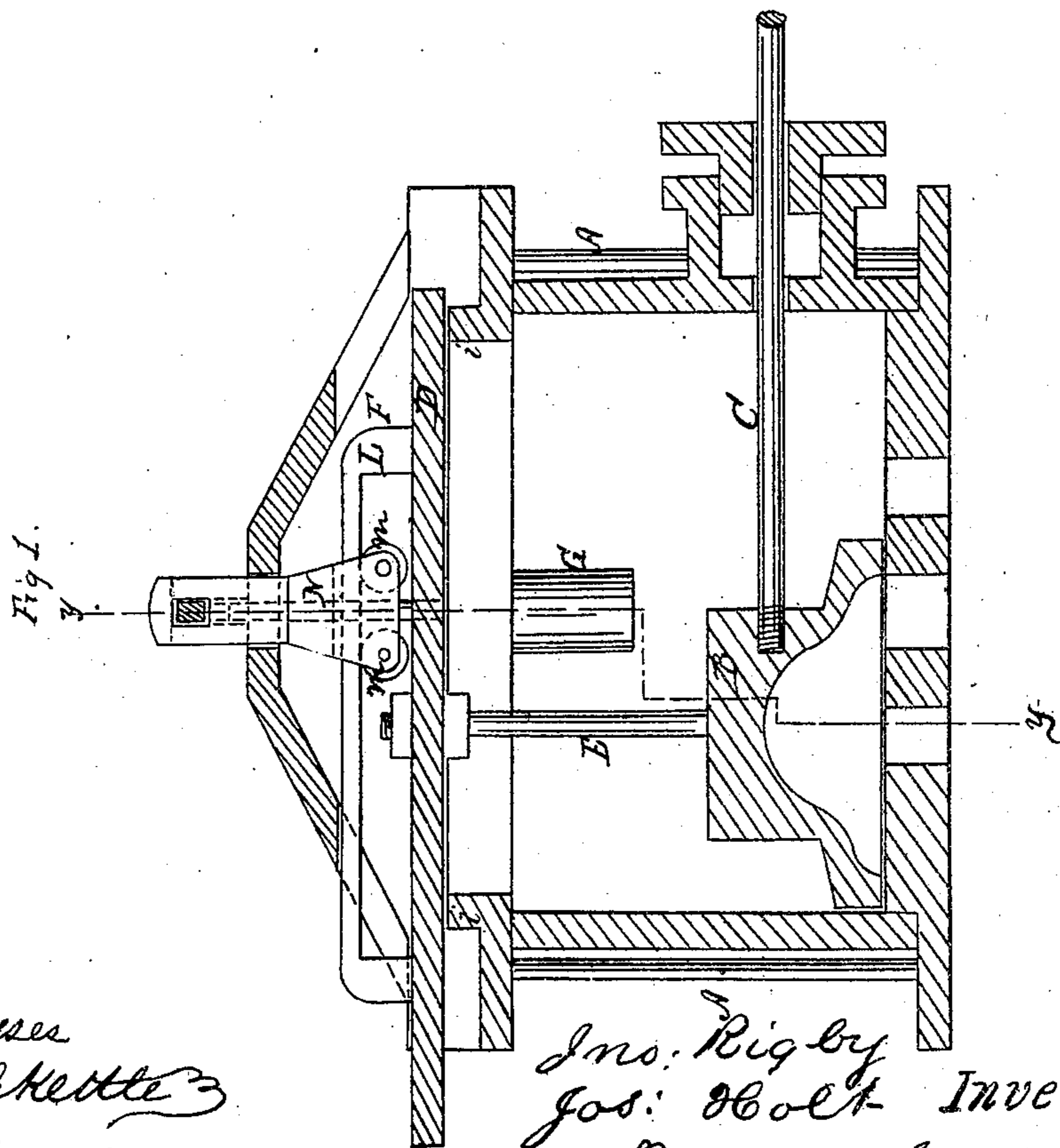
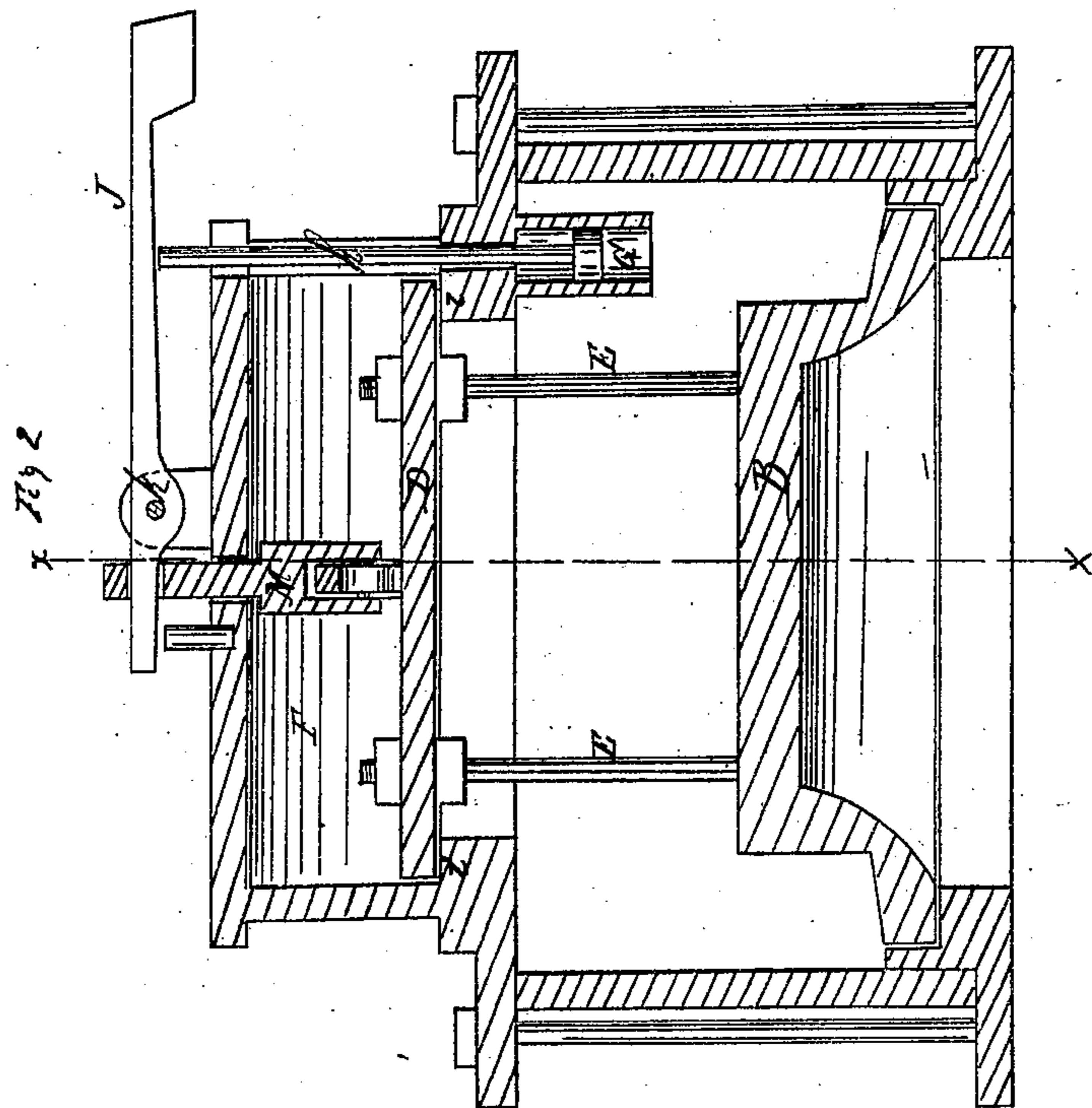


John Rigby & Joseph Holt *Balanced Slide Valve.*

No. 119,789.

Patented Oct, 10, 1871.



Witnesses
W. C. Ashkettle
J. A. Service

John Rigby
Joseph Holt Inventor
per Munn & Co
Attys

UNITED STATES PATENT OFFICE.

JOHN RIGBY AND JOSEPH HOLT, OF MARQUETTE, MICHIGAN.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. 119,789, dated October 10, 1871.

To all whom it may concern:

Be it known that we, JOHN RIGBY and JOSEPH HOLT, of Marquette, in the county of Marquette and State of Michigan, 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 those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in the method of balancing slide-valves for steam-engines; and it consists in connecting the valve with a slide which is given a uniform and simultaneous sliding motion with the valve, the steam being admitted between them; and it consists also in a device for raising the valve and slide from their seats when the engine is not in motion by the fall of a weighted lever, sustained when the engine is in motion by the pressure of steam on the piston in a small cylinder within the steam-chest, as will be hereinafter more fully described.

Figure 1 is a vertical section of the steam-chest and valve arrangement through the line *x x* of Fig. 2. Fig. 2 is a vertical section of the same through the line *y y* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A represents the steam-chest. B is the slide-valve over the ports of the engine. C is the valve-rod attached to B. D is the upper slide, which is connected with the valve B by the connecting-rods E. F is a chamber above the upper slide D. G is the small cylinder containing a piston in the steam-chest, the rod of which, *h*, passes up through the chest and operates against the weighted lever J, and when so operating it serves to keep the valve B and the slide D to their seats. *i* represents the seat of the slide D. The fulcrum of the lever J is at *k*, on the top of the chamber F. L is a rod attached to the top side of the

slide D, as seen in Fig. 1. Its position is parallel with the face of the slide, and it is raised from the back of the slide sufficiently far to admit the rollers *m m* between them, as seen in the drawing. These rollers are attached to a hanger, N, which hanger is connected with the weighted lever J, as seen in the drawing. When the valve is not in motion and the engine in a state of rest the weight on the lever J will raise the valve and slide from their seats through the rod F and hanger N. When steam is admitted into the steam-chest the pressure will act upon the piston in the cylinder G and raise the lever and weight through the piston-rod *h*, and thereby press the valve and slide to their seats. The under side or face of the slide D is designed to be about equal in superficial area to that of the back of the valve B, so that the upward and the downward pressure shall be about equal. An equilibrium of pressure being thus produced the valve works without friction or wear, greatly economizing power thereby. The slide D moves over two ports, which are, of course, made to suit the size of the valve, so that the requisite pressure may be produced on both the slide and the valve. It will be seen that the areas of the slide and the valve may be varied in their construction, so as to give the predominating pressure either up or down.

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

The hanger N, rollers *m*, weighted lever J, and steam-cylinder G, in combination with a steam slide-valve, arranged substantially as and for the purposes set forth.

JOHN RIGBY.
JOSEPH HOLT.

Witnesses:

CYRUS HOLT,
JOSEPH DYSON.

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