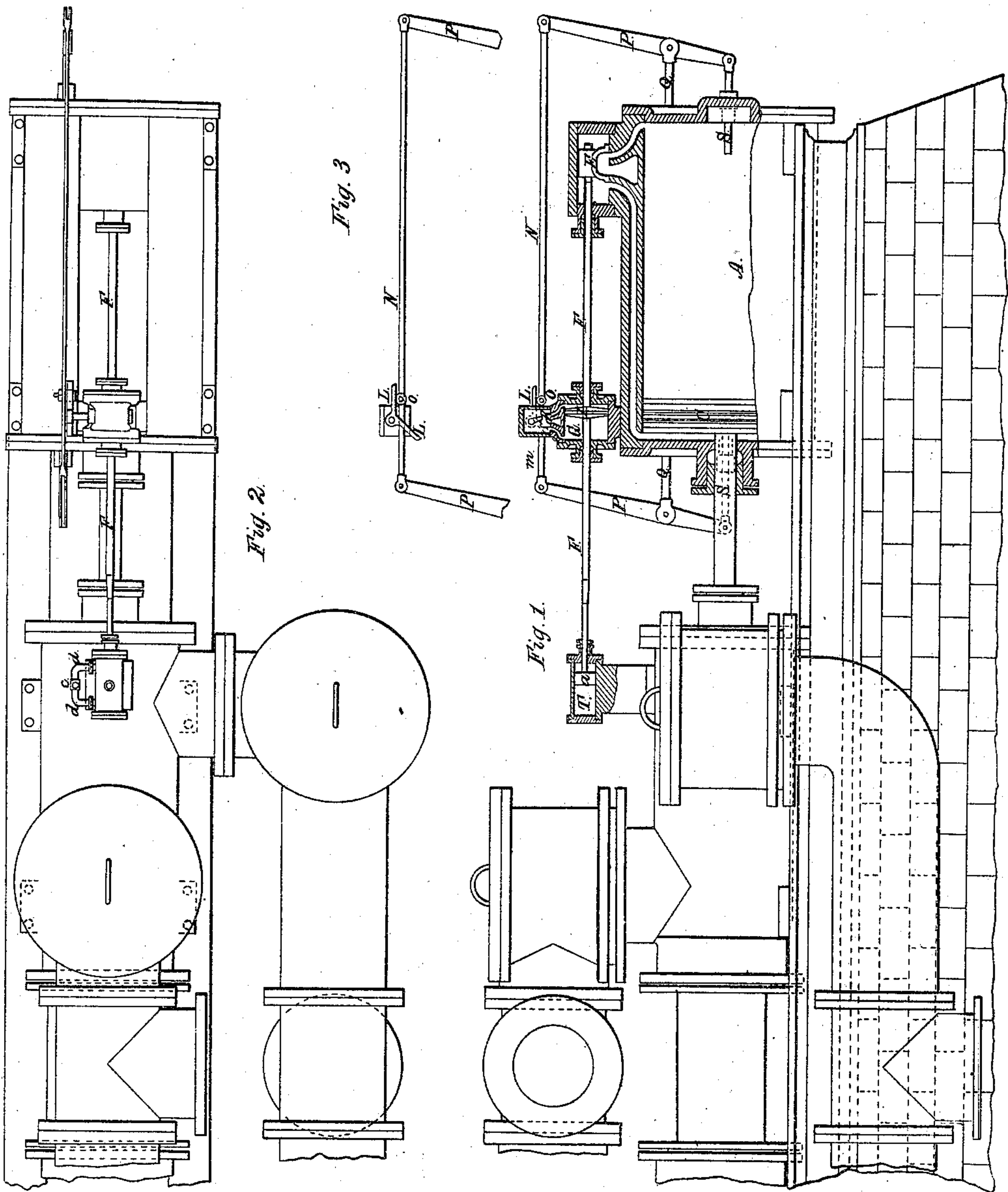


*W. H. Roberts.*  
*Steam Pump.*

*No. 88,512.*

*Patented Mar. 30, 1869.*



*Witnesses.*

*J. L. Glass*  
*J. L. Coole*

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# UNITED STATES PATENT OFFICE.

WILLIAM H. ROBERTS, OF MAUCH CHUNK, PENNSYLVANIA.

## IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. 88,512, dated March 30, 1869.

*To all whom it may concern:*

Be it known that I, WILLIAM H. ROBERTS, of Mauch Chunk, in the county of Carbon and State of Pennsylvania, have invented a new and useful Improvement on Steam-Pump; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and the letters of reference marked thereon.

The nature of my invention consists in a certain combination and construction and arrangement of parts, herein described, whereby all sudden thumping or pounding is effectually prevented, even where the height is three or four hundred feet, and the movement of the pump is made as regular as a crank-motion, and under the complete and perfect control of the engineer, without regard to the varied pressure of the steam.

In the following figures similar letters refer to similar parts.

Figure 1 is a sectional view of a longitudinal elevation. Fig. 2 is a horizontal sectional view. Fig. 3 is a section of the parts moving the valve K.

In order that others skilled in the art may make and use my invention, I will proceed to describe its construction and operation.

In Figs. 1 and 2 the water-cylinder or water-cushion is represented by T, and is provided with a U-shaped pipe, *d*, Fig. 2, connecting both ends of the cylinder. In the center of this pipe, or conveniently near the center, is a choke-valve, *c*, Fig. 2, to regulate the flow of water from one end of the cylinder to the other. This cylinder is filled with water, and has a water-tight piston, *a*, working in it. Said piston *a* is attached to the valve-rod F F. At each stroke of the valve-rod F F the water is driven through the pipe *d*, Fig. 2, and passes the choke-valve *c*, Fig. 2, which is always under the control of the engineer.

G is a small steam-cylinder, arranged in the same plane with, and about equidistant between, the steam-chest D and dash-pot T. I is a piston keyed on the rod F, which latter passes through suitable stuffing-boxes in the respective ends of the cylinder. This piston

is formed with inclined or convex sides, to the end that the outer edges of the same may at no time come into contact with the inner surfaces of the heads of cylinder G, thus providing a chamber for the reception of the steam entering through either port. Without this construction and arrangement the pump would be practically inoperative, as, were the piston I formed with straight or parallel sides, the steam could not, except it be during a rapid movement of the piston, find an entrance between the latter and either of the cylinder-heads—i. e., when the piston is at the end of its stroke.

L is a rocker, keyed on a short rock-shaft, the same being horizontally arranged, and having the arm *m* on its opposite end, which engages with the valve K, arranged within the chamber J, so that its movement shall alternately open and close the ports *e*, leading to the cylinder G.

O is a friction-roller, arranged on a pin projecting from the rod N. The latter connects the two ends of the longer arms of the levers P, which are pivoted to the stationary arms Q, projecting horizontally from the heads of the main cylinder. S are tappet-rods, pivoted to the ends of the shorter arms of levers P, and inserted through said cylinder-heads. E is a slide-valve secured on the end of the rod F, and arranged, in relation to the steam-ports *i* and piston C, in the same manner as the valve K to the piston I and ports *e*.

I will now proceed to show the operation of my improved pump. When the piston-head C has nearly completed its stroke it comes in contact with the tappet-stems S S alternately as they run through the heads of the main cylinder, and these stems convey the motion to the levers P P, which work the tappet-rod N, on which is the tappet-roller. The latter works the rocker L, thereby imparting motion to the valve K, and allowing steam to enter cylinder G, for operating the slide-valve E through rod F. The function of the dash-pot T is, at this point, to prevent a too sudden or unsteady motion of the slide-valve, as the piston *a* cannot traverse its cylinder until the water contained therein has

time to flow through the pipe *d* and cock *c*. The rapidity of the flow is perfectly controlled by means of said cock.

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

1. The rocker L, arranged and operated substantially as herein described.

2. The combination of the rocker L with the friction-roller O, substantially as herein described.

3. The arrangement of the rocker L, arm *m*, roller O, valve K, rod N, levers P, and tappet-stems S, with reference to each other and the cylinders G and A, substantially as set forth.

4. The piston I, when constructed as described, and arranged in relation to the steam-ports *e e*, valve K, rocker L, roller O, rods N and F, and slide-valve E, substantially as specified.

5. The combination and arrangement of the rocker L, arm *m*, valve K, ports *e e*, piston I, rods N and F, levers P P, tappet-stems S S, slide-valve E, dash-pot T, and pipe *d*, containing the choke-valve *c*, as set forth.

WM. H. ROBERTS.

Witnesses:

I. D. LACIAR,  
THOMAS RYAN.