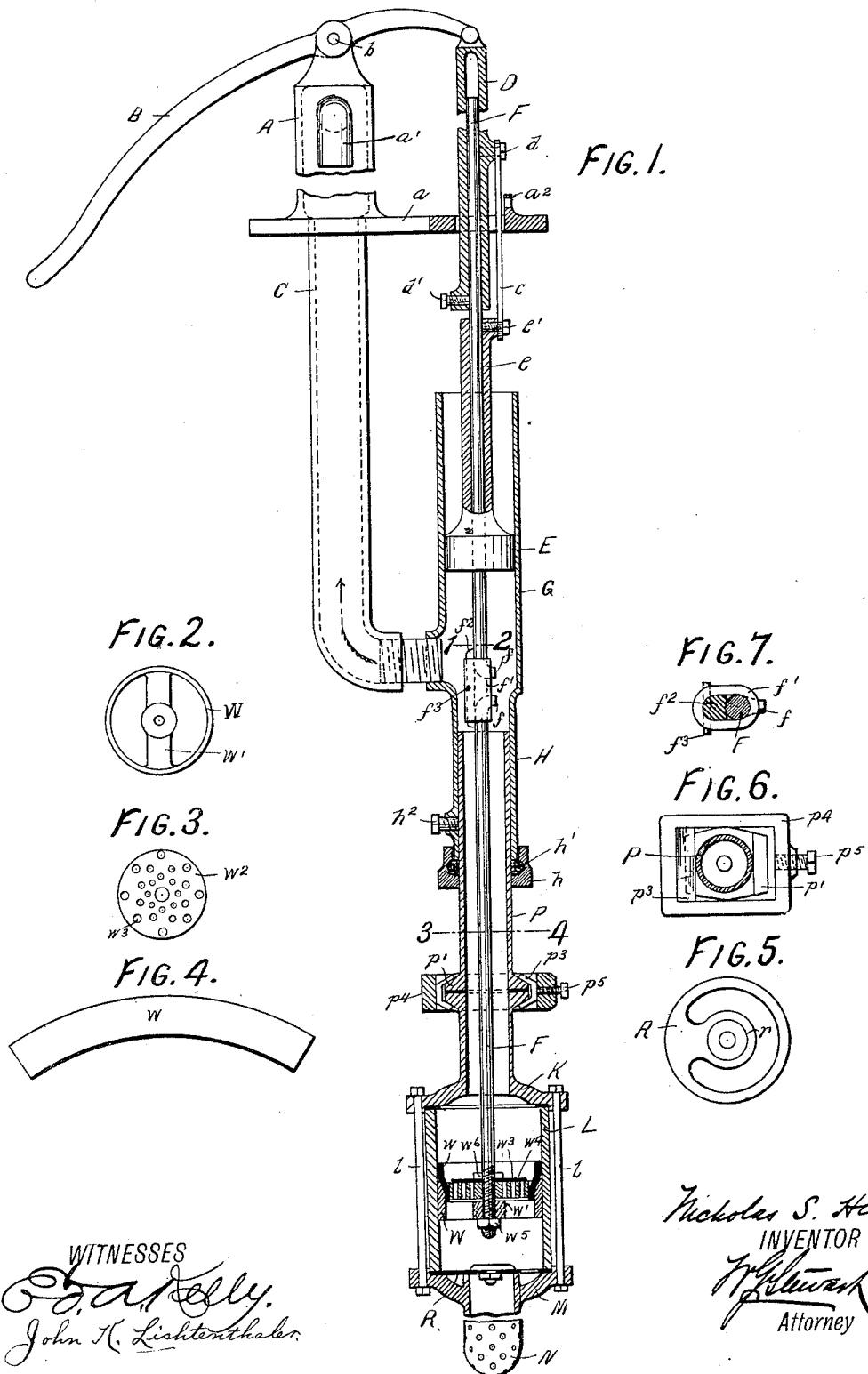


(No Model.)

N. S. HILL.
PUMP.

No. 419,197.

Patented Jan. 14, 1890.



UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 419,197, dated January 14, 1890.

Application filed August 19, 1889. Serial No. 321,324. (No model.)

To all whom it may concern:

Be it known that I, NICHOLAS S. HILL, a citizen of the United States, residing at Shillington, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to pumps adapted more particularly for cisterns, &c.

The object is to furnish a pump which can be readily put in position, adjusted to different depths of wells, and kept in repair without the assistance of a skilled mechanic or the necessity for tools which are not constantly at hand.

The invention consists, mainly, in a construction which permits the pump to be quickly and easily changed from single to double acting, and which permits the length of the piston-rod and casing to be easily changed to adapt the pump to any desired location.

The features are fully set forth herein and specifically pointed out in the claims.

Figure 1 is a sectional view of a pump embodying my invention. Fig. 2 is a plan of the lower piston-shell. Fig. 3 is a plan of the lower piston perforated disk. Fig. 4 shows the strip of leather from which the lower piston-bucket is formed. Fig. 5 is a plan of the suction-valve in lower cylinder. Fig. 6 is a section through 3 4 of Fig. 1. Fig. 7 is a section through 1 2 of Fig. 1.

The operating-lever B is fulcrumed at *b* to the hollow standard A, which is supported upon a base *a*, below which extends the discharge-pipe C, which communicates with the upper cylinder G below the piston E. This piston is hollow and has a hollow rod in two sections D and *e*, which are represented as connected by a link *c* at points *d* and *e'*, respectively. These two sections, when thus connected, are operated together by the lever B, but may be disconnected, as will be explained hereinafter. The section D is ex-

tended to serve as an operating-rod, being connected to the end of lever B or other means for imparting to it a reciprocating motion.

The lower piston-rod F F passes upward through the hollow upper piston and rod, and is adjustably secured to the upper section D of the latter by means of a set-screw *d'*. The lower cylinder L is secured by bolts *l* between heads K and M, the suction-valve R forming the lower joint and having a weighted flap *r*, and a suction-pipe extends downward from the head M to any desired distance and terminates in a strainer N, as usual.

The casing connecting the upper and lower cylinders and inclosing the lower piston-rod is made up of sections united in such a manner as to be easily disconnected or to permit a considerable variation in length without disconnecting. The extension H of cylinder G is of such diameter as to permit a section P of the casing to slip longitudinally within it, being secured by a set-screw *h*², and packing *h'* may be set up by a gland-nut *h* to avoid leakage. The different sections of casing are coupled together in a special manner to avoid the use of bolts and nuts and to facilitate the operation of coupling and uncoupling. The ends of adjoining sections are provided with rectangular heads having tapering opposite edges *p'*, which are covered by corresponding cap-pieces *p*³, which are inclosed by a frame *p*⁴, having a set-screw *p*⁵, by means of which the caps *p*³ are pressed together and the coupling effected. The lower piston-rod is also made up of sections, which are coupled together in a special manner. Adjoining sections F F have hooked ends *ff*, which enter an oblong sleeve *f'* from opposite ends and engage radial holes in the shell of said sleeve. A gib *f*² fills up the sleeve and holds the hooked ends in place, while a cross-pin *f*³, of wood or equivalent material, secures the gib to the sleeve. Coupling is easily effected and just as easily parted, the wooden pin *f*³ serving to securely hold the gib in place during service, practically the whole strain coming upon the hooked ends *f*, yet being easily cut by forcing the gib out of the sleeve to uncouple.

The lower piston consists of a shell W, Figs. 1 and 2, provided with a cross-bar *w'*, which

may be formed integral with the shell or separate, a disk w^2 , having perforations w^3 , and a bucket w , formed from a flat strip of leather or equivalent material, (see Fig. 4,) which, when rolled and secured between the disk w^2 and shell W , assumes in service the shape shown in Fig. 1. The rod F passes through the disk w^2 and the cross-bar w' , and the leather w is clamped tightly in place by means of nuts w^5 and w^6 on the threaded end of the rod, the former serving also to hold in place a leather disk-valve w^4 , which closes the perforations in the disk w^2 during the upward stroke of the piston. The main purpose of this construction of piston is to avoid the necessity of a specially-pressed leather bucket, the strip w being easily prepared by any one, and the ends being either butted or scarfed and lapped, so as to form a perfectly-tight piston.

Under some circumstances—as, for instance, when operated by a windmill—it is preferable to have a single-acting pump, thus avoiding alternate tension and compression upon the rod. When the link c is attached to both section e and section D of the upper piston-rod, as shown in Fig. 1, both pistons are moved together, thus operating as a double-acting pump. To change to a single-acting it is only necessary to disconnect the link c at d and connect it to a fixed point a^2 , thus preventing any movement of the upper piston, while the rod of the lower piston works freely through it. In order to vary the length of the pump within a comparatively short distance, it is only necessary to slide the casing and lower rod to the proper point and secure them by means of the set-screws h^2 and d' , or by other suitable means, and to set up the packing h' . When a considerable change in length is required, one or more sections of the casing or rod can be readily added or removed by means of my improved couplings.

It is evident that the construction herein set forth may be considerably modified without departing from the spirit of my invention, and I do not therefore limit myself precisely to said construction; but

What I claim is—

1. In a double-acting pump, the combination of upper and lower cylinders united by tubular sliding sections, substantially as described, a hollow upper piston, a lower piston having a rod extending through said hollow piston, a hollow operating-rod adjustably secured to said lower piston-rod, and means, substantially as described, for connecting said hollow piston with the lower piston-rod or with a fixed point, substantially as set forth.

2. In a pump, the casing-coupling herein described, consisting of similar rectangular ends on adjacent sections with tapering opposite edges p' p' , caps p^3 , and frame p^4 , with set-screw p^5 , substantially as set forth.

3. In a double-acting pump, the combination, with a lower piston and rod, of a hollow upper piston and rod in two sections, the upper section being adjustably secured to said lower rod and the lower section detachably attached to said upper section, substantially as set forth.

4. In a pump, the piston-rod coupling herein described, consisting of rods F , having adjacent hooked ends engaging corresponding holes in a sleeve f' , with gib f^2 and pin f^3 , all substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

NICHOLAS S. HILL.

Witnesses:

HENRY C. G. REBEN,
F. M. BANKS.