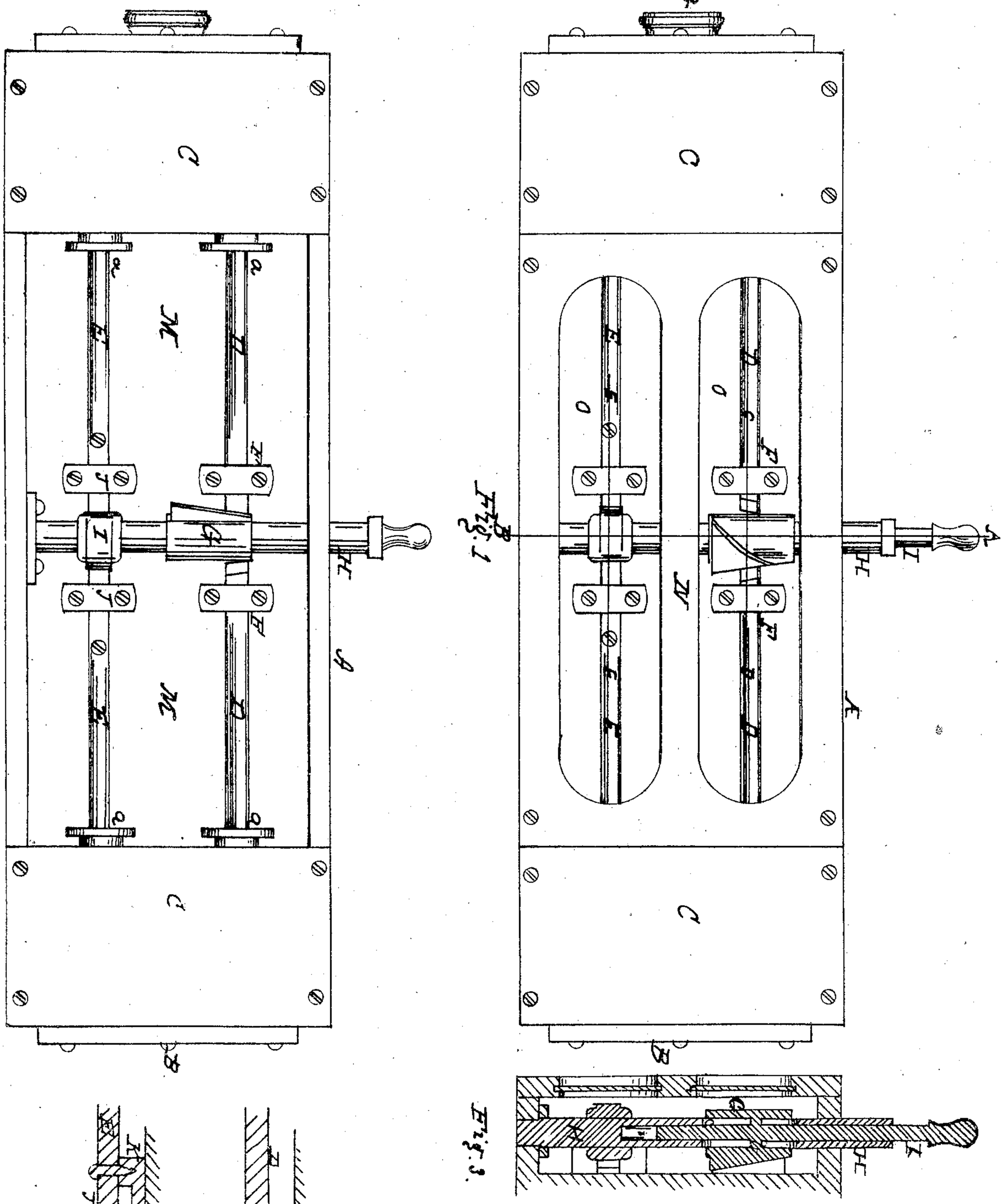
E. H. Bellows.

Steam-Engine.

No. 74039 Patented Feb. 4, 1868



WITNESSES

Geo. H. Miller

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Letters Patent No. 74,039, *dated February* 4, 1868.

IMPROVEMENT IN STEAM-ENGINES.

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

KNOW ALL MEN BY THESE PRESENTS:

That I, E. H. BELLOWS, of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Steam-Engines; 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, forming a part of this specification, in which—

Figure 1 represents so much of a steam-engine as is necessary to illustrate my present improvements.

Figure 2 represents a side view of the same parts, with the glass windows and their frame removed.

Figure 3 represents a section on line A B, fig. 1.

Figure 4 represents a section on line C D, fig. 1; and

Figure 5 represents a section on line E F, fig. 1.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

My present improvements relate to the peculiar relative arrangement of the steam and exhaust-valves of a steam-engine, and to the peculiar mode of operating the same.

In the drawings, A represents the shell or case containing the steam-cylinder, the heads of which are shown at B B. The steam and exhaust-valves are arranged in the ends C C. D D represent the rods which operate the steam-valves, and E E represent the rods which operate the exhaust-valves. These rods are packed at *a a a a* in the usual manner. The inner ends of the rods D D are supported and work in the bearings F F, while their extreme ends rest against the cam G, loose on the hollow shaft H. The cam G is fastened to the spindle I by a pin, *b*, the ends of which work in slots, *c c*, in the tubular or hollow shaft H, which slots, *c c*, are of sufficient length to permit of the cam G being raised and lowered a distance equal to its entire length, less the thickness of the valve-rods, to give a greater or less motion to the rods D D, which operate the steam-valves. The inner ends of the exhaust-valve rods E E are supported and work in bearings J J, and are connected by the bridge-piece K, which is also held in place by passing through the bearing-pieces J J, as fully shown in fig. 5 of the accompanying drawings. Motion is imparted to the rods E E, and through them to the exhaust-valves, by the cam L, on the lower end of shaft H. The upper end of the spindle or rod I is to be connected in any proper manner to the adjusting-rod of a regulator, while the tubular shaft is to be revolved by the mechanism of the engine when in motion.

The operation is as follows: After the engine has been started in the usual manner, the regulator will elevate or depress rod or spindle I and cam G, according as more or less steam may be required. If steam is required, during a full stroke, to keep up the proper speed, then the regulator elevates rod I and cam G to the highest point, thereby causing the rods D D of the steam-valves to work to their fullest extent, but, if a less quantity of steam is required, then the regulator elevates the rod I and cam G to a less height. When the cam G is depressed to its lowest point, the steam does not pass at all, there being no motion to the steam-valves.

The arrangement of the steam and exhaust-valves is such that the mechanism for operating them can be made very compactly, and all enclosed in the chamber M, between the ends C C, the front of which is covered by the frame N, provided with glass windows O O, whereby the valve-rods, and the mechanism for working them, are well and securely protected from all dust and dirt, while, at the same time, the mechanism is exposed to view, and the operation of the same can be examined and inspected without removing the frame N.

Having described my improvements in steam-engines, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The arrangement of the valve-rods D D and E E, in the chamber M, and in relation to each other, substantially as and for the purposes set forth.

2. The combination, with the valve-rods D D and E E, of the shaft H, spindle I, and cams G and L, substantially and for the purposes set forth.

E. H. BELLOWS.

Witnesses:

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