

(No Model.)

J. FLANAGAN.
Submerged Pump.

No. 237,175.

Patented Feb. 1, 1881.

Fig. 1

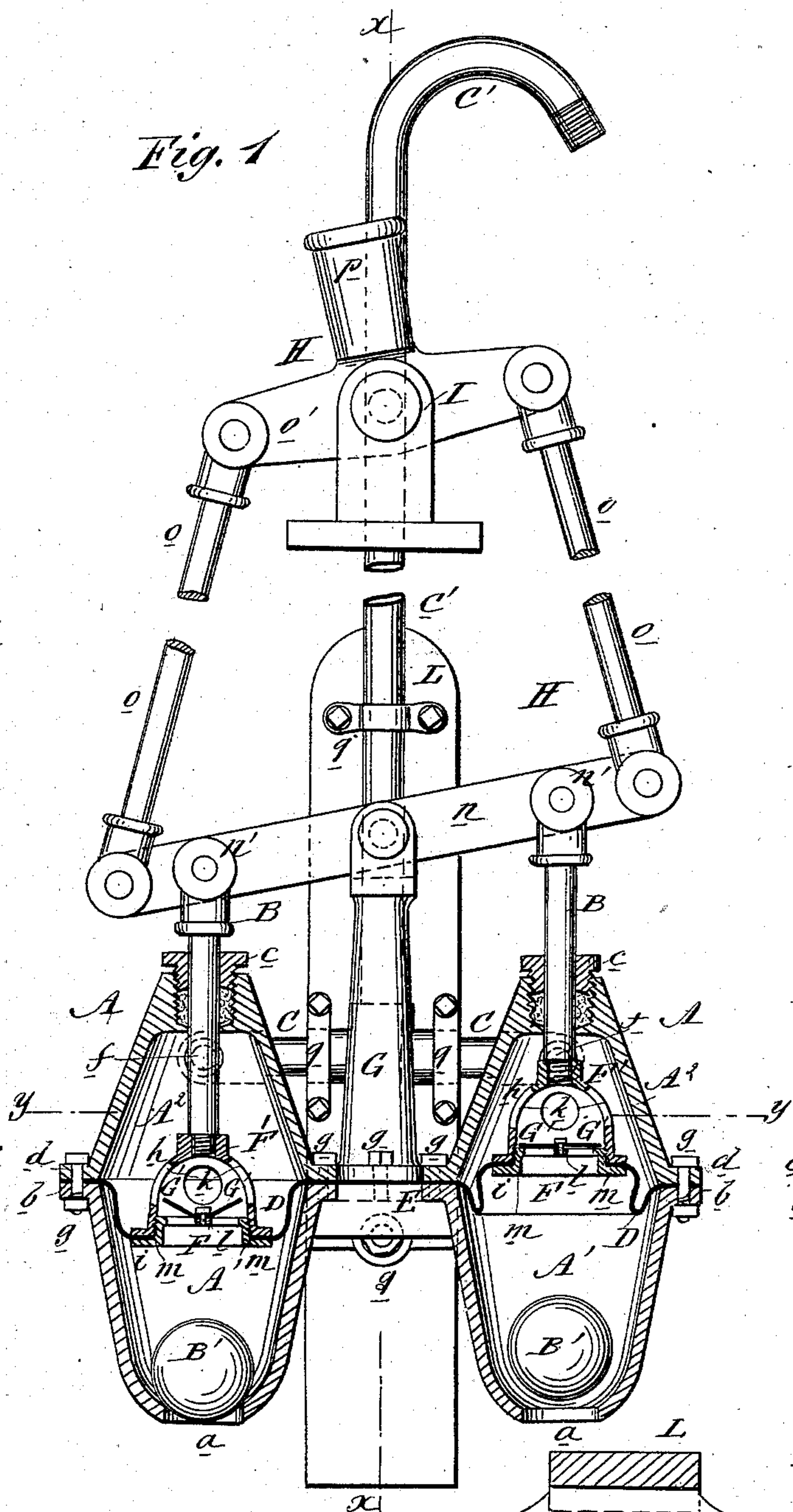


Fig. 2

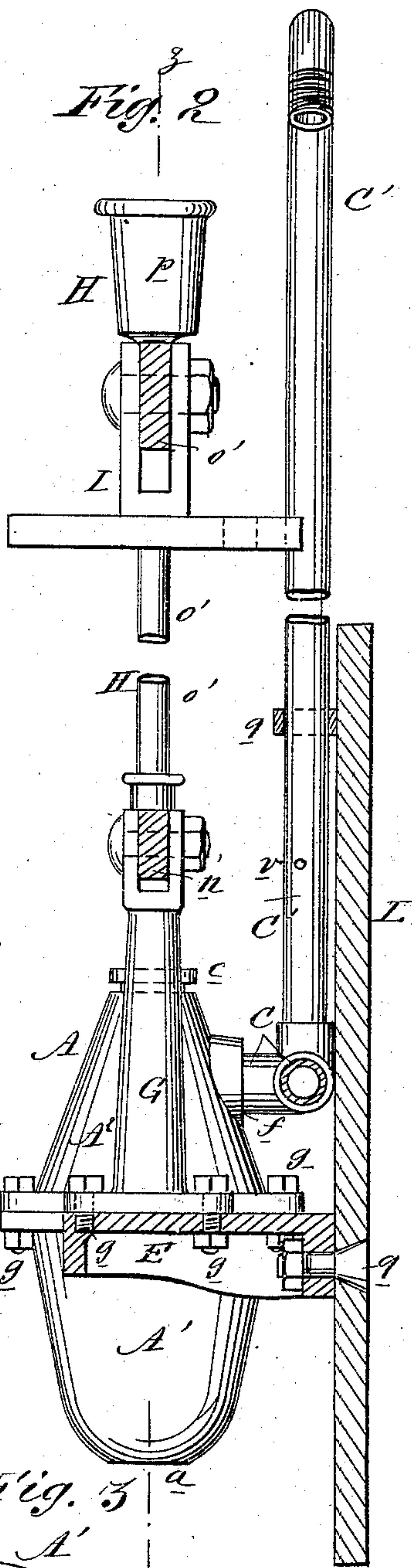
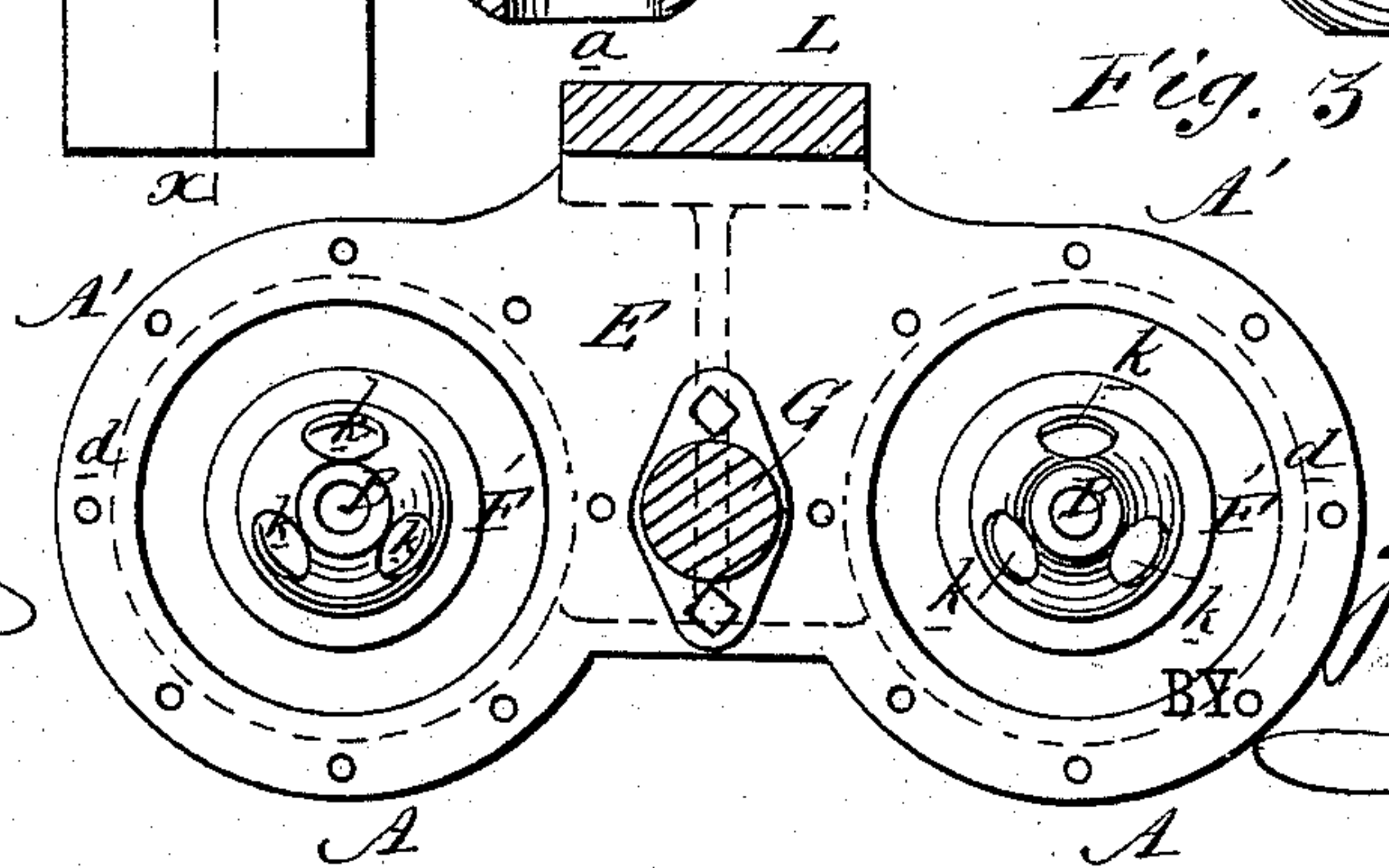


Fig. 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN FLANAGAN, OF NEWBURG, NEW YORK.

SUBMERGED PUMP.

SPECIFICATION forming part of Letters Patent No. 237,175, dated February 1, 1881.

Application filed December 2, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN FLANAGAN, of Newburg, in the county of Orange and State of New York, have invented a new and Improved Submerged Pump, of which the following is a full, clear, and exact description.

The object of this invention is to provide an improved double-acting lift and force pump, simple of construction and of little cost.

The invention consists of a double-cylindrical pump provided with pistons composed of elastic diaphragms secured at their edges in the sides of the cylinders, and centrally in arched and perforated valve-boxes that are provided with ordinary hinged lift-valves, said cylinders having open and cup-shaped bottoms, forming suitable seats for the ball-valves, and having egress-ports above the elastic diaphragm, the design being to submerge said pump and operate it by means of a rocking lever to lift and force water.

Figure 1 is a partly-sectional front elevation of the pump on line $z z$, Fig. 2. Fig. 2 is a partly-sectional side elevation of the same on line $x x$, Fig. 1. Fig. 3 is a cross-section of the same on line $y y$, Fig. 1.

Similar letters of reference indicate corresponding parts.

In the drawings, A A represent the two pump-cylinders, each consisting of a cup-shaped bottom section, A', provided in its lower end with an inlet-opening, a , closed by a ball-valve, B', and at its top with lateral flanges b ; and consisting, further, of a conical upper section, A², with a suitable stuffing-box, c , in the top for the passage of the piston-rod B, and with flanges b of the lower sections, and having a lateral egress-port, f , through which the water is forced through connecting-pipes C C', the latter of which is provided with a waste-hole, v , to prevent the pipe from freezing. These two cylinder-sections A' A² have inserted between their flanges $b d$ a horizontal diaphragm, D, of rubber or other elastic material, and are secured together and to a horizontal table, E, by means of bolts g . The diaphragm D has a central opening, and is clamped about said opening between the upper and lower parts, $h i$, respectively, of the valve-box F, thereby forming a piston, F'. The upper part, h , of the valve-box F is of the shape of

an inverted cup, with flanges on its rim, and is provided with lateral perforations k , and is screwed on the piston-rod B, while the lower part, i , of the valve-box F is a flanged ring provided with a central cross-bar, l , on which are hinged the valves G', that swing upward on the downstroke of the pump. These parts $h i$ are placed centrally on either side of the diaphragm D, and are screwed together, as shown at m , and on each downward stroke the water enters through the parts controlled by the valves G' and then through the piston perforations k into the section A² of the cylinder A, and on the upward stroke the valves G' close and the water in the section A² is thereby forced out through the port f , while at the same time the ball-valve B' is lifted by the ingress of water through the inlet a , and the lower section, A', of the cylinder is thereby filled.

Fixed on the table E, centrally between the cylinders A A, is a standard, G, having a forked upper end, in which is pivoted the lower horizontal arm, n , of the rocking lever H, to which arm n the piston-rods B are pivoted, as shown at n' , while the extremities of this arm n are connected, by upward-extending rods o , with a shorter horizontal arm, o' , that is provided with a vertical socket, p , for the lever-handle, (not shown,) and is centrally pivoted on a suitable support, (represented at I,) so that by a rocking motion of the lever H the valves of the cylinders A A are alternately operated to lift and force water.

The parts are conveniently held in position by bolting, clamping, or otherwise securing the table E and the pipes C C' to a suitable back, L, as shown at $q q$.

This pump works more easily than any of those in common use and with less friction, there being no friction in the cylinders A A, excepting that of the piston-rods B in moving in the stuffing-boxes c , and it works with more accuracy, because of the cup-shaped form of the lower sections of the cylinders A A, which form removes the possibility of the sticking or catching of the ball-valves B'.

I am aware that elastic diaphragms are not new in pumps, hence I do not broadly claim them; but I am not aware that they have ever before been used in combination with valves constructed as herein shown and described, nor

am I aware that submerged lift piston-pumps have been constructed for forcing water, nor am I aware that submerged pumps having diaphragms have been used.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A double-acting lift and force pump constructed substantially as herein shown and
10 described, consisting of conical sections $A^1 A^2$, with their respective inlet and outlet openings $a f$, ball-valves B' , central pistons, F' , composed of elastic diaphragms D , with attached valve-boxes F , provided with lateral perfora-
15 tions k , and valves G' , piston-rods B , and rocking bar n , operated as set forth.

2. In a force and lift pump, the piston F' ,

consisting of elastic diaphragm D , secured between the sections of the valve-box F , composed of a cup-shaped section, h , provided with
20 flanges, and with lateral perforations k , and of a horizontal ring-section, i , provided with flanges, with cross-bar l , and valves G' , substantially as herein shown and for the purpose described.

3. In a force and lift pump, the combination, with the elastic pistons F' , provided with valves G' and perforations k , of the piston-rods B , lever H , and intermediate mechanism,
25 substantially as herein shown and described.

JOHN FLANAGAN.

Witnesses:

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