

P. C. Mc Manus,
Steam Balanced Valve.

N^o 67,204

Patented July 30, 1867.

Fig 3.

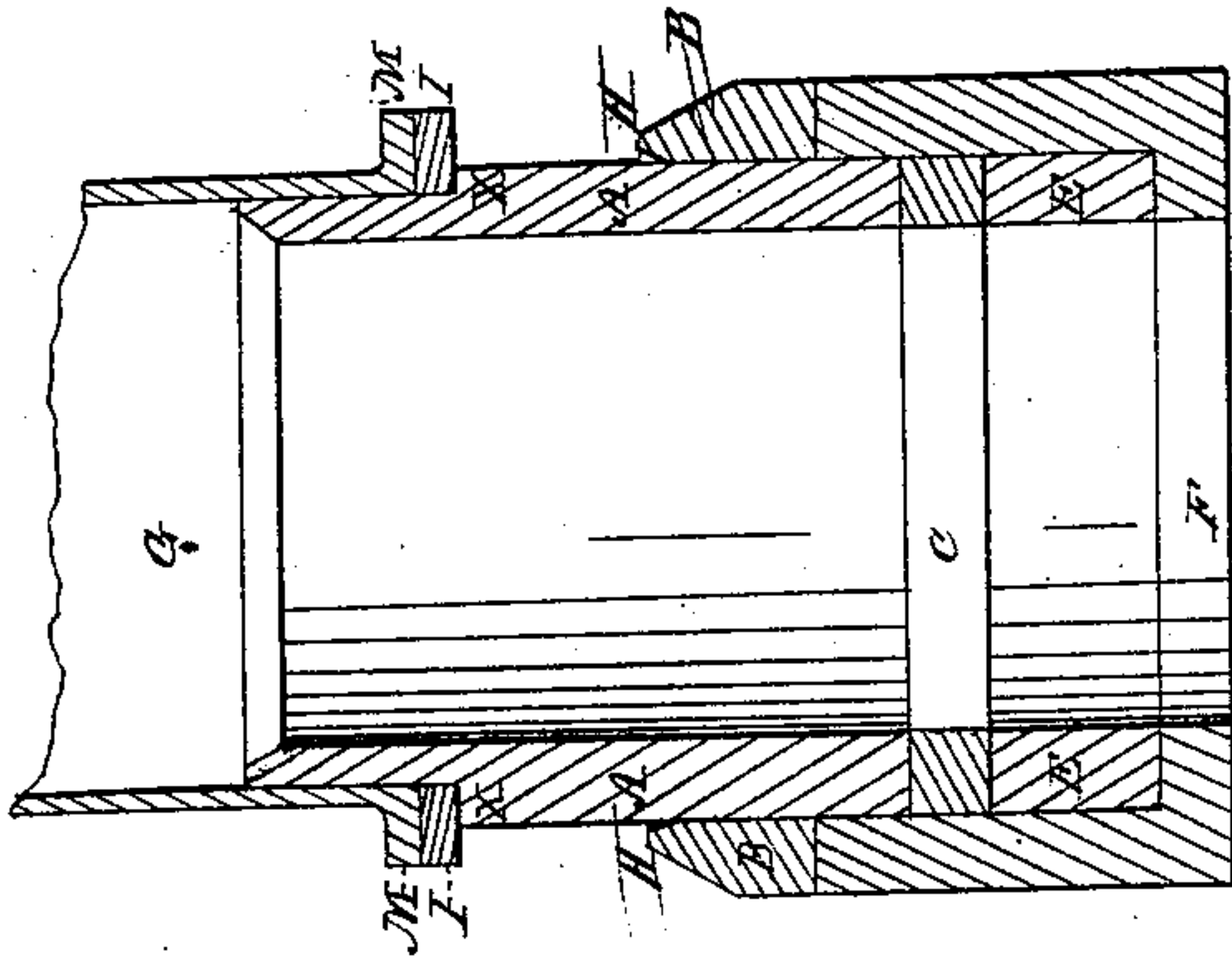


Fig. 2.

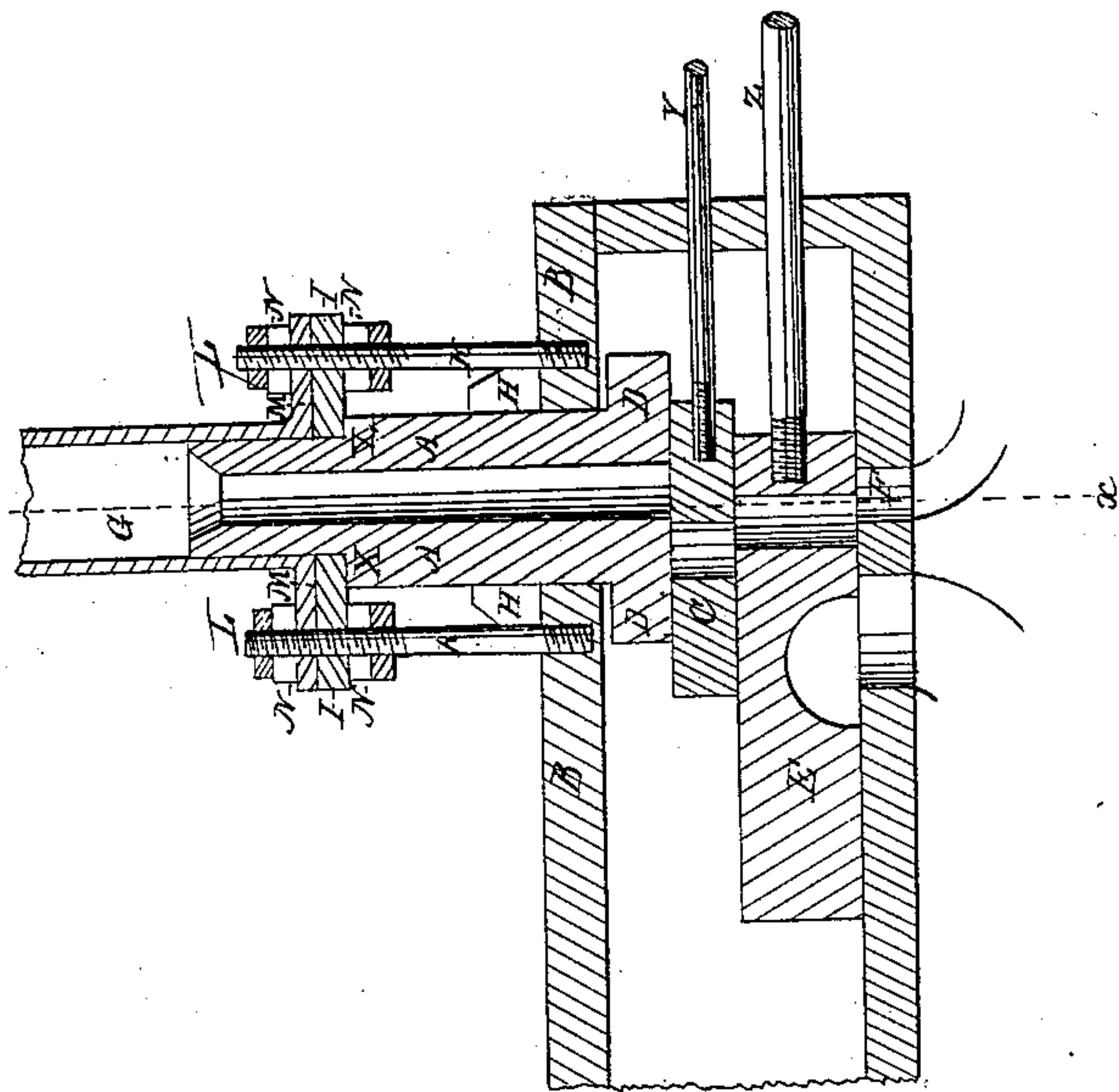
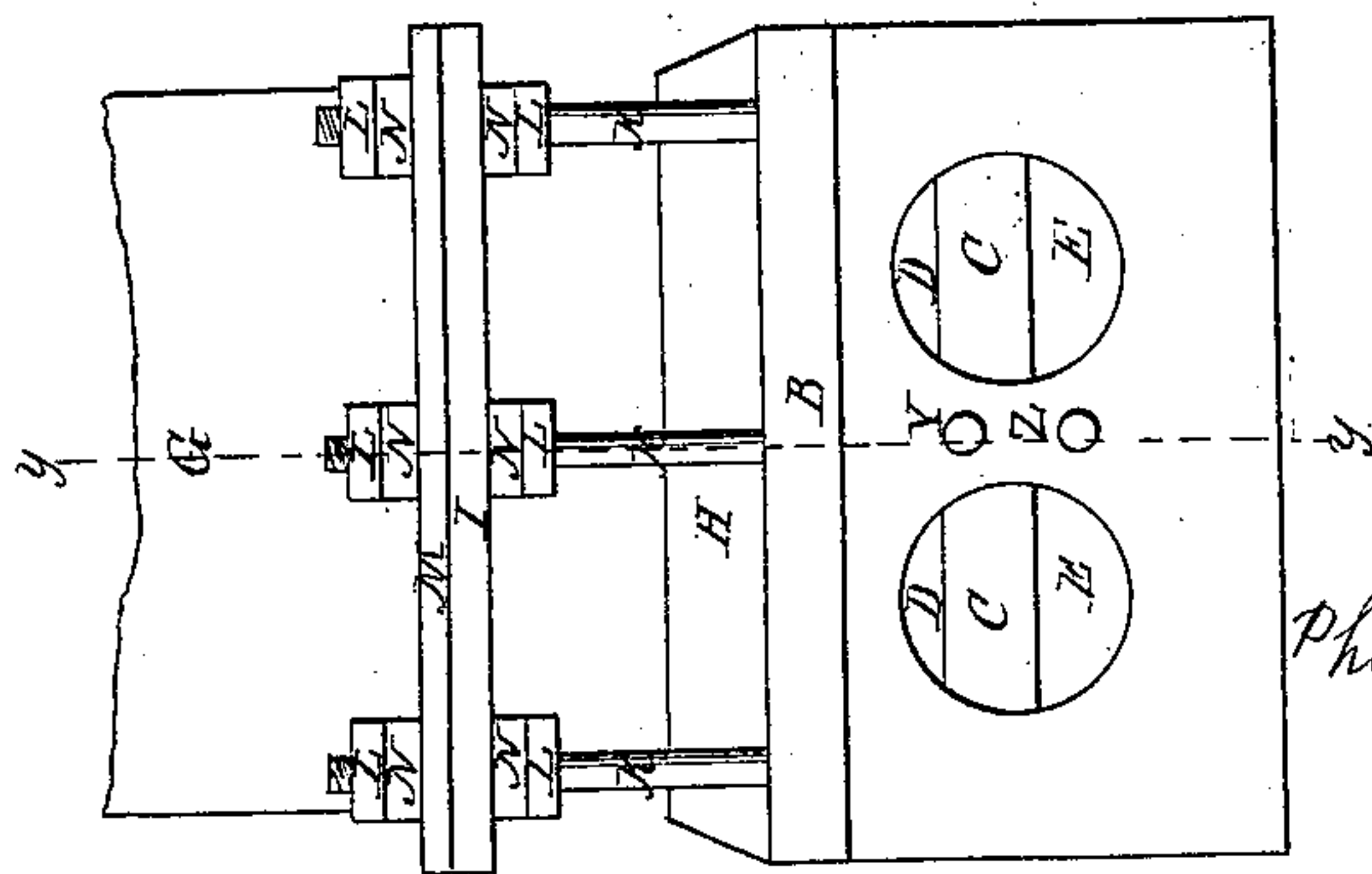


Fig 1.



Witnesses.
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PHILIP C. McMANUS, OF TROY, NEW YORK.

Letters Patent No. 67,204, dated July 30, 1867.

IMPROVEMENT IN STEAM-ENGINE SLIDE-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, PHILIP C. McMANUS, of the city of Troy, in the county of Rensselaer, in the State of New York, have invented a new and useful Improvement on and for the better Conveyance of Steam to the Valves and to the Cylinder of a Steam Engine, preventing the pressure of steam on the valve or valves, forming a quicker cut-off, and holding the valve or valves to its or their seats against a reactionary force from the cylinder.

The following is a full, clear, and exact description of the construction and operation of my invention, reference being had to the annexed drawings, making a part of this specification, with letters of reference marked thereon.

On the end of the tube, next to the valves, are flanges for covering the valve-ports and cutting off the steam at almost any desired point or length of stroke. Near the end of the steam-tube a shoulder is made to receive a collar; said collar receives the steam-pipe flange and is secured to it with bolts. These bolts are firmly secured to the valve-chest cover. The ends of the bolts pass through the collar and flange and having threads and nuts on them. On both sides, or above the steam-pipe flange, are placed India-rubber disks, held by the nuts against the flange. Under the collar are also India-rubber disks held by nuts. These India-rubber disks serve as springs to yield to any irregularity in the valves, and insuring a constant yielding pressure against the valves. Said cut-off and valves are made steam-tight. If an explosive or highly elastic gas be used in the cylinder, occasioning a reaction through the port or ports against the valves, the pressure, by means of the elastic disks and nuts, can be so adjusted as to hold them to their seats.

By moving the engine, so as to bring the valve-ports in line with or open with the steam-tube or port with that of the valve-seat of the cylinder, the steam from the steam pipe passes direct to the cylinder, and a small amount of pressure remains on the valves. Move the cut-off valve so as to cut off the steam in the steam-tube or port, then the pressure on the valve is only as the area of the steam-tube or port.

Having given a description of the nature and construction of my improvement, I will proceed to describe the construction and operation, to enable those skilled in the art to make and use my invention.

Figure 1 is a front view showing the different parts.

Figure 2 is a longitudinal vertical section showing the tube or port and valves.

Figure 3 is a transverse section showing the valve open for the steam to pass to the cylinder.

The nature of my invention consists of a steam-tube, A, fig. 2, passing direct through the valve-chest cover B, of a steam engine, to the slide-valve C; the tube or port A having flanges D made steam-tight and pressing against the valve C. Said flanges D cover the port of the slide-valve C and prevent the escape of steam into the valve-chest. The valves C and E are connected to the engine by the connecting-rods Y and Z. The valve C, being moved by the engine, passes across the port A, cutting off the steam. When the valves C and E are moved, so as to bring their ports in line with the valve-seat port of the cylinder F, to cause an opening direct to the steam-tube or port A, fig. 3, the steam passes direct from the steam pipe G, fig. 1, into the steam-cylinder; the flanges D, fig. 2, making a separate and independent seat for the valve C to cut off the steam against. The valve-ports being open, very little, if any, except the weight of the tube or port, will press upon the valve or valves. The friction being obviated there will be less strain and wear on the connections of the engine. The valve-chest cover B has a slot, H, made to closely fit the tube A, and made thick enough to form a guide, H, for the tube A to slide in either direction. The object of the sliding arrangement is to secure the tube-port A at a right angle to the valve C, giving their contact surfaces a tendency to wear to truer surfaces than they would under a greater pressure of the steam. The tube-port A is constructed with a shoulder, X, fig. 2, as a means to receive and support the collar I, fig. 2. The said port A is held in its position by collar I surrounding it and fitted to it. Said collar receives and holds the steam pipe G, fig. 1. The said collar I, fig. 2, has bolts K, six in number, passed through it with nuts L; the said bolts and nuts having threads cut thereon to enable the said nuts to turn in either direction, on both sides of said collar I, fig. 1, including the flange M, fig. 1, of the steam pipe G, fig. 1. Between the nuts L and the collar I, figs. 1 and 2, is India-rubber packing N. The packing N is also placed between the nuts L and the flange M. The opposite ends of bolts K are firmly secured to the

valve-chest cover B. The object of this arrangement is to adjust the pressure on valve C. The India-rubber packing N serves as springs, yielding to the inequalities of the valves and their movements, and keeping a constant pressure against the valves.

When an explosive or highly elastic expansive gas is used in the cylinder of an engine, an expansive reaction takes place, having a tendency to force the valves from their seats. By the steam-port mode of adjustment the valves are confined to their seats, and are easy to be moved. The letters *y* and *x*, figs. 1 and 2, steam current.

My new steam-port and cut-off is believed to have many advantages over the many inventions that have been introduced. It is simple in construction, not easy to get out of order. The valves working under so light a pressure comparatively must wear much longer and more true on their surfaces. The pressure being greatly removed from the valves, a large amount of friction is obviated, relieving the engine of a heavy strain and wear, making in all a great saving. The valve-chest requires no packing to make it tight, and less bolting. Openings are made to admit light and air to observe the operation of the valves and leakage of steam, if any, and to lubricate the valves. My cut-off arrangement requires much less throw of eccentric than the present mode.

I have represented but one port of a steam engine, in the specifications and drawings, to show and explain the steam-port and cut-off.

Having described the nature, construction, operation, and utility of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The steam-tube or port A, provided with flanges D and shoulder X, pressing on the valve C, substantially as set forth.

Also, I claim the guide H, substantially as described, to hold in proper adjusted position, on the valve C, the steam-tube A, as set forth.

Also, I claim the arrangement of the steam-tube A with the India-rubber springs N N, for the purpose of giving to the flange D, of the steam-tube A, a constant yielding pressure upon the valve C, substantially as herein described.

Also, I claim the arrangement of the collar I, bolts K, and nuts L, and India-rubber springs N, substantially as set forth and described.

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Witnesses:

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