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S. S. SCOTT & G. W. BONNEY.
VAPORIZING DEVICE FOR EXPLOSIVE ENGINES.

(Application filed Nov. 24, 1900.)

(No Model.)

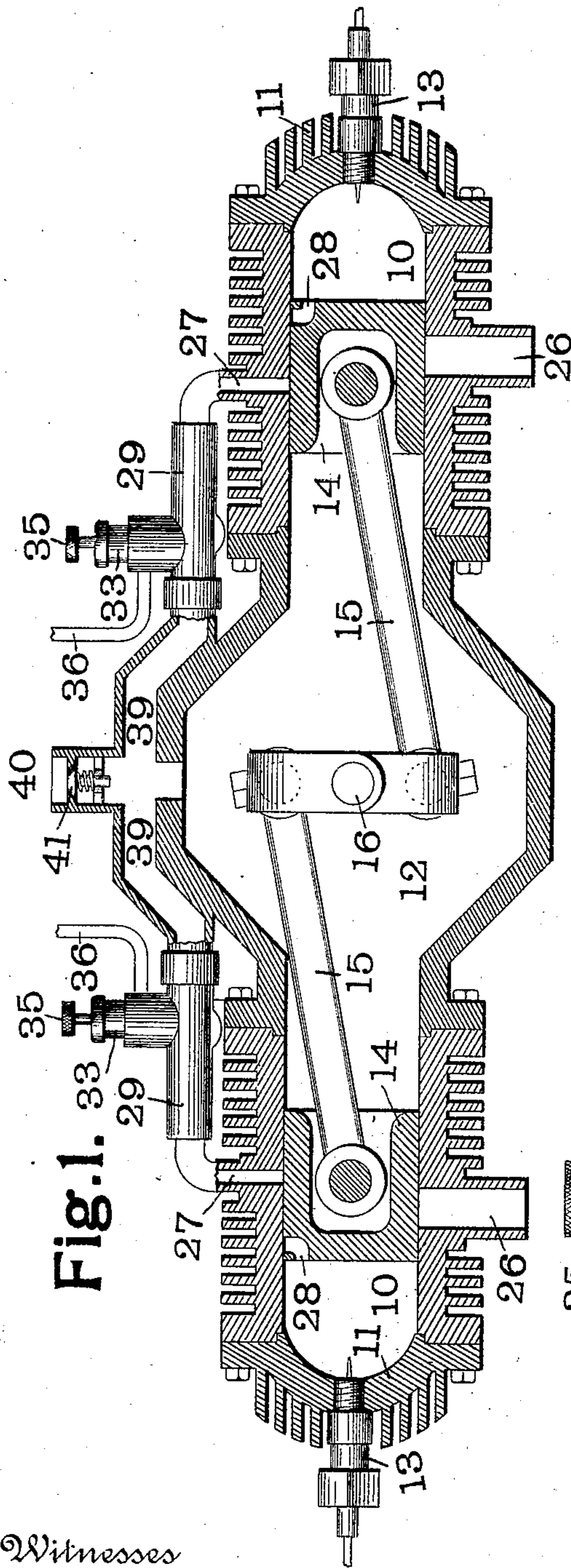


Fig. 1.

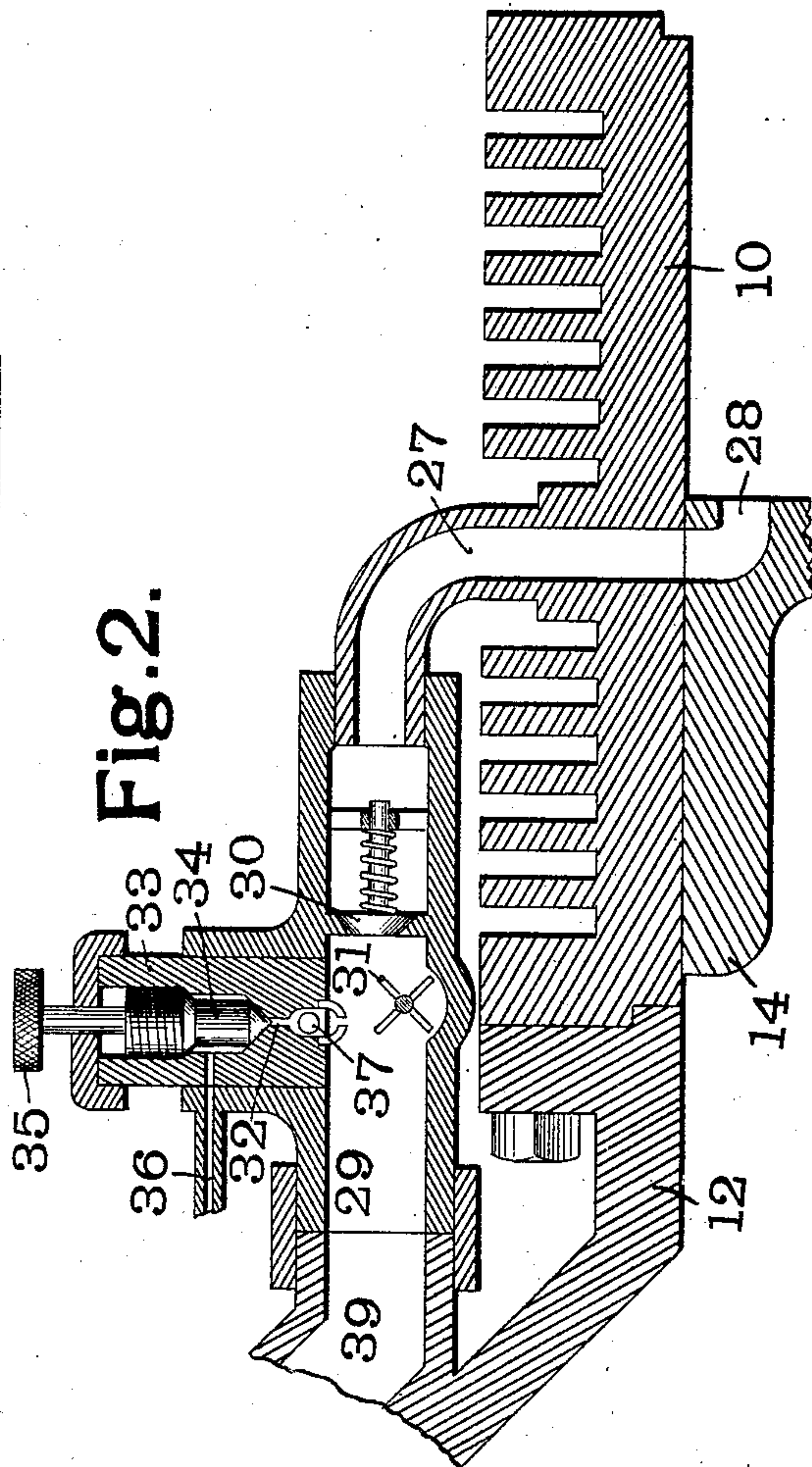


Fig. 2.

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UNITED STATES PATENT OFFICE.

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VAPORIZING DEVICE FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 688,349, dated December 10, 1901.

Application filed November 24, 1900. Serial No. 37,603. (No model.)

To all whom it may concern:

Be it known that we, SEMPLE S. SCOTT and GEORGE W. BONNEY, citizens of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Gas-Engine, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of our invention is to provide improved means for supplying the engine with vapor from a liquid hydrocarbon, such as gasolene.

Our invention consists in various novel features and details of construction, all of which are described in the following specification and pointed out in the claims affixed hereto.

In the accompanying drawings, which illustrate one form of double-cylinder engine made in accordance with our invention, Figure 1 is a vertical central section through the complete engine, the vaporizers being shown in elevation; and Fig. 2 is an enlarged vertical section of one of the vaporizers.

Like marks of reference refer to similar parts in both views of the drawings.

10 represents the cylinders of the engine, which are provided at one end with heads 11, which serve as igniting-chambers. The heads 11 are preferably formed separate from the cylinders 10 and bolted thereto, as shown in the drawings. Both the cylinders 10 and heads 11 are ribbed in the usual manner to supply additional radiating-surface. The cylinders 10 are bolted to a body 12, which also serves as an air-compression chamber. In each of the heads 11 is screwed a suitable igniting-plug 13. In each of the cylinders 10 is a piston 14, which is connected by means of a pitman-rod 15, which at the opposite end engages with a crank on the shaft 16. One of the pitman-rods 15 is preferably bifurcated at its end, so as to prevent the racking strain which would otherwise be imparted to the body of the engine owing to the opposite pressures on the crank-shaft. At one side of the body 12 is secured a plate 18, provided with

an elongated bearing 19, through which the shaft 16 passes, at this side of the engine. The shaft 16 has secured to it a fly-wheel 20.

Each of the cylinders 10 is provided with an exhaust-port 26, which is adapted to be uncovered by the piston 14 when the said piston is at the forward end of its stroke. Each of the cylinders 10 is also provided with a supply-port 27, which communicates with an L-shaped port 28, formed in the piston 14, when said piston is at the forward end of its stroke, as shown in Fig. 2. The supply-port 27 communicates with a vaporizing-chamber 29. The vaporizing-chamber 29 is provided with a check-valve 30, Fig. 2, which opens toward the supply-port 27. The vaporizing-chamber 29 is also provided with a fan 31, which is loosely journaled therein and whose blades extend into a depression in the floor of the chamber. The depression serves to collect any of the liquid hydrocarbon which is fed into the chamber 29 during the time when no air is being forced through the same and retains it in position to be acted upon by the fan 31. Gasolene or other liquid hydrocarbon is dropped upon the fan 31 from an opening 32, formed in the valve-plug 33. This opening 32 is controlled by means of a needle-valve 34, provided with a milled head 35. The gasolene is supplied through a tube 36, communicating with any suitable source of supply. Back pressure in the pipe 36 is prevented by means of a ball-valve 37, adapted to close the passage 32. The body or compression-chamber 12 communicates with the vaporizing-chambers 29 by means of passages 39, as shown. The compression-chamber 12 is supplied with air through an opening 40, provided with an inwardly-opening check-valve 41, Fig. 1.

The operation of our engine is as follows: Suppose the pistons 14 to be at the rear end of their stroke—that is, adjacent to the heads 11—and the charge being compressed between said pistons and the heads. When the charges are exploded by the igniters 13, the pistons will be driven forward, at the same time compressing the air in the body 12. As soon as the pistons have reached the forward end of their strokes, the exhaust-ports 26 will be uncov-

ered and at the same time the supply-ports 27 will be opened through the ports 28 in the pistons 14. As the air is compressed in the body 12 it will pass through the passages 39 and enter the vaporizing-chambers 29. Here the air will become saturated with vapor generated from the gasoline dropping into said chambers. The air in its passage through the vapor-chambers will rotate the fan 31, thus spraying any unvaporized gasoline which has collected in the depression in the bottom of the chamber, and thus aiding the vaporization of the liquid. The mixed air and vapor will pass down through the supply-ports 27 and the port 28 and be discharged from the faces of the pistons 14 toward the heads 11 of the cylinders. This will drive the exhausted charge out through the exhaust-ports 26, which will at the same time open. It may happen that the entire exhausted charge is not discharged through the port 26 or that in addition to the exhausted charge a small portion of the fresh charge will escape; but in neither case does this amount to a sufficient portion of the charge to effect the working of the engine. Upon the return stroke of the pistons 14 the charge is compressed between the pistons and the heads 11 and is ignited at the next stroke.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a gas-engine, the combination with a cylinder, of a piston working therein, a supply-passage leading to said cylinder, a vaporizing-chamber in said supply-passage, a recess in the bottom of said vaporizing-chamber, a fan loosely pivoted in said chamber and dipping into said recess, and means for forcing air through said vaporizing-chamber.

2. In a gas-engine, the combination with a cylinder, of a piston working therein, a horizontal vaporizing-chamber in said passage, a recess in the bottom of said vaporizing-chamber, a fan loosely pivoted in said chamber and dipping into said recess, a supply-valve situated above said fan for dropping liquid hydrocarbons into said chamber, and means for forcing air through said vaporizing-chamber.

In testimony whereof we have hereunto set our hands and affixed our seals in the presence of the two subscribing witnesses.

SEMPLE S. SCOTT. [L. S.]
G. W. BONNEY. [L. S.]

Witnesses:

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