

Collier & Masterman,

Balanced Valve.

No. 107,453.

Patented Sept. 20. 1870.

Fig. 1.

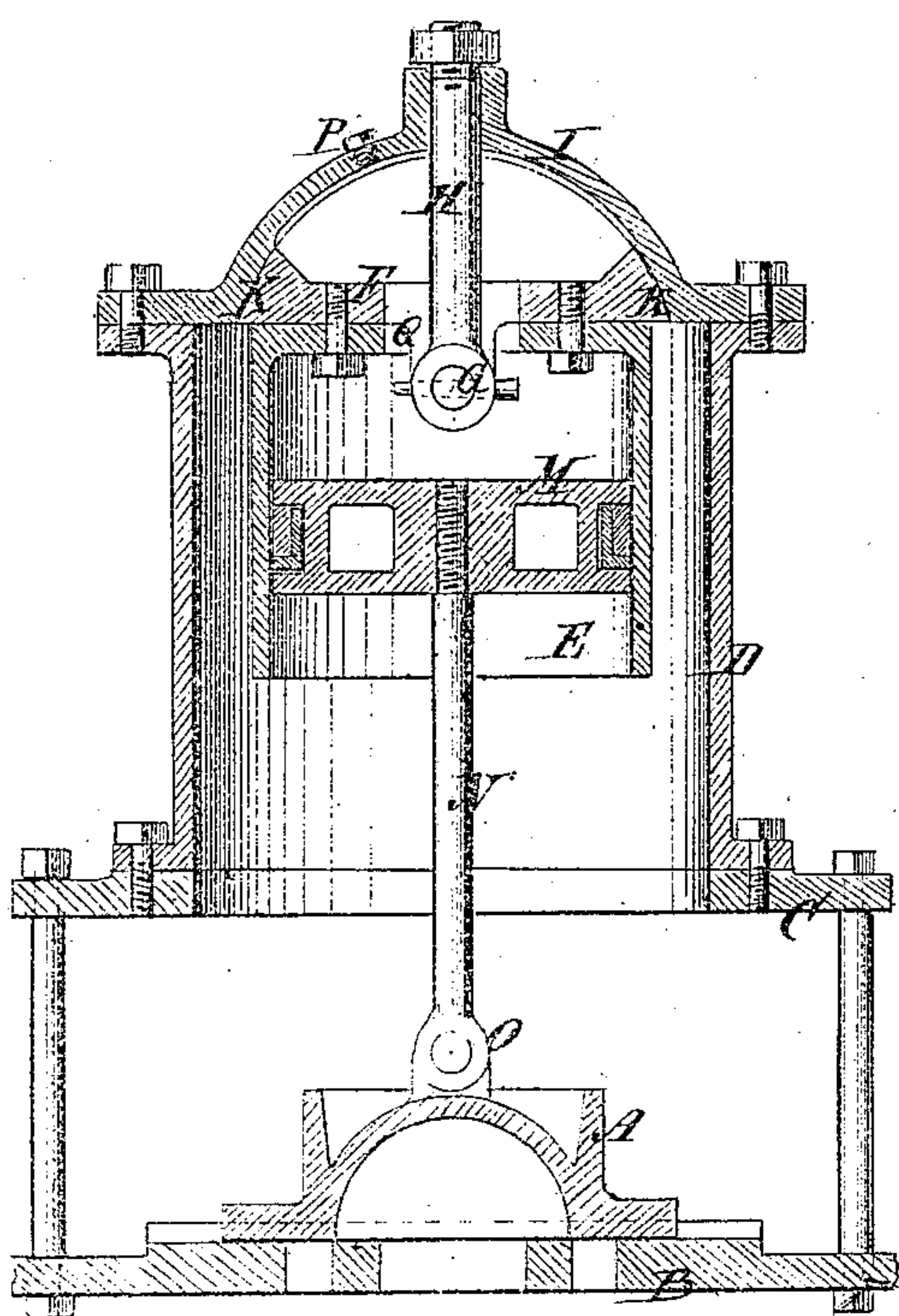
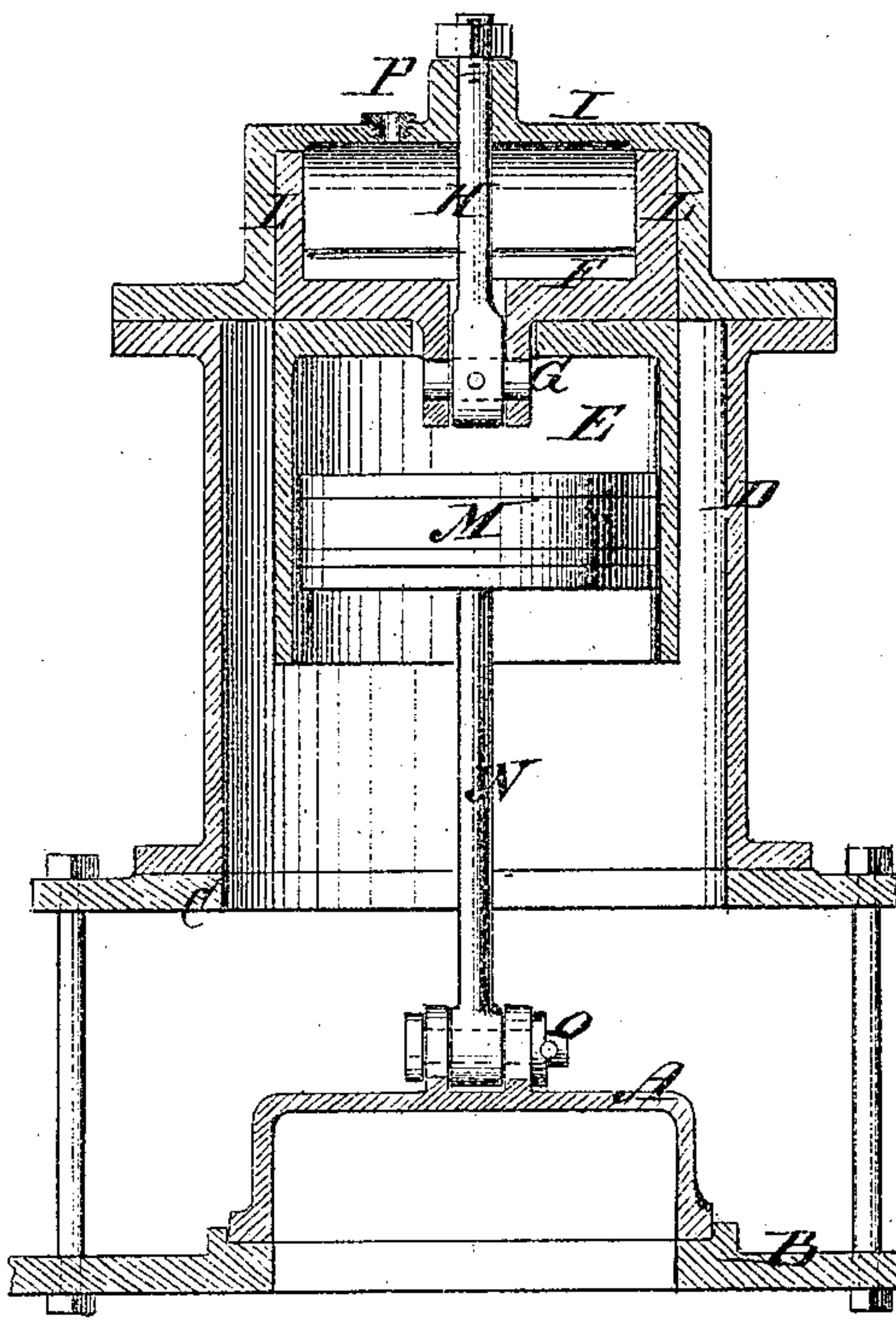


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

ORRIN COLLIER AND WILLIAM H. MASTERMAN, OF SACRAMENTO, CAL.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. **107,453**, dated September 20, 1870.

To all whom it may concern:

Be it known that we, ORRIN COLLIER and WILLIAM H. MASTERMAN, of Sacramento, in the county of Sacramento and State of California, have invented a new and Improved Balanced Slide-Valve; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to improvements in balanced slide-valves; and it consists in the arrangement, in a cylindrical or other case attached to the top of the steam-chest and opening into it, of a cylinder suspended above so as to swing back and forth with the valve, having a piston the rod of which is pivoted to the valve, one side of the piston being exposed to the steam in the valve-chest and the other to the atmosphere, so that the down-pressure on the valve is counteracted by the upward pressure of the steam on the under side of the piston, which is intended to be of such area as to regulate the pressure of the valve upon its seat as may be required. This piston moves out and in its cylinder to compensate for the lengthening and shortening of the distance between the point of the piston-rod with the valve and the point at which the said cylinder is suspended.

Figure 1 is a sectional elevation of our improved apparatus, and Fig. 2 is another sectional elevation taken in a plane perpendicular to that of Fig. 1.

Similar letters of reference indicate corresponding parts.

A is the sliding valve, and B the seat thereof.

C represents the top of the steam-chest, the sides of which are not shown.

D is a hollow cylinder, arranged vertically on the top of C, which has an opening through it communicating with the interior of the said cylinder.

E is a steam-cylinder, open at the bottom and attached to a plate F so as to be suspended vertically from it. This plate F is jointed at G to a rod, H, which suspends it from the top case, I, the interior of which is fitted to a true curve struck from the axis of the joint G, and

the plate is fitted steam-tight to this curvature at the edges K, also to the walls at the ends L thereof, so that while oscillating thereon the steam will be prevented from escaping.

M is a piston, arranged in the cylinder E, the rod N of which is pivoted at O to the valve A. The area of this piston is calculated with reference to the area of the valve A so that the steam acting upon both will have such preponderance of pressure on the valve as to hold it down upon its seat sufficiently to cause it to work steam-tight, but no more. The upper side of the piston is open to the atmosphere, which is admitted through the openings P in the case I, and Q in the plate F and cylinder-head. It will be seen that as the cylinder E and its piston swing back and forth with the valve the lifting force will be constant and uniform thereon, the piston moving in the cylinder as required by the horizontal motion of the valve.

Instead of the employment of the plate F and its curved seat to prevent the escape of the steam at the place where the air is admitted, we propose in some cases to attach the cylinder to trunnions in place of the axis G, one of which may be hollow to admit the air to the space above the piston. We do not therefore limit ourselves to the arrangement here shown. The function of the rod H in this arrangement is mainly to hold the cylinder when steam is not on, for the steam holds it up when on.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination, with the valve A, of the cylinder E and piston D, the latter being pivoted to the valve A and the former being open to the steam at one end and the air at the other, and suspended to oscillate in unison with the movements of the valve, all substantially as specified.

2. The combination of the cylinder E, plate F, case I, and rod H, all substantially as specified.

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WILLIAM HENRY MASTERMAN.

Witnesses:

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