(No Model.) 3 Sheets—Sheet 1.

W. M. FERRY

STEAM PUMP.

No. 267,410. Patented Nov. 14, 1882.

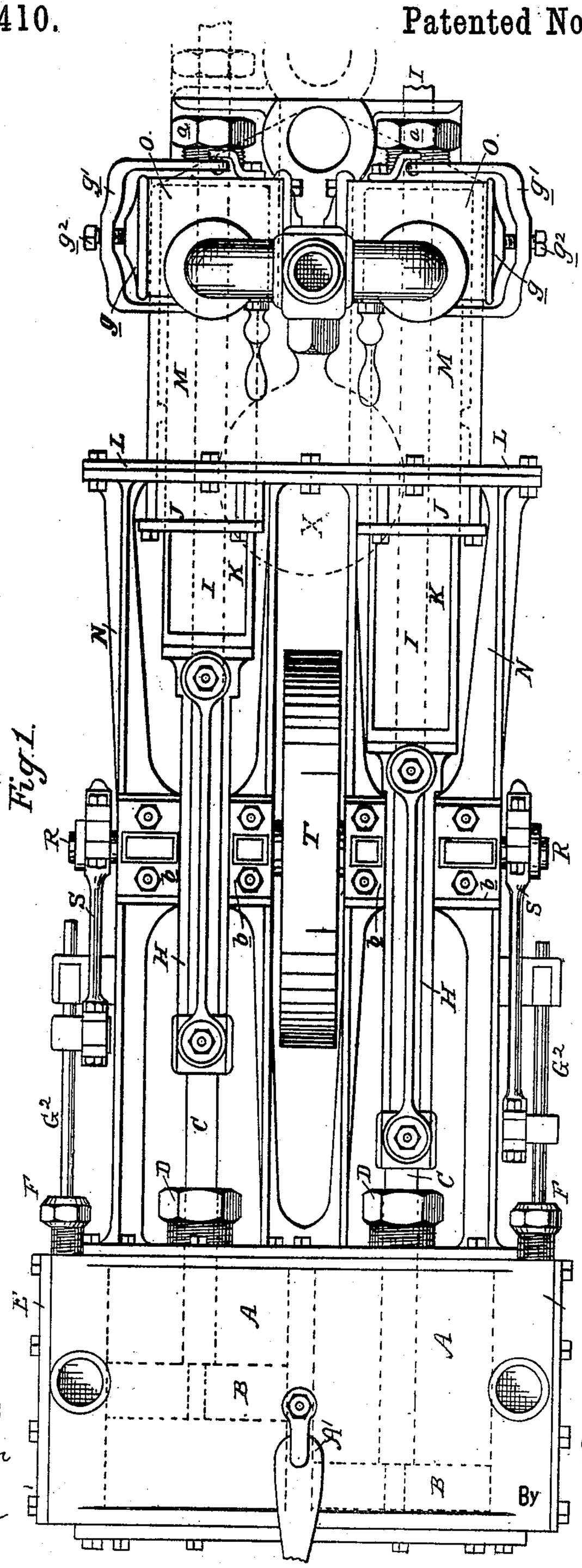

Fig. 1.

WITNESSES:

A. B. Robertson

Wm. Turner

INVENTOR

Wm. M. Ferry.

T. J. W. Robertson

ATTORNEY.

(No Model.) 3 Sheets—Sheet 2.

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STEAM PUMP.

No. 267,410. Patented Nov. 14, 1882.

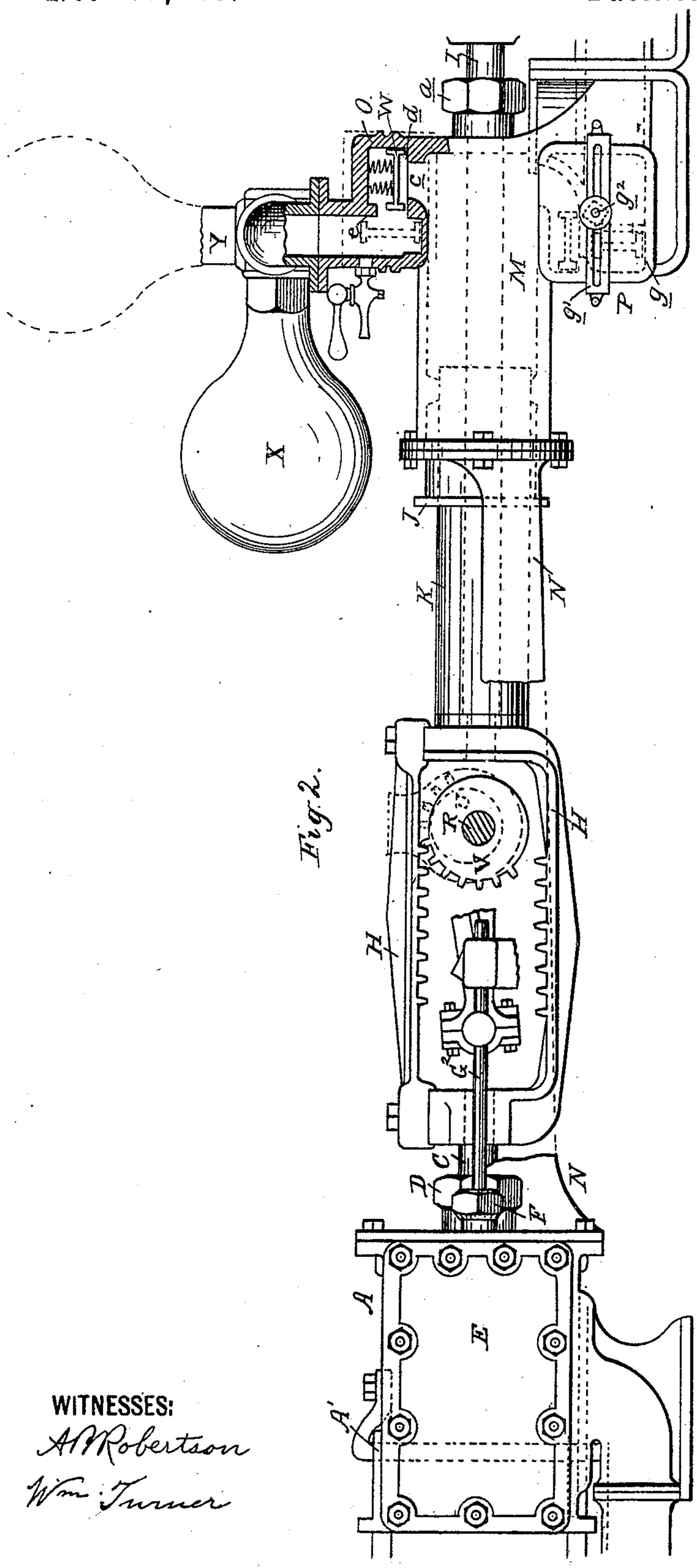

Fig. 2.

WITNESSES:
A. P. Robertson
Wm. Turner

INVENTOR:
Wm. M. Ferry
By T. J. W. Robertson
ATTORNEY.

(No Model.) 3 Sheets—Sheet 3.

W. M. FERRY.

STEAM PUMP.

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Fig. 6.

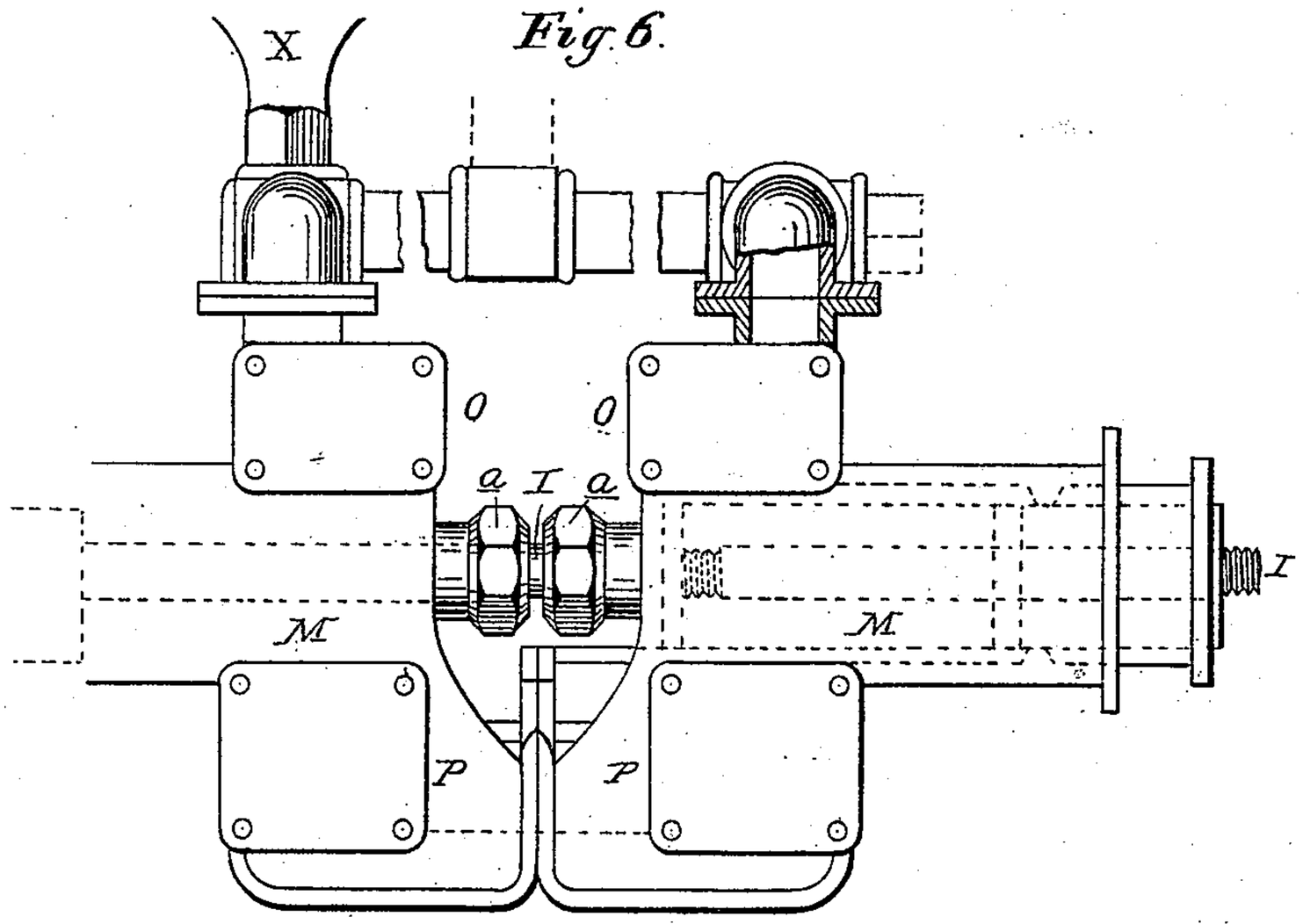


Fig. 4.

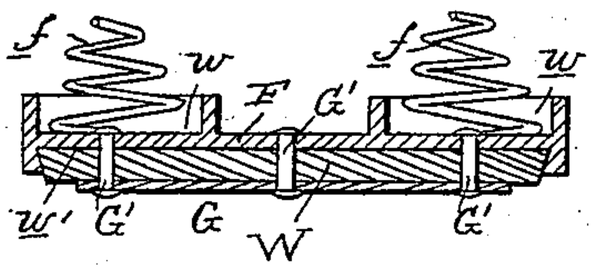


Fig. 3

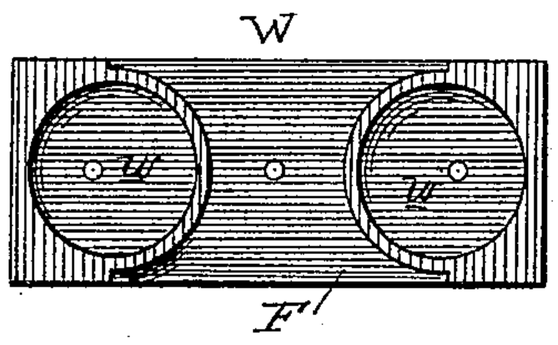
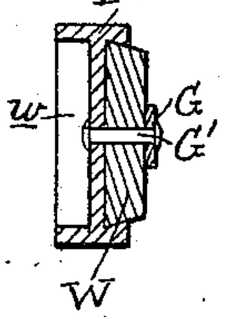


Fig. 5.



WITNESSES:

A. B. Robertson

Wm. Turner

INVENTOR:

Wm M. Ferry

By T. J. W. Robertson

ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM M. FERRY, OF PARK CITY, UTAH TERRITORY.

STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 267,410, dated November 14, 1882.

Application filed August 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. FERRY, of Park City, in the county of Summit and Territory of Utah, have invented new and useful Improvements in Steam-Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

The nature of this invention relates to certain new and useful improvements in steam-pumps, by means of which they may be used in a horizontal or vertical position; and the invention consists, first, in the peculiar construction of the suction and discharge valve-chambers and their seats; second, in the movable air-chamber; third, in the construction of the valves; fourth, in the manner of securing the covers of the valve-chambers; and, fifth, in the peculiar construction and various combinations of parts, as more fully hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view; Fig. 2, a side elevation; Fig. 3, a top view of one of the valves with the springs removed; Fig. 4, a vertical longitudinal section; Fig. 5, a cross-section, and Fig. 6 a detail showing how pumps may be connected in series head to head.

A represents two steam-cylinders side by side, each being provided with a steam-chest, E, having ordinary valves to alternately open and close the ports, which are also of the usual construction. The piston B of each cylinder has its piston-rod secured to a yoke, H, and the opposite end of each yoke is secured to a plunger-rod, I, of the pump. The opposite inner faces of each yoke are provided with cogs, so that each side forms a rack, which racks alternately gear with a mutilated gear-wheel on the main shaft for the purpose of imparting a rotary movement to said shaft for operating the steam-valves in the chests E.

M M represent two water-cylinders or pump-chambers, standing side by side, with their longitudinal centers in line with the corresponding centers of the piston-rods. These water-cylinders are provided with flanged heads, L, by means of which they are secured to one end of the body-piece or frame N, the opposite end of which is secured in the same manner to the steam-cylinders. Each of these water-cylinders is provided with a stuffing-box, J, through which the plunger K reciprocates, said plungers being hollow to allow the plunger-rod I to pass down through them and through stuffing-boxes *a* at the opposite ends of the water-cylinders.

The body-piece N is provided with bearings and boxes *b* midway between the pump and engine cylinders, to carry the main shaft R, which in turn carries the mutilated pinions V and the eccentrics U, for respectively receiving the motion from the racked yokes and imparting the same to the steam-valves.

O represents the discharge valve-chamber, into which the water-way *c* leads from the pump-cylinder. This valve-chamber is provided with a horizontal valve-seat, *d*, and also with a vertical valve-seat, *e*, said seats standing at right angles to each other. Although this valve-chamber has two seats, as stated, yet only one valve, W, is used, the position of the same being governed by the position of the pump.

In Fig. 2 the valve is shown in the position it occupies when the pump is acting horizontally; but when the pump is acting vertically the covers *g* are separated from the valve-chamber, and the valves are taken out and seated upon the seat *e*, when the covers are replaced and secured.

The suction valve-chambers are constructed in the same manner as the discharge-chamber, in order to allow its valves to be moved to correspond with the position of the pump.

The covers *g* of the valve-chambers of the pump-cylinders are secured in place by bails *g'*, which are pivoted at their ends, and provided with central screws, g^2, to press against the covers, as shown in Fig. 1. This construction allows easy and speedy access to the interior of the valve-chambers for the purpose of changing the position of the valves, or any other reason.

The construction of the valves is clearly shown in Figs. 3, 4, and 5 of the drawings, in which F represents a metallic frame provided on one side with circular recesses *w* for receiving the spiral springs *f*, and on the other side with a large recess, *w'*, for receiving the valves facing W, which is secured in place by a metal strip, G, and rivets G'.

The air-chamber X is secured to the dis-

charge valve-chamber by a ground joint, or other means which will allow it to be partially rotated by force, and can be used in the position shown in Fig. 2, when the pump is in a vertical position, or can be turned at right angles, as shown in dotted lines, when the pump is acting horizontally.

Y represents the discharge-outlet.

Should circumstances require it, a series of water-cylinders can be secured together, head to head, with their suction and discharge valve-chambers, and the plungers be secured to the plunger already described by means of screw-joints connecting the plunger-rods, and so on. These pumps can be added in line and in series, with their plungers and plunger-rods connected, so that the plunger-rods really become one rod through the whole series of pumps in line, as shown in Fig. 6.

The steam-cylinders are provided with a bail, A, by means of which the pump may be suspended bodily over the water, being operated on by attaching said bail to any known hoisting device by which the pump can be lowered as the level of the water descends.

I have in a separate application (Serial No. 56,690) made claims to the pumping-engine proper and the devices for operating the valves thereof, and I do not therefore claim the same in this application.

What I claim as my invention is—

1. In a force-pump constructed to be used in a vertical or horizontal position, the combination, with the cylinder thereof, of an induction or eduction chamber provided with a vertical and a horizontal valve-seat and a changeable valve, substantially as described.

2. In a force-pump constructed to be used in a vertical or horizontal position, the combination, with the cylinders thereof, of an eduction or induction valve-chamber provided with a vertical and a horizontal valve-seat, a changeable valve, and an air-chamber constructed to be moved into a vertical or horizontal position, substantially as described.

3. The combination, with a force-pump constructed to be used in a vertical or horizontal position, of an air-chamber adapted to be turned into a position parallel with or at right angles to the supporting-frame, substantially as and for the purpose specified.

4. In a force-pump constructed to be used in a vertical or horizontal position, the combination of induction and eduction chambers O P, having vertical and horizontal valve-seats *d e*, and the removable valves W, adapted to be used on either of the seats, substantially as and for the purpose specified.

5. In a pump, the loose valves provided on one side with a recess for holding the valve-face, and on the other side with recesses for holding springs, substantially as described.

6. In a pump, the metallic frame F, provided on one side with circular recesses *w*, and on the other side with a recess, *w'*, in combination with the facing W, the springs *f*, and means for securing the springs and facing in their proper positions, substantially as described.

WM. M. FERRY.

Witnesses:
A. B. EMERY,
D. C. MCLAUGHLIN.