

(No Model.)

J. H. KNIGHT.
VAPORIZER FOR HYDROCARBON MOTORS.

No. 518,151.

Patented Apr. 10, 1894.

Fig. 1.

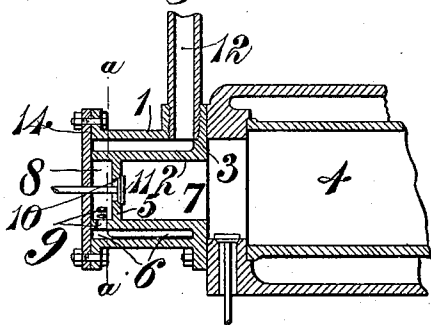


Fig. 2.

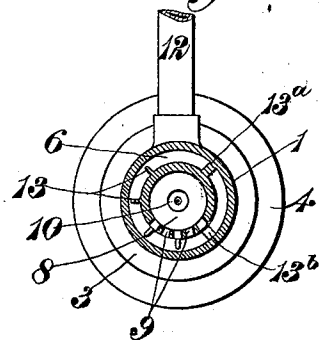


Fig. 3.

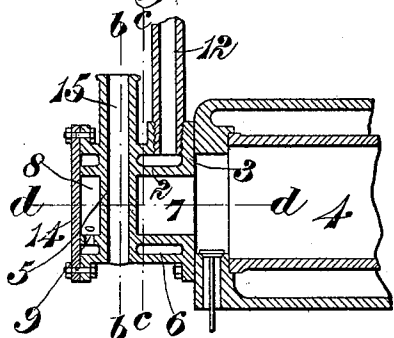


Fig. 4.

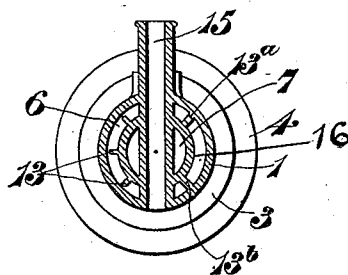


Fig. 5.

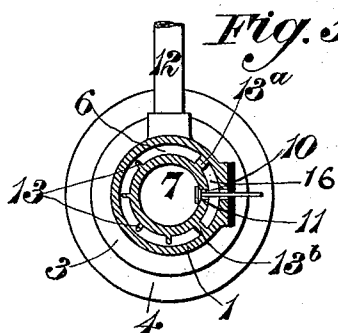


Fig. 6.

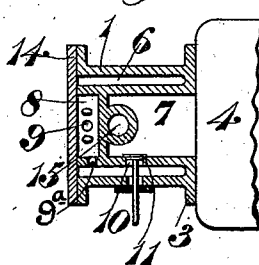
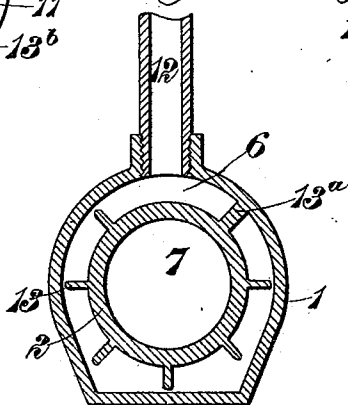


Fig. 7.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN HENRY KNIGHT, OF FARNHAM, ENGLAND.

VAPORIZER FOR HYDROCARBON-MOTORS.

SPECIFICATION forming part of Letters Patent No. 518,151, dated April 10, 1894.

Application filed November 6, 1893. Serial No. 490,146. (No model.) Patented in England December 1, 1891, No. 20,926.

To all whom it may concern:

Be it known that I, JOHN HENRY KNIGHT, a subject of the Queen of Great Britain and Ireland, residing at Farnham, in the county of Surrey, England, have invented Improvements in Vaporizers for Hydrocarbon-Motors, (for which an English patent was granted on December 1, 1891, No. 20,926,) of which the following is a specification.

In the specification of another application for Letters Patent of the United States of America, filed by me, Serial No. 491,139, I have described a construction of a vaporizer specially adapted for use for hydro-carbon motors working with heavy hydro-carbons such as kerosine and paraffin oils.

Now my present invention has reference to improved constructions and arrangements of vaporizers for motors of the kind referred to, the object being to simplify and cheapen the construction of such vaporizers and likewise to increase their efficiency. For this purpose I construct the vaporizers in the improved ways I will now proceed to explain by reference to the accompanying drawings, in which—

Figure 1 shows in longitudinal vertical section, one construction of vaporizer according to this invention, applied to the combustion end of a motor cylinder. Fig. 2 is a cross section thereof on the line *a a* (Fig. 1). Fig. 3 is a similar view to Fig. 1 illustrating a modified construction of vaporizer. Figs. 4 and 5 are cross sections, and Fig. 6 a horizontal section, on the lines *b b*; *c c*; and *d d* respectively of Fig. 3. Fig. 7 is a cross section illustrating a further modified construction.

The vaporizer shown in Figs. 1 and 2 comprises inner and outer cylindrical walls 1 and 2 connected at their forward ends by an annular wall 3 by which they can be readily attached to the end of the motor cylinder 4, the inner wall 2 being provided with a transverse wall or partition 5. These walls are made in one piece of metal, preferably by casting, so that heat imparted to one of them will be readily conducted to the others, and they are so arranged as to form an outer vaporizing chamber 6 of narrow annular form in cross section, an inner combustion chamber 7 and an intermediate vaporizing cham-

ber 8 located at the rear of the combustion chamber which is thus inclosed on all sides, excepting the front, by vaporizing chambers. The vaporizing chamber 8 is in permanent communication with the vaporizing chamber 6 by holes 9 in the inner wall 2 and is adapted to be placed in direct communication with the rear end of the combustion chamber by a passage 10 controlled by a valve 11. The outer wall 1 is provided with an inlet 12 for liquid hydro-carbon and air. The inner wall 2 is formed externally with longitudinal ribs or projections 13 that project into the vaporizing chamber 6, and convert the same into a circuitous passage, and at the same time provide a large heating surface for the hydro-carbon flowing through such passage. One of these ribs, viz:—13^a may connect the inner and outer walls 1 and 2 as shown so that the hydrocarbon is caused to flow in one direction around the inner wall 2. The rear end wall of the chambers 6 and 8 is formed by a detachable plate 14 by moving which access can be readily obtained to such chambers for cleaning or other purposes.

By making a vaporizer in the form described and in one piece of metal, excepting its rear end wall, its construction is considerably simplified and cheapened, while the heat of a lamp or stove applied externally to the vaporizer at starting and the heat caused by the explosions of the combustible charges within the combustion chamber after starting, can be efficiently utilized to effect the vaporization of the hydro-carbon employed.

In the modified construction shown in Figs. 3 to 6 inclusive the vaporizer has formed integral therewith, as for example by casting, a vertical chimney 15 that traverses the combustion chamber 7 and vaporizing chamber 6 and whereby the heat of an external lamp can be more effectually utilized for heating up the vaporizer and combustion chamber at starting. In this arrangement the inner wall 2 may, as shown, be connected to the outer wall by two ribs or partitions 13^a, 13^b so as to form with the end walls 3 and 14 an additional vaporizing chamber 16 (Figs. 5 and 6) which is adapted to be placed in direct connection with the combustion chamber by a lateral passage 10 controlled by the valve 11 and is in permanent communication with the

intermediate chamber 8 by one or more holes such as 9^a (Fig. 6).

The vaporizer may obviously be of other forms than circular in cross section. Thus the outer wall of casing may be constructed with a flat bottom as shown in Fig. 7.

What I claim is—

1. A vaporizer for hydrocarbon engines comprising a combustion chamber, a vaporizing chamber extending longitudinally of and surrounding the same, a vaporizing chamber extending across and closing the end of the said combustion chamber, and a communication between said chambers and the combustion chamber.

2. A vaporizer for hydrocarbon motors, comprising a casing, an inner longitudinal wall arranged to form with said chamber a vaporizing chamber inclosing a combustion chamber, and longitudinal retarding ribs between said casing and inner wall, one edge of the ribs being separated from one wall to form a passage way for oil and vapor.

3. A vaporizer for a hydro-carbon motor, comprising inner and outer tubular walls and a transverse wall located within the inner one, and intermediate its ends to form in conjunction with end walls an inner combustion chamber that is open to the motor cylinder, and outer vaporizing chambers one of which is located at the rear of said combustion chamber, substantially as herein described.

4. A vaporizer for a hydrocarbon motor, comprising an outer tubular wall or casing provided with an inlet for hydrocarbon and air, an inner tubular wall connected to said outer wall or casing and forming therewith a vaporizing chamber and provided with longitudinal external ribs or projections, a transverse wall arranged within the inner tubular wall and arranged to divide the same into a rear vaporizing chamber and an inner combustion chamber, a passage for connecting said combustion chamber with one of said vaporizing chambers, a valve controlling said passage, and a detachable rear end wall arranged to close the rear ends of said vaporizing chambers, substantially as herein described.

5. A vaporizer for a hydrocarbon motor,

comprising an outer tubular wall or casing provided with an inlet for hydrocarbon and air, an inner tubular wall connected to said outer wall or casing and forming therewith a vaporizing chamber and provided with external ribs or projections, a transverse wall arranged within the inner tubular wall and arranged to divide the same into a rear vaporizing chamber and an inner combustion chamber, a passage for connecting said combustion chamber with one of said vaporizing chambers, a valve controlling said passage, a chimney extending through said combustion chamber and having its wall formed integral with said inner and outer walls substantially as herein described for the purpose specified.

6. A vaporizer for a hydrocarbon motor, comprising inner and outer tubular walls 1 and 2 connected by an annular end wall 3, provided with ribs or projections 13, 13^a and 13^b and arranged to form outer vaporizing chambers 6 and 16, a transverse wall 5 located within said tubular inner wall so as to divide the same into an inner combustion chamber 7 and a rear vaporizing chamber 8 that is in free communication with the vaporizing chambers 6 and 16, an outlet passage 10 connecting the vaporizing chamber 16 with said combustion chamber, a valve controlling said outlet passage, a chimney 15 traversing said vaporizer and integral with said inner, outer and transverse walls, and a detachable end plate arranged to close the rear ends of said vaporizing chambers, substantially as herein described for the purposes specified.

7. A vaporizer for hydrocarbon motors comprising a combustion chamber, a vaporizing chamber inclosing the same, and a chimney or tube passing through the combustion and vaporizing chambers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HENRY KNIGHT.

Witnesses:

CHARLES E. BROUGHAM,

WILLIAM CROSS,

Both of 46 Lincoln's Inn Fields, London, W. C.