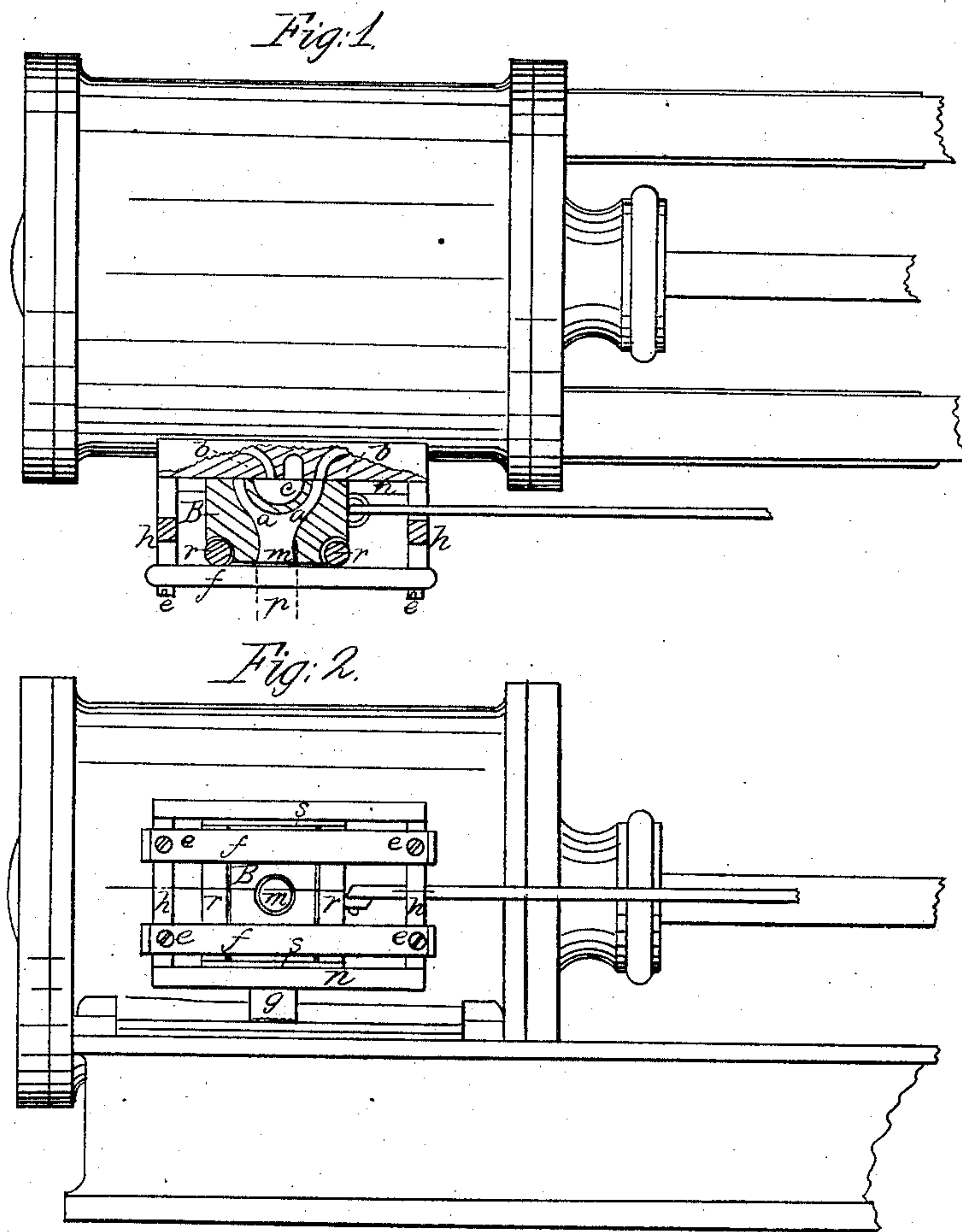


J. B. Dougherty,
Steam Balanced Valve.
N^o 56,384. *Patented July 17, 1866.*



Witnesses

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JOHN B. DOUGHERTY, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN SLIDE-VALVES.

Specification forming part of Letters Patent No. 56,384, dated July 17, 1866.

To all whom it may concern:

Be it known that I, JOHN B. DOUGHERTY, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Balanced Valves for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a top view of an ordinary steam-cylinder with my invention (shown in horizontal section) applied. Fig. 2 is a side elevation of the same.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to that class of valves of steam-engines called "balanced valves;" and it consists in such a relative arrangement of the steam-ports, in combination with the rollers, as shall avoid the necessity of using a relieving or balance plate, and in the arrangement of such rollers in connection with supporting-bars.

To enable others to make and use my invention, I will describe its construction and operation.

I prepare the face of the valve B and its seat in the ordinary way; but, in addition to the ordinary exhaust-cavity *c*, I provide the valve with an induction-channel, *a*, leading from the mouth *m* of the steam-pipe. (Shown by the dotted lines *p*.) The channels are made to register to the induction-ports *b b* alternately, and of course they should correspond therewith in shape and capacity.

I provide the back of the valve at each end with an anti-friction roller, *r*. They may be made of steel or other suitable material, and are pivoted to the valve by the straps or plates *s*, Fig. 2, which are bolted to the valve. The

ways or bars *f* are bolted to the hangers *h* with set-screws *e*, whereby any wear of the parts may be compensated for.

The inner face of the bars should be planed and fitted exactly parallel to the plane of the valve-seat.

The rib *n* forms a vertical support for the valve.

It will be seen that the pressure of the live steam through the closed channel *a* against the valve-seat and in the open port, as well as the lift produced by the exhaust, is borne by these rollers *r*.

The steam-pipe is fixed to the valve B, and this end moves with it. If this cannot be permitted by the spring of the pipe, it may be effected by connecting it to the valve with an ordinary packed swivel ring-joint and a similar joint above or below, as the case may be.

The pipe in this construction necessarily leads to the valve vertically to its travel.

The valve may be so constructed as to receive the steam-pipe on the top or bottom, instead of at the back.

The exhaust may lead out from below, as indicated by the section *g* of pipe, Fig. 2.

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

1. The arrangement of the exhaust-port *e*, inlet-ports *a a* and *m*, in combination with the rollers *r r* and the steam-pipe *p*, which combination and arrangement avoid the necessity of a relieving or balance plate.

2. The combination of the rollers *r r*, in slide-valves, with the bars *f*, when the same are used without a steam-chest, as and for the purposes shown and described.

JOHN B. DOUGHERTY.

Witnesses:

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