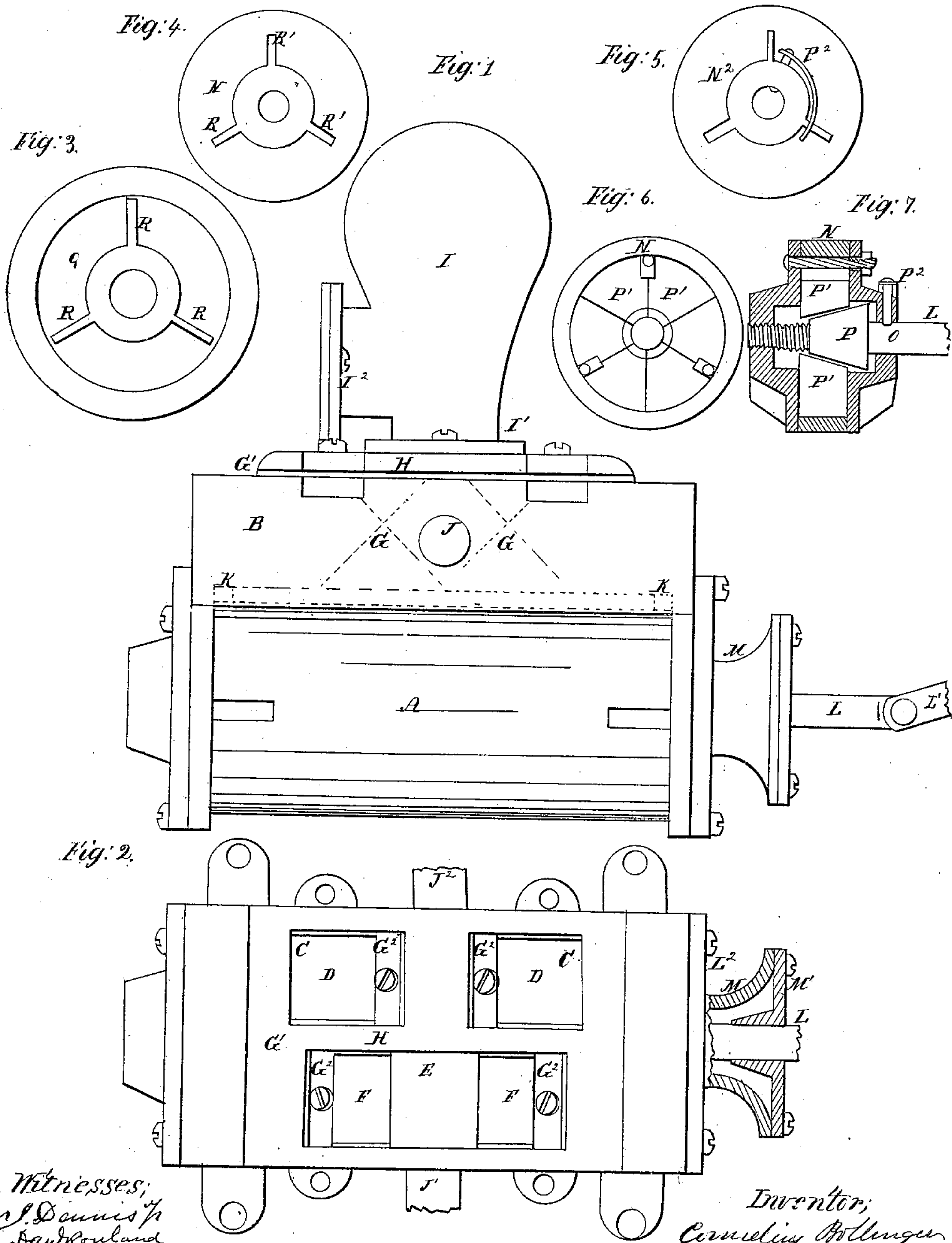


Force Pump.

N^o 41,133,

Patented Jan. 5, 1864.



UNITED STATES PATENT OFFICE.

CORNELIUS BOLLINGER, OF HARRISBURG, PENNSYLVANIA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 41,133, dated January 5, 1864.

To all whom it may concern:

Be it known that I, CORNELIUS BOLLINGER, of Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Suction and Force Pumps; and I do hereby declare that the same are described and represented in the following specification and drawings.

To enable others skilled in the art to make and use my improvements, I will proceed to describe their construction and operation, referring to the drawings, in which the same letters indicate like parts in each of the figures.

The nature of my invention consists in making lugs or stops on the inside of the cylinder-head and on the piston-head so that they will hold the piston-head from turning when the piston-rod is screwed through it to tighten the packing, and in making a screw and cone on the piston-rod to press out the segments in the piston and tighten the packing without removing the cylinder-heads; also, in making recesses in the piston-head and follower for the cone on the piston-rod, and a recess in the cylinder-head for the screw or end of the piston-rod, and a spring pawl on the follower acting on the piston-rod to prevent the piston from turning, and in a conical packing-box on the cylinder-head, in combination with a cone on the follower or packing-plate; also, in the peculiarly-constructed valve box and valves on the cylinder.

In the accompanying drawings, A is the cylinder, in which the piston works, made of cast metal with the valve-box B on one side, which is cast with it, with openings C C in the top with seats for the induction-valves D D, and also an opening, E, with seats for the eduction-valves F F. All the valve-seats are inclined as shown by dotted lines G G in Fig. 1, and a sheet of leather or other packing, G', is laid on the valve-box and cut so as to form the hinges and packing of the several valves, and secured by the pieces G², fastened with screws. The partition H separates the induction from the eduction valves, and the plate H' is screwed onto the top of the packing G', and covers the openings C C and E. A hole may be made through the plate H' and the air-chamber I applied to it. This air-chamber is made with two flanges, I' and I², so that it can be applied to the pump and stand perpendicularly when the cylinder is either

vertical or horizontal. J is the hole for the eduction-pipe J', and there is a similar hole in the opposite side of the valve-box for the induction pipe J². The water after passing the induction-valves enters the cylinder through openings K K, shown by dotted lines in Fig. 1, and passes out through the same openings to the eduction valves and pipe.

The piston-rod L is traversed by the link L', which connects it to the power or first mover which operates the pump. This piston-rod works through the cylinder-head L², which is fitted to the rod, and provided with a funnel-shaped flange, M, on the outside, forming a conical packing-box around the rod for hemp or water packing, which box is covered by the plate M', which is fitted to the rod and provided with a conical projection on the inside much smaller than the conical packing-box, to leave a space for either hemp or other packing, or the water which leaks into it from the cylinder may serve as a packing. The water leaking into the packing-box when the piston-rod is drawn out is sucked out into the cylinder when the piston-rod is pushed in, so that very little water escapes beyond the plate M', as the conical projection on the plate guides or strips the water from the rod and spreads it into the packing-box.

The piston-head N has a female screw in it to which the male screw on the piston-rod L is fitted, and the packing N' is placed between the head N' and the follower N², which moves freely on the piston-rod, and is drawn toward N by bolts to clamp the packing.

To tighten the packing or force it out against the cylinder as it wears away, I make a cone, P, on the piston-rod, and arrange a series of segments between the piston-head and follower. The inner end of these segments or sectors P' P' are fitted to the cone P, and there is a recess in the follower N² into which the cone may be partially drawn to let the segments come close together when the packing is applied around them, and the follower is put on the bolts, screwed up to hold it to the piston-head and clamp the packing, but not the segments, which must be left free to traverse as they are forced out by the cone on the piston-rod, when it is screwed into the piston-head, which has a recess in it for the small end of the cone P. The spring-pawl P² on the follower catches into countersinks in

the piston-rod when it is screwed into the cylinder-head to prevent it from turning and unscrewing. The cylinder-head Q has a recess on the inside for the end of the piston-rod when it is screwed through the piston-head, and the inside of this cylinder-head has three radial lugs, R R, on it, and there are three corresponding lugs, R' R', on the piston-head, so that the piston-head may be pushed against the cylinder-head and locked by the lugs to prevent its turning while the link is disengaged from the lever or crank, and used as a lever to screw the piston-rod in through the piston-head and force the cone P in between the segment P' and force out the segments and press the packing against the cylinder to tighten it without removing either of the cylinder-heads, and thereby saving much time and labor and tightening the packing with great facility without disturbing the joints or packing between the cylinder-heads and cylinder.

Some of my improvements may be applied to steam-engines.

I believe I have described and represented my improvements in pumps so as to enable any person skilled in the art to make and use them without further invention or experiment. I will now state what I desire to secure by Letters Patent.

1. The lugs R R on the cylinder-head with the lugs on the piston-head when applied to prevent its turning when the piston-rod is screwed in to tighten the packing.

2. A piston-rod with a screw working in the piston-head, and provided with a cone by which the segments to tighten the packing may be pressed out, substantially as described.

3. In combination with the cone on the piston-rod, the recess in the piston-head and follower, which receive the cone, and also the recess in the cylinder-head Q which receives the end of the piston.

4. In combination with the devices for tightening the packing, the spring-pawl P², working into countersinks in the piston-rod, for the purpose set forth.

5. The packing-box on the cylinder-head in combination with the cone on the follower or plate M'.

6. In combination with the cylinder A, the valve-box and valves, constructed and arranged substantially as described.

In testimony whereof I have signed my name.

CORNELIUS BOLLINGER.

Witnesses:

DANL. ROWLAND,
J. DENNIS, Jr.