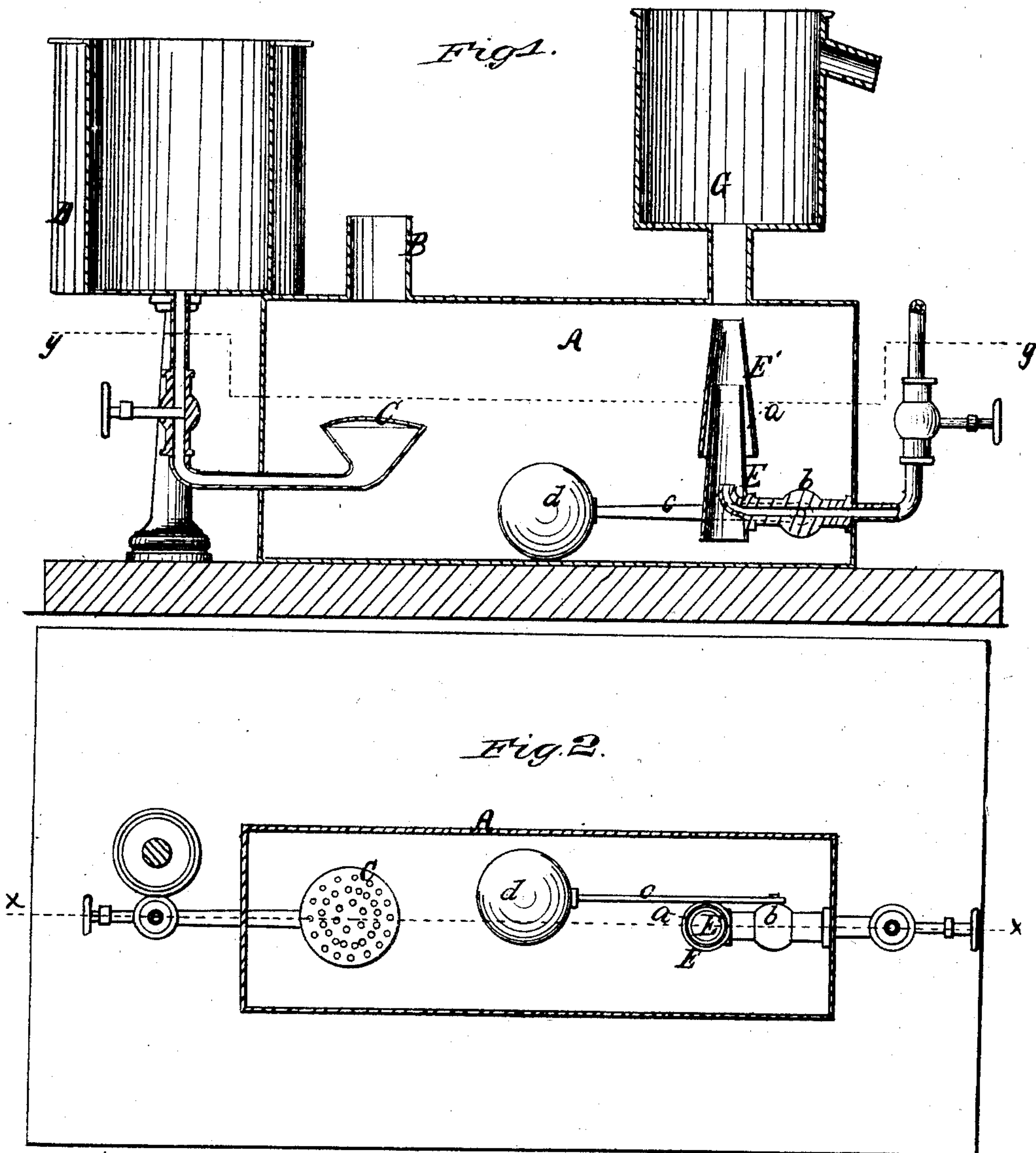


J. A. HARTUPEE & H. P. GENGEMBRE.
CONDENSER.

No. 45,408.

Patented Dec. 13, 1864.



Witnesses.

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UNITED STATES PATENT OFFICE.

A. HARTUPEE AND H. P. GENGEMBRE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN CONDENSERS.

Specification forming part of Letters Patent No. 45,408, dated December 13, 1864.

To all whom it may concern:

Be it known that we, J. A. HARTUPEE and H. P. GENGEMBRE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Condenser; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal vertical section of our invention, the line *x x*, Fig. 2, indicating the plane of section. Fig. 2 is a sectional, plan, or top view of the same, the plane of section being indicated by the line *y y*, Fig. 1.

Similar letters of reference indicate like parts.

This invention consists in the arrangement in the interior of a condenser of two or more conical pipes placed one over the other so as to leave an annular space between them, and applied in combination with a steam or compressed-air supply pipe in such a manner that if, by the action of the steam or compressed air, a current of water is impelled through the conical pipes the annular space left open at the bottom end of the second tube allows the air in the condenser to be sucked up by the water, and the atmospheric air is readily expelled therefrom without the use of an air-pump. The action of the injector, or, more properly speaking, the "expeller," thus obtained, is regulated by a float which opens or closes the steam or compressed, air supply pipe.

A represents a condenser, constructed of cast-iron plates or other suitable material in any convenient form and size. This condenser communicates with the exhaust port or ports of a steam-cylinder by means of a pipe, B, and the exhaust steam, on arriving in the condenser, meets a spray of cold water injected through the nose C from the supply-pipe D, or in any suitable manner. The atmospheric air which accumulates in the condenser, and which generally is expelled by the action of an air-pump, is removed from

our condenser by a current of water impelled through a series of conical pipes, E E', which are situated in the interior of the condenser, as clearly shown in the drawings.

The first or lowest pipe, E, which may be conical or cylindrical, is open at the bottom and top, and its bottom end is elevated a little above the bottom of the condenser, as clearly shown in Fig. 1 of the drawings, so that the condensing and condensed water accumulating in said condenser will readily close said tube at its lower end.

The tube E' is conical and open at top and bottom. Its lower end is somewhat larger than the upper end of the tube E, and it extends some distance beyond it, as clearly shown in Fig. 1, leaving an annular space, *a'*, through which air is sucked up by the current of water passing up through the pipes E E'.

The current of water in the pipes E E' is impelled by steam or compressed air admitted to the lowest pipe, E, through the pipe F, which is provided in the interior of the condenser with a stop-cock, *b*, as clearly shown in the drawings. The plug of this stop-cock connects by a rod, *c*, with the float *d*, which, when the condenser is empty, rests on the bottom and closes the stop-cock. If the condensed and condensing water begins to accumulate in the condenser, the float rises, it opens the plug of the stop-cock, and admits steam or compressed air to the expeller E E', which steam or compressed air, being deflected upward, produces a partial vacuum within the tubes, so that the water which covers the bottom of the pipe E is caused to rise in the same and rush up through the expeller into the receiving-tank G. In its course through the pipes E E' the water creates a draft through the annular space *a* between the upper end of the pipe E and the upper end of the pipe E', and the air contained in the condenser is sucked in and expelled with the water rushing up through the pipes E E'. This expeller starts and stops automatically by the action of the float *d*, which opens the stop-cock *b* so soon as sufficient water has accumulated at the bottom of the condenser to close the bottom end of the pipe E, and the

air is removed from the condenser without the action of an air-pump.

We claim as new and desire to secure by Letters Patent—

1. The use of the expeller E E', arranged in combination with a condenser, A, and operating in place of the ordinary air-pump in the manner and for the purpose substantially as described.

2. The float d, applied in combination with the steam or compressed-air pipe F, expeller E E', and condenser A in the manner and for the purpose set forth.

A. HARTUPPE,
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Witnesses:

J. DONALDSON,
THOMAS O'CONNOR.