

F. TRUMP.
Steam-Pumps.

No. 158,447.

Patented Jan. 5, 1875.

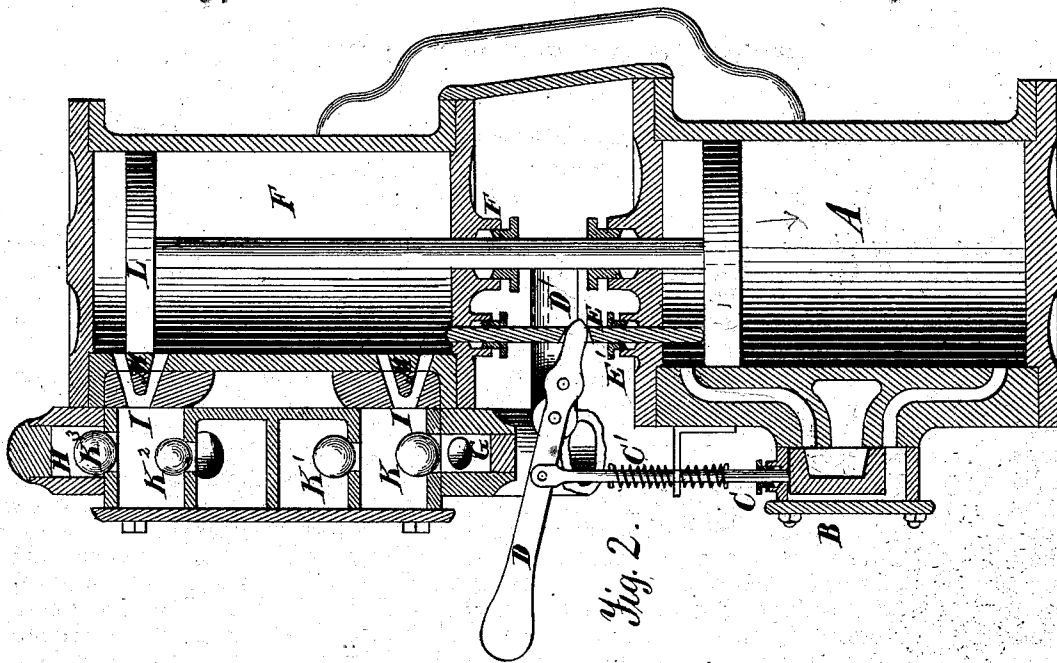


Fig. 2.

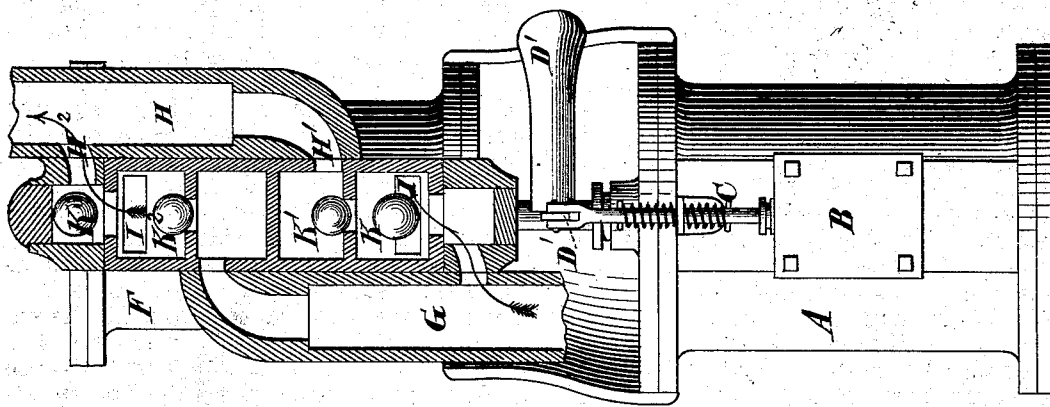


Fig. 1.

Witnesses.
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UNITED STATES PATENT OFFICE.

FULLER TRUMP, OF SPRINGFIELD, OHIO, ASSIGNOR TO JAMES LEFFEL
& CO., OF SAME PLACE.

IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. **158,447**, dated January 5, 1875; application filed
December 4, 1874.

To all whom it may concern:

Be it known that I, FULLER TRUMP, of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Steam-Pumps; and I do hereby declare that the following is a specification of the same.

My improvement relates to that class of pumps in which a water and steam cylinder are placed in line with a single piston-rod and two heads, so that the steam-pressure acts directly on the pump. I have illustrated the cylinders as arranged one over the other. They can as well be both horizontal.

In the annexed drawings, Figure 1 is an elevation of the steam cylinder and pump, showing the water-valves in a longitudinal section through the valve-chest. Fig. 2 is a vertical section of both the steam and water cylinders and their valve-chests.

The same letters are employed in both figures in the indication of the same parts.

In the annexed drawings, A represents the cylinder, and B the valve-chest. As these parts are in familiar use they need not be described. The piston and piston-rod are also of the usual form, except that the piston-rod extends into the pump-cylinder, so as to cause the steam to act directly upon the piston of the pump. This part of the machine is well known, also. The valve is the common slide-valve, though any other may be employed. The valve-rod C passes through a lug, and has two coiled springs, C', bearing against it on opposite sides, so as to hold it normally closed in its central position, the steam being admitted only at the end of the stroke, and but for an instant. At the outer end of the valve-stem C is a lever, D, to which it is attached by a pin. This lever is pivoted to an arm, D', and its short arm engages the rod E, which extends across and passes through stuffing-boxes E' a short distance into the two opposite cylinders. It is shifted so as to move the valve by the two piston-heads alternately striking against each end, and forcing it as far as the piston-head moves in that direction. Thus the valve is opened into alternate ends of the steam-cylinder near the end of each

stroke, remaining open until the piston-head leaves the rod E on the return stroke, when, the rod being freed, the springs C' will instantly close the induction-port. F is the water-cylinder, which is also provided with its valves and valve-chamber, divided into compartments containing, in the case as illustrated, ball-valves; but as this part of the machine is no part of my invention, any of the known valves adapted to such use may as well be employed. G is the induction and H the eduction pipe, alternately delivering the water to and receiving it from the valve-chest and cylinder. I I are the ports to the water-cylinder, and K, K¹, K², and K³ are the valves, alternately opening and closing with the motion of the piston L. The ports I I, on leaving the valve-chest, are divided, and enter the chamber of the cylinder F through two apertures, separated by a solid portion of the cylinder M. The width of this bridge should be at least equal to the thickness of the head L, so that as it traverses the cylinder from end to end in passing the bridge, the two openings of the ports I should be on opposite sides of the piston-head. While in this position the water will flow around the piston-head, and the resistance of the water be taken off in whole or in part. This will cause a sudden acceleration of the speed of the piston as the load is taken off, which will cause it to suddenly start forward, so as to strike the end of the stem E a quick, sharp blow, and thus instantly shift the valve, and cause it at once to admit steam on the other side of the steam-piston through a fully open port. The same absence of resistance will carry the piston-head L on the return stroke beyond the port. By this means the engine is prevented from stopping in such position that it will not take steam.

I however do not claim the ports forming an opening around the piston independently of their application in this particular combination, for I am aware that the cylinders of steam-engines used for ringing bells have been so constructed for the purpose of applying the steam-power only at the middle of the stroke. My invention is distinguished from

what has been before known in this, that I combine with a steam-cylinder, the valve of which is actuated by a tappet on the pump-piston, a pump-cylinder having openings around the valve near the end of each stroke, to suddenly relieve the resistance from the steam-cylinder, and thus accelerate its movement at the instant when the tappet strikes the valve-stem.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the steam-cylinder, the valve of which is actuated by a tappet at each stroke of the piston, a pump-cylinder constructed with double ports, the channels of

which open on opposite sides of the piston of the pump when near the end of the stroke, substantially as set forth.

2. In combination with the cylinder F and piston-head L, and double ports I, the tappet-rod E, lever D, valve-stem and springs of the steam-valve, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FULLER TRUMP.

Witnesses:

W. A. SCOTT,
F. C. GOODE.