(No Model.)

2 Sheets—Sheet 1.

J. L. STYRON.

APPARATUS FOR VAPORIZING AND BURNING HYDROCARBON OILS.

No. 425,009. Patented Apr. 8, 1890.

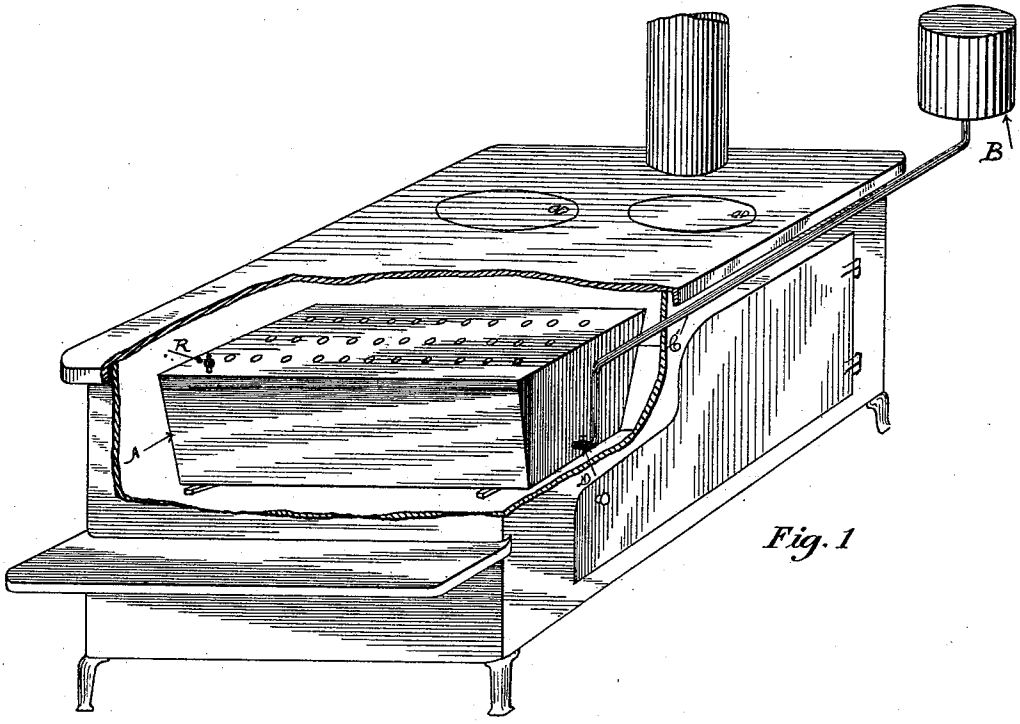


Fig. 1

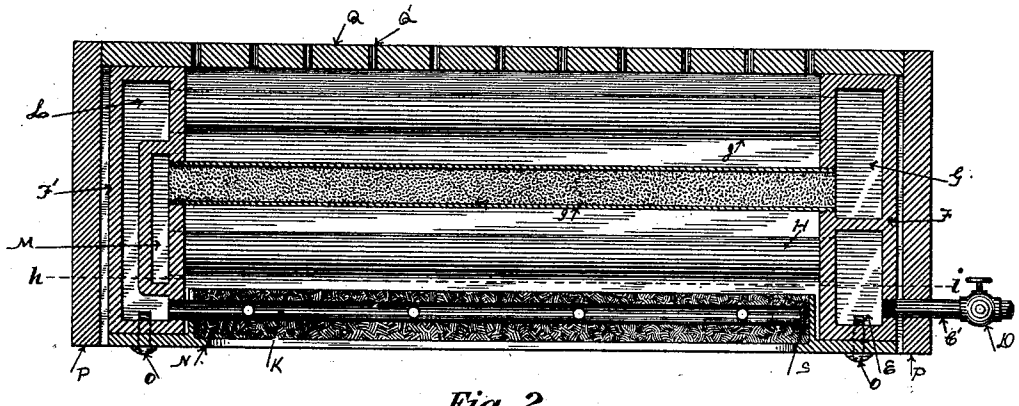


Fig. 2

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(No Model.) 2 Sheets—Sheet 2.

J. L. STYRON.

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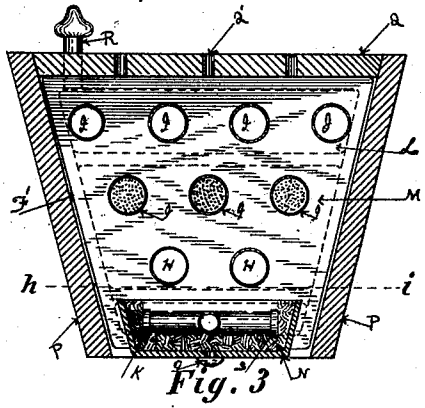


Fig. 3

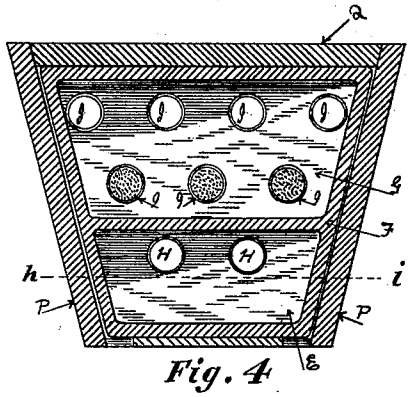


Fig. 4

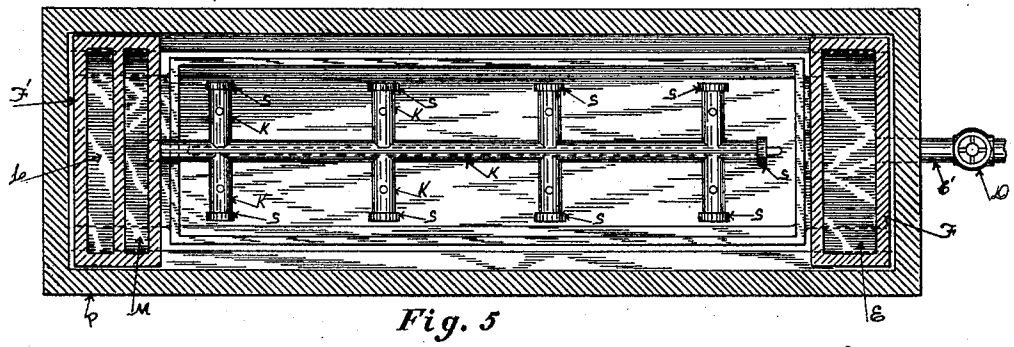


Fig. 5

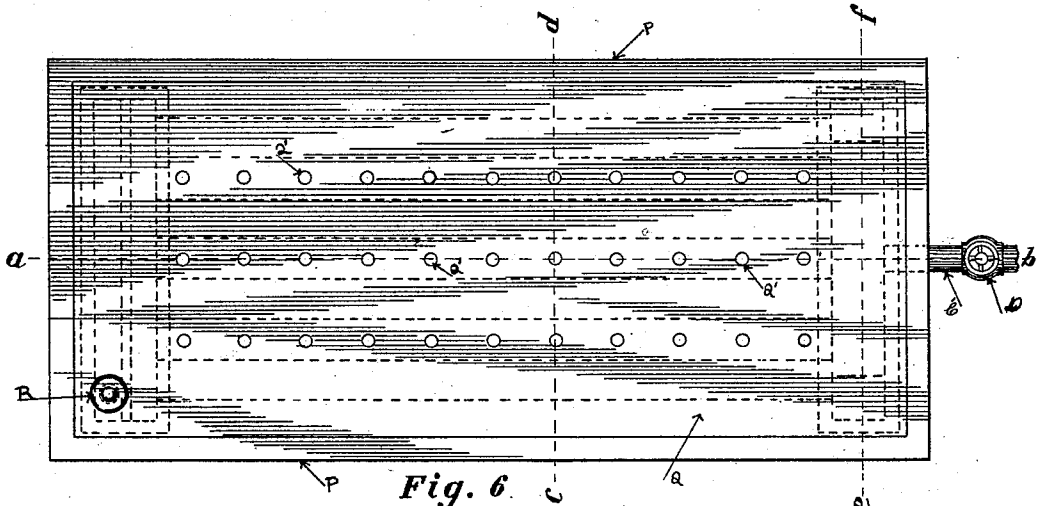


Fig. 6

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UNITED STATES PATENT OFFICE.

JOHN L. STYRON, OF NEWARK, OHIO.

APPARATUS FOR VAPORIZING AND BURNING HYDROCARBON OILS.

SPECIFICATION forming part of Letters Patent No. 425,009, dated April 8, 1890.

Application filed October 9, 1889. Serial No. 326,526. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. STYRON, a citizen of the United States, residing at the city of Newark, in the county of Licking and State of Ohio, have invented a new and useful Apparatus for Vaporizing and Burning Hydrocarbon Oils, of which the following is a specification.

My invention relates to an apparatus for vaporizing hydrocarbon oils to be used for fuel purposes, and applied to any stove, grate, or apparatus where heat may be desired for cooking, heating purposes, or for generating steam.

It consists of metal frames F F′, with chambers E, G, L, and M cast in the same; a series of pipes or retorts H and of purifying-pipes I; mixing-pipes J; burner or jet pipes K; heating-pan N, partially filled with asbestus; metal or composite frame or jacket P, surrounding the apparatus; top or diffusing plate Q, made of metal, fire-clay, or carbon, with perforations Q′ through it; safety-valve R, located in top of apparatus; feed-pipe of metal attached at one end to oil-tank and at the other end to the apparatus, passing through the frame or jacket P; needle-valve D, which is located in feed-pipe C′.

Similar letters and figures refer to similar parts throughout the several views.

Figure 1 in the drawings is a perspective view of a stove, showing its front broken away, and showing my improved apparatus therein as applied in the art. Fig. 2 is a vertical longitudinal section of the device, taken on line *a b* of Fig. 6. Fig. 3 is a transverse section taken on line *c d* of Fig. 6. Fig. 4 is transverse section taken on line *e f* of Fig. 6. Fig. 5 is a horizontal longitudinal section taken on lines *h i* of Figs. 2, 3, and 4. Fig. 6 is a plan view of the apparatus.

A, Fig. 1, shows the apparatus as applied to an ordinary cook-stove; B, oil-tank, which may be placed wherever desired, the oil being conducted to the apparatus through feed-pipe *c′*, which is attached to the lower part of the apparatus in frame F, as shown in Fig. 2; D, needle-valve in feed-pipe *c′*, for the purpose of allowing the oil to flow into the oil-chamber E below the line *h i*, as shown in Fig. 2; E, oil-chamber located in lower portion of frame F, as shown in Fig. 4, for receiving the oil from feed-pipe *c′*; F, frame (or casting) into which are cast chambers E and G, as shown in Fig. 2; F′, frame (or casting) into which are cast chambers L and M, the two frames being connected by the generating-pipes or retorts H, purifying-pipes I, and mixing-pipes J, as shown in Fig. 2; G, gas-chamber located in upper portion of frame F, for receiving the gas as it passes from the purifying-pipes I and conducting the same into the mixing-pipes J, as shown in Fig. 4.

H represents retorts or generating-pipes, to one end of which is attached frame F at oil-chamber E. To the other end of said pipes is attached frame F′ at chamber M, as shown in Fig. 2, (relative position shown in Figs. 3 and 4;) I, purifying-pipes filled with bits of carbon for purifying the gas as it passes through them, the pipes being attached at each end to frames F F′ at chambers M and G, as shown in Fig. 2. (Relative position also shown in Figs. 3 and 4.)

J represents mixing-pipes, to one end of which is attached frame F at the upper part of chamber G. To the other end of the pipes is attached frame F′ at top of chamber L, as shown in Fig. 2, (relative position also shown in Figs. 3 and 4;) K, burner or jet pipe, which is attached at one end to lower part of chamber L, located in lower end of frame F′ and lying in heating-pan N, as shown in Figs. 2, 3, and 5, the other ends of pipes or jets being closed by caps *s*, as shown in Figs. 2, 3, and 5; L, gas-chamber in frame F′, which receives the gas from the mixing-pipes J and conducts it to the burner or jet pipe K, as shown in Fig. 2; M, gas-chamber in frame F′, which receives the gas from the retort or generating-pipes H and conducts it to the purifying-pipes J, as shown in Fig. 2; N, heating-pan, partially filled with asbestus, which acts as an absorbent for the oil, into which the burner or jet-pipe is laid, as shown in Figs. 2, 3, and 5; O, screws which pass through the heating-pan N and into the frames F F′, for the purpose of holding the said pan in position, and by removing the screws any sediment which may accumulate in the bottom of the chambers E and L may be removed, as shown in Fig. 2; P, metal or composite frame or jacket for placing the apparatus in when placed in position, for use in either stove-grate, furnace, or other apparatus where heat is desired, as shown in

Figs. 2, 3, and 5; Q, diffusing or top plate, made of metal, fire-clay, or carbon, and perforated with holes Q′, the plate resting on or against the tops of jackets P, as shown in Figs. 2, 3, and 6; R, safety-valve passing through top plate Q and in the frame F′ at chamber L, as shown in Figs. 1, 3, and 6.

The method of generating gas from hydrocarbon oils for fuel purposes by the use of the above-named apparatus is obtained by letting oil in through the valve D until the pan N is partially filled with the oil, close the valve D, and ignite the oil in the pan N, and the heat thus produced will heat the retorts or generating-pipes H lying just over the flame from the pan, thereby generating gas from the oil which remains in the oil-chamber E and in the generating-pipes H. The gas thus generated passes through the chamber M, thence into and through the purifying-pipes I into the receiving-chamber G, thence into and through the mixing-pipes J into the conducting-chamber L, down the same to burner or jet pipe K, where it is ignited by the flame from the pan N. The heat from the gas so ignited passes up between and around the various pipes H, I, and J through the perforations Q′ in the top or diffusing plate Q, where it is utilized for fuel for any desired purpose where heat is desired for cooking, heating purposes, or generating of steam. The heat from the gas, as it passes from the burner or jet K up between and around the various pipes, keeps the generating-pipes or retorts hot to a sufficient degree to generate gas from the oil, which can be let into the oil-chamber E by turning on the oil at the needle-valve D. The flow of the gas can be governed to the required amount by the amount of oil allowed to flow through the feed-pipe *c′* by means of the needle-valve D. If there should be by any cause a larger amount of gas than could be consumed by reason of size of burner or jet pipe K to such an extent as to render explosion liable, the extra pressure of gas in the chamber L would cause the safety-valve R to open, thereby allowing the surplus gas to escape into the flame above the plate Q. By removing the screws O any sediment which may accumulate in the bottom of the chambers E and L can be removed.

The oil-tank may be placed at any convenient place and be made of any desired size or shape, and the oil can be conducted by means of pipes to any part of the house or place so desired.

The apparatus can be made of any shape or size to suit the place required to be heated, or any number of generating-pipes or retorts, burners, or jets desired, according to the amount of gas required, can be used. By the use of the device as described no steam is required to convert the oil into good fuel-gas.

What I claim as new, and desire to secure by Letters Patent, is—

In an apparatus for vaporizing and burning hydrocarbon oils, the oil-vaporizer consisting of the hollow end frames F F′, each divided into two chambers by suitable division-plates, pipes H I J, connecting the end plates together and communicating with the respective chambers in the end plates, forming a continuous zigzag vaporizing and heating chamber, a burner-pipe connected to the final chamber in the end plate and extended beneath the series of connecting-pipes, in combination with a suitable oil-supply, the drip-pan and surrounding jacket, substantially as described.

JOHN L. STYRON.

Witnesses:
A. D. ROE,
W. P. YOUNG.