J. W. NYSTROM.

Burning Hydrocarbon.

No. 167,684. Patented Sept. 14, 1875.

Fig. 1.

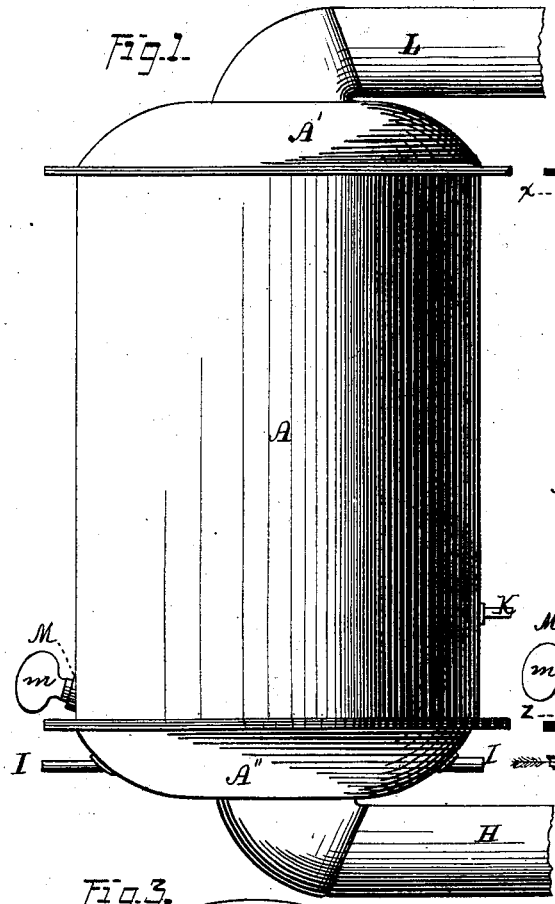


Fig. 2.

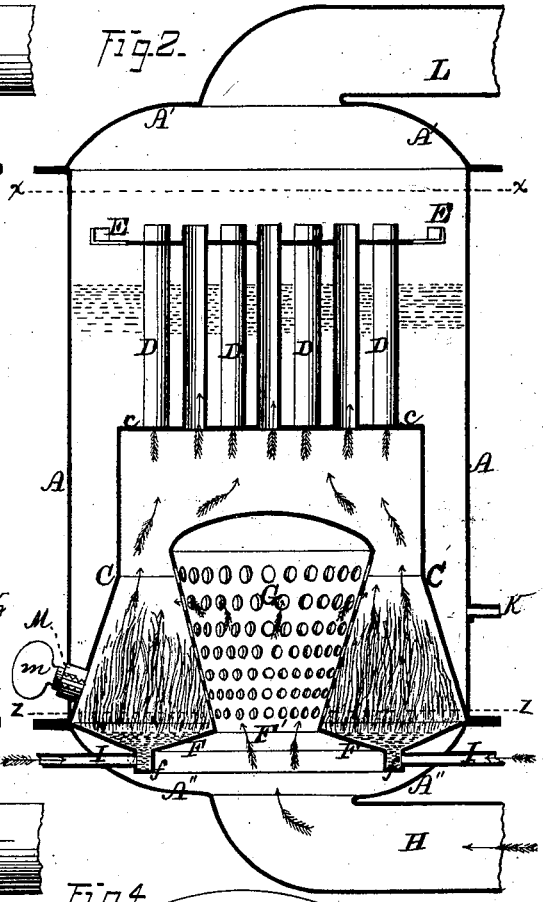


Fig. 3.

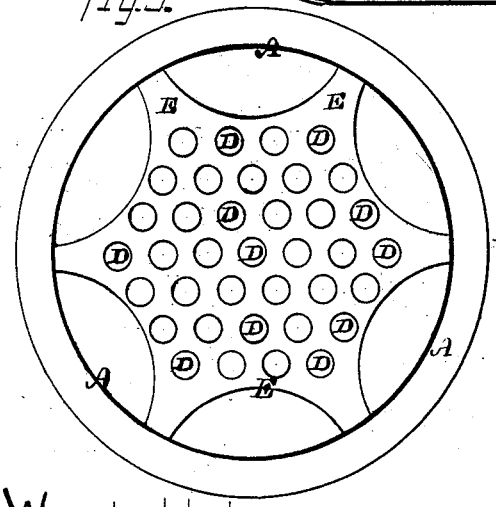
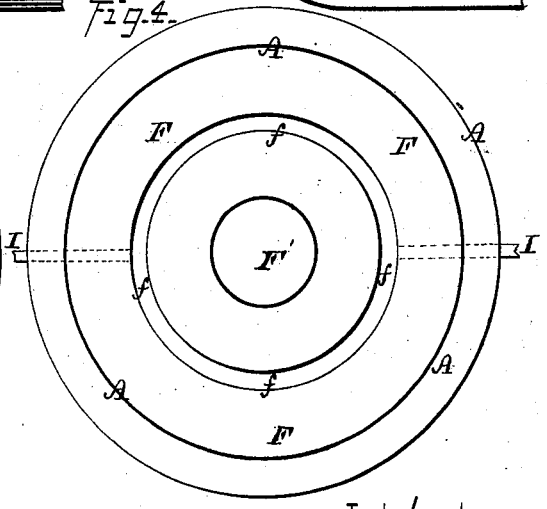


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN W. NYSTROM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN BURNING HYDROCARBONS.

Specification forming part of Letters Patent No. **167,684**, dated September 14, 1875; application filed July 29, 1875.

To all whom it may concern:

Be it known that I, JOHN W. NYSTROM, of Philadelphia, county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Generating Motive Power by the Products of Combustion; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a side elevation of my improved apparatus. Fig. 2 is a vertical central section of the same, and Figs. 3 and 4 are horizontal sections upon lines *x x* and *z z*, respectively, of Fig. 2.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to enable a gaseous vapor, for use in operating engines, to be produced with ease and economy; and it consists in the peculiar construction of the apparatus employed, substantially as and for the purpose hereinafter specified.

In the annexed drawings, A represents a cylindrical casing, provided, preferably, with semi-spherical ends or heads A′ and A″, and supported in a vertical position upon or by means of a suitable base. At the point of union between the lower end of the casing A and its lower head A″ is secured the lower end of a combustion-chamber, C, which from thence extends upward and inward for a short distance, and thence vertically upward to a point near the longitudinal center of said casing, where said combustion-chamber is inclosed by a crown or tube sheet head, *c*. Within the head *c* are secured the ends of a number of tubes, D and D, which from thence extend upward, and at their upper ends pass through a horizontal plate, E, which latter, at suitable points around its periphery, is attached to or upon the casing A, and insures the relative positions of said flues. The bottom of the combustion-chamber C is inclosed by means of a plate, F, which, at its center, is provided with a round opening, F′, and midway between the same and the wall of the casing A has an annular channel, *f*, from whence said plate inclines upward in each direction upon a radial line. The opening F′ is inclosed by a round casing, G, which has recticulated sides and an imperforate semi-spherical upper end, and from its lower end upward increases regularly in size, as shown by Fig. 2. An air-pipe, H, opening into the space beneath the combustion-chamber C, two or more tubes I and I, for supplying liquid combustible passing horizontally through the apparatus and opening into the annular channel *f*, a tube, K, for supplying water to the space around said combustion-chamber, entering at one side of the casing A, and a pipe, L, at the upper end of the said casing for conveying away the gaseous vapor, when generated, completes the device, the operation of which is as follows:

The space between the combustion-chamber and casing is partially filled with water, and oil is admitted to the concaved channeled bottom of said chamber and ignited through an opening, M, in one side of the latter, after which said opening is closed by means of a screw-plug, *m*. Air is forced into the lower pipe H by any suitable means, and after being distributed laterally through the combustion-chamber, and supplying the oxygen requisite for combustion, passes upward with the gaseous products of the same through the tubes D and D, where they mingle with and superheat the steam that is generated from the water by the heat within the combustion-chamber, and from thence pass onward through the pipe L to the engine.

In consequence of the peculiar form of the bottom of the combustion-chamber the surface of oil that is exposed to the action of the flame is in direct proportion to its height, so that by increasing or diminishing the quantity of said oil its combustion will be correspondly increased or diminished.

The apparatus described can be adjusted so as to automatically supply the desired quantity of gaseous vapor as long as water, oil, and air are furnished with regularity. It requires no fireman, and as it emits no smoke and requires no chimney, can be employed in any place where the requisite space can be secured.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

The hereinbefore described apparatus, in which the water casing or cylinder A, combustion-chamber C, tubes D and D, oil-reservoir F *f*, and pipes H, I, K, and L, are combined to operate in the manner and for the purpose substantially as specified.

JOHN W. NYSTROM.

Witnesses:
O. G. HEMPSTEAD,
WM. O. HEMPSTEAD.