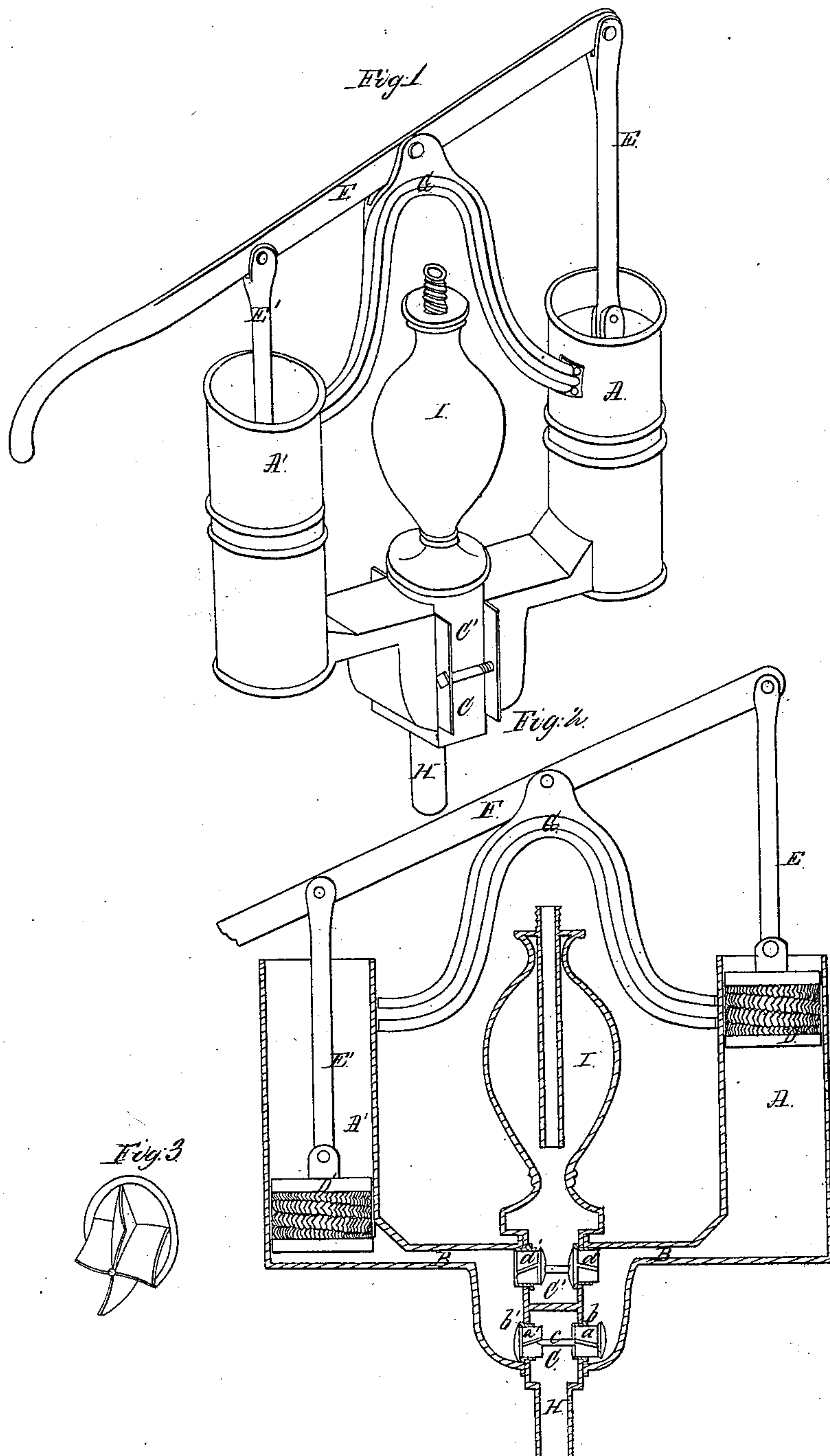


T. Thatcher,

Double Acting Pump,

N^o 6,596,

Patented July 17, 1849



UNITED STATES PATENT OFFICE.

THOS. THATCHER, OF WILKES-BARRE, PENNSYLVANIA.

PUMP-VALVE AND ITS ARRANGEMENT.

Specification of Letters Patent No. 6,596, dated July 17, 1849.

To all whom it may concern:

Be it known that I, THOMAS THATCHER, of Wilkes-Barre, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Force and Lifting Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a perspective view of my pump complete. Fig. 2 a vertical section of the same, the pistons and valves being shown in elevation, and Fig. 3 a perspective view of one of my improved wing valves.

The nature of my invention consists, first, in connecting together the valves of the cylinders of two alternating single acting pumps or the valves of the upper and lower portions of the cylinder of a double acting pump, in such manner that the two injection valves cannot both be open to their full extent at the same moment, the two discharge valves being connected in like manner. Second, in giving the wings of valves a spiral or screw form whereby the motion of the water through the valve causes it to rotate on its axis.

In the drawing A A' represent the cylinders of two alternating single acting force pumps connected by the passages B B' with the opposite sides of a double valve chest C C'.

The cylinders are each furnished with a piston D, D', packed in any of the usual methods, having piston rods E, E', connected with the opposite arms of a brake F whose axis is supported by the frame G. C is the lower or injection valve chest, communicating with the water by the pipe H, and C' is the upper or discharge valve chest, connected with an air vessel I which equalizes the discharge of the water; *a a'* are the lower or injection valves. I prefer to make these of brass of the form usually called wing valve, and to insert brass seats *b b'* in the valve chests on which the valves shut; the valves are connected with each other by the rod *c* which is of such length that when the valve *a* is open to its full extent the valve *a'* is closed and vice versa. The discharge valves *d d'* are also connected with each other so that when the valve *d'* is opened the valve *d* is closed and vice versa.

If the wings of the valves were perpendicular to the direction of the valves mo-

tion in opening and shutting, the same parts of the valve and seat would always strike each other, and if (as invariably happens) there should be an inequality in the hardness of different portions of either valve or seat, an inequality in the wear would result, and leakage ensue; to obviate this difficulty which frequently impairs the action of pumps to such a degree as to require a new fitting and grinding of their valves. I give the wings a spiral or screw form as represented in Fig. 3, the water moving through the valve and acting on the inclined wings causes it to rotate on its axis continually changing the portions of the valve in contact with the seat, and thus equalizes the wear and prevents leakage.

I have stated that I prefer to make valves of pumps constructed by me of the wing form, but it is obvious that my system of connecting valves is applicable to all forms.

To show the advantage of this system, let us suppose that the pump Fig. 2 is put in operation, the piston D descending while D' ascends. The pressure caused by the descent of D will close the injection valve *a* at the same time opening *a'*, and will open the discharge valve *d* at the same time closing *d'*. I am aware that the rush of air or water through the pipe H to fill the partial vacuum caused by the ascent of the piston D' will naturally open the valve *a'* without the assistance of *a* but in places where the vertical distance between the pump and the surface of the water approaches the limit at which water is supported in a vacuum by the atmospheric pressure, this does not always take place in the usual arrangement of pump valves while by connecting the valves together, the proper opening and closing of both the injection and discharge valves is guaranteed.

Having thus described my improved pump, and its operation what I claim as my invention and desire to secure by Letters Patent is—

1. Connecting the valves substantially in the manner and for the purpose herein set forth.

2. I also claim making the wings of valves of a spiral or screw form substantially in the manner and for the purpose herein set forth.

THOMAS THATCHER.

Witnesses:

E. A. BULKELEY,
WILLIAM L. STEWART.