

A. Lapham,
Steam Trap,

N^o 26,950.

Patented Jan. 24, 1860.

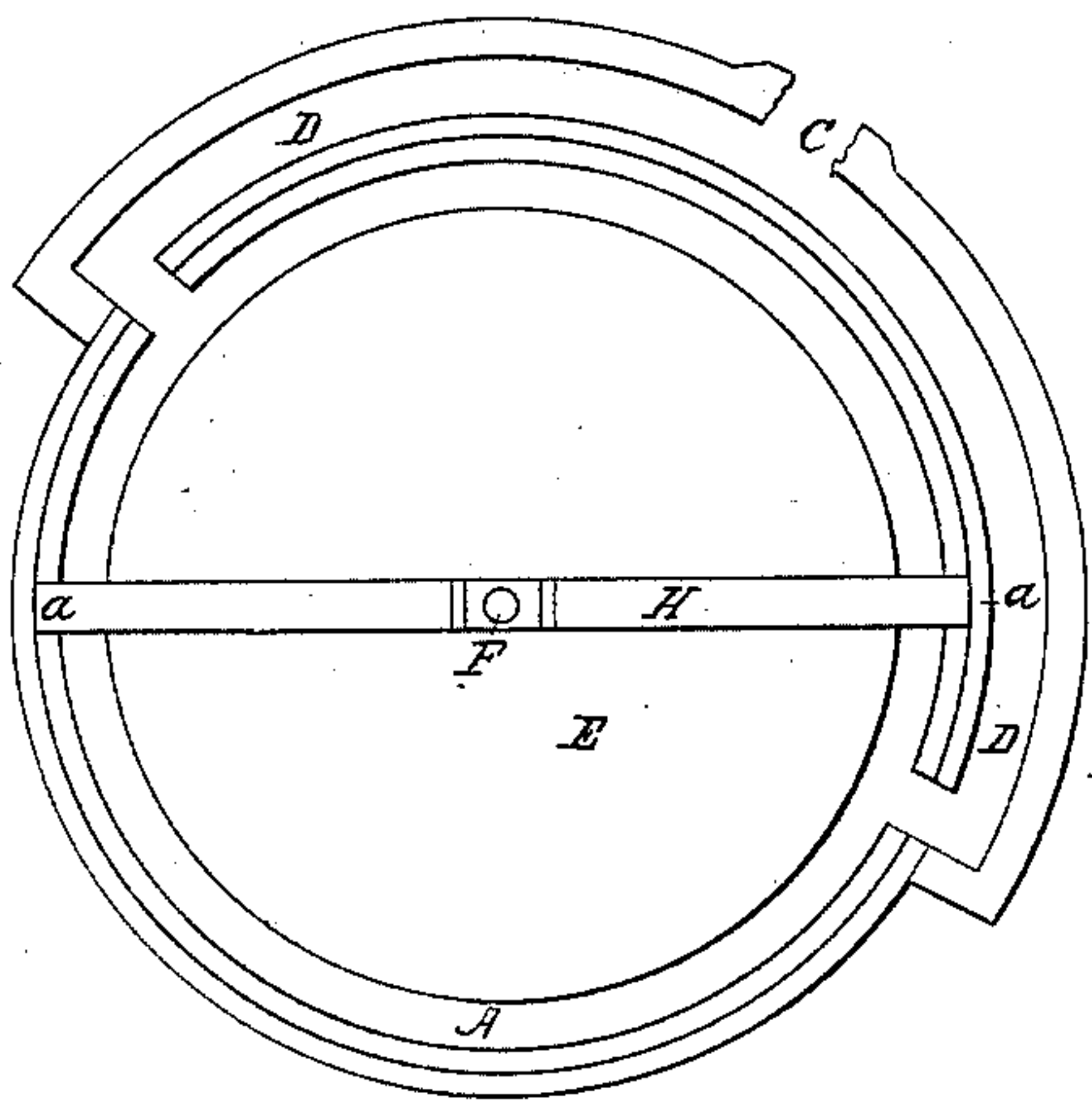


Fig. 3.

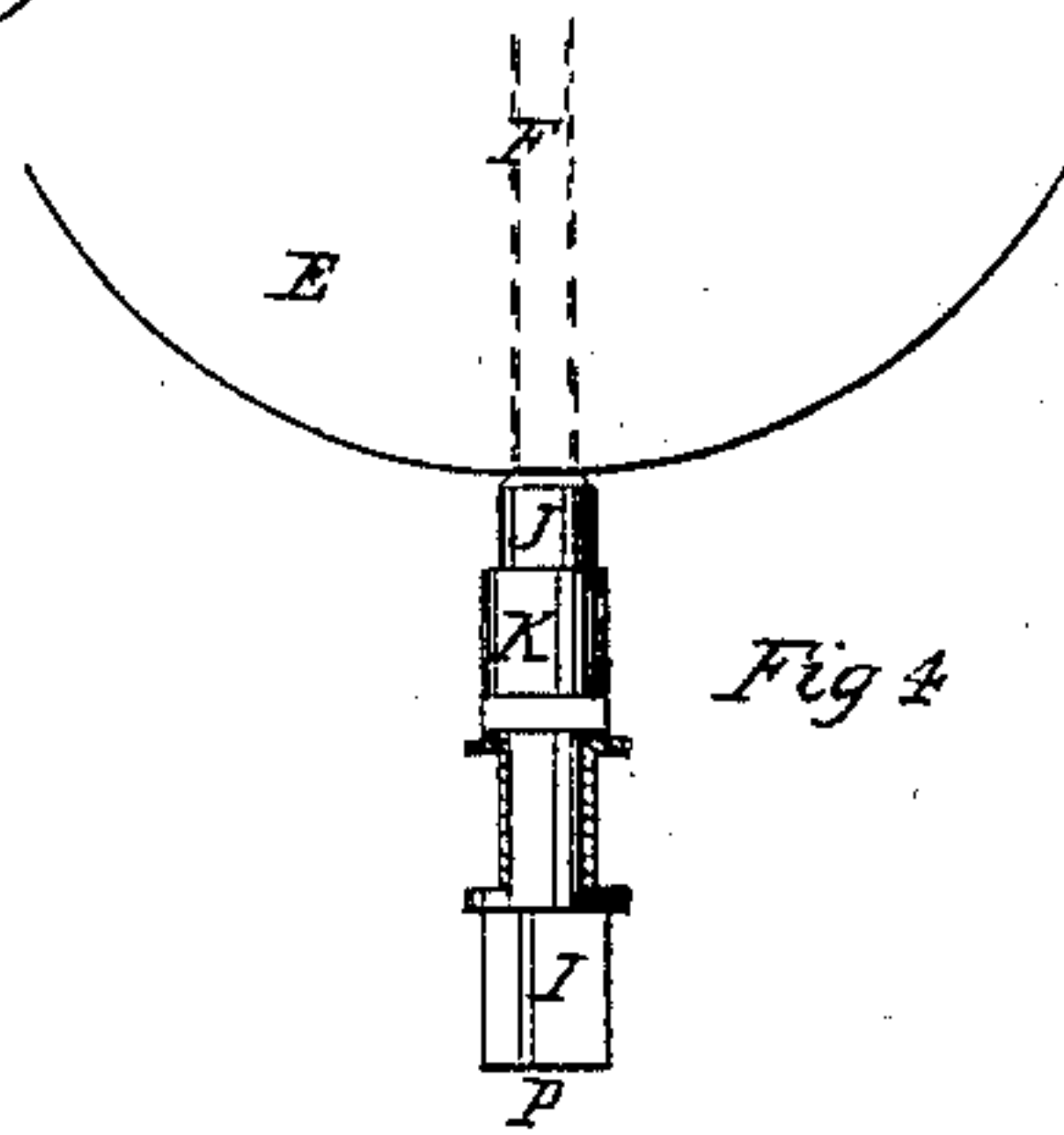
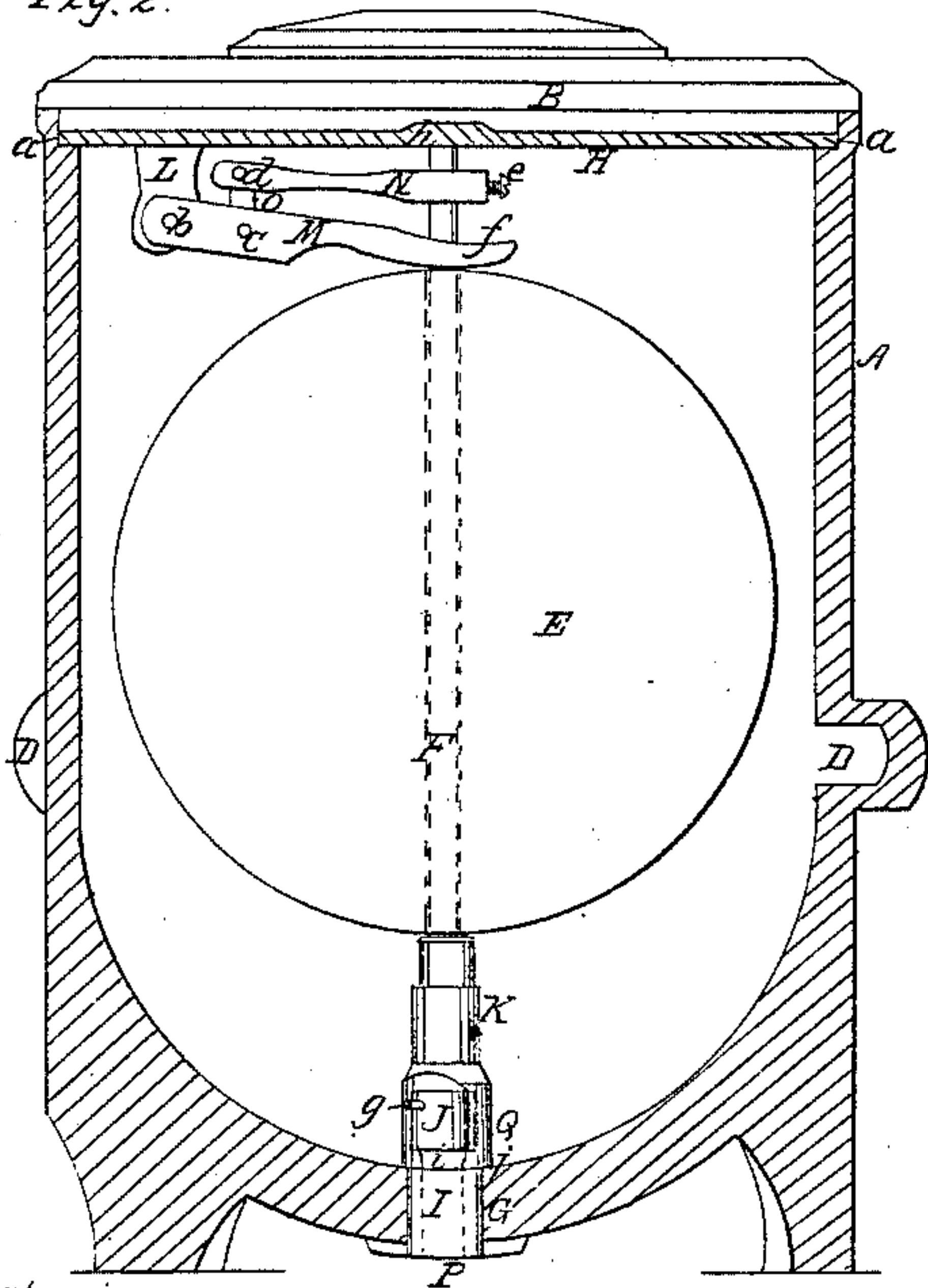


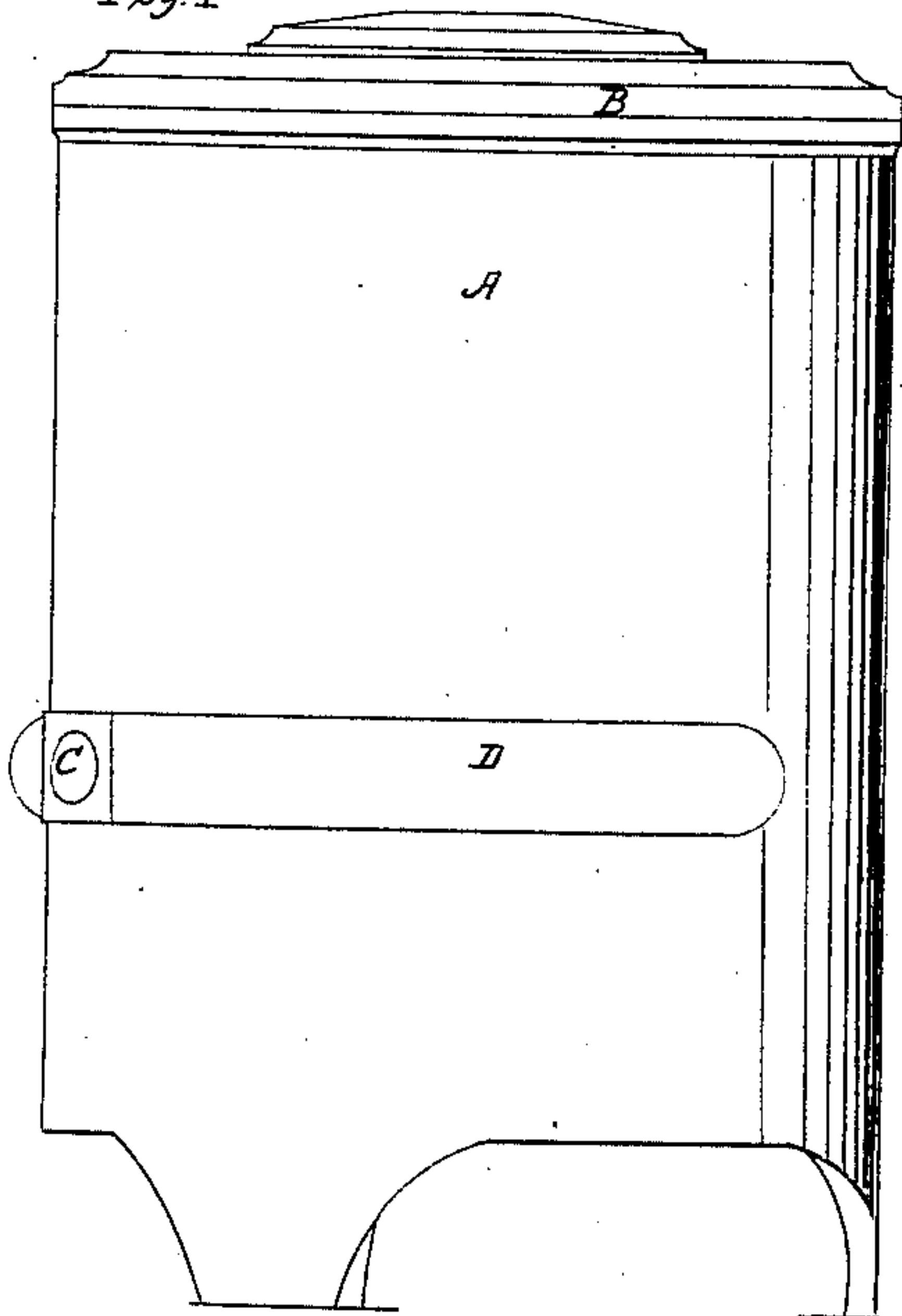
Fig. 4.

Fig. 2.



Witnesses:
Edmund
D. G. Rowlands.

Fig. 1.



Inventor.
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UNITED STATES PATENT OFFICE.

A. LAPHAM, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF AND C. A. DURGIN,
OF NEW YORK, N. Y.

STEAM-TRAP.

Specification of Letters Patent No. 26,950, dated January 24, 1860.

To all whom it may concern:

Be it known that I, ALLEN LAPHAM, of Brooklyn, Kings county, State of New York, have invented a new and Improved Automatic Steam-Trap for Relieving Steam Cylinders, Pipes, &c., From the Condense-Water; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings and letters of reference thereon, making part of this specification.

Of the said drawings Figure 1 is an elevation of my improved steam trap as closed and ready for connection with an induction pipe. Fig. 2 is a projection of a vertical section showing the mechanism for operating the valves. Fig. 3 is a horizontal section of the same, showing the channels for steam communication. Figs. 4 and 5 show parts in detail.

Similar letters of reference indicate like parts in all the drawings.

Heretofore all the various devices for the purpose of relieving steam pipes cylinders and other places of the water produced from the condensation of steam have proved ineffectual where the steam is used at even the ordinary pressure, the force of the steam preventing the valves from working, thereby choking up the pipes with water. In their construction it has been found necessary to use air cocks, and provide the traps with channels and cocks which might be opened to allow the steam to blow the water from the vessel containing it, thus requiring constant attendance.

My invention is designed to obviate all these difficulties by rendering a steam trap perfectly automatic under all degrees of steam pressure, and requiring no attendance when once properly attached to the vessel to be relieved from condense water.

To this end the nature of the first part of my invention consists in arranging and combining with a movable float the channels for equalizing the pressure of steam upon the float when introduced within the vessel as will be more fully hereafter set forth.

The nature of the second part of my invention consists in combining with a vertical rod operating the valves a float which moves upon said rod and operates the valves as will be fully set forth.

The nature of the third part of my invention consists in combining with a float a

double valve as will be fully described hereafter.

The last part of my invention consists in combining with a float having a movement independent of the valve rod a mechanism for working the valves as will be more fully described hereafter.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A is the shell of a cylindrical cast iron vessel which rests upon legs and is provided with a cap B, fitted steam tight.

C is the induction port.

D D are channel ways cast on the side of the vessel with cores for introducing steam to the opposite sides of the float.

E is the float which is of the proper size to work freely in the vessel, and has a pipe extending through its diameter which is made air-tight at the ends of the float by riveting or soldering.

F is the valve rod (upon which the float is inserted) the upper end having a bearing at (h) in the cross-bar H, which is fitted to a mortise in the shell of the vessel at (a a,) and held in place by the cap B. The lower end of this rod is secured to the stem K, of the valve J, which has its seat in the valve I at (i).

G is the discharging orifice for the valve I, and P for the valve J. To the cross-bar H is cast a lug L, projecting downward to which at (b) is jointed the lever M, which is forked and straddles the rod F at (f). To the valve rod F is secured by a screw (e) or other fastening the arm N, which is jointed to the lever M by a strap O, at (c) and (d.)

Operation: The operation will be as follows. Steam being admitted at C, will strike against the shell of the vessel (which breaks the force) and then passes through the channels D, D, to the opposite sides and enters as plainly shown in Figs. 2 and 3. The condense water as fast as formed will pass into the vessel with the steam until enough accumulates to raise the float E, which rises independent of the rod F, until it strikes the lever M at (f) which by its connection with the arm N raises the rod F, and valve J, which has its seat at (i) and slides freely through the portion K of the valve I, and admits the discharge of water through the small orifice P, in the valve I. The valve I, has its seat at (j) (Fig. 2) and

is in the trident form (as shown in Fig. 5,) below its seat and forms the lower bearing for the rod F, by the triangular edges which are fitted to the orifice G. There is a portion of the valve stem K cut through at *a*, as a water way (to the orifice P) and a pin (*g*) inserted in the valve J, its ends projecting far enough to catch upon the valve stem K, and raise the valve I, when the rod F, is raised high enough by the buoyancy of the float for this purpose.

If the condensation is slow the water will all be discharged through the orifice P, in the valve I, by the lifting of the valve J. If the condensation is rapid the water accumulating in the vessel will raise the float and lift the valve J until the pin (*g*) will also raise the valve I and thus form two discharging orifices P and G, and carry away all the condense water as fast as received except a quantity insufficient to raise the float. The lever and arm working the rod requiring but little power which is imparted by the buoyancy of the float, as the various parts work with but slight friction.

I would here remark that the entire working mechanism should be made of non-corrosive material as brass or copper which will not be affected by steam or water. I would also further remark that care should be taken that the floats are perfectly tight, as the perpetual working of the apparatus

depends entirely upon this motor. This may easily be ascertained by testing the floats by hydraulic pressure, by air pumps or electro plating the surface.

I am aware that floats are in common use for operating indicators to steam boilers and other purposes and I therefore disclaim broadly such floats.

I claim—

1. Arranging and combining with a float operating as described the channels for the introduction of steam whereby I am enabled to equalize the pressure upon the float substantially as set forth and specified.

2. I claim combining with a vertical rod, a float which moves upon said rod and operates the valves by mechanism substantially as set forth and specified.

3. I claim combining with a float operating as described a double or compound valve substantially as set forth and for the purpose specified.

4. I claim combining with a float having a movement independent of the valve rod the mechanism described (or its equivalent) for operating the valves substantially as set forth and specified.

ALLEN LAPHAM.

Witnesses:

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C. A. DURGIN.