JAMES POWELL.

Improvement in Pneumatic Pumps.

No. 119,641. Patented Oct. 3, 1871.

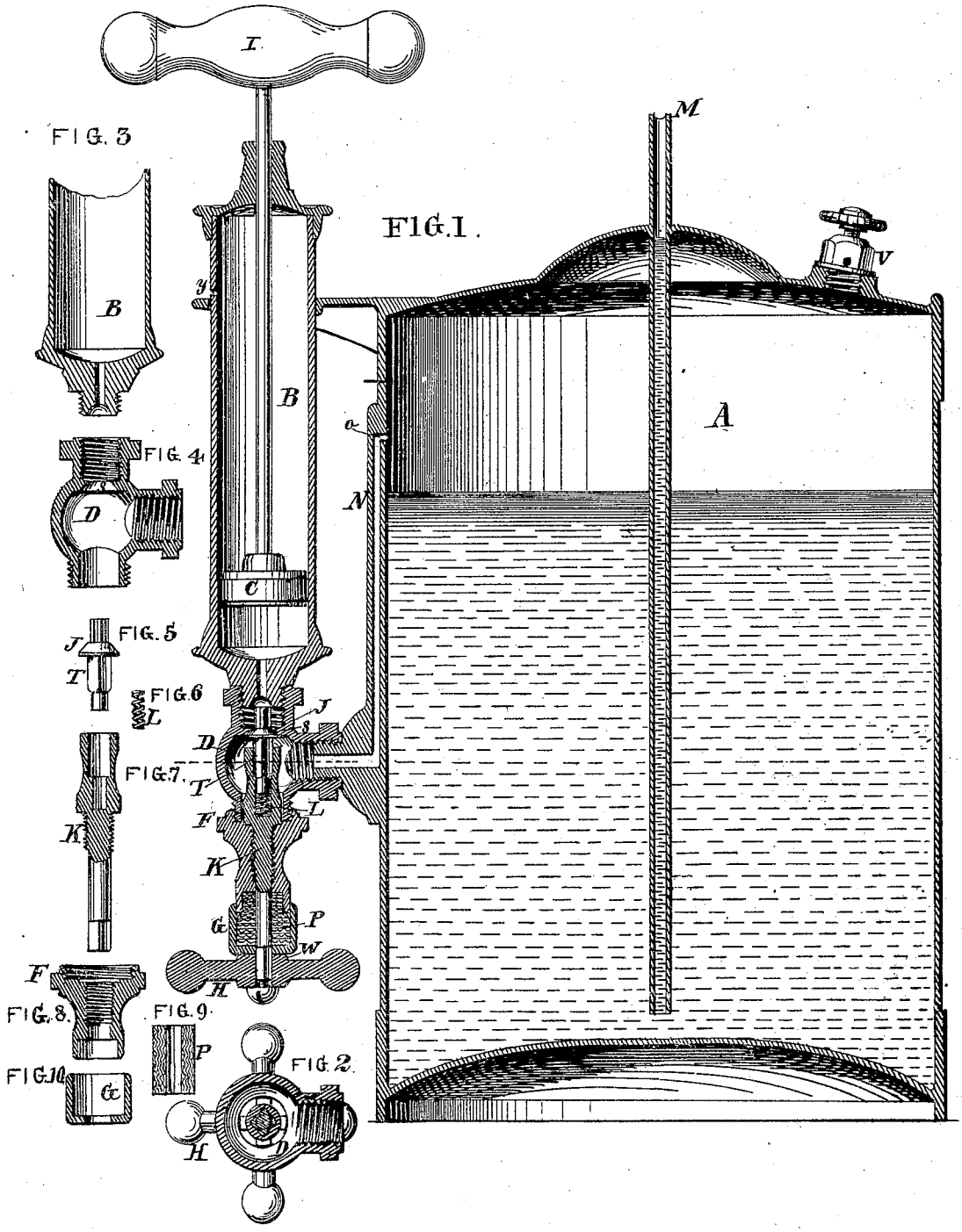

FIG. 3

FIG. 1.

FIG. 4

FIG. 5

FIG. 6

FIG. 7.

FIG. 8.

FIG. 9.

FIG. 10

FIG. 2.

ATTEST.

H. C. Elliott

Walter Allen

INVENTOR.

James Powell

By Knight Bros

Attys

UNITED STATES PATENT OFFICE.

JAMES POWELL, OF CINCINNATI, OHIO.

IMPROVEMENT IN PNEUMATIC PUMPS.

Specification forming part of Letters Patent No. 119,641, dated October 3, 1871.

To all whom it may concern:

Be it known that I, JAMES POWELL, of Cincinnati, county of Hamilton, State of Ohio, have invented a new and useful Improvement, of which the following is a specification:

My said invention relates to the class known as pneumatic pumps for condensing air; and consists in a peculiar construction of the lower valve or check and in the provision made for fastening or locking down the same when the pump is not in use. The object of my improvement is to produce and maintain an artificial pressure upon fluids contained within a reservoir or chamber to enable the fluid to be forcibly ejected from the said chamber when desired, and to overcome the liability to leakage through the check-valve of the pump without the necessity of interposing an additional cock or valve than that contained in the pump itself.

Figure 1 is a vertical section of the pump applied to a reunion. Fig. 2 is a horizontal section of the pump taken in the plane indicated by the dotted line in Fig. 1. Fig. 3 is a vertical section of the lower end of the pump-cylinder. Fig. 4 is a vertical section of the coupling by which the pump is attached to the receiver. Fig. 5 is a side elevation of the valve. Fig. 6 is an elevation of the spring by which the valve is kept to its seat. Fig. 7 is a vertical section of a screw-stem employed to lock the valve. Fig. 8 is a vertical section of a screw-nut in which the valve-stem works. Fig. 9 is a vertical section of the packing of the valve-rod. Fig. 10 is a vertical section of a cap employed to secure said packing.

A is the reservoir, for containing the fluid to be placed under pressure, constructed of strong sheet metal. M is the discharge-pipe, for conveying the fluid to any required distance by means of extending the same. N is a channel attached to the outside of the reservoir, and leading from the lower valve of the pump to an opening, O, at the top of the reservoir for the conveyance of the condensed air to said chamber. V is a vent, for the escape of air whenever it is required to reduce the pressure in the reservoir A. B is the condensing-pump, of the usual construction, fastened to the chamber, at top by a metal strap and at bottom by means of a screw-thread connection with the lower valve or check. C is the plunger of the pump. D is a peculiarly-constructed valve and valve-chamber, by means of which communication is made between the pump B and the air-passage N. J is the loose puppet-valve of the pump, with conical facings, and fitted into the seats in the usual way, and having a three-winged projection or tail-piece on the face side fitting loosely in the central opening of the seat, which tail-piece acts as a guide to maintain the valve in a truly axial position within the same. T is a square-shaped extension upon the back of valve J, and which moves freely in a four-sided socket in the screw-stem K. L is a coiled spring, operating between the bottom of the socket and the end of the projection T, provided to keep the valve J pressed against the seat while the pump is being operated. F is the screw-nut of the valve-chamber D, and connected with it by means of the screw-thread on the neck of the same. G is a loose cap fitting over the end of the screw-nut F, and compresses the packing P of vulcanized India rubber when the stem K is screwed down. H is the wheel-handle by which the screw-stem is actuated, and which is adapted to press upon the loose cap G by means of the shoulder W, the whole being attached to the air-tube N by a screw-thread connection. I is the handle of the piston-rod of the pump, which piston-rod works loosely through the cap at the top of the pump-chamber B. *y* is an opening in the side of the pump-chamber, to admit air under the plunger C when it is drawn up to its fullest extent.

When it is desired to charge the containing-vessel with the necessary pressure of air the screw-stem K is unscrewed from its bearing on the top of the valve J by two or three turns, thus relieving the valve so that it may move freely to and fro upon its bearing. The handle I is grasped by the hand and the piston being reciprocatingly worked the air is forced into the reservoir A until the desired pressure is obtained; the screw-stem K is then immediately screwed down until the outer end of the socket bears against the back of the valve J and forces said valve firmly against its seat and thus effectually prevents leakage of air from back pressure through the pump, at the same time the shoulder W engages with the sliding cap G, and thereby compressing the elastic packing P and insuring a tight joint around the screw-stem K.

The following are some of the advantages of my improvement: The construction is simple, strong, and durable, and not easily put out of or-

der; the working parts are so arranged as to be easily and quickly put together or taken apart for repairs. The arrangement of the lower check-valve of the pump is such that when the reservoir is once charged with the required pressure of air no loss is sustained by leakage through the valves or working parts of the pump. It is well known that in the old form of construction the air-chamber or vessel containing the charge of compressed air is liable to a very considerable and annoying loss in consequence of the impossibility of making the valves perfectly air-tight when the action is only automatic. With the apparatus constructed with my improvement provision is made whereby the function of the valve is made more perfect when upon its seat by the positive action of the pressure-screw upon the top of said valve.

I am aware that efforts have been made to overcome the difficulty of leakage referred to in apparatus of this kind; but such attempts have been confined to the interposition of a stop-cock between the lower check-valve of the pump and the air-chamber, making a cumbersome and unsightly appearance and adding considerably to the cost of the same.

I do not confine myself to the precise arrangement here shown, as it is obvious that slight changes can be made in the arrangement without adding any new principle; as, for instance, the pump may be so adapted as to force a liquid into the reservoir and so produce a pressure by confining the air which remains in the vessel.

I claim as new, and of my invention, herein—

1. The arrangement and combination of the valve J and valve-seat S, the axial projection T, spring L, screw-socket K, and screw-nut F, when the said parts are arranged for locking the otherwise automatically-operated valve and adapted to an air-pump, substantially as and for the purpose described.

2. In combination with the subject-matter of the first claim, the arrangement of the shoulder W, sliding cap G, elastic packing P, and screw-nut F, substantially as described.

3. The combination of the foregoing with the pump B and air-chamber or reservoir A, as and for the purpose described.

JAMES POWELL.

Witnesses:

OCTAVIUS KNIGHT,

WALTER ALLEN.

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