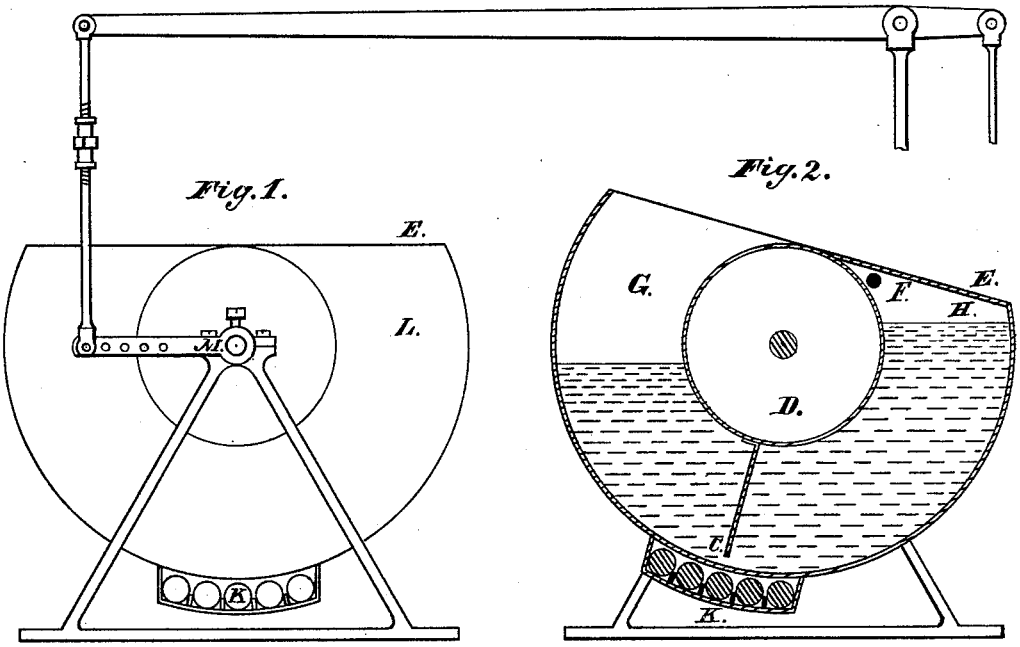
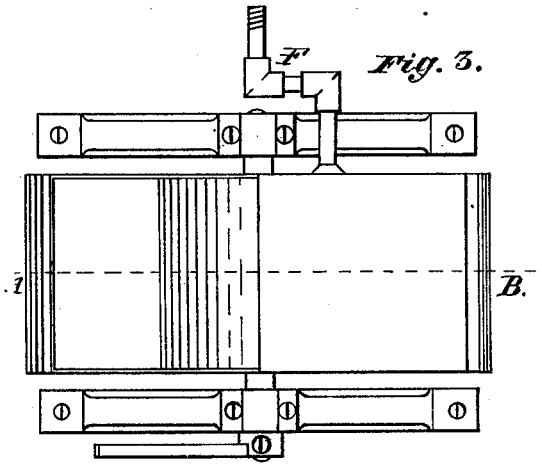
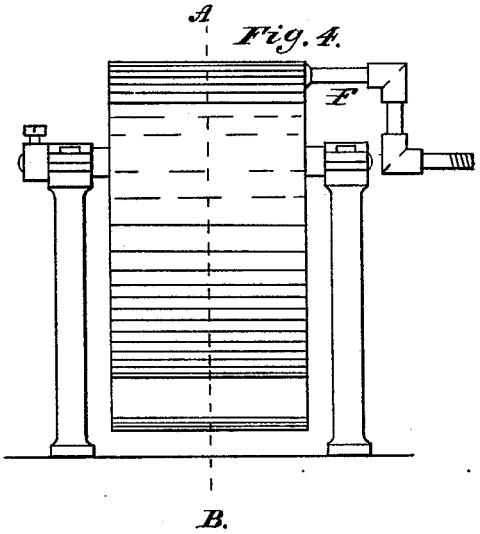
W. HELME.

Gas-Exhauster Governor.

No. 220,284. Patented Oct. 7, 1879.







Witnesses:
Jno. McElhenny
Edw. M. Billings

Inventor:
William Helme

UNITED STATES PATENT OFFICE.

WILLIAM HELME, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN GAS-EXHAUSTER GOVERNORS.

Specification forming part of Letters Patent No. **220,284**, dated October 7, 1879; application filed August 30, 1879.

To all whom it may concern:

Be it known that I, WILLIAM HELME, of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Gas-Exhauster Governors; and do hereby declare that the following is a full, clear, and exact description thereof, and consists in a new arrangement for governing gas-exhausters.

In the manufacture of gas for illuminating purposes it has been found advantageous to relieve the retorts of the pressure incident to the generation of the gas. Various machines have been used for this purpose, known as "gas-exhausters," mostly propelled by steam-engines, but in some cases by gas-engines; but there are some in which a jet of steam is introduced requiring no propelling power, but require to be governed in the amount of steam admitted.

As the amount of gas produced in the retorts during distillation is constantly varying, it is necessary to have a corresponding varying power to relieve them, in order to maintain a uniform pressure.

The object of my invention is to govern the action of the exhauster through the propelling power, and thereby secure this uniformity of pressure desired in the retorts during distillation. Various devices have been used for this purpose with varying success, all of which depend upon a float of some kind for their action.

In this arrangement no float is used, and all the difficulties heretofore met with in their use are obviated.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation. Fig. 2 is a sectional elevation through the center of Fig. 1, and on a line with A B in Figs. 3 and 4. Fig. 3 is a ground plan of Figs. 1 and 4, and in connection with the latter shows how the center of the pipe, connecting the exhauster with the opening F, can be brought opposite and on a line with the center of the shaft supporting the cylindrically-formed vessel L, whereby the use of a stuffing-box or other device for making an air-tight joint around a moving shaft or spindle can be adopted. Fig. 4 is an end view and elevation with chamber H in front, showing the manner of supporting the vessel L.

L is a cylindrically-formed vessel (excepting the top) supported on a shaft running through its axis, and so arranged that it can make part of a revolution in either direction. Extending from near the bottom of this cylinder, as shown at C, to the top on a perpendicular line through the center is a partition partly formed by the plate C and partly by the center cylinder, D, both of which are made fast in an air-tight manner to the heads or sides of the vessel inclosing them. This partition might be made entirely of the plate C by extending it to the top; but I prefer to use a cylinder, as shown, on account of its taking the place of that much water at a point where it would be of little use, but add much to the weight, and consequently to the friction, of the shaft-journals. In addition to this, by having a cylinder at this point the water, which is displaced on the one side and transmitted to the other by a change of pressure, is removed to a greater distance from the center of shaft, thereby increasing the leverage and power exerted on the arm M, connected with the lever of steam-valve.

From the top of the cylinder D to the circumference at E is an air-tight cover, which is made fast in such a manner as to prevent the escape of air from either the ends or sides. From the chamber thus formed a pipe leads to and is connected with the exhauster, as shown at F.

The chamber G, forming the other side or half of the cylinder L, is open at the top, so that the water therein contained is subject to the pressure of the atmosphere. At this opening water is poured in until it rises to about the center of the cylinder D. The water necessary to fill the other side will pass under the partition at C, expelling the air through the opening F. The water will now stand on the the same level in both chambers, and the weights K at the bottom will keep the partition C in a perpendicular position as long as the pressure is equal on both sides.

By removing a portion of the air from chamber H through the opening F the pressure

therein will be reduced, and a portion of the water in chamber G will be transmitted by the pressure of the atmosphere to chamber H through the opening under the partition at C. This increase of weight on that side will cause the cylinder L to turn on its axis, as shown by Fig. 2.

On the other hand, an increase of pressure in chamber H will expel a portion of the water which would be transmitted to chamber G, producing the reverse effect of what is shown in Fig. 2, and is the same in effect as an increase in the amount of gas generated in the retorts would produce, while a diminished amount would have a reverse effect. This being the case, if the pipe leading from the opening F in chamber H is connected with the inlet-pipe to the exhauster, all variations of pressure at this point will be communicated to this chamber, and the effect would be as above described.

Having secured these reverse motions a connection is made in some convenient way with the lever operating the steam-valve, as shown at M, opening it when the pressure is too great and closing when too little.

Ordinarily, exhausters are run so as to keep the pressure in the retorts at zero, or the same as the atmosphere; but there are many gas-works where this is not adhered to, some running above and others below, as circumstances may require. To vary in either direction the weights K are used, as only the center one is needed when running at zero.

When running under a reduced pressure, or a partial vacuum, one or both of those under the chamber G is used, and those under H left out.

When an increase of pressure is desired the weights are reversed.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent:

The vessel L, containing water or other liquid, having a cylindrically-formed bottom and supported on a shaft, with journals parallel with its axis, and having a partition formed of the plate C and inner cylinder, D, extending from near the bottom to the top, and there connecting with a cover which extends to the outer edge or circumference at E, forming an air-tight chamber above the water of that portion or half of the vessel, in combination with the opening F, with which to make connection with the inlet-pipe to a gas-exhauster or other gas-conveying pipe about a gas-works, for the purpose as shown and described.

WILLIAM HELME.

Witnesses:
JNO. MCILHENNY,
EDW. M. BILLINGS.