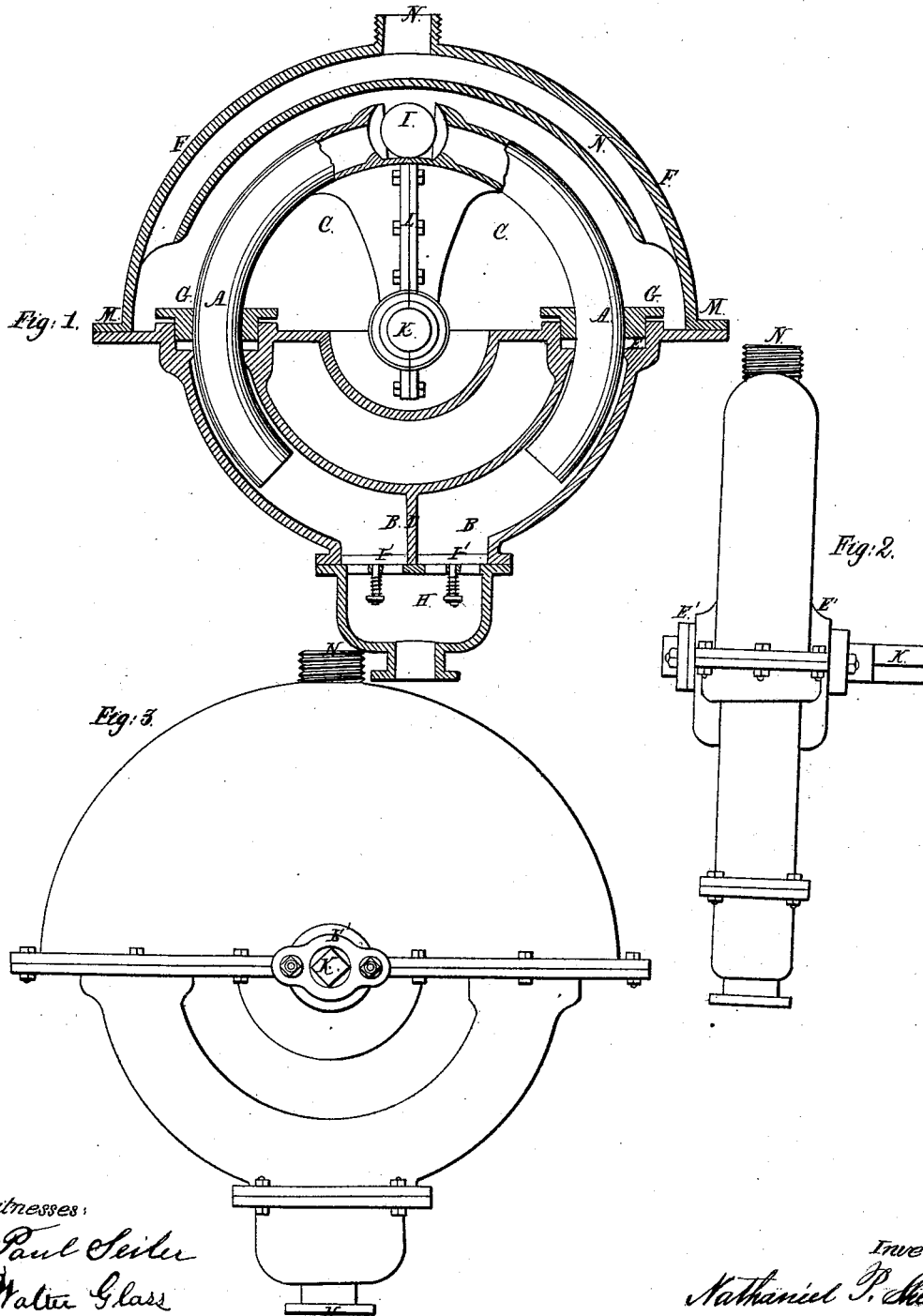


N. P. Sheldon.

Pump.

N^o 110,297.

Patented Dec. 20, 1870



Witnesses:

Paul Seiler
Walter Glass

Inventor:

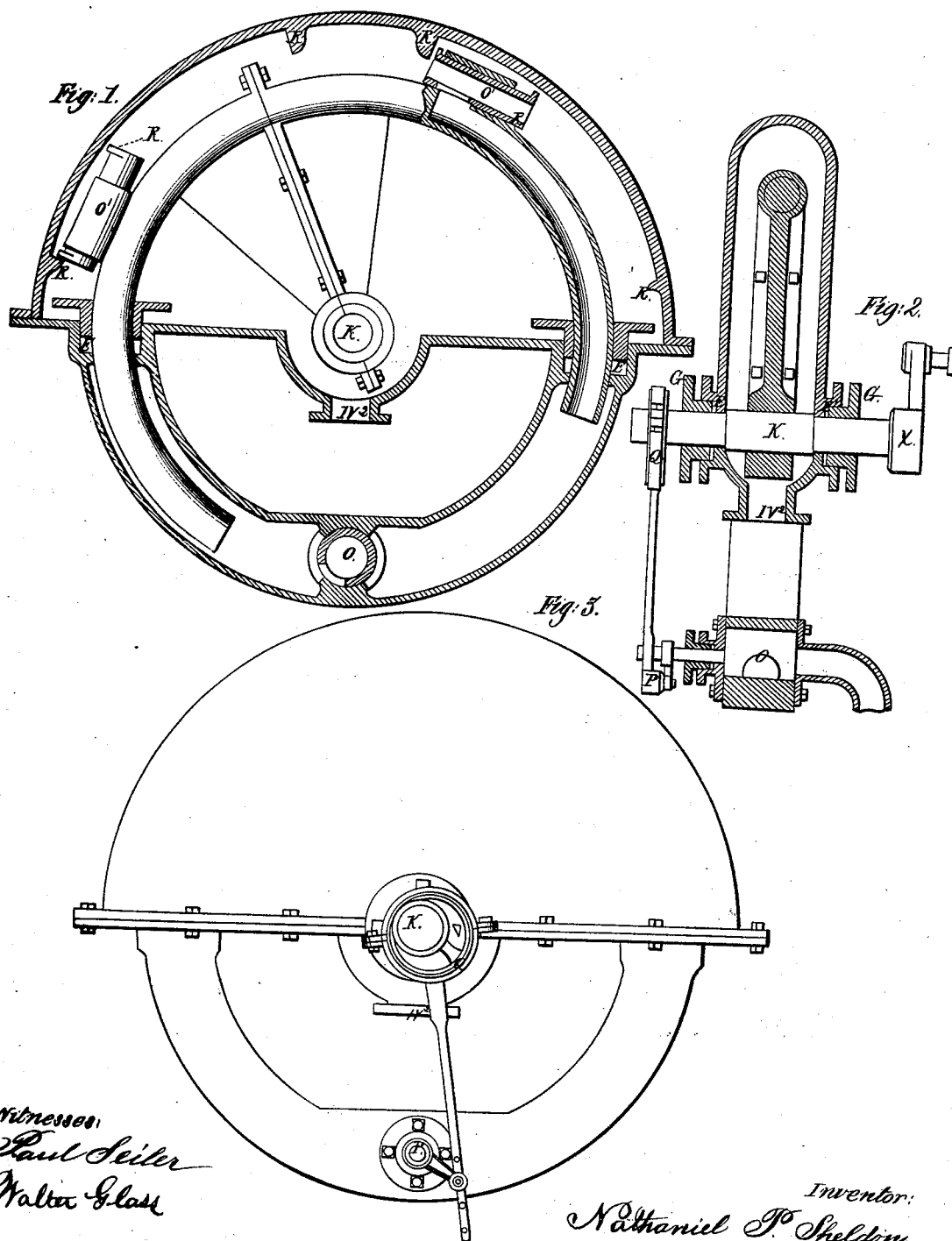
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Fig. 1.

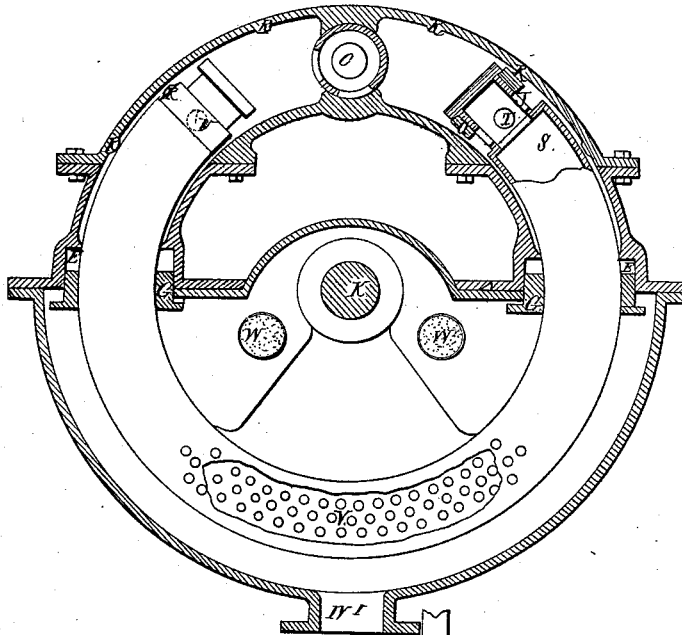


Fig. 2.

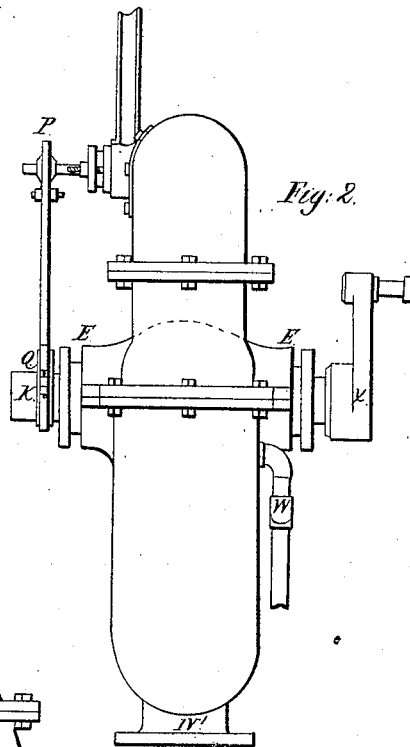
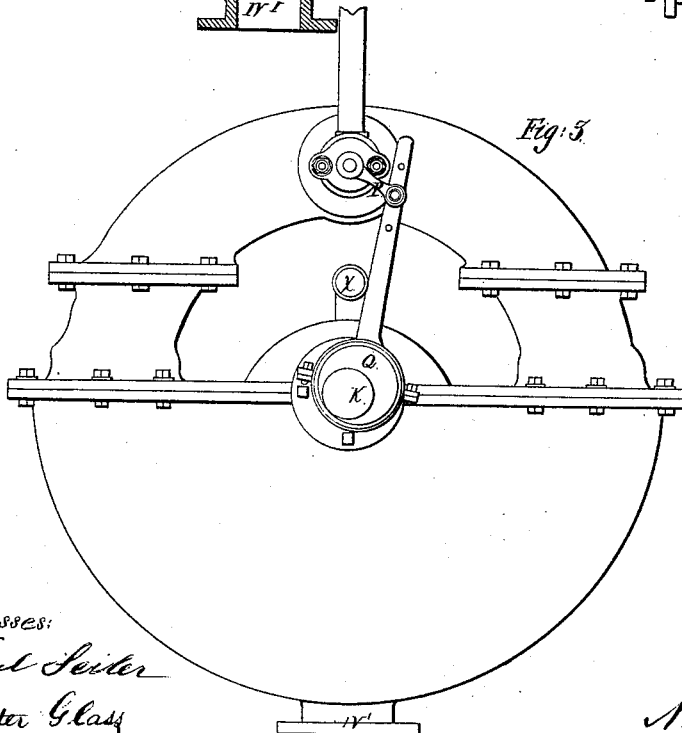


Fig. 3.



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United States Patent Office.

NATHANIEL P. SHELDON, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 110,297, dated December 20, 1870; antedated December 16, 1870.

IMPROVEMENT IN PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

I, NATHANIEL P. SHELDON, of the city and county of San Francisco, in the State of California, have invented certain Improvements in Pumps, applicable also to Hydraulic and Steam-Engines, of which improvements the following is a specification.

The nature of my invention relates to an engine or pump in which the cylinder or barrel is so shaped or cast as to form the segment of a circle, and provided about midway between its ends with apertures or openings, capable of being opened or closed for the admission of steam or water.

The piston or plunger of said engine or pump consists of a tube bent in the shape of an arc of a circle, having a common center with the center of the circle of which the cylinder or barrel forms a segment.

The ends of said plunger or piston are packed and fitted into the open ends of said cylinder or barrel, and about midway between said ends is attached to one end of an oscillating beam, which has a journal at its other end, having a bearing at the center of the circle of which the plunger or piston forms an arc.

At the ends, or any other convenient part of said plunger or piston, suitable valves are arranged to be opened or closed, as the case requires, as each side of the cylinder or barrel is to be emptied or filled with steam or water.

The piston or plunger is inclosed, and moves in a semi-cylindrical casing attached to the segment forming the cylinder or barrel, and the water or exhaust steam is discharged through said plunger into said casing previous to its discharge from the apparatus.

The casing thus forms an air-chamber or condensing-chamber, as the apparatus may be used for a pump or steam-engine.

Description of the Accompanying Drawings.

Figure 1, sheet 1, is a sectional view of a pump.

Figure 2, sheet 1, is an end view of a pump.

Figure 3, sheet 1, is a side view of a pump.

Figure 1, sheet 2, is a sectional view of a hydraulic engine.

Figure 2, sheet 2, an end view of a hydraulic engine.

Figure 3, sheet 2, a side view of a hydraulic engine.

Figure 1, sheet 3, a sectional view of a steam-engine.

Figure 2, sheet 3, an end view of a steam-engine.

Figure 3, sheet 3, a side view of a steam-engine.

General Description.

A is the plunger, and is made hollow, leaving the metal therein as thin as the desired strength will admit of. The portion of the plunger which passes through the packing-boxes should be of a perfectly

circular form, and smoothly turned to avoid friction. The remaining portion thereof may be of any desired form for arranging the valves.

A single valve may be used, as shown in the drawing of the pump, or a partition may be placed in the center of the plunger, and valves placed upon either side thereof.

B B are the receiving-chambers, and are made of one casting, separated by a partition in the center. The upper ends of these chambers terminate in stuffing-boxes, through which the respective ends of the plunger play.

Surrounding these stuffing-boxes is a disk, covering the receiving-chambers, and forming a base for the air-chamber. In the lower portion of each receiving-chamber is an open port, for receiving water from the suction-ports.

C is the air-chamber, and is made of an oval form, corresponding to the form of the disk upon the receiving-chamber, which forms its base. A discharge-pipe is cast around the air-chamber, with openings into the cavity of the air-chamber at the bottom, for receiving therefrom, and with an outward opening on top, for discharging into the conducting-pipe.

D is the division or partition between the receiving-chambers and the ports therein.

E E are the stuffing-boxes upon the receiving-chamber, through which the plunger plays.

E' is a stuffing-box, one of which is formed in the air and receiving-chambers (one-half in each) upon either side, for the purpose of packing around the shaft.

F, is the disk, covering the top of the receiving-chambers outside of the stuffing-boxes, the outer edge serving as a flange for attaching it to the flange of the air-chamber.

G G are glands, for pressing the packing into the stuffing-boxes.

H is a device for forming a double valve-seat, whose ports open into the open ports of the receiving-chambers.

I is a valve in the plunger.

I' I' are valves upon the suction-ports.

K is a shaft, to which the plunger is attached, and by which it is worked.

L is a flange for attaching the plunger to the shaft.

M is a flange around the air-chamber.

N is the discharge-pipe therefrom.

N¹ is the discharge-pipe from the hydraulic-engine.

N² is the discharge-pipe from the steam-engine.

O is an oscillating-valve in the hydraulic and steam-engine, to be opened and closed by mechanical action.

O' is a discharge-valve in the hydraulic-engine.

P is a lever, attached to an eccentric, for working the oscillating valves.

Q is the eccentric, and is worked by the shaft of the piston.

R R are devices upon the air or discharging-chambers, for opening the discharging-valves upon the pistons of the steam and hydraulic-engines.

S is a section of the piston in a steam-engine, arranged for a valve-seat.

T is a steam-port for the passage of "exhaust" steam from the receiving-chambers into the hollow piston of the steam-engine.

U U are sliding valves for said ports.

V represents openings for steam to pass from the piston into the condensing-chamber.

W W are ports for admitting cold water into the condensing-chambers.

For increasing the capacity of the plunger, it may be made of an oval or parallelogram form, thereby increasing its size in a lateral direction only, adapting the form of the chambers to correspond.

If needed for supplying the air-chamber with air when working under a heavy pressure, an air-cock may be placed in one of the receiving-chambers, and by opening it upon the receiving-stroke, and closing it upon the discharging-stroke, supply the air-chamber of a pump with the required amount, or, if required for an air-pump, a valve opening by pressure from without, and closed by pressure from within, may be placed in the receiving-chambers and air pumped through water.

In the operation of my invention as a pump, the receiving-chambers are alternately filled and discharged by the upward and downward motion of the respective ends of the plunger working therein, thus keeping up a constant flow into the air-chamber, from whence it is discharged by the elastic property of the air.

A rapid motion may be given to the plunger, the elastic property of the air in which the valves play, together with the form of the plunger, preventing the jar or concussion caused by direct contact with water under a heavy pressure.

In the operation of my invention as a hydraulic or steam-engine, the water or steam is forced by pressure into the receiving-chambers as the ports are opened and closed by the action of the oscillating valves, and in like manner discharged through the valves upon their respective pistons.

I claim as my invention—

1. The segmental cylinder or barrel, in combination with the oscillating plunger or piston, substantially as herein described.

2. In combination with the segmental cylinder, the air-chamber or condensing-chamber inclosing the plunger or piston, substantially as herein described.

NATHANIEL P. SHELDON.

Witnesses:

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HORACE W. SMITH.