

(No Model.)

A. JORGENSEN.

PUMP.

No. 299,478.

Patented May 27, 1884.

Fig. 1.

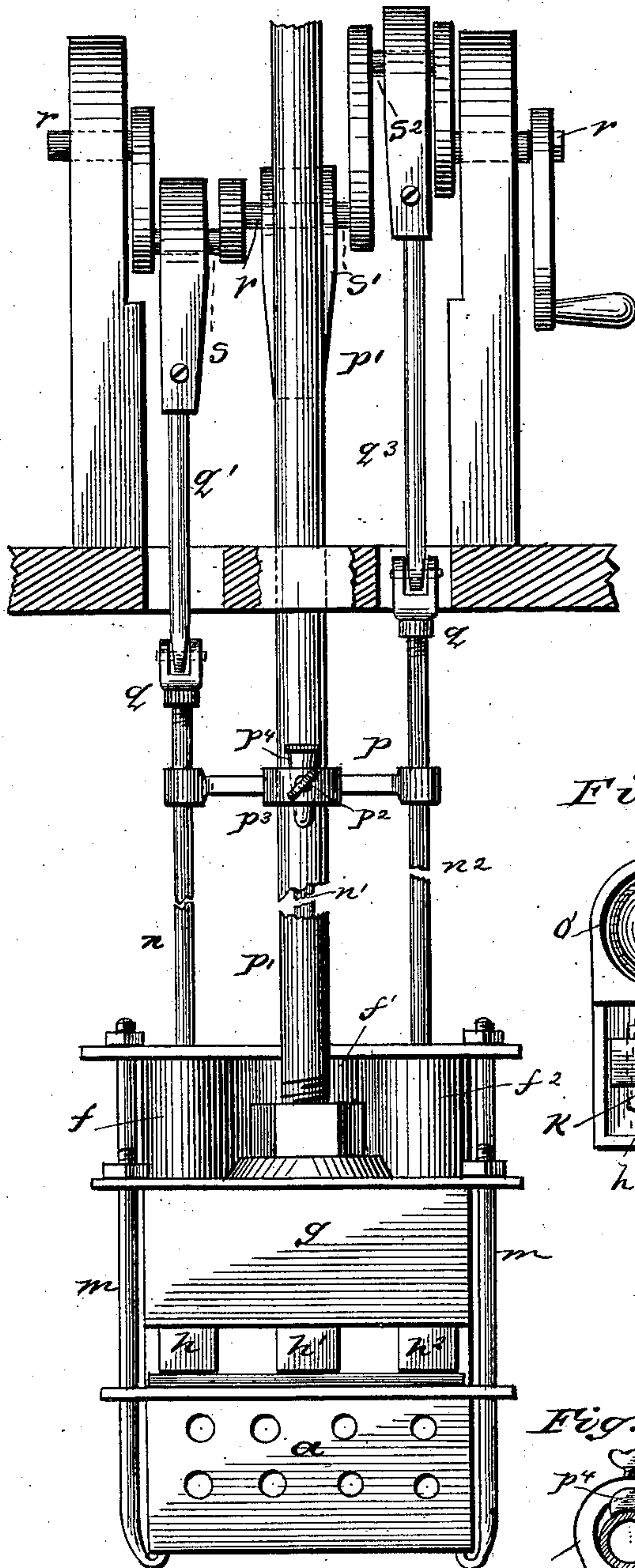


Fig. 2.

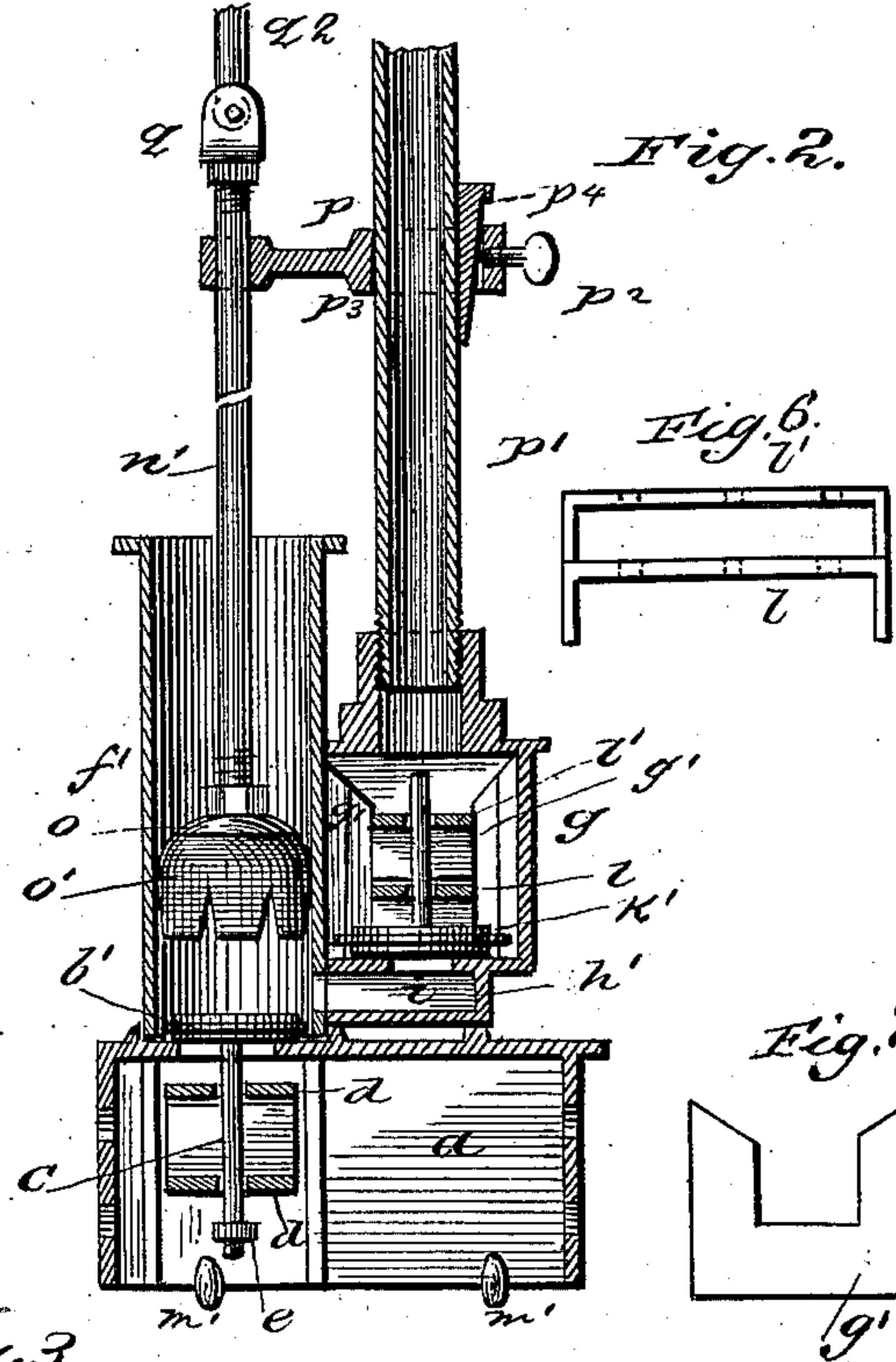


Fig. 3.

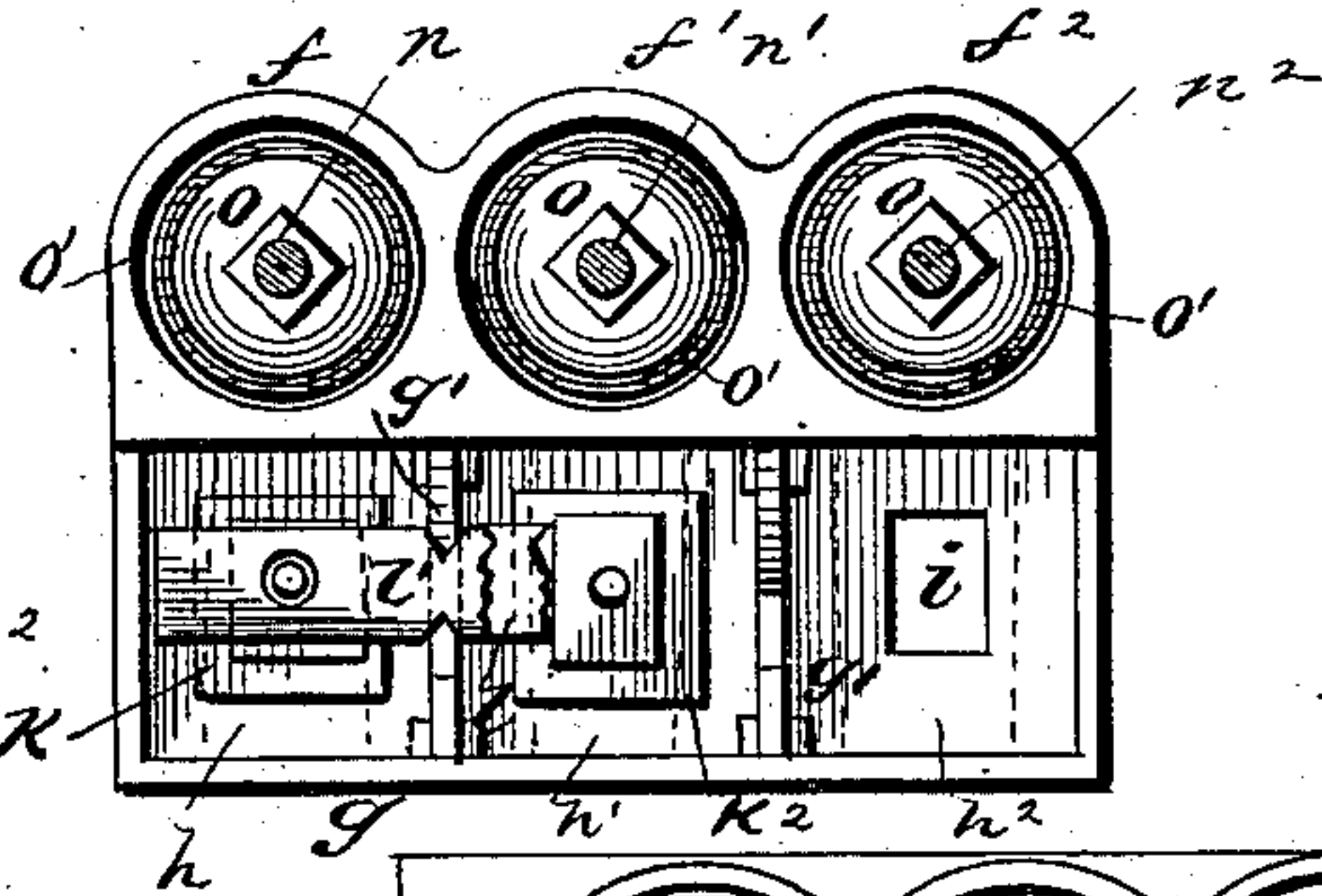


Fig. 4.

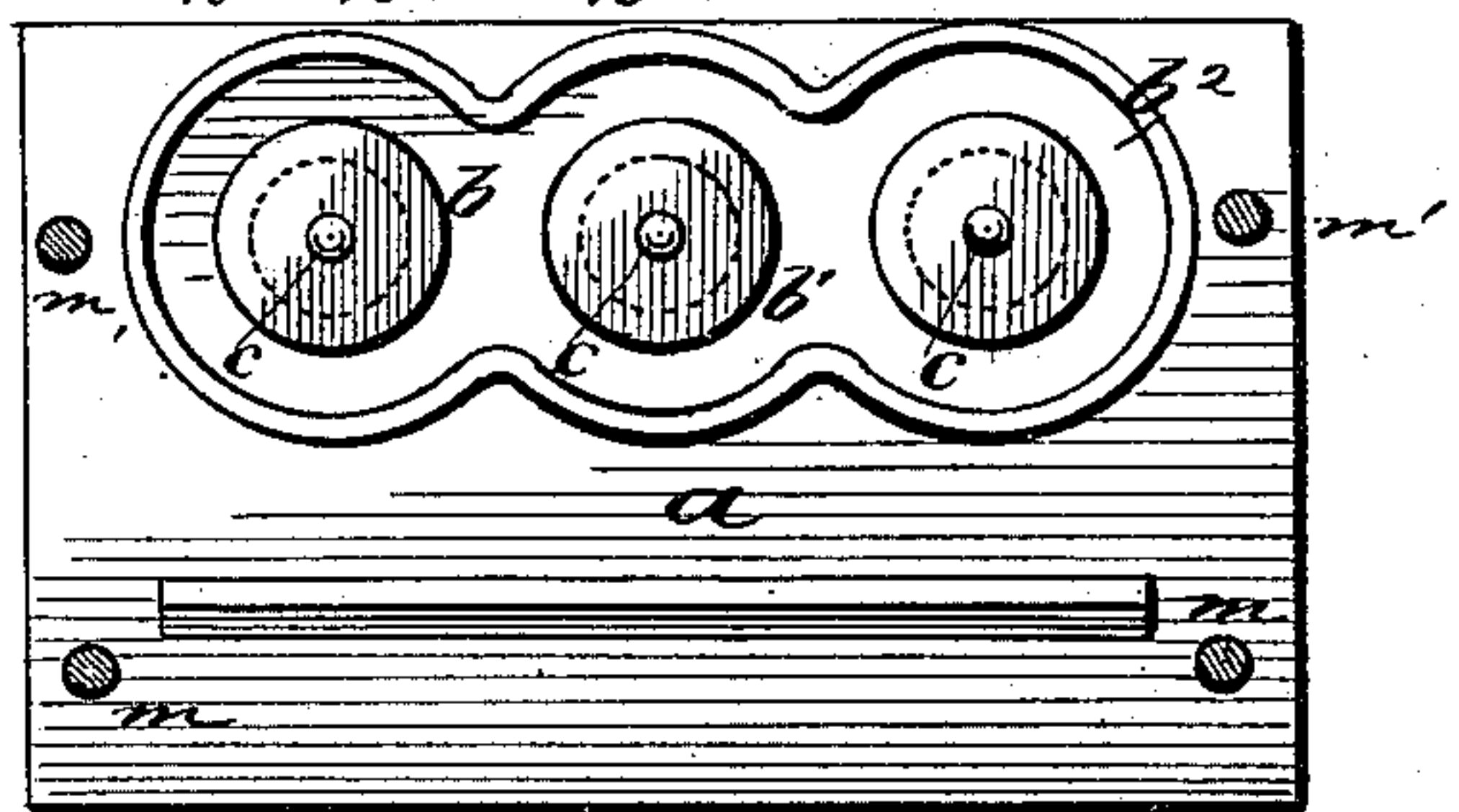
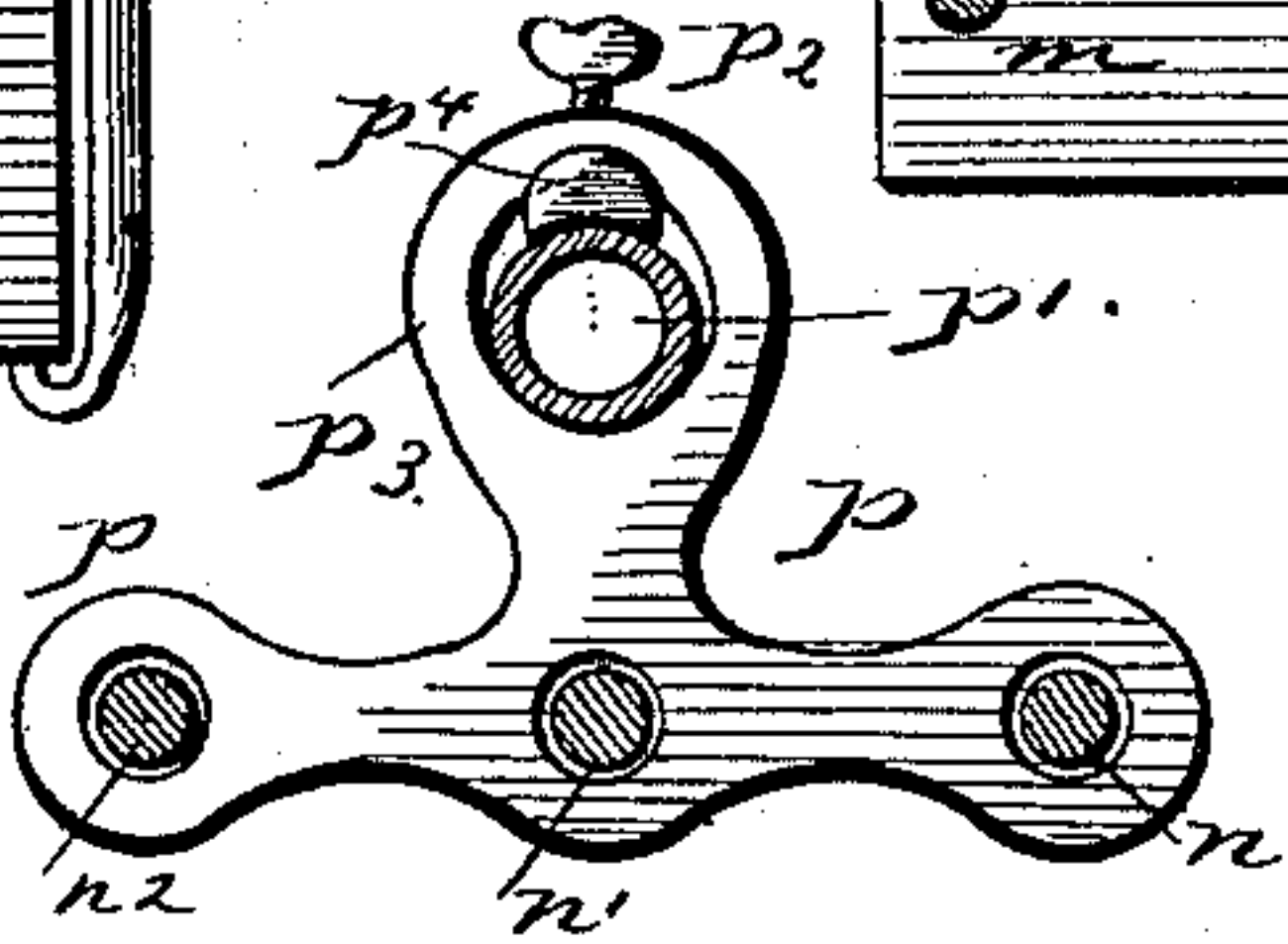


Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

AXEL JORGENSEN, OF KEYSTONE, MINNESOTA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 299,478, dated May 27, 1884.

Application filed September 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, AXEL JORGENSEN, a citizen of the United States of America, residing at Keystone, in the county of Wright and State of Minnesota, have invented certain new and useful Improvements in Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a side elevation. Figs. 2, 3, 4, and 5 are detail views. Fig. 6 is a longitudinal sectional view of the strips $l\ l'$ removed from the water-chest; and Fig. 7 is a side view of one of the vertical strips, g' , removed from the water-chest.

This invention has relation to force-pumps; and it consists in the construction and novel arrangement of devices, as will be hereinafter fully described, and particularly pointed out in the claims appended.

Referring by letter to the accompanying drawings, a designates the water-box, which is preferably rectangular in form, and is perforated in two of its vertical walls. This water-box is provided with three drop-valves, $b\ b'\ b''$, seated in valve-seats in the top of the water-box, and stems c , bearing in the transverse strips d within the water-box, check-weights e being provided at their lower ends to prevent the valves $b\ b'\ b''$ from being raised too high when the piston is drawn up, and also to insure their quick return to place when the piston starts down in the cylinder. The water-box is of cast-iron, and should rest on a flat stone or cast-iron plate placed in the bottom of the well or cistern to keep it from sinking into the mud.

$f\ f'\ f''$ designate three cylinders, and g designates the water-chest, which are cast together, and are bolted onto the water-box a , the bases of the cylinders fitting over the valves $b\ b'\ b''$. The cylinders communicate with the water-chest g through three water-ducts, $h\ h'\ h''$, cast on the bottom of the water-chest, and provided with valve-openings $i\ i\ i'$. The in-

ner faces of the longitudinal walls of the water-chest are provided with vertical grooves a' , to receive the vertical strips g' , having a central vertical recess, b^3 , which are designed to extend transversely of the chest between the valves $k\ k'\ k''$, which are drop-valves, and have their stems working up through registering-perforations in two removable longitudinal strips, $l\ l'$, having legs at their ends at right angles to their planes, and the upper strip, l' , may be provided with edge notches, as shown, to receive the recessed edges of the said vertical strips g' . The legs of the strip l rest on the bottom of the water-chest, and the legs of the strip l' rest upon the top of the strip l . The objects of the longitudinal and vertical strips are to avoid interference of the water forced from one cylinder through its water-duct into the water-chest with the valve of another water-duct, which would tend to prevent the other valve from dropping to place to hold the water in the chest after the pressure of the piston has ceased in that cylinder, and to permit the removal of the valves when repairs are needed. The cylinders and water-chest are bolted onto the water-box by bolt-rods $m\ m'\ m''$ of their respective flanges, as shown in the drawings.

Although I have shown and described and prefer three cylinders, with their attendant connections, a very good pump may be produced by using only two cylinders, and would lessen the cost of the pump.

$n\ n'\ n''$ designate the plunger-rods, which are provided with plungers o , consisting of a downwardly-flaring plunger-head provided with a packing, o' , of leather. The plungers o need not fit the cylinders so tightly in this construction as in pumps where the plungers perform their work above the water, for the reason that the cylinders are submerged, and the outside pressure of the water above the plungers in the cylinders assists in packing them on the upstroke. The vacuum may be created by a comparatively-loose plunger. The lower sections of the plunger-rods $n\ n'\ n''$ pass up through holes in guide-castings p , secured to the discharge-pipe p' by set-screws p^2 , passed through their encircling-arms p^3 , and bearing against the interposed wedges p^4 . These guide-castings should be provided at points on the pipe

5 p' , at about four or five feet apart, and are intended to prevent the plunger-rods from being bent when operated. The discharge-pipe p' is screwed into the top of the water-chest g , and extends up through well or cistern cover. The pipe p' should be braced to the walls of the well or cistern by braces arranged eight or ten feet apart, in order to give it the requisite stability to meet the strain of the plunger-rods on the guide-castings. The plunger-rods are jointed at q to the crank-rods $q' q^2 q^3$, as shown, and their upper ends are connected to a triple-crank shaft, r , having bearings in a suitable frame erected on the well-cover or cistern-cover. This frame may be either of iron or wood. The cranks $s s' s^2$ are arranged around the shaft at such angles thereto that the plunger-rods will operate alternately—*i. e.*, no two of them will complete the stroke at the same time.

20 The ordinary-sized pump will be in about the following dimensions: Cylinders, diameter, two inches, height, seven inches; bottom diameter for valves to work in, two and one-half inches; water-chest, seven inches long, four inches wide, and five inches high, including water-ducts; the water-ducts about two inches in diameter, the openings one inch square. The stroke should be about a four-inch stroke. The discharge-pipe should be a one-inch pipe. On the upward stroke of the plungers the water enters the cylinders, and on the downward stroke is forced from the cylinders through the water-ducts into the water-chest, and, after the latter has become packed, out through the discharge-pipe. When the pumping ceases, the valves and plungers are sufficiently loose to permit the water to go

down in the pump, so that the pump will not freeze.

40 The cylinders may be glazed on the inside to render them smooth, so that the packing will not wear so rapidly. The joints should be all cemented to render the pump tight.

45 The discharge-pipe p and the plunger-rods (where more than one solid length is needed) can be jointed with ordinary pipe-unions.

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

50 1. In a force-pump, the combination of the perforated water-box a , provided in its top plate with the drop-valves $b b' b^2$, and the cylinders $f f' f^2$, water-chest g , and the water-ducts $h h' h^2$ connecting them, the loose drop-valves $k k' k^2$ in the water-chest, and the plungers o on the plunger-rods $n n' n^2$, packed to fit loosely within the cylinders, whereby the pump may be submerged and the water caused to serve as an auxiliary packing for the plungers, substantially as specified.

60 2. In a submerged force-pump, the water-chest g , provided with the vertical strips g' , extending between the drop-valves $k k' k^2$ and the longitudinal strips $l l'$, and the valves $k k' k^2$, having bearings in the strips $l l'$, in combination with the cylinders, water-ducts, and plunger-rods and plunger, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

AXEL JORGENSEN.

Witnesses:

A. N. DOYL,
 J. T. ALLEY.