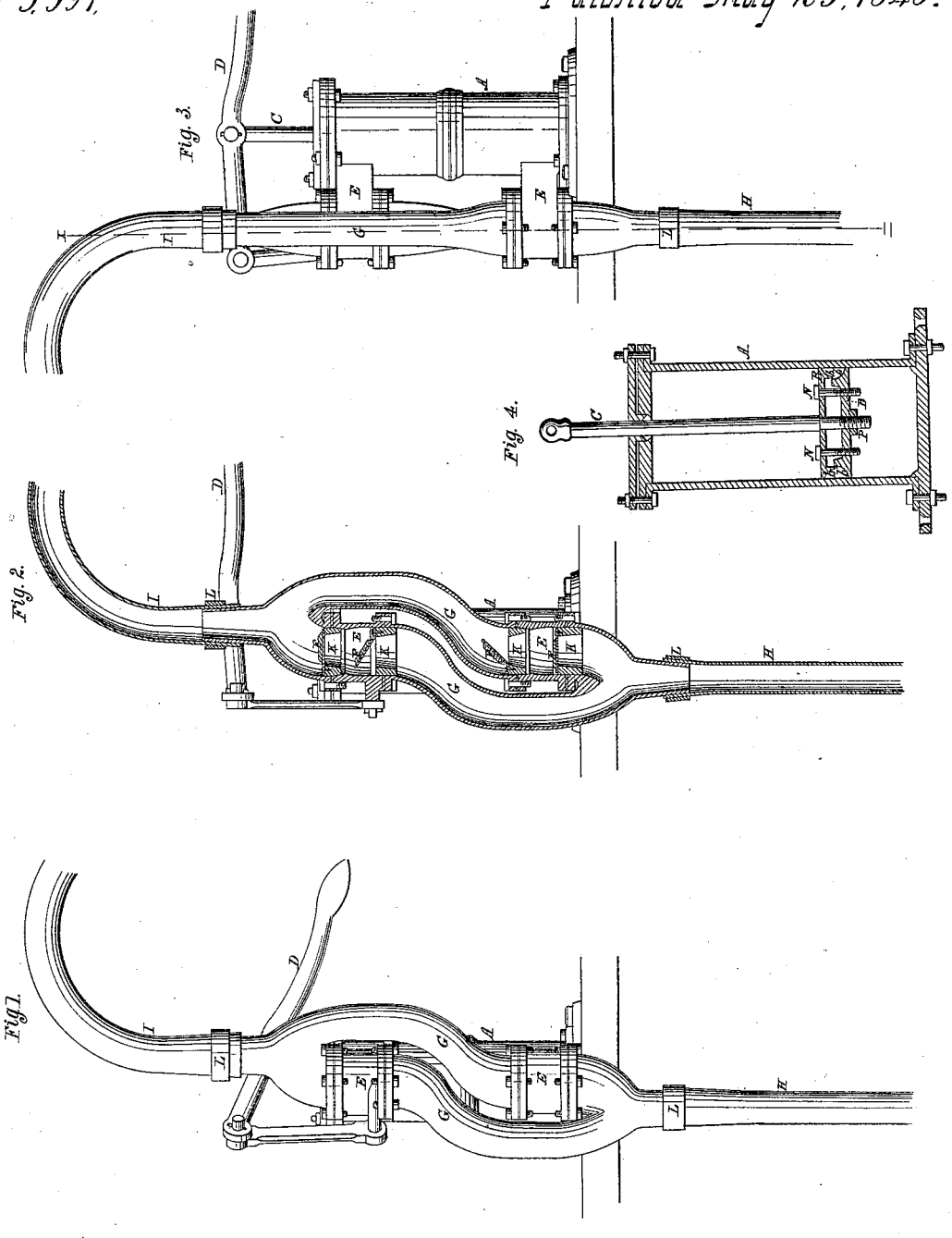
A. H. Fitch,

Force Pump.

No. 5,591. Patented May 23, 1848.



UNITED STATES PATENT OFFICE.

A. H. FITCH, OF CUYLERVILLE, NEW YORK.

PUMP FOR RAISING WATER.

Specification of Letters Patent No. 5,591, dated May 23, 1848.

To all whom it may concern:

Be it known that I, AMARIAH H. FITCH, of Cuylerville, in the county of Livingston and State of New York, have invented a new and useful Improvement in the Construction of Suction and Force Pumps, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1, is a front elevation of the conducting tube, serpentine water chambers, water trunks, discharging pipe, cylinder and lever. Fig. 2, is a vertical section, drawn on the dotted line *x x*, of Fig. 3, of the aforesaid conducting tube, water chambers, trunks, and discharging pipe, showing also the valves and their seats, and the rings for coupling the conducting and discharging tubes, to the water chambers. Fig. 3, is a side elevation of the pump. Fig. 4 is a section of the cylinder and piston, showing the manner of constructing the piston.

Similar letters in the several figures, refer to corresponding parts.

This pump, generally, is made like other suction and force pumps in use, having a cylinder A, piston B, piston rod C, lever D, side trunks E, valves F, water ways or chambers G, conducting tube H, discharging tube I, and other appendages belonging to such pumps, which are too well known, to require particular description of them.

The improvements that I have made, relate to the construction and arrangement of the side water chambers G, the manner of arranging the valve seats K, the construction of the piston B, and the mode of coupling the induction and eduction tubes, to the water chambers, by rings I, driven over the screws, instead of screw couplings.

I cast the side chambers G G, in a similar manner, in two parts, in the form of a serpentine tube, each having at one of its ends a short curved hollow branch, provided with flanges, by which it is screwed to the flanges of the trunk, while the opposite end, which is of greater diameter, is likewise provided with flanges, by which it is screwed to a similar trunk. The lower end of the lower chamber, (when the pump stands in a vertical position,) is made to taper downward, with a screw cut on the outside thereof, over which is placed the funnel shaped end of the conducting or induction tube. The water chamber gradually enlarges itself from the branch to the upper end, which is flanged to the under side of the upper trunk. The branch is flanged to the under side of the lower trunk. The upper serpentine chamber is made in a similar manner, but its position is reversed, the branch being screwed to the upper side of the upper trunk, and the enlarged end of the main stem, being screwed to the upper side of the lower trunk. By this construction and arrangement, the valves, when out of order, may be reached in a few moments, by simply removing the screws of the said upper water chamber, without disturbing the lower chamber, to which the conducting tube is affixed, which may, however, be removed with equal facility. The upper end of the upper chamber above the branch is made to taper upward, to receive the funnel shaped end of the discharge or eduction tube, which is secured in a similar manner, by a ring of iron or other hard metal, forced over it by any suitable mechanical means, sufficient to press the inner sides of the funnel shaped end of the discharge tube which is made of lead or other soft metal into the cavities between the threads of the screw, formed on the outside of the upper or tapered end of the water chamber, to make a perfectly air tight joint, without the use of packing, or screws, of the ordinary construction, and arrangement.

The valve seats K, are metallic rings to which the valves are fixed by screws, rivets, nails, or other means in the usual manner. They are arranged, and secured, directly over the joints, formed by the union of the serpentine chambers, with the side trunks of the cylinder, so as to render said joints perfectly water tight, without the use of packing; although packing may be used if necessary—by which arrangement, said rings, are made to perform the double office of seats for the valves, and closers of the joints of the curved chambers, and side trunks. These rings are held in their proper positions by making the interior surface of the chambers, and trunks, next the flanged ends, slightly tapering downward—the rings being made slightly conical, to correspond therewith.

The piston B, is composed of two plates B, B′, each having a rim *b*, formed around its periphery, of greater thickness than the plate, made concave on the outside—said plates being placed parallel to each other, with the concave rim of the upper plate, overlapping the concave rim of the lower

plate, and held together by screws N, passed through the upper plate, and screwed into the lower plate, so that by turning the screws to the right, the plates will be closed, the one toward the other, and by turning them to the left, they will be separated, the one from the other—the closing of the plates, having the effect of condensing the packing, and forcing it against the inside of the cylinder, and separating the plates, producing a contrary effect. The piston passes through the centers of the plates, being secured by a nut P, screwed to the lower end of the rod, bearing against the under side of the bottom plate. By bringing the upper plate against a shoulder on the piston rod, and causing the lower plates to slide on it, by the use of the nut P, the same effect can be produced, that is accomplished by the screws N.

The operation of the pump, is similar to other suction and force pumps, for instance, as the piston descends, a vacuum is formed in the upper part of the cylinder, into which the water ascends by atmospheric pressure, through the conducting tube H, and lower serpentine chamber G, and passes through the valve F and upper trunk E, into the upper half of the cylinder A, above the piston; at the same time, the descent of the piston forces the water, that was in the lower half of the cylinder, through the lower trunk E—valve F (represented open in Fig. 2)—upper water chamber G, and into the discharge tube I—this operation causing two valves to open, and two to close, namely—the lower valve of the lower trunk, and the upper valve of the upper trunk, to close, and the upper valve of the lower trunk, and the lower valve of the upper trunk, to open. As the piston rises, the valves that were open, will now close, and those that were closed, will open—the water in the upper part of the cylinder, being forced through the trunk and branch chamber, into the discharge tube, and the water from the well or cistern, rising by atmospheric pressure through the conducting tube, branch chamber, and trunk, into the lower part of the cylinder.

The pump may be provided with an air chamber, of the usual form, for keeping up a steady stream through the discharge pipe, and a valve for preventing the return of the water from pipe I.

I do not claim as my invention, a cylinder pump, with side pipes, and quadrupled valves, two at one end of the cylinder, and two at the other, for raising water by atmospheric pressure, and lever power, as this is a common construction in hydraulics, well known to mechanics. But

What I do claim is—

The mode of arranging and combining the bent tubes G G—valve seats E E and cylinder A—the said bent tubes G G being made in the peculiar manner described and represented.

In testimony whereof I have hereunto signed my name before two subscribing witnesses this eighteenth day of August, 1847.

A. H. FITCH.

Witnesses:

Wm. P. Elliot,

A. E. H. Johnson.