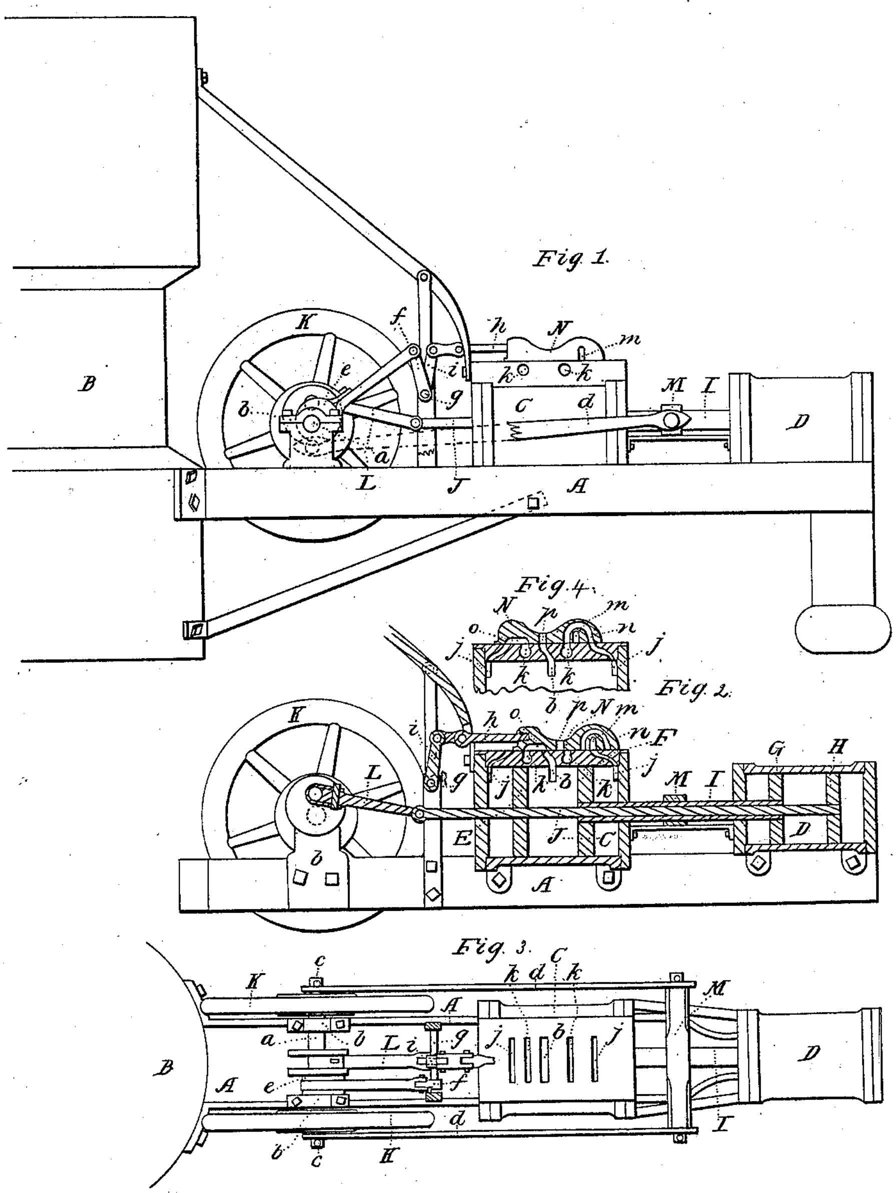
Button & Blake,

Steam Pump.

No. 42,557. Patented May 3, 1864.



Witnesses
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UNITED STATES PATENT OFFICE.

LYSANDER BUTTON AND ROBERT BLAKE, OF WATERFORD, NEW YORK.

IMPROVEMENT IN STEAM FIRE-ENGINES.

Specification forming part of Letters Patent No. **42,557**, dated May 3, 1864.

To all whom it may concern:

Be it known that we, LYSANDER BUTTON and ROBERT BLAKE, of Waterford, in the county of Saratoga and State of New York, have invented a new and Improved Steam Fire-Engine or Pump; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon.

The nature of our invention consists in the arrangement and combination of a steam and water cylinder, each having double pistons, attached to two rods, one working within the other, and their motion governed by double cranks, the object being so to construct a steam fire-engine or pump as to obviate the vibrating motion always produced by single-piston engines, and at the same time dispense with the necessity of great weight of parts, which is of great importance in the construction of steam fire-engines.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a vertical longitudinal section through the same; Fig. 3, a top view of the same, and Fig. 4 a section of the valve and detached part of the cylinder having the steam-ports.

Same letters have reference to like parts in all the figures.

We have not thought it necessary to represent our engine mounted upon a carriage, which may be done in any form which the judgment and taste of the constructer may choose.

We construct a frame, A A, secured to the boiler, (partially represented at B,) upon which frame we secure the steam-cylinder C and water-cylinder D, each having two pistons, E F and G H, one in each cylinder, F and G being secured to a hollow piston-rod, I, and the other two, E and H, being secured to the rod J, which works within the hollow rod I. We place the shaft *a* upon bearings *b b*. Upon either end of said shaft we place balance-wheels K K, and between the bearings two cranks, to one of which is connected the piston-rod J by means of connecting-rod L, and in the balance-wheels (one of which is removed in Fig. 1, so as to represent the parts behind it) we place crank-pins *c c*, to which are attached the connecting-rods *d d*, and the opposite ends are attached to a cross-head, M, which is secured to the hollow piston-rod I.

The valve N is worked by means of the crank or eccentric *e*, connected with the arm *f* upon the rock-shaft *g*, and the valve-rod *h* being connected to said rock-shaft by means of the arm *i*. The steam is admitted at the ends of the cylinder through the ports *j j'* when the valve is in position as in Fig. 2, forcing the steam-pistons to the center and the water-pistons to the ends of their respective cylinders, the steam exhausting through the ports *l k*, and as the valve is changed the steam is admitted to the center port, *l*, and the several pistons are forced in opposite directions. To accomplish these results, our valve is peculiarly constructed so as only to require a single valve to operate the two pistons, the opening *m* admitting the stem to the port *j'*, and having a chamber, *n*, through which the steam exhausts through the port *k'* when in position as in Fig. 4, and at the opposite end by way of the chamber *o* and the port *k*, at the same time admitting steam to the center through the opening *p* in the valve and port *l*, and thus alternately working the pistons as desired, said pistons being governed in their exact motion by means of the double cranks connected to the respective piston-rods, as described, and securing a uniform and exact motion to the respective pistons and valve, as described and represented, thereby securing a simple and compact construction, and the working of the pistons against each other in the respective cylinders being such as to produce equalization of strain upon the frame and steadiness of motion to the whole machine.

Having thus described the construction and operation of our engine, what we claim, and desire to secure by Letters Patent, is—

1. The combination of two pistons moving in opposite directions at the same time in one steam-cylinder, operating two pistons in one water-cylinder, in opposite directions, connected by two piston-rods, one working with-

in the other, the motions of which are governed by a double crank having direct connection with the piston-rods, substantially in the manner and for the purpose described.

2. The construction of the single valve, having openings and chambers for the admission and exhaustion of the steam at the ends and center of the cylinder, so constructed as that both pistons are operated upon in opposite directions at the same moment.

LYSANDER BUTTON.
ROBERT BLAKE.

Witnesses:
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