(No Model.)

C. ROSINE.

STEAM PUMP.

No. 287,863. Patented Nov. 6, 1883.

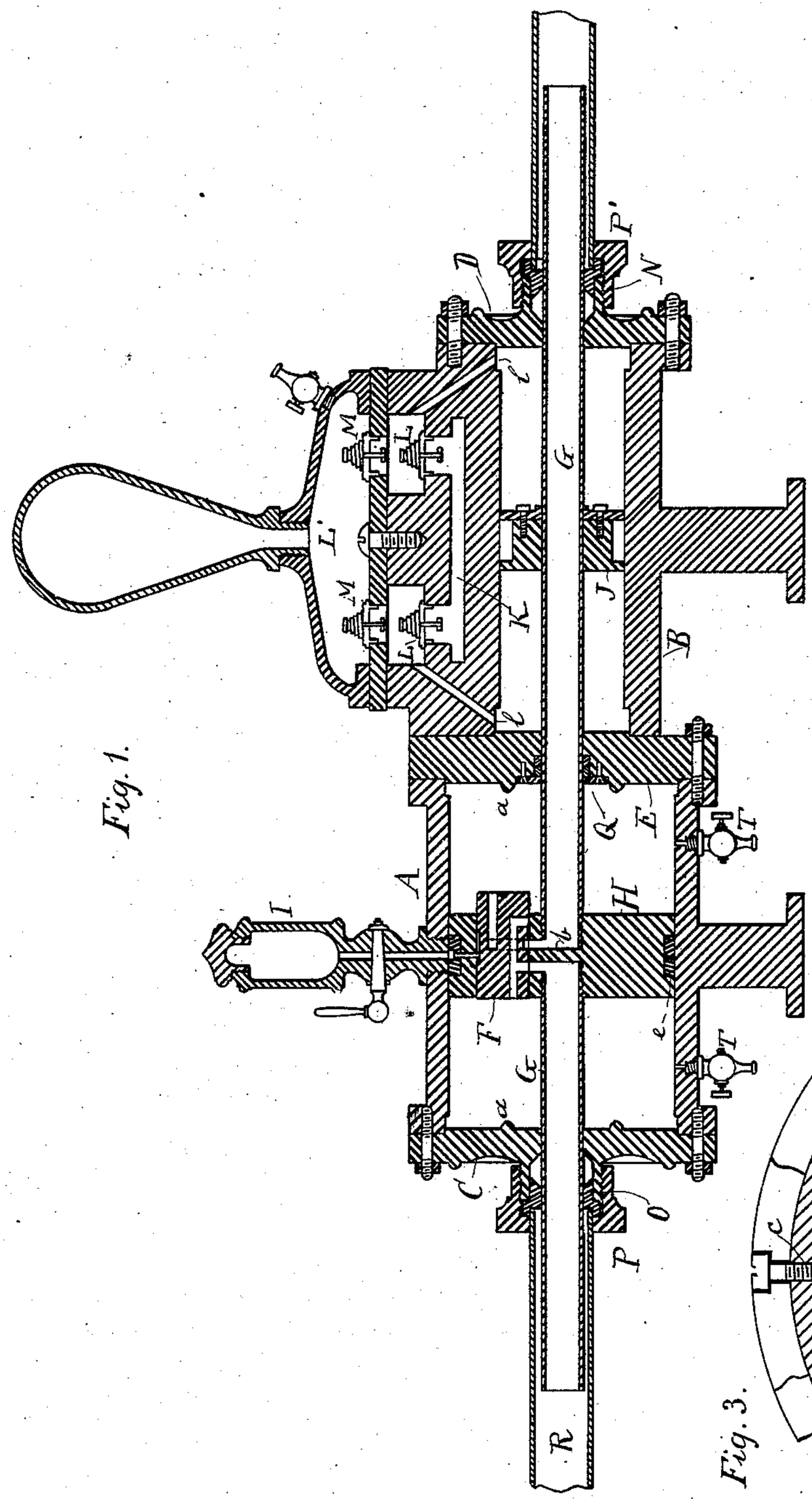

Fig. 1.

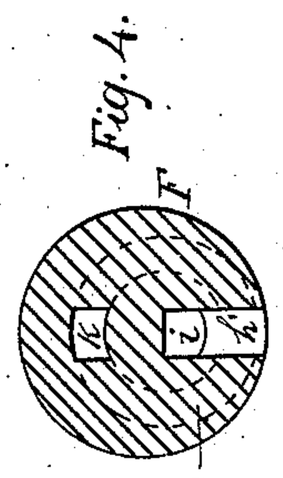

Fig. 4.

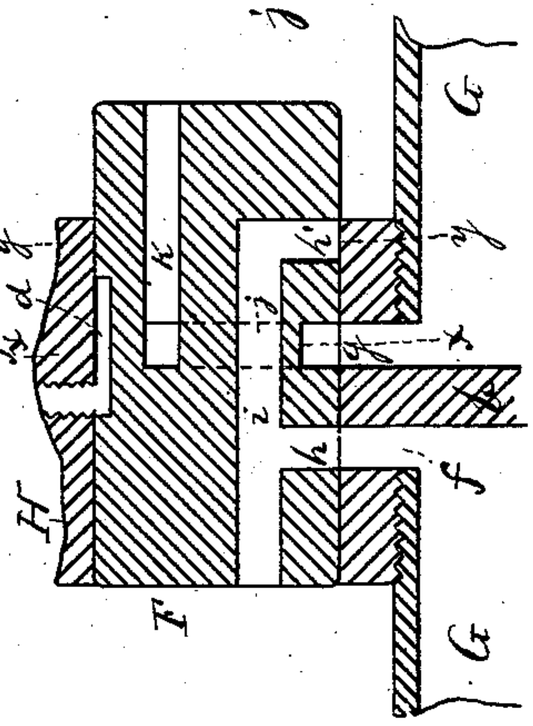

Fig. 2.

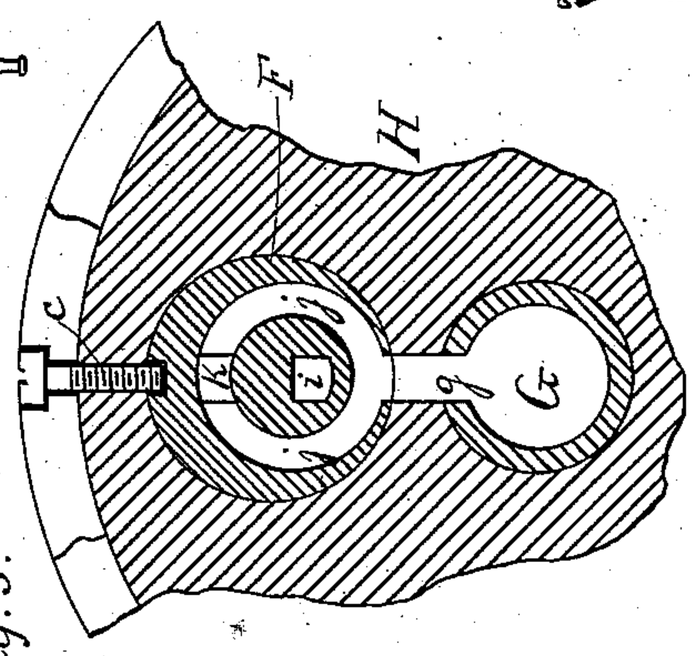

Fig. 3.

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STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 287,863, dated November 6, 1883.

Application filed August 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, CONRAD ROSINE, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in steam-pumps. The object it has in view is to afford simple and convenient means for the admission of live steam to the steam-cylinder, for the operation of the piston and plunger, and to allow of the escape of the exhaust-steam from said cylinder; and to the accomplishment of the above the invention consists of certain novel devices and combination of devices, as will be described and claimed.

Reference will be made to the accompanying drawings, in which Figure 1 is a sectional view of a steam pump and cylinder; Fig. 2, a sectional view, on an enlarged scale, of the piston-valve, and showing part of the piston and piston-stem; Fig. 3, a sectional view on line *x x* of Fig. 2, and Fig. 4 a section on line *y y* of the same figure.

Like letters refer to corresponding parts in each of the several views.

In the drawings, A represents the steam-cylinder; B, the pump-cylinder; C, the steam-cylinder head; D, the pump-cylinder head, and E a plate interposed between the ends of these two cylinders and forming one head of each. Cast upon the inner face of head C and upon one face of plate E, as shown, is a flange or ring, *a*, against which the piston-valve F strikes, as will be described.

The piston-stem G, I form of a hollow tube, and it is made in two sections, each of which is preferably provided with an exterior screw-thread upon its inner end and screwed into a screw-threaded opening in piston H. A partition, *b*, formed in piston H, separates the inner ends of the sections, and at the point shown each is provided with a suitable opening, one of which admits live steam to the cylinder and the other allows of the escape of the exhaust-steam therefrom. One section of piston-stem G passes through a stuffing-box, O, and a screw-threaded gland, P, secured to cylinder-head C and the outer end of this section, moves in the supply-pipe R. The other section of the piston-stem passes through stuffing-box Q, secured to plate E; thence through the pump-cylinder and through a stuffing-box, N, and screw-threaded gland P′, secured to head D, the outer end of this section moving in exhaust-pipe S.

A plunger, J, is secured to the piston-rod at a suitable point within the pump-cylinder. The openings described as formed in the piston-stem communicate one with a supply-port, *f*, and the other with an exhaust-port, *g*, both formed in the piston H, said ports communicating, alternately, with other steam-ports formed in the piston-valve, and now to be referred to. Formed in this valve are two ports, *h h′*, situated at such a distance apart that one will always have communication with either the supply-port *f* or the exhaust-port *g* of the piston. Both of these ports *h h′* open into a port, *i*, which extends from said port *h′* to the opposite side or end of the valve, where it opens into the steam-cylinder. Situated midway between ports *h h′* is a circular port, *j*, the location of this last-named port causing it to communicate with the exhaust-port *g* when the port *h* communicates with the supply-port *f*, and with the supply-port *f* when the port *h′* communicates with the exhaust-port *g*. Port *j* communicates with a port, *k*, which opens into the steam-cylinder on the opposite side of the piston H to that into which port *i* opens.

Valve F is preferably circular in form, and is provided on its upper face with a groove, *d*, into which the lower end of a pin or screw, *c*, is inserted, said screw being inserted into a suitable opening made through the piston-ring *e* and the piston for that purpose. This construction serves to limit the movement of the valve.

The pump is provided with suitable pump-cylinder ports, *l*, suction-valves L, suction-port K, discharge-valve M, and air-chamber L′, all of ordinary construction.

T represents suitable discharge-cocks for the escape of surplus steam from cylinder A.

The operation of the device is as follows: Live steam is admitted through supply-pipe R to piston-stem G, whence it passes through the opening made in said piston-stem to the supply-port *f* of the piston. When the piston-

valve is in the position shown in Fig. 1 of the drawings, this supply-port *f* communicates with the port *h* of the valve, and the steam escapes through said port to port *i*, whence it passes into the steam-cylinder. The chamber formed by the piston and cylinder-head C is thus filled with live steam and the piston set in motion. At the end of the piston-stroke the valve F comes in contact with the ring or flange *a* of plate E, and the position of the different ports and their relation one to the other changed as follows: The port *h* of the valve is closed, the circular port *j* is brought into communication with supply-port *f* of the piston, and the port *h'*, which during the first part of the operation was closed, communicates with the exhaust-port *g* of the piston. By this operation the exhaust-steam in the cylinder is allowed to escape through ports *i*, *h'*, and *g* to the piston-stem, whence it is carried off through exhaust-pipe S, and live steam is admitted through ports *f*, *j*, and *k* to the opposite side of piston H and the motion of the piston reversed.

It will be understood that when the parts are in the position first described any exhaust-steam in the cylinder escapes through ports *k*, *j*, and *g*, which then communicate.

The advantages I claim for my device are that it is simple in construction, perfect in its operation, and inexpensive.

Having thus described my invention, what I claim as new therein, and that for which I desire to secure Letters Patent, is—

1. The combination, with the piston H and screw *c*, passed therethrough, of piston-valve F, provided with groove *d*, as and for the purpose set forth.

2. The piston-valve F, provided with steam-ports *h*, *h'*, *i*, *j*, and *k*, in combination with the piston H and hollow piston-stem G, said piston provided with supply and exhaust ports *f g*, and the piston-stem provided with suitable openings, through which the live and exhaust steam passes, the several parts being arranged so that live steam will be alternately admitted on opposite sides of the piston and the exhaust-steam allowed to escape, as described and shown.

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

CONRAD ROSINE.

Witnesses:
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