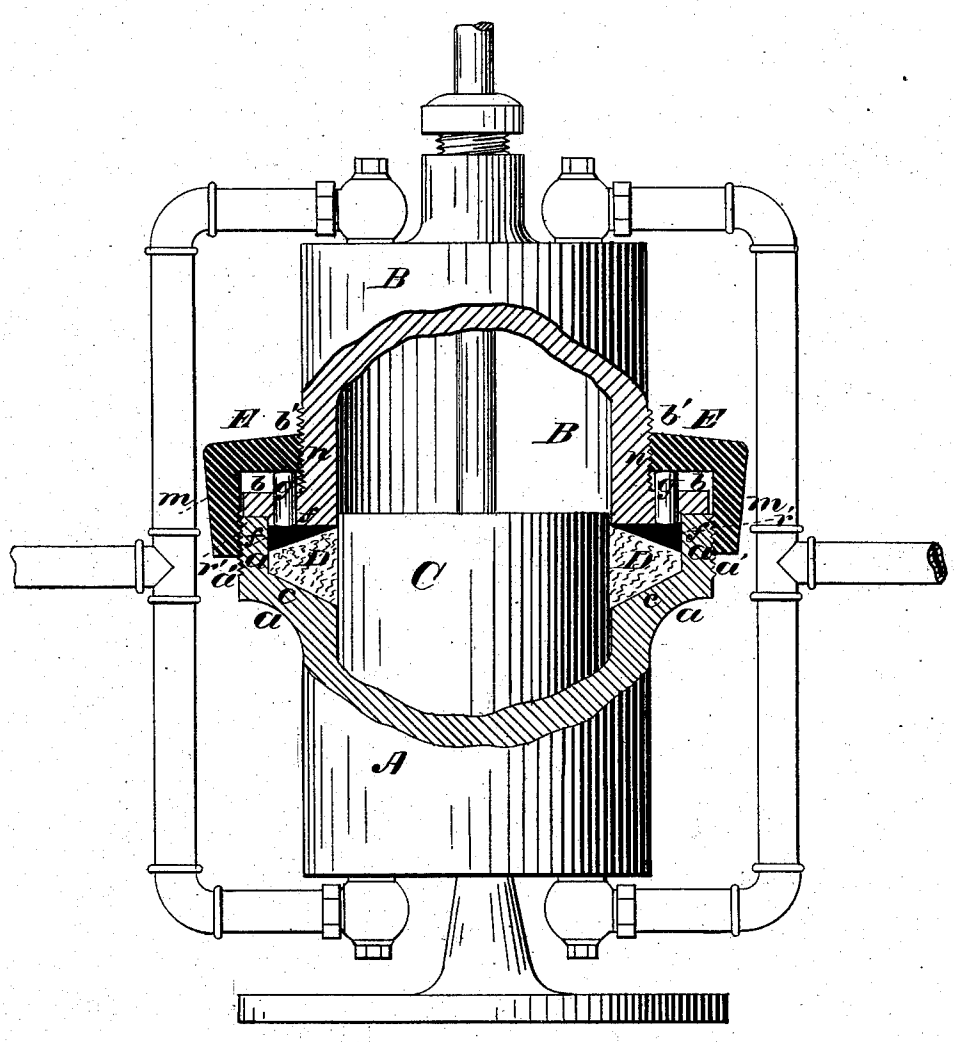
(No Model.)

P. E. JAY.

Pump.

No. 239,960. **Patented April 12, 1881.**



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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 239,960, dated April 12, 1881.

Application filed April 28, 1880. (No model.)

To all whom it may concern:

Be it known that I, PIERRE E. JAY, of the city, county, and State of New York, have invented certain Improvements in Pumps, of which the following is a specification.

This invention relates to the construction of pumps having reciprocating plungers or pistons; and its object is to provide a snug packing, so applied to the plunger as to afford the sole bearing of the said plunger during its reciprocating movement.

The invention comprises certain novel mechanical combinations of parts, whereby the packing is made adjustable to fit the circumferential surface of a plunger of somewhat less diameter than the bore of the pump-cylinder, and whereby the objects hereinbefore set forth are effectually secured, and whereby, moreover, provision is made for the economical construction of the pump-cylinder and for the insertion therein of the packing.

The figure is a partial side view and vertical section representing a pump embracing my said invention.

The pump-cylinder is composed of two parts, A and B, the part A having at its inner extremity the circumferential offset *a*, and the part B having at its inner extremity a circumferential flange, *b*, which fits upon the flat inner extremity of the offset *a*, and is firmly secured thereto, these two parts having, of course, their interiors bored out for the reception of the plunger C. The diameter of this plunger C is somewhat less than the internal diameter of the pump-cylinder A B—in practice about one-sixteenth of an inch—so that a space of about the one thirty-second part of an inch is left all around the plunger C, between the said plunger and the adjacent internal surface or bore of the cylinder. Formed internally within the offset portion *a* of the part A of the pump-cylinder is an annular chamber, which receives the packing D, said packing being of any suitable kind, as hereinafter more fully explained. The bottom *c* of this annular chamber is inclined or sloping, the inclination being downward and inward, as represented in the drawing. Above the packing D, and capable to a greater or less degree of a vertical movement within the aforesaid annular chamber, is a metallic ring, *f*, the under side of which is inclined or sloping in an inward and upward direction, as also represented in the drawing. Passed through vertical openings in the flange *b* of the part B of the cylinder are movable bolts *g*, by which a downward pressure may be communicated to the ring *f*. When this is done the packing D, acted upon at its opposite sides by the inclined bottom *c* of the annular chamber in which the said packing is placed, and the sloping or inclined inner surface of the ring *f*, is compressed and wedged inward against and around the plunger C, so that the said plunger is kept concentric with the surface of the bore of the pump-cylinder, the slight space between the plunger and said surface being filled by the inward projection against the plunger of the packing D, so that by this means the plunger is supported around its circumference, though only a small portion of its length, by the packing, thereby materially diminishing the friction exerted upon the piston as it is moved to and fro within the pump-cylinder and through the said packing. By thus providing a stationary packing capable of being compressed against the plunger in such a manner that the plunger will move free and out of all contact with the surface of the cylinder itself, a most effectual packing to the plunger is secured simultaneously with a very considerable reduction of the friction and consequent loss of power which would otherwise be incident to the movement of the plunger.

It may be here remarked that the arrangement of the ports, valves, &c., of the pump may be of any ordinary or suitable kind adapted to a pump of the general character herein indicated, or that represented in the drawing may be used with very superior results.

The packing D may be of hemp or fibrous material, as represented in Fig. 1, or it may be composed of concentric metallic rings, each split at a suitable part in order to permit of its contraction or expansion, as required, and said rings being made to break joint in the manner well understood by mechanics conversant with the packing of pumps, engines, &c. In either case the action of the ring *f* when brought downward or inward, as hereinbefore explained, is to compress the aforesaid packing-rings and force them radially inward, so to speak, against the adjacent surface of the plunger, to form a tight packing thereto and

to sustain the said plunger concentric with the inner surface of the pump-cylinder, but out of contact therewith.

A screw-thread, a', is formed on the outer circumference of the offset a, and a similar screw-thread, b', is formed on the inner portion of the outer circumference of the part B. A cap, E, has an internal screw-thread, as shown at n, which screws upon the thread b' of the part B. The said cap is also formed with a downwardly-projecting circumferential flange, m, in which is formed an internal screw-thread, r', which screws upon the thread a' of the part C of the cylinder.

The screw-threads by which the cap E is attached to the two parts of the cylinder, as just described, should, of course, have the same pitch and inclination. The movable bolts g in this case are arranged simply to slide through the holes in the flange b, and while their innermost ends rest upon the adjacent surface of the ring f their outermost ends rest against the innermost surface of the cap E, as shown in the sectional portion of Fig. 1. By rotating the cap E, therefore, to force the bolts g inward, the ring f, acting in conjunction with the sloping bottom c of the annular chamber containing the packing D, will cause the said packing to be forced inward to and against the plunger, as hereinbefore explained; and inasmuch as all the bolts g will be simultaneously and uniformly acted upon by the inward movement of the cap E, it follows that the compression and consequent inward pressure of the packing will be uniform in character and simultaneous in movement at all parts of the said packing—in other words, at all parts of circumference of the plunger C.

As will be seen by reference to Fig. 1, the ring E, from its attachment to the two parts A B of the pump-cylinder, may be used as means, either alone or in conjunction with other devices, for connecting or holding together the said two parts of the cylinder.

What I claim as my invention is—

The ring E, constructed with the screw-threads n r', in combination with the screw-thread a' of the part A of the cylinder, the screw-thread b' of the part B of the said cylinder, the sloping or inclined bottom c of the offset a, the packing D, the ring f, and movable bolts g, substantially as and for the purpose herein set forth.

PIERRE E. JAY.

Witnesses:
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