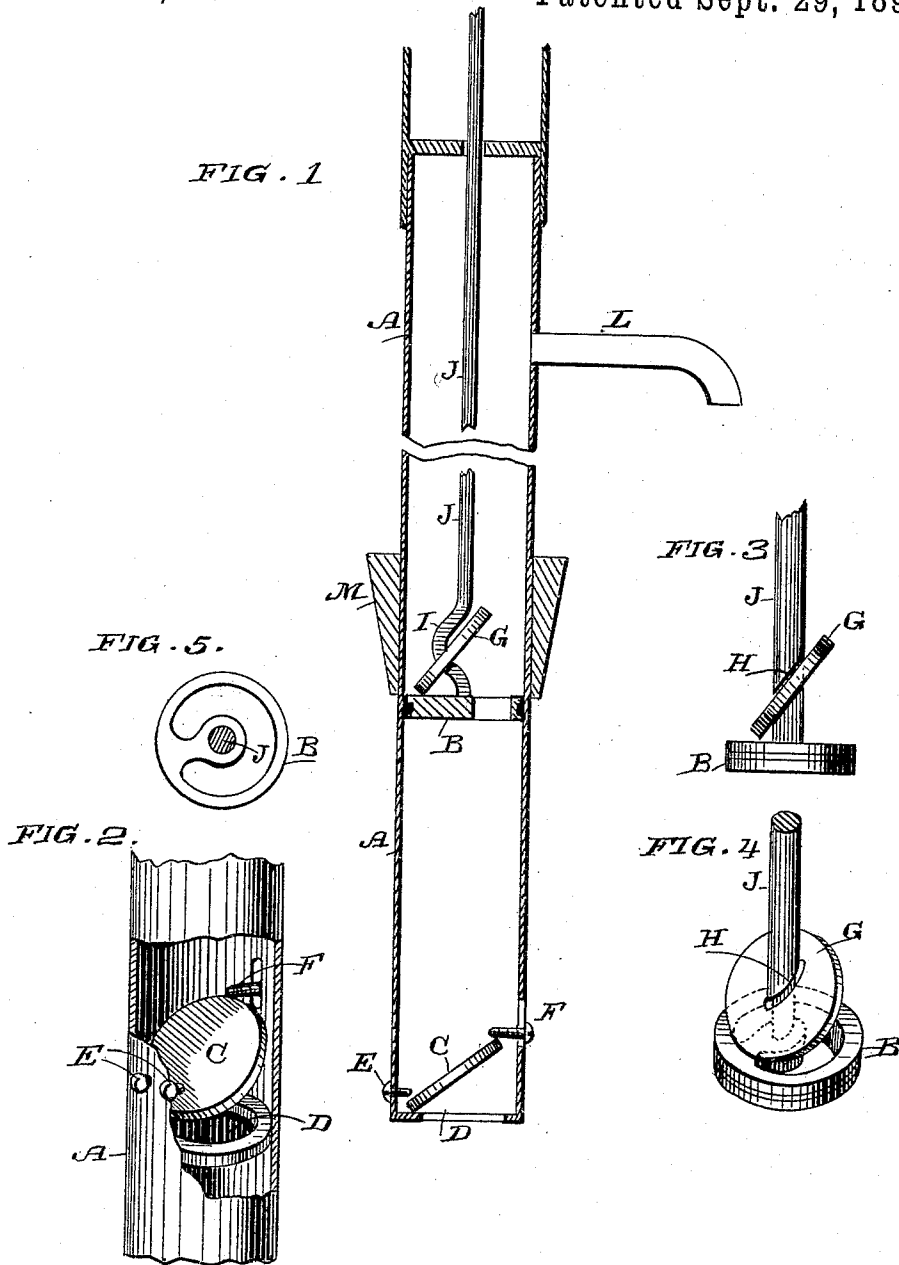


(No Model.)

C. P. SMITH.
PUMP.

No. 460,223.

Patented Sept. 29, 1891.



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UNITED STATES PATENT OFFICE.

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PUMP.

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Application filed October 31, 1890. Serial No. 369,963. (No model.)

To all whom it may concern:

Be it known that I, CLAYTON P. SMITH, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Pumps; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in pumps; and it consists in certain details of construction, and arrangement of valves, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a sectional view showing the interior of the pump and its valves. Fig. 2 is an enlarged view of the inlet-valve. Fig. 3 is an enlarged view of the plunger-valve. Fig. 4 is a perspective view of the plunger and valve. Fig. 5 is a plan view of the plunger.

The object of my invention is to provide float or hingeless valves with a free opening for the passage of liquids or fluids which are to be pumped, and a means for guiding and controlling the movements of the valves.

A is the pump-cylinder.

B is a piston, which is adapted to reciprocate within the cylinder, and this piston has an opening made through it for the free passage of the liquid.

At the bottom of the pump-cylinder is fixed the inlet-valve C, through which the material to be pumped passes, and it closes to prevent its flowing out again when the piston is depressed in the usual manner for pumps. A peculiarity of the construction lies, essentially, in the valves. The opening for the lower or suction valve is made of considerable diameter, as shown at D, leaving but a narrow rim or flange upon which the valve may seat. The valve itself is a disk of sufficient diameter to rest upon the rim or flange and close the opening.

Just above the valve, at one side, are fixed two pins E, against which this edge of the valve will impinge when it is lifted, and upon the opposite side and higher up is fixed another pin F, which arrests the upper edge of the valve. The pins E are fitted so that they may screw in or out, so as to leave a greater or less projection on the interior of the

pump, against which the lower edge of the valve is retained, and the pin F is fitted into a slot or channel, so that it may be adjusted up or down, and thus allow the free or moving edge of the valve to move and open to a greater or less distance, as the character of the material to be pumped requires.

The valve C is simply a round disk, which, when closed, fits closely upon the flange around the inner passage D, and when it is opened by the inward flow of the material caused by the rise of the piston it is only checked by its contact with the projecting pin F. It will be seen that as the valve commences to rise the rear edge of it will first come in contact with the pins E, and the other edge will continue to rise until the valve stands at an angle within the passage, this opposite edge being checked by contact with the pin F, as before stated. The valve may be made of any suitable or desirable material, depending upon the material to be pumped, being made either of glass, rubber, metal, or other substance which will arrest the action of any corrosive or caustic material, and as no hinge-pins or journals are employed it is not difficult to make the valve of any material. Being perfectly free to turn about, it is manifest that it may change its position freely, and consequently there will be no more wear upon one part of the valve than the other. The plunger-valve is operated in a similar manner, having no hinge, but being allowed to lift and close freely. It may be guided and checked in its movements in various ways. One method is to flatten the pump-rod and to make a slot through the valve corresponding in shape to the flattened section of the pump-rod. The upper shoulders of the flattened section are beveled or inclined, as shown in Fig. 3, so that the valve when lifted by the inflow of the material through the piston or plunger will stand at an angle, as shown, the back being checked by the inclined shoulders H.

Another form, which is preferable, is shown in Fig. 1, in which the plunger-rod J is bent into a curve, as shown at I, and the valve G is perforated, so as to clasp or inclose the rod below this curve when closed. When the valve is open, it will be inclined upward and its upper edge will strike against the upper

part of the curve, which will thus arrest it to prevent any further movement, the valve-stand serving as a guide for the valve in the same manner as previously described. The center of the plunger presents sufficient surface to receive the rod and to cover the hole in the valve when the latter is closed. By this construction both the suction-opening D and the opening through the plunger may be made of large size, and the valves are particularly effective in pumping thick and heavy liquids, operating perfectly where ball and other float valves will not work at all. The upper end of the pump has a cap fitting around the piston-rod, with a cup at the upper end, so that any liquid which may follow the rod up by cohesion will be caught in this cup and returned again through the opening around the rod. The lower valve may either be fixed directly at the lower end of the pump-cylinder or it may be fixed in a sleeve which telescopes upon the lower end of the pump-cylinder and may be removed at will. At any suitable point in the pump-cylinder between the piston and the upper end is fixed the discharge pipe or faucet L. Around the pump-cylinder is fitted a sleeve or collar M, of any suitable material, which clasps the cylinder closely enough to remain at any point, but which may be moved by considerable pressure. When this pump is employed for use with cans, such as coal-oil and some other materials are shipped in, it is only necessary to punch a hole through the top of the can with a tapering marline-spike. The pump is then introduced until the lower end is at the proper position with relation to the bottom of the can, and this surrounding sleeve M is pushed down until the lower end fits snugly into the opening made. This serves at once to steady and support the pump-barrel, and the contents of the can may be pumped out from time to time without turning the can down upon the side or employing any of the

usual methods for discharging the can. If the can has a screw-top, the collar M is screw-threaded to fit the corresponding part of the can to which it is thus easily received. The sleeve or collar M makes a joint sufficiently tight to prevent evaporation, while holding the pump steadily, and it will be manifest that no leakage can occur, as the can always remains right side up.

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

1. A pump having a barrel, plunger, and plunger-rod, the latter having inclined shoulders formed upon it, in combination with a hingeless disk mounted upon the plunger-rod and limited in its movement by the inclined shoulders thereon, substantially as herein described.

2. In combination with a pump-cylinder and plunger having the inlet-openings, the hingeless disk or valve fitted to close upon the seat of the inlet-opening, pins acting as stops to limit the lift of the rear edge of the valve, and a third pin upon the opposite side of the cylinder acting as a stop for the opposite edge of the valve, said pins being adjustable in the sides of the cylinder, substantially as herein described.

3. In a pump, the pump-cylinder with the inlet-valve and the plunger having an opening made through it, a piston-rod having inclined shoulders or stops formed upon it, and a hingeless disk or valve perforated to fit around the piston-rod and limited in its movements by the shoulders upon the piston-rod, substantially as herein described.

In witness whereof I have hereunto set my hand.

CLAYTON P. SMITH.

Witnesses:

S. H. NOURSE,
H. C. LEE.