Jeffery & Quackenbush,

Double-Acting Pump,

No. 35,522, Patented June 10, 1862.

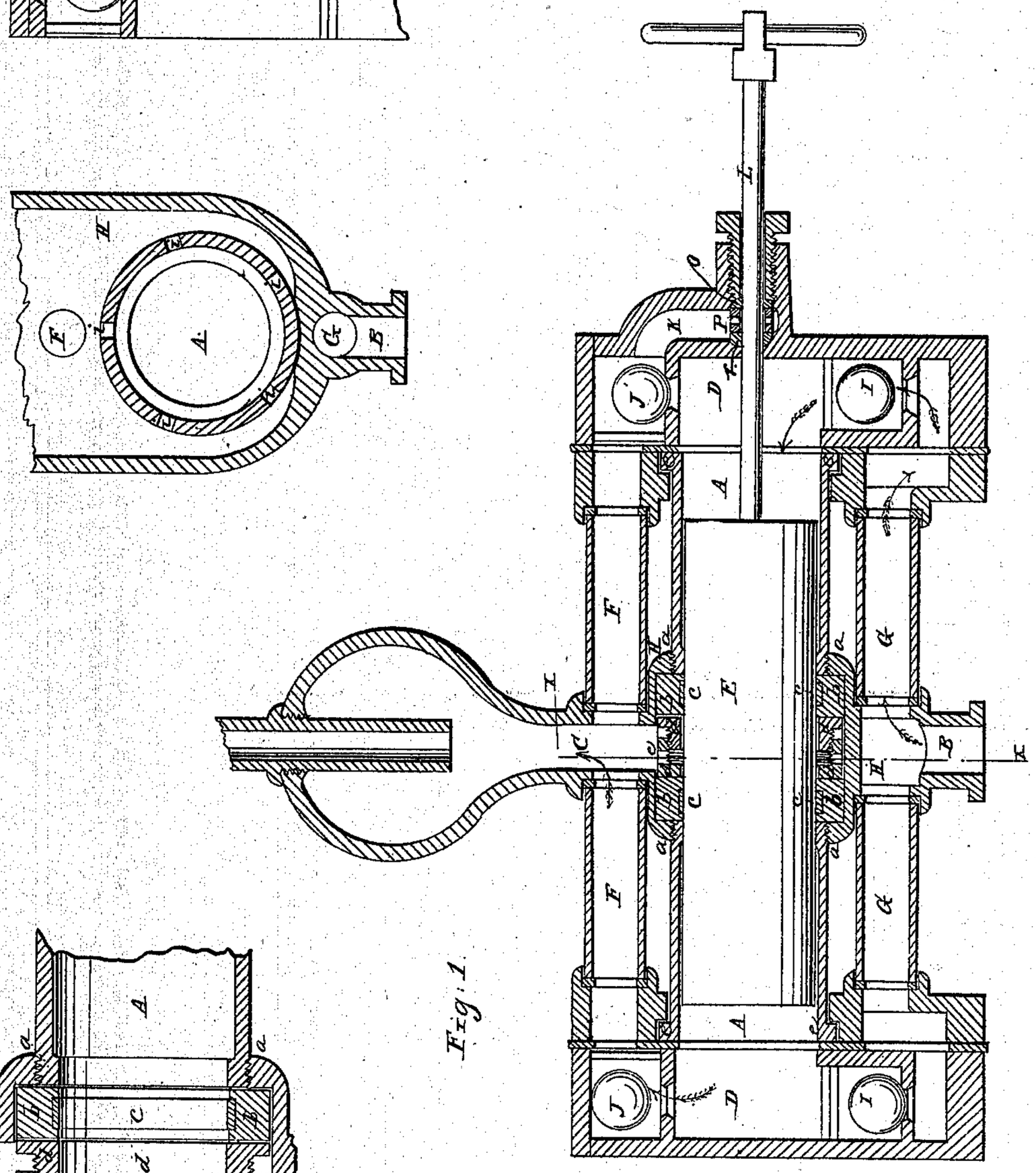

Fig. 1.

Fig. 3.

Fig. 4.

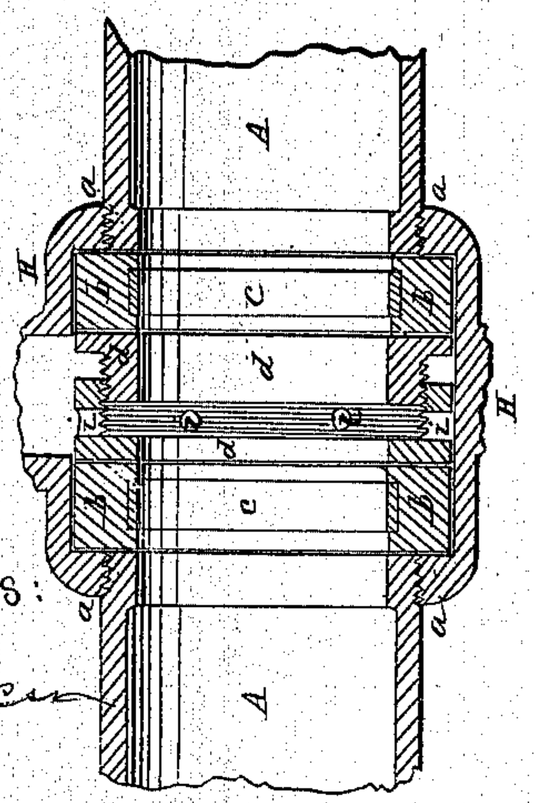

Fig. 2.

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UNITED STATES PATENT OFFICE.

E. A. JEFFERY AND J. D. QUACKENBUSH, OF CORNING, NEW YORK,
ASSIGNORS TO J. D. QUACKENBUSH.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **35,522**, dated June 10, 1862.

To all whom it may concern:

Be it known that we, E. A. JEFFERY and J. D. QUACKENBUSH, of Corning, in the county of Steuben and State of New York, have invented a new and Improved Force-Pump; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical longitudinal section with the piston in elevation. Fig. 2 is an enlarged sectional view of the central portion of the cylinder and packing device, the piston being removed. Fig. 3 is a transverse section of the cylinder and packing-rings on the line *x x* of Fig. 1. Fig. 4 is an enlarged section of one end of the cylinder, showing the method of packing the piston-rod and the water communication therewith.

Similar letters designate corresponding parts in all of the figures.

As represented in the drawings, A A represent the cylinder, B the induction-pipe, and C the discharge-passage through the air-chamber. The piston E is a cylinder closed at both ends, so that no water is admitted to its interior. The position of the cylinder is horizontal, though it may be used vertically, the valve-chambers being arranged at each end in separate castings D D. The central portion, H, of the cylinder, which receives the packing for the piston, is also cast separately, and the two sections A A are secured to the end or valve portions of the pump by the flanges *e e*, which are held by bolts and packing in the usual manner; but they are connected with the central portion, H, by male and female screws *a a*. The connecting-pipes F F and G G enter sockets in the middle and end castings, and, packing being provided at the ends thereof, are rendered tight by screwing the cylinder-sections A A into the central portion, H, which compresses the packing against the ends of the pipes. This arrangement not only admits of tightening the packing by screwing up the parts A A, but of readily changing them from iron to brass or copper cylinders, and vice versa, as may be required.

The piston E being a smooth cylinder is packed from the outside wholly by means of two rings, *b b*, of rubber or other suitably-elastic material. These rings are faced upon the inside with flat plates *c c*, of brass or copper in the form of rings, but their ends not united, which prevents the adhesion of the piston and rubber and the wearing of the latter. These rubber rings lie in a chamber or enlargement of the cylinder formed in the casting H, and occupying the space between them are two screw-rings, *d d*, which are connected together by a male and female screw. As these are screwed apart they compress the rubber rings against the sides of the chamber in which they lie and cause them to tighten around and against the piston. A series of small holes, *i i*, is provided through one of these rings, which admit water to enter from the discharge-passage C, which is in communication therewith, and fill all the spaces in the interior of the packing-chamber and around the piston, so as to render the packing very perfect and complete. These rubber rings serve also to pack the joints *a a* where the cylinders are screwed in, the screw-rings pressing them firmly against those points. The turning of one ring to accomplish this result is effected by inserting a rod or wrench in the discharge-opening C.

It will be seen by reference to Fig. 3 that the water passes nearly or quite around the packing-rings, thereby having ready access through all the apertures *i i*. This mode of packing secures perfect tightness between the cylinder and piston, and permits of the easy working of the latter on account of the friction which it dispenses with.

As the piston reciprocates the water alternately enters each end of the cylinders by the passages G G through the ball-valves I I, as a vacuum is formed at either end, and is forced out through the valves J J in the same manner. The flow being continuous there is constant and nearly uniform pressure in the discharge-pipes F F, and this is applied to the special purpose of excluding the air from entering the cylinders around the piston-rod, by forming a passage, K, by which the water, after passing the discharge-valve J′, communicates with the piston-rod. The water fills all the space around the rod L and packing *o* in the stuffing-box. As the discharge-pressure

is always outward at that point, when that pressure is greater than the suction, the tendency will always be for water to pass out at the stuffing-box, and thereby prevent air from passing in.

As it is desirable to exclude the water from re-entering the cylinder from the stuffing-box, provision is made by inserting a small perforated tube, *p*, which surrounds the piston-rod, the inner end resting on a gasket of india-rubber, *r*, or other suitable material, and the outer end forming the bottom of the stuffing-box. The water enters the perforations of the tube, filling every interstice and preserving a perfect vacuum in the cylinder.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the cylinder A with the parts constituting the valve-chambers D D, and with the packing-chamber H, so as to secure the suction and discharge pipes G G and F F in sockets in their respective parts, substantially in the manner and for the purposes shown and described.

2. The india-rubber rings *b b* and perforated screw-rings *d d*, so constructed and arranged as by their compression to pack not only the piston, but the joints *a a* of the cylinder, substantially as shown and described.

3. The passage K for admitting water to the stuffing-box of the piston-rod and maintaining it there under the discharge-pressure of the pump, substantially as and for the purposes set forth.

4. In combination with the foregoing, the perforated tube *p* and gasket *r* for excluding water from entering the cylinder from the stuffing-box, substantially as set forth.

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