J. F. SPENCE.

HYDROCARBON VAPOR MACHINE.

No. 69,037. Patented Sept. 17, 1867.

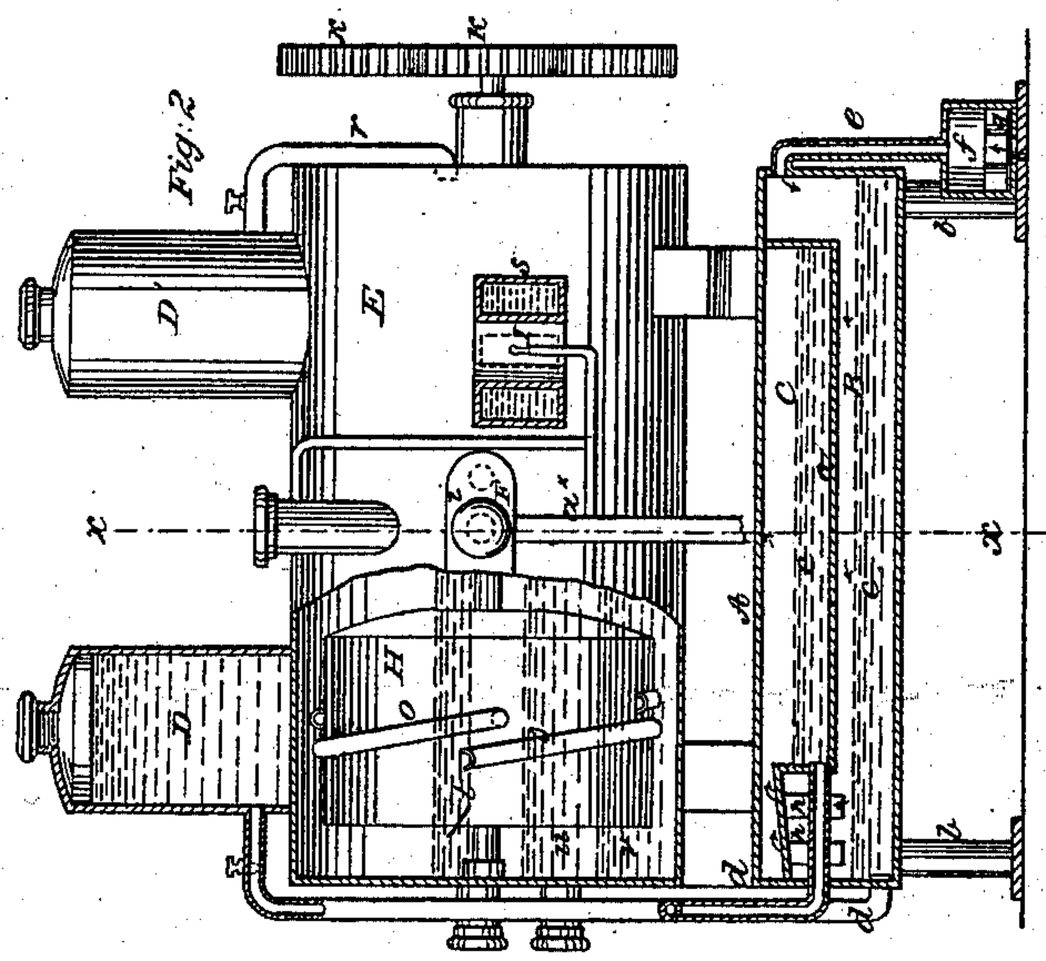

Fig. 2

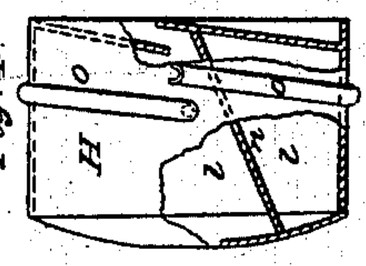

Fig. 4.

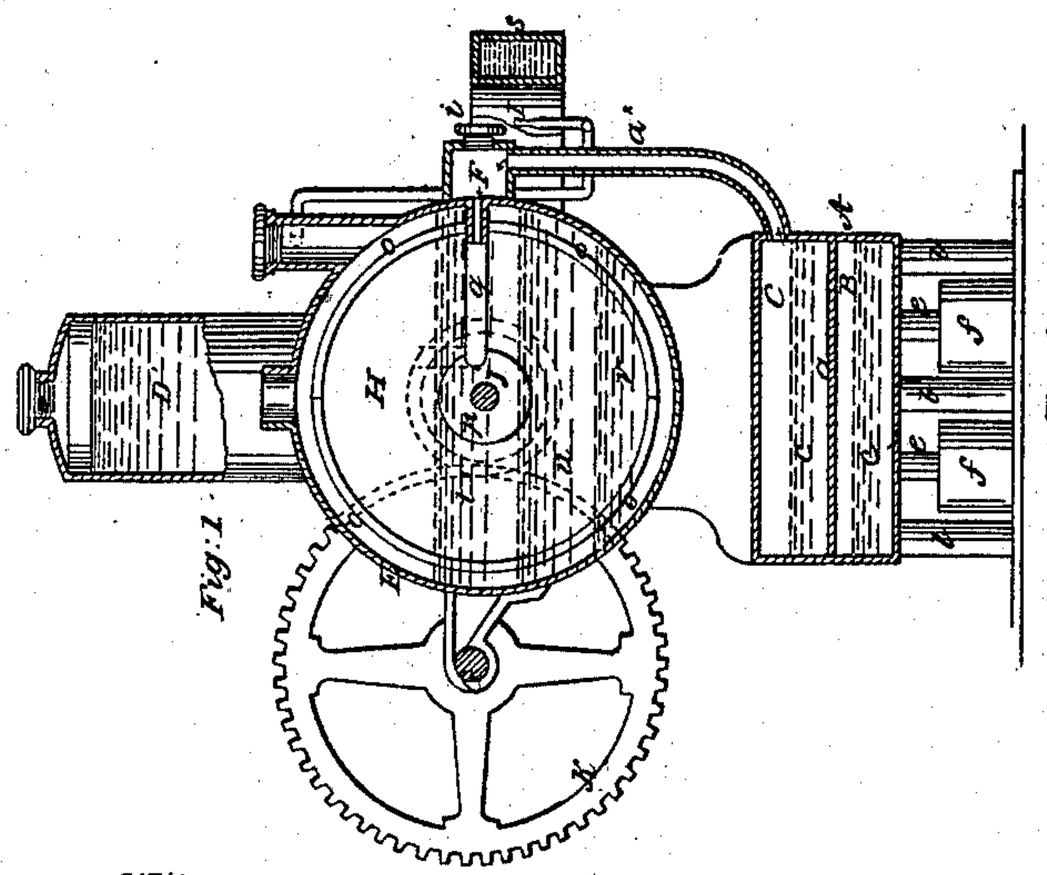

Fig. 1.

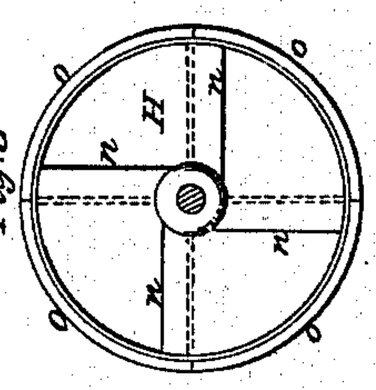

Fig. 3

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JAMES F. SPENCE, OF BROOKLYN, NEW YORK.

Letters Patent No. 69,037, *dated September* 17, 1867.

IMPROVED HYDROCARBON VAPOR MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JAMES T. SPENCE, of Brooklyn, in the county of Kings, and State of New York, have invented a new and improved Hydrocarbon Vapor Machine, and that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

This invention relates to a new and improved machine or apparatus for vaporizing volatile hydrocarbons for illuminating purposes, and consists in a novel and improved means for creating a draught of atmospheric air through the chambers containing the material to be vaporized, such for instance as the light grades of coal oil, naphtha, gasoline, etc., etc., and also in improved valves for checking the draught whenever the apparatus ceases its operation. The invention finally consists in the use of a combination of heavy hydrocarbons, or those which vaporize at quite a high temperature, with that of a lighter grade, whereby all danger of explosion is avoided.

The invention has for its object the production of a steady light, a large vaporizing surface within a limited space, and safety from explosion in using the apparatus. In the accompanying sheet of drawings—

Figure 1 is a transverse vertical section of my invention, taken in the line *x x*, fig. 2.

Figure 2, a front view of the same, partly in section.

Figure 3, a detached end view of one of the revolving chambered drums pertaining to the same.

Figure 4, a front view of one of said drums, partly in section.

Similar letters of reference indicate like parts.

A represents a rectangular box, which is divided into two compartments B C, by a partition, *a*, and supported at a proper height by feet *b*. Each of these compartments is supplied with the naphtha or other fluid to be vaporized, and designated by *c*, and this fluid is supplied to the compartments B C, through pipes *d d*, leading from a reservoir, D, on the top of an upper chamber, E. The lower compartment B has two pipes *e e*, communicating with its upper part, and to the lower ends of these pipes chambers *f* are attached, each containing a valve, *g*, constructed out of some light material, such as cork, for instance. The lower compartment B communicates with the upper one C, by means of a series of small pipes *h*, and the upper compartment C communicates by a pipe, $a^{\times}$, with a receptacle, F, at one side of the upper chamber E, an opening being made in the outer or face side of said chamber, which is closed by a screw, *i*, or other means. In the upper chamber E there is placed centrally and longitudinally a shaft, *j*, which is rotated by gearing *k* from a driving-shaft, G, and has upon it two drums H H, divided into four compartments *l*, by oblique partitions *m*, (see fig. 4.) Each chamber has a radial opening, *n*, at one end of it, and a tube, *o*, communicates with each chamber and extends around the periphery of the drums in a backward direction a distance equal to about one quarter of their circumference, (see fig. 3.) The sides of the drums H, opposite to the sides where the openings *n* are made, have concentric openings *p* to receive each a pipe, *q*, from the receptacle F, the ends of the pipes *q* turning upward above the surface of the liquid in chamber E, (see fig. 1.) The chamber E is supplied with a light grade of fluid, such as naphtha, gasoline, etc., from a reservoir, D′, in the chamber E, a pipe, *r*, conducting the same from D′ into E, (see fig. 2.) I represents gas jets, which are within annular chambers *s*, which communicate with chamber E, and are supplied with gas from the chamber E.

The operation is as follows: The upper chamber E is supplied with the light material, naphtha, gasoline, or other similar substance, designated by *t*, and also supplied with heavier substances, such as whale oil *u*, and lard oil *v*. These heavier hydrocarbons serve as adulterates, and prevent a too great vaporization of the liquid in E, and consequently prevent a liability to explosion. The drums H, as they rotate, serve to create a suction through the chambers B, C, and E, as indicated by the arrows, and the tubes *o* admit of the air in the chambers *l* being gradually expelled as the openings *n* of the chambers *l* pass through the fluid in E, the mingled vapor and air passing gradually out from the ends of the tubes *o*, and preventing the sudden puffs or vibrations which would otherwise occur when the openings *e* pass out from the fluid at the rising sides of the drums, it being understood that the openings *p*, at one side of the drums, are below the surface of the fluid in E. The air that enters the drums H through the openings *n*, when the latter are above the fluid in E, is mingled with the vapor

as the openings become submerged in the fluid, and effective and even vaporization of the fluid is therefore effected. The draught caused by the rotation of the drums causes a good draught through all the chambers. The gas jets I are kept burning in case the fluid in E requires any warmth. The tubes *o* are a great acquisition, causing a steady light, it being understood that the chamber E is the main or holder with which the pipes on which the gas-burners are placed communicate. The light valves *g* check the draught instantly as soon as the rotation of the drums H ceases. Their extreme lightness admits of them readily rising under a light draught while the valves will close or drop instantly, as soon as the draught is stopped. These valves thereby prevent any escape of vapor when the device is inoperative.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

1. The combination and arrangement of the three chambers B C E, with the reservoirs D D′ and supply pipes *d d r*, substantially as and for the purpose set forth.

2. The two rotating drums H, provided with chambers *l*, in combination with the tubes *o*, substantially as and for the purpose specified.

3. In a hydrocarbon vapor machine, the employment or use of a plurality of hydrocarbons of different grades, placed in one or more chambers of the machine, substantially as and for the purpose set forth.

4. The valves *f*, constructed of cork, or other similar light material, when used in connection with a hydrocarbon vapor machine, substantially as and for the purpose set forth.

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Witnesses:

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