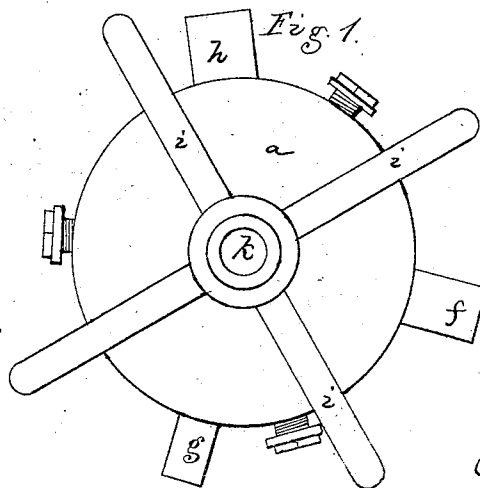
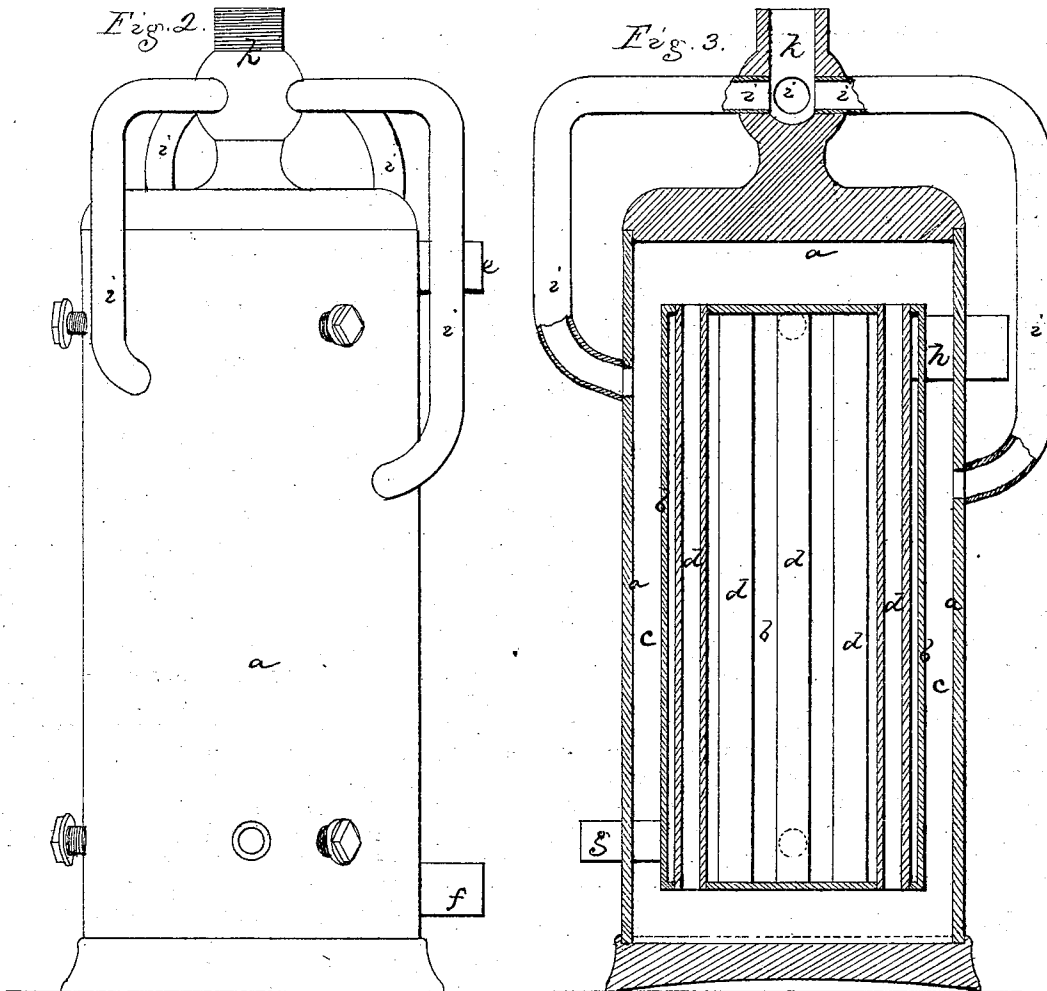


J. F. HASKINS.
Vapor-Engines.

No. 136,241.

Patented Feb. 25, 1873.



Witnesses.
M. W. Frothingham.
L. H. Bates.

Inventor.
John F. Haskins.
By his Atty.

Crosby & Soule.

UNITED STATES PATENT OFFICE.

JOHN F. HASKINS, OF FITCHBURG, MASSACHUSETTS.

IMPROVEMENT IN VAPOR-ENGINES.

Specification forming part of Letters Patent No. 136,241, dated February 25, 1873.

To all whom it may concern:

Be it known that I, JOHN F. HASKINS, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented an Improvement in Vapor-Engines; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates particularly to generators of that class of fluids which vaporize below 212° Fahrenheit. Fluids which are in use for generating such vapors to drive engines are obnoxious and deleterious in vaporized state, and are sometimes inflammable; and extraordinary care has to be exercised in making all joints and connections in order that the vapor shall not escape, for if a pipe break or a joint or a cock becomes loose the vapor will escape, and will continue to escape so long as there may be liquid in the boiler and heat against the boiler, and it is almost impossible to stop any leakage. The volatile liquid is generally boiled by the application of the heat of exhaust steam, the liquid being contained in a boiler inclosed within a second vessel, the steam passing through the space between the inner and outer vessel, and through tubes passing through the inner vessel, the water of condensation being drawn off by a suitable outlet-pipe at the bottom of the steam-chamber.

The object of my invention has been to devise means by which the generation of the vapor can be instantaneously arrested, so that at any moment escape of obnoxious vapor may be arrested by arresting the supply of heat that generates such vapor, and by reducing the heat existing around the boiler. To effect this, I combine with the inner and outer vessels a series of pipes entering the steam-chamber at various points, these pipes branching from a main pipe, which extends from a source of cold-water supply under pressure. In case of breakage or leakage at any point where the vapor can escape the supply of steam is shut off and a cock in the main pipe opened, when water will be projected into the steam-chamber and against the shell of the inner vessel, thereby con-

densing the steam, cooling the inner vessel, and stopping the generation of the vapor, and condensing what vapor exists in the vapor-generating chamber. It is in this construction or this method of arresting the generation of the escaping vapor that my invention consists.

The drawing represents a boiler embodying my invention.

Figure 1 shows the boiler in plan. Fig. 2 is a side elevation. Fig. 3 is a sectional elevation.

a denotes the outer cylinder, and *b* the inner cylinder, the space *c* between them constituting the space which is supplied with steam to heat the vessel *b* and its contents, the vessel *b* containing the highly-volatile liquid to be vaporized, and having steam-tubes *d* extending through it to increase the heating-surface, said tubes opening from and into the steam-chamber *e*. *e* denotes the inlet-pipe, by which exhaust steam enters the steam-chamber *e*; and *f* denotes an outlet-pipe through which water of condensation escapes, the exhaust steam having imparted its heat to the outer surfaces of the shell *b* and the inner surfaces of the tubes. *g* denotes the pipe through which liquid is supplied to the inner vessel, and *h* the pipe through which the vapor generated from such liquid is led to the cylinder of the engine to be driven. *i i* denote four or any other suitable number of pipes branching from a main pipe, *k*, and entering the steam-chamber *e*. The pipe *k* is a water-pipe connected with a source of cold-water supply, and having a cock, by opening which water is driven through the pipes *i* into the steam-chamber *e* and against the shell *b*, the water condensing the steam and also cooling the shell *b* by its direct contact therewith, supply of steam being of course cut off by a cock in the steam-pipe.

By these means it is practical to stop escape of the offensive or deleterious vapor as soon as any leakage occurs and before the vapor is disseminated sufficiently to effect any bad results, the turning of the two cocks—the steam and water cock, to shut off supply of steam and let on supply of water—almost instantly reducing all the vapor to a liquid

form. The debouching ends of the water-pipes may be made with fine slits or perforations to "spray" the water.

I claim—

1. In combination with the steam-chamber *c* and liquid and vapor chamber or vessel *b* and their respective inlet and outlet pipes, the water-supply pipes *i*, for throwing water into the steam-chamber to condense its steam and cool the vessel *b*, substantially as described.

2. The method of producing and stopping

the supply of heat to volatilize the liquid from which the vapor is to be generated by subjecting the generator to the action of steam to heat the generator and volatilize its liquid, and the steam-chamber and the generator to the action of water under pressure to condense the steam and cool the generator.

JOHN F. HASKINS.

Witnesses:

CHAS. FOSDICK,

HARDING JENKINS.