W. BURLINGHAM.

Pump.

No. 201,909. Patented April 2, 1878.

Fig. 1

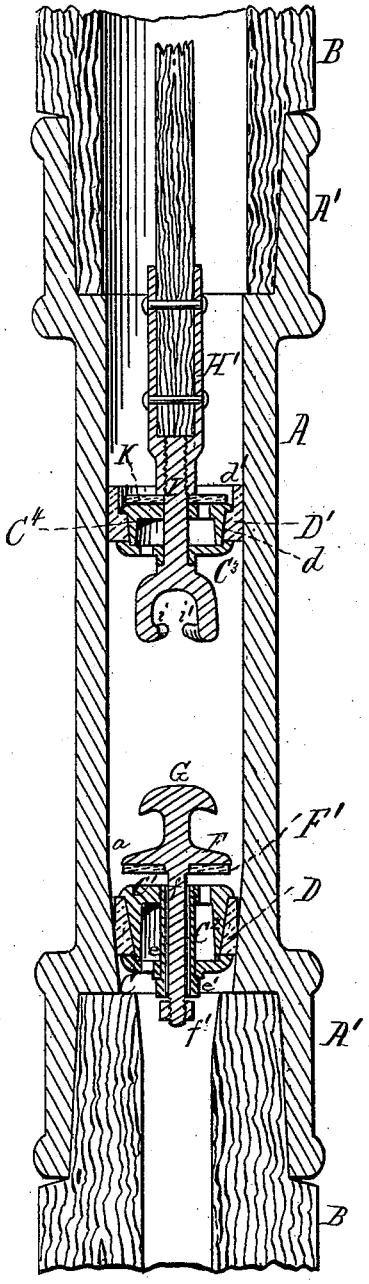


Fig. 2.

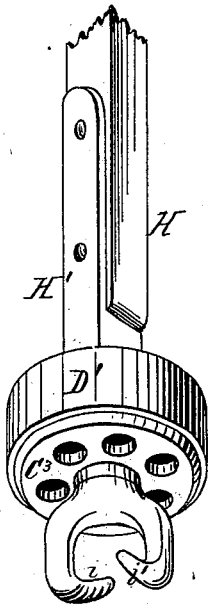
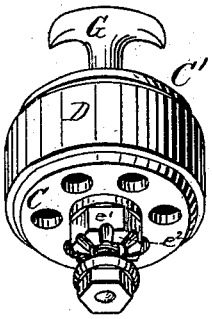


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM BURLINGHAM, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **201,909**, dated April 2, 1878; application filed January 31, 1878.

To all whom it may concern:

Be it known that I, WILLIAM BURLINGHAM, of the city and county of Baltimore, State of Maryland, have invented certain new and useful Improvements in Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a vertical section through a pump-cylinder, check-valve, and plunger, showing my improvements. Fig. 2 is a perspective view of the plunger, and Fig. 3 is a similar view of the check-valve.

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

My invention relates to a novel construction of an intermediate metallic section of a pump-cylinder, in which the plunger or piston operates, having a contracted base, forming a support or seat for the check-valve, and provided with end sockets, adapting it to be readily united to the adjacent sections of the pump-cylinder, as hereinafter described.

It further relates to the construction of the clamping rings and plates of the plunger and check-valve, and to the means for uniting them, and to the arrangement of devices for facilitating the withdrawal of the check-valve, all as hereinafter fully set forth.

In the accompanying drawings, A represents the intermediate metallic section of the pump-cylinder, provided at its ends with enlarged sockets A′ A′, for the reception of the ends of the adjoining sections B B′, of wood or other suitable material, as shown in Fig. 1.

The bore of section A is contracted in diameter at its lower end, at *a*, in such manner as to form a support for the check-valve or check-valve seat, which enters said contracted portion in wedging form, as shown, and is thus firmly held in place. This section of the cylinder, with its sockets, and having its bore contracted at the base, as described, is cast or otherwise formed in one piece, and may, if desired, be lined on its inner face with porcelain, galvanized iron, or other suitable material, for giving a smooth interior surface, preventing corrosion, and thereby giving increased efficiency and durability to the pump.

The check-valve or valve-seat (shown in section in Fig. 1, and in perspective in Fig. 3) is composed of a lower horizontal plate or ring, C, and an upper plate or ring, C^1, the latter having a pendent annular flange, C^2, made, by preference, slightly tapering from the plate C^1, the outer edge of which projects beyond the vertical flange C^2, forming a clamping-shoulder, between which and the plate C the packing-ring D is placed, surrounding the annular flange C^2, as shown.

The flange C^2 extends downward into a depression or groove formed in the upper face of plate C for its reception, and which serves to prevent lateral displacement of the clamping-plates relatively to each other; and the plates, thus formed, are united and drawn toward each other, clamping the packing-ring D snugly between their outer edges, by a central tubular screw, *e*, having a head, e^1, at its lower end, and a screw-thread at its upper end, which engages with a corresponding screw-thread in a central perforation in plate C^1.

The plate C and the horizontal part of plate C^1 are perforated around the connecting tubular bolt or screw, and between said bolt and the flange C^2, to permit the free passage of the water.

The plates C C^1, constructed as described, in connection with the packing-ring D and the clamping bolt or screw, form, as a whole, the valve-seat, adapted to fit into and be held firmly in place in the contracted portion *a* of the cylinder A, as described.

F is the valve, having a stem, *f*, of less diameter than the bore of the connecting tubular screw or bolt *e*, and which passes through said tubular screw, and is provided on its lower end with a nut, *f′*, which serves to limit the throw or upward movement of the valve F.

The stem *f*, immediately below the valve-plate F, is slightly enlarged in diameter to a depth about equal to the thickness of a packing valve or washer, F′, of leather or equivalent material, placed immediately under the valve or head F, and forming a packing between said head and the perforated plate C^1. The central perforation in this packing-washer is thus enlarged to about the bore of the tubular clamping-bolt *e;* and when the head F is lifted by power applied from above for withdrawing the valve or valve-seat for any pur-

pose, the packing-valve will drop down upon the plate C^1, and allow the water to escape through said central perforation, and through the tube *e* around the stem *f*, thereby relieving the valve of the weight of water above it and facilitating its removal.

The lower face of the head e^1 of said tube has a series of radial grooves, e^2, formed in it, for permitting the water to escape between it and the nut *f'* on the valve-stem in the operation described.

In the ordinary operation of the pump, the packing-washer will, of course, adhere to and move with the head F, rising to admit the water through the perforated clamping-plates, and dropping again, in the usual manner, for preventing its return.

The tubular connecting screw or bolt *e* is thus made to perform three distinct functions—viz., first, of holding the clamping-plates together and adjusting them, as required; second, serving as a guide for the valve-stem; and, third, as a conduit for the escape of the water in drawing the valve.

The packing-ring D is made of rubber, preferably having a tapering bore, as shown, matching the annular flange C^2, and fitting snugly thereon, and firmly clamped in the groove formed around said flange by the overhanging edges of the clamping-plates C C^1.

The valve-head F is provided on its upper face with an upright T-shaped projection or button, G, having the outer ends of the cross-head slightly curved downward into hook form, as shown, for facilitating the withdrawal of the valve, as hereinafter explained.

The clamping plates or rings of the plunger are similar in construction to those of the check-valve seat; but for the purpose of distinguishing them separate letters of reference are employed in describing them, as follows:

C^3 represents the lower plate; C^4, the upper one, having the vertical annular flange; and D', the packing-ring, the plates having perforations to permit the passage of the water similar to the perforations in plates C C^1 for that purpose.

H is the pump-rod, provided at its lower end with a socket-piece, H', and I is a clamping-screw for uniting the plates C^3 C^4 and holding the packing-ring D' in place, said screw engaging with the socket-piece H', as shown.

A valve, K, of leather or other suitable pliable material, is placed over the plate C^4, covering the perforations therein, and held in position between the end of the socket-piece H' and the plate C^4 by the action of the clamping-screw I.

The packing-ring D' is different in form from that employed in the check-valve, as instead of terminating at the lower face of the upper clamping-plate, it is shouldered at that point, at *d*, to receive the outer edge of said plate, and outside of said edge the ring extends upward, around, and above the plate, at *d'*, forming an annular extension, and giving to the plunger, as a whole, a cup shape, as shown, and this upper edge or extension of the packing-ring, which is of rubber and pliable, will be crowded or pressed outward into close contact with the cylinder by the action of the water, and will thus more effectually pack the plunger and prevent the return or escape of the water. These rings are molded in the form described, and of a size or diameter conforming to the pump-cylinder to which they are to be applied.

The head of the screw I is extended and forked or bifurcated, and the lower ends of the fork or arms *i i'* are bent in opposite directions, so as to bring them about parallel with each other, and are turned up or slightly hooked, as shown, in such manner that when the pump-rod is detached from its actuating arm or lever the fork *i i'* can be lowered, striding the hook or button G, when, by giving the rod a quarter-turn, the hooks *i i'* will engage with said button or projection, and the check-valve can be readily withdrawn for repairs or other purposes, as required.

It will be seen that by the construction shown and described all the parts of the pump essential to complete its operation are brought within the single intermediate metallic section of the pump-cylinder, all joints or couplings between the check-valve and the piston are dispensed with, and the liability to leakage, such as would impair the efficiency of the pump, to a great extent obviated, while the ease with which any necessary adjustments or repairs can be made is greatly increased.

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

1. The intermediate metallic cylinder A, having the contraction in its bore, forming a seat or support for the check-valve, and provided with the end sockets A' A', substantially as and for the purpose set forth.

2. The valve-seat composed of the plates C C^1 and central tubular clamping bolt or screw, in combination with the valve having the central stem and the hook or button, adapting the valve-seat to be withdrawn, substantially as described.

3. The valve-seat composed of the clamping-plates C C^1, packing-ring D, and central tubular connecting bolt or screw, in combination with the valve F, with its stem *f*, arranged and operating substantially as described.

4. The clamping-plates C^3 C^4 of the plunger, united by the central bolt or screw, as described, in combination with the shouldered rubber packing-ring D', forming both the packing and the plunger-cup, as described.

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