[105.]

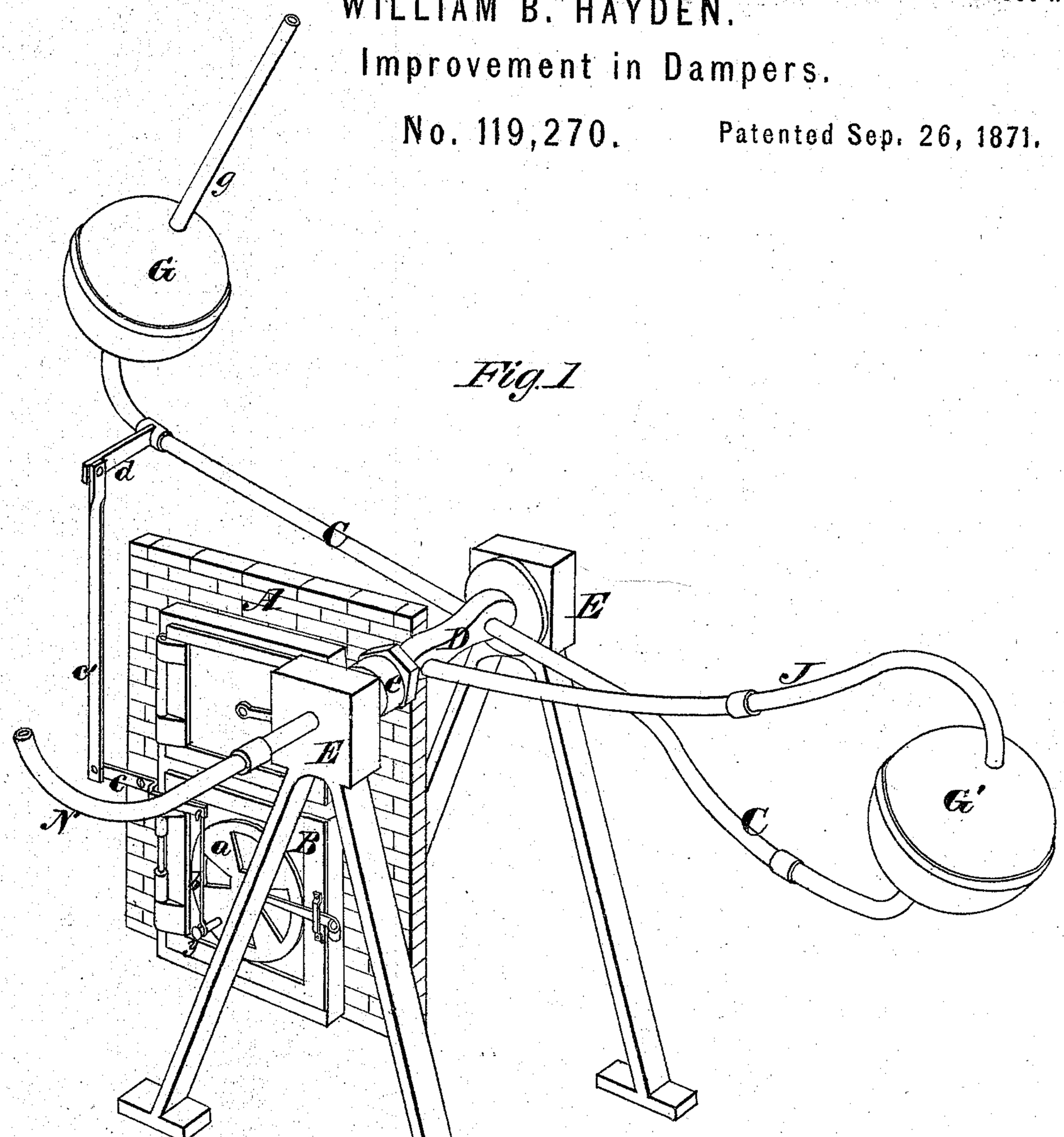
2 Sheets--Sheet 1.

WILLIAM B. HAYDEN.

Improvement in Dampers.

No. 119,270. Patented Sep. 26, 1871.

Fig. 1



Witnesses.
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J. A. Campbell.

Inventor
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[105.]

2 Sheets--Sheet 2.

WILLIAM B. HAYDEN.

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Fig. 2

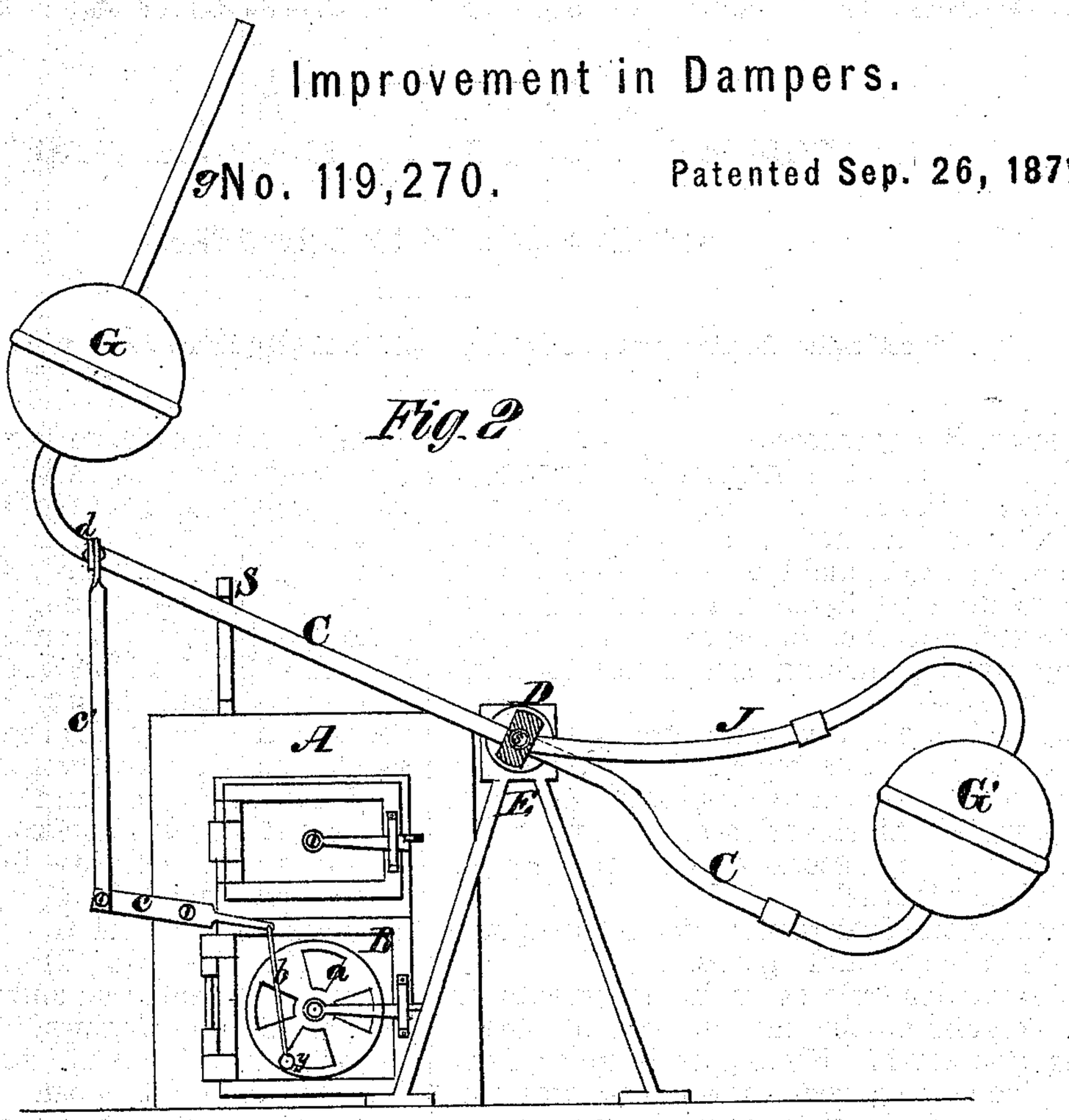
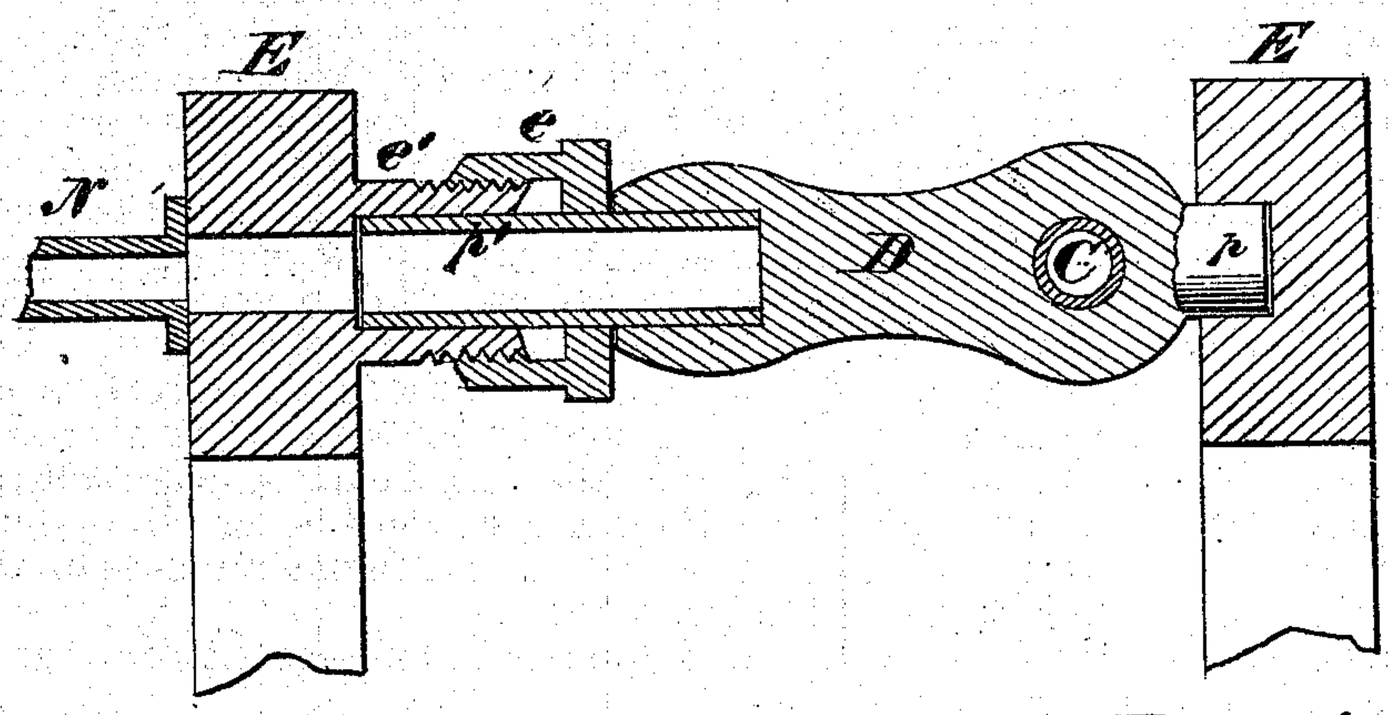


Fig. 3



Witnesses.
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J. T. Campbell.

Inventor
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UNITED STATES PATENT OFFICE.

WILLIAM B. HAYDEN, OF COLUMBUS, OHIO.

IMPROVEMENT IN DAMPERS.

Specification forming part of Letters Patent No. 119,270, dated September 26, 1871.

To all whom it may concern:

Be it known that I, WILLIAM B. HAYDEN, of Columbus, in the county of Franklin and State of Ohio, have invented a new and Improved Damper-Regulator; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1, Plate 1, is a perspective view of my regulator applied to a register in the furnace-door of a steam-heating apparatus. Fig. 2, Plate 2, is a front elevation of the apparatus. Fig. 3, Plate 2, is a sectional view of the oscillating tubular journal.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to improvements on draught-regulators for the furnaces of steam-heating apparatus. My object is to combine with a pipe leading from a steam-generator a vibrating mercurial balance, which is connected to a draught-damper of the furnace and operated automatically by the varying pressure of steam in the generator, as will be hereinafter explained.

The following description of my invention will enable others skilled in the art to understand it.

In the accompanying drawing, A represents the front of a steam-heating furnace, of which B is the ash-pit door and *a* an oscillating damper for regulating the influx of air through said door. To a pin, *y*, which projects from the damper B, one end of a rod, *b*, is connected, the upper end of which is connected to a lever, *c*, which is held by a fulcrum-pin entering the furnace-wall. The outer end of lever *c* is connected to an arm, *d*, on a vibrating pipe, C, through the medium of a rod, *c'*, as shown in Figs. 1 and 2. The pipe C carries on its ends two vessels, G G', and this pipe is applied to an oscillating shaft, D, on standards E E, so that the end carrying the vessel G' will preponderate over the opposite end, except under certain conditions hereinafter explained. The vessel G' has a pipe, J, leading out of its upper end, and communicating with a pipe, N, through a tubular journal, *p'*, of the shaft D, shown in Fig. 3. The journal *p'* is supported in a journal-box, *e'*, on one of the standards, E, and packed, so as not to leak, by means of a stuffing-box, *e*, as shown in Fig. 3. The opposite journal of shaft D is solid. The pipe C has applied to it a double stop, S, which limits its vibration and prevents the end-carrying vessel G' from descending too far.

To operate this apparatus mercury is put into the vessel G', and rises in the lower end of pipe C to a given height, corresponding to the number of pounds' pressure of steam required to close the damper B. For instance, a column of mercury two inches in height equals a pressure of about one pound of steam to the square inch; so, if it is desired to close the damper at say five pounds' pressure to the square inch in the steam-generator, the vessel G should be ten inches above the vessel G'. The pipe N is connected to the steam-generator, and the parts connecting the pipe C to the damper B are so adjusted that when the vessel G' is at its lowest point the said damper will be fully open. Now, it will be seen that when there is not a sufficient pressure of steam in the generator to force the mercury from G' to G, the lower end of the pipe C will be the heaviest and the damper B will remain open. When, however, the pressure of steam in the generator increases to its maximum, the mercury will be forced out of vessel G' through pipe C and into the vessel G, thereby causing the latter vessel to descend, close the damper B, and cut off the free draught to the furnace-fire. The damper will remain closed until the pressure in the generator falls below the point necessary to hold the mercury in G, when the mercury will return into G' and open the damper. The pipe *g* which rises from the top of vessel G is designed for the escape and entrance of air as the mercury rises and falls. It should be long enough to prevent the mercury from being blown out of the vessel G at the maximum pressure of steam in the generator.

Having described my invention, what I claim is—

1. The combination of an oscillating mercurial steam-balance with a damper, substantially as described.

2. The oscillating pipe C, communicating at its ends with vessels G G', in combination with

steam-pipe J for conducting steam into vessel G′ above the mercury therein, substantially as and for the purposes described.

3. The hollow journal p' of oscillating shaft D, as a means of communication between stationary steam-pipe N and the pipe J, which leads into the upper end of vessel G′, substantially as described.

4. The pipe g, in combination with the vessel G on the highest end of oscillating pipe C, substantially as and for the purposes explained.

WILLIAM B. HAYDEN.

Witnesses:
ROBT. CHADWICK,
JOHN H. MARTIN.