

No. 768,436.

PATENTED AUG. 23, 1904.

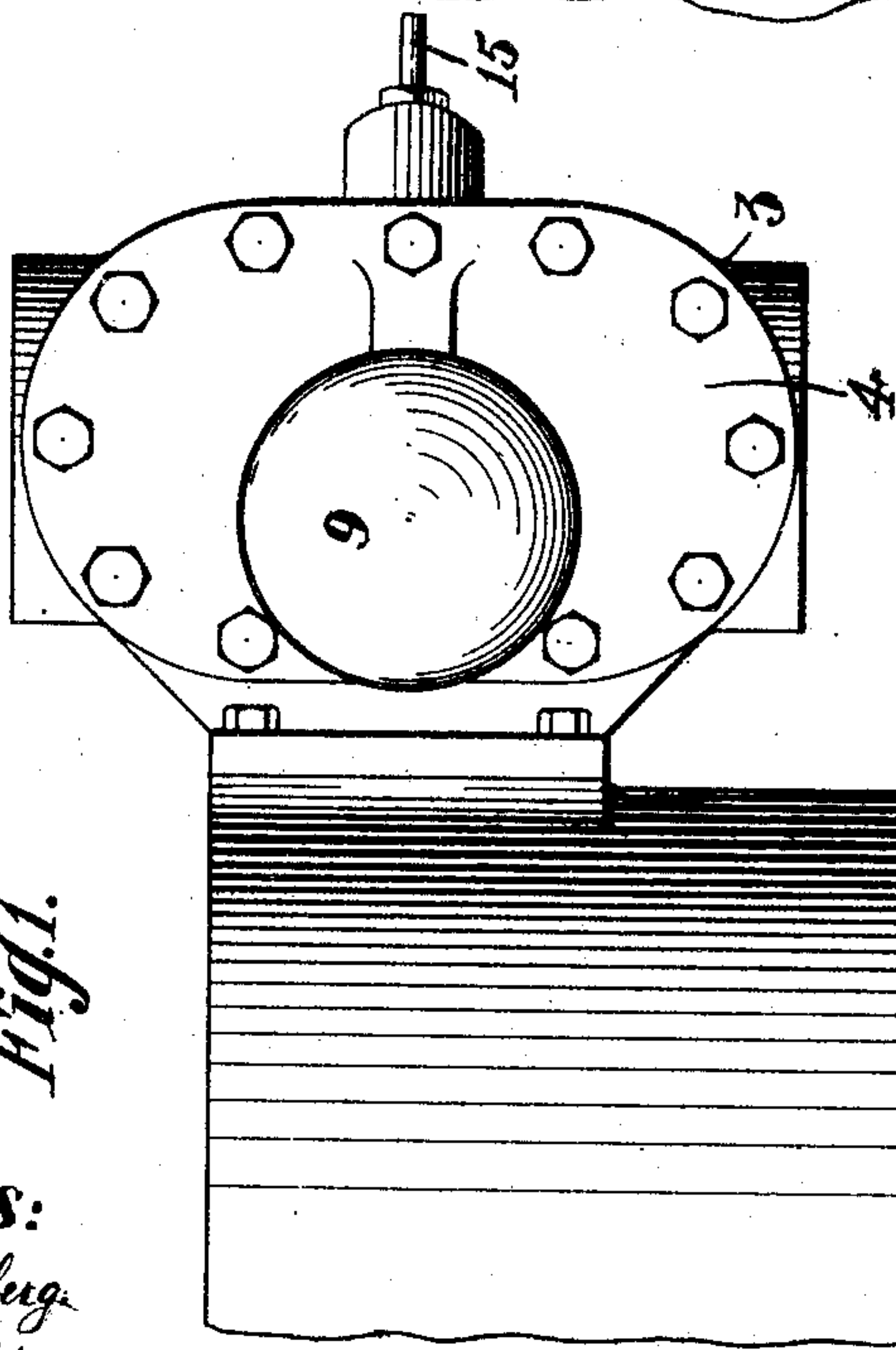
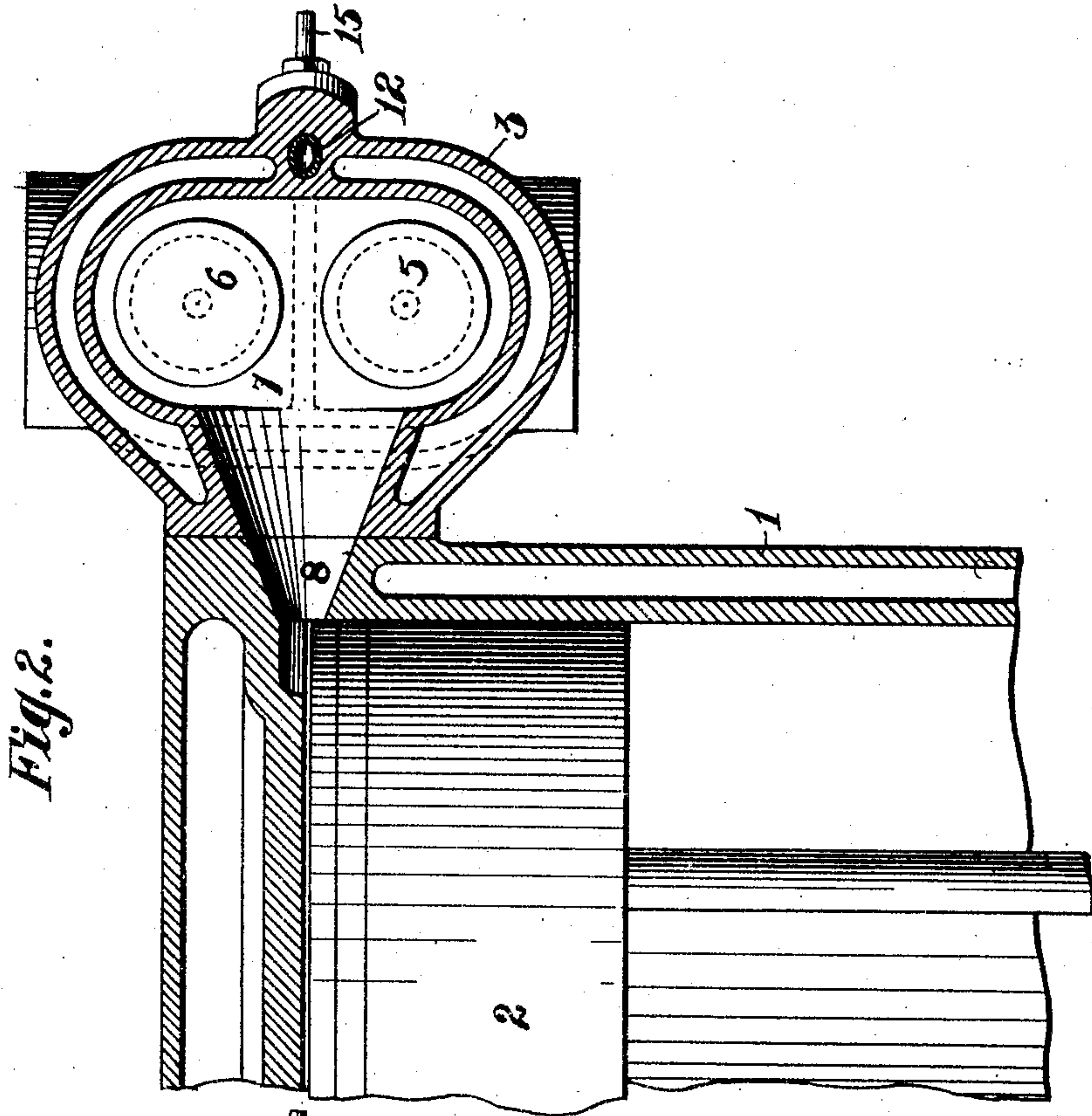
C. J. EVERETT.

VAPORIZER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED NOV. 20, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

F. G. Hachenberg

Henry Thieme

Inventor:

Charles J. Everett
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2 SHEETS—SHEET 2.

Fig. 4.

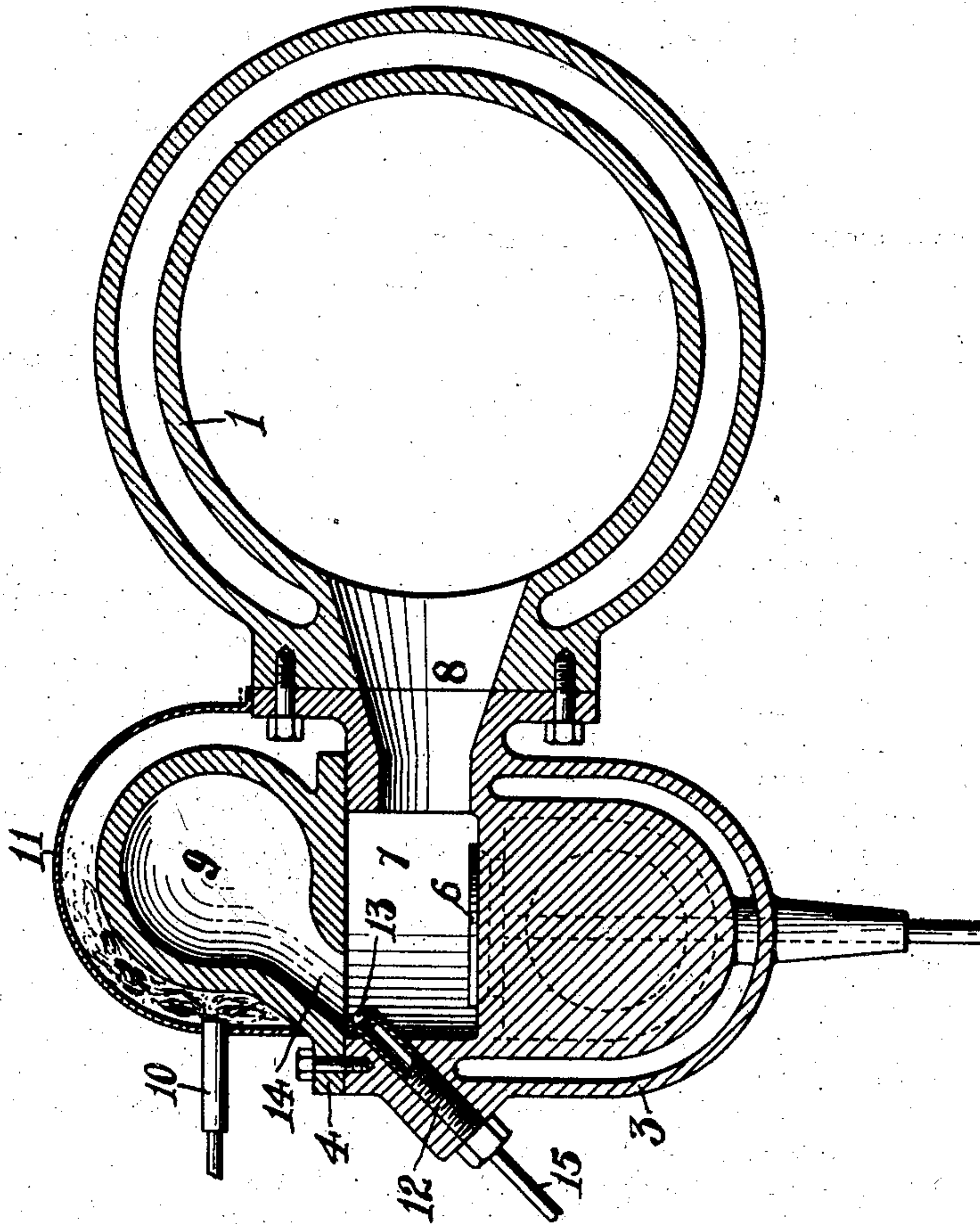
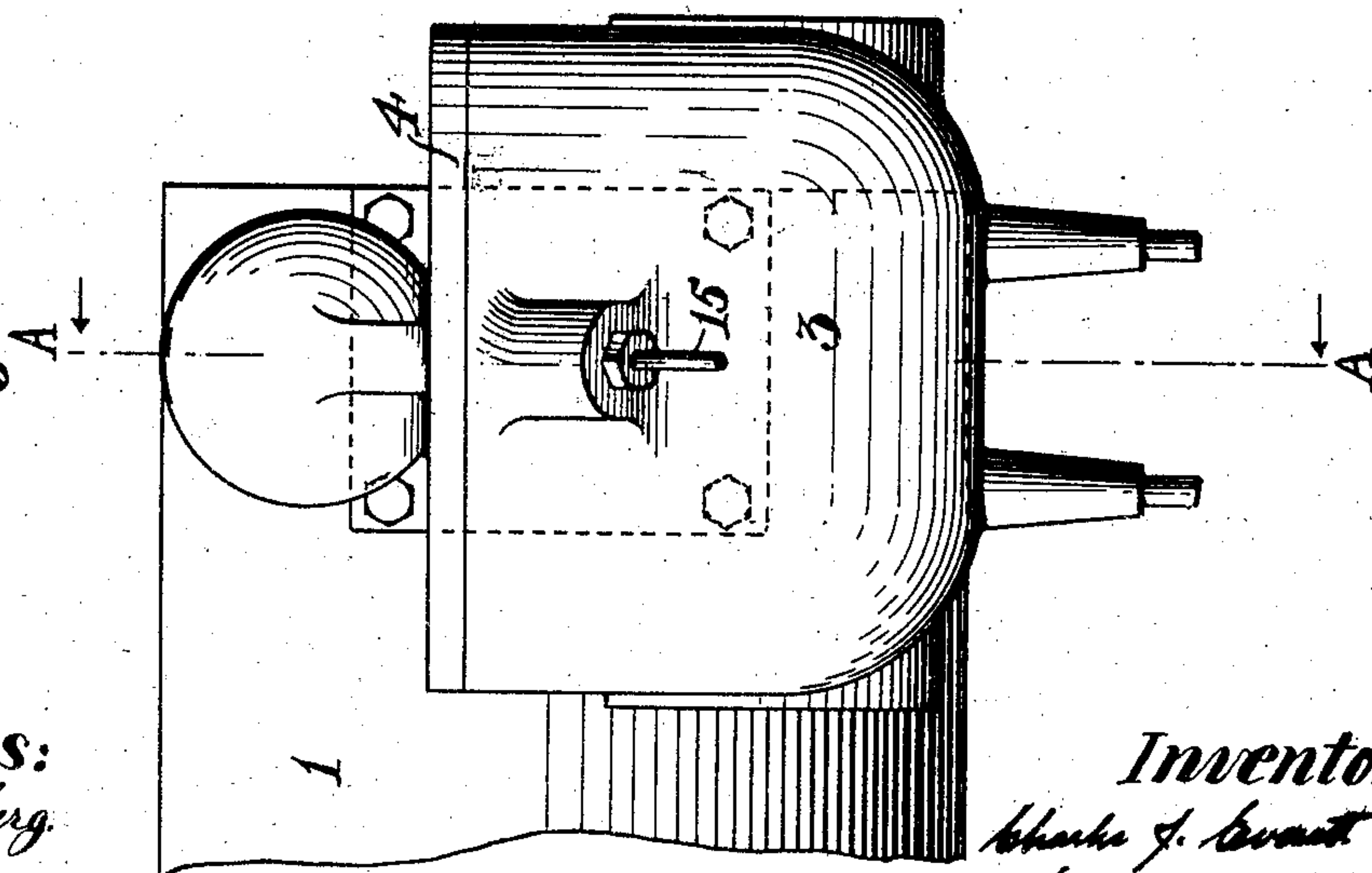


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES J. EVERETT, OF NEW YORK, N. Y.

VAPORIZER FOR INTERNAL-COMBUSTION ENGINES.

SPECIFICATION forming part of Letters Patent No. 768,436, dated August 23, 1904.

Application filed November 20, 1902, Serial No. 132,076. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. EVERETT, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented new and useful Improvements in Vaporizers for Internal-Combustion Engines, of which the following is a specification.

My invention relates to improvements in internal-combustion engines, and more particularly to an internal-combustion engine in which a liquid hydrocarbon fuel is injected into a hot vaporizer containing an expansion medium—such, for instance, as compressed air—the vaporizer being kept at a sufficiently high temperature to cause an ignition of the mixed hydrocarbon and air.

My invention contemplates a structure in which the vaporizer is carried by the valve-box and is at all times in open communication therewith instead of in direct communication with the cylinder, thus permitting the piston to be brought into close proximity to the end wall of the cylinder at the limit of its outward stroke for increasing the efficiency of the engine by producing a higher pressure.

A further object is to provide a structure of the above character in which a more thorough mixture of the air and fuel is obtained within the valve-box, port, and vaporizer, thus preventing the heavy deposition of carbon within the cylinder between the piston and the end of the cylinder, as is now common where the vaporizer is directly connected to the cylinder.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents in top plan a valve-box, the vaporizer, and a portion of the cylinder of an internal-combustion engine embodying my improvements. Fig. 2 is a transverse section through the valve-box and the portion of the cylinder of the engine. Fig. 3 is a side view of the parts represented in Fig. 1, and Fig. 4 is a transverse vertical section taken in the plane of the line A A of Fig. 3 looking in the direction of the arrows.

The engine-cylinder is denoted by 1, and the piston fitted to reciprocate therein is denoted by 2.

The valve-box is denoted by 3, its removable cover by 4, and the usual inlet and exhaust valves by 5 and 6.

The chamber within the valve-box is denoted by 7, and the port leading from the chamber to the interior of the cylinder 1 of the engine is denoted by 8.

The parts above described may be made of size and shape to suit different requirements.

The vaporizer is denoted by 9, which vaporizer is herein shown as being formed integral with the cover or top 4 of the valve-box. However, this vaporizer may be made separate from the cover of the valve-box, the essential feature being that the interior of the vaporizer should be always in open communication with the chamber 7 within the valve-box. This vaporizer is herein shown as of spherical form, and it may be heated up to a point sufficient to ignite the combined liquid hydrocarbon and compressed air therein for starting the engine by any suitable means—such, for instance, as a burner 10 and a hood 11, partially embracing and spaced from the vaporizer.

The injector for the liquid hydrocarbon is denoted by 12 and in the present instance is removably secured in the wall of the valve-box, with its discharge-tip 13 located within the chamber 7 in position to direct the entering liquid hydrocarbon into the interior of the vaporizer 9 through the narrow port 14, which connects the interior of the vaporizer 9 with the chamber 7 of the valve-box. The pipe 15 of the injector 12 leads to any suitable source of liquid-hydrocarbon supply. (Not shown herein.)

The stroke of the piston within the cylinder is so arranged that the piston will be brought into close proximity to the outer end of the cylinder when the piston is at the limit of its outward movement, thus compressing practically all of the air within the valve-box, port, and vaporizer.

The liquid hydrocarbon is injected into the

vaporizer by any desired means at such a point in the stroke of the piston as will give the best efficiency and not endanger a premature ignition of the mixed oil and air.

5 While the vaporizer 9 is heated to a point sufficient to insure the ignition of the mixed hydrocarbon and air for starting the engine, after the engine has been started the vaporizer will be kept sufficiently hot by the heat of combustion to render the exterior heating means
10 superfluous.

Some of the advantages arising by connecting the vaporizer directly to the valve-box are as follows: The liability of the formation of
15 carbon within the cylinder is obviated, because of the ignition of the gases within the valve-box, port, and vaporizer. The vaporizer is kept very clean, and the carbon will not be permitted to form on the walls thereof. The
20 air caused to enter the vaporizer during compression will be the last and freshest air that entered the valve-box, thus insuring a more perfect combination with the liquid hydrocarbon injected into the vaporizer. Any forma-
25 tion of loose carbon within the vaporizer or valve-box will either be blown out by the exhaust-gases or the valve-box chamber may be readily cleaned by removing the cover of the valve-box without disturbing any other
30 portion of the engine.

The arrangement hereinabove described also insures the discharge through the exhaust of any possible excess of liquid hydrocarbon at each opening of the exhaust-valve. This
35 is a very important point, as it prevents the liability of the racing of the engine, which has proven a serious source of trouble where an undue amount of liquid hydrocarbon has been permitted to collect within the cylinder
40 or vaporizer.

Another great advantage arising from the arrangement of the parts hereinabove described lies in the cheapness of construction, owing to the small amount of machine-work

required and the ease with which the parts may
45 be assembled.

It is evident that changes might be resorted to in the form, construction, and arrangement of the several parts without departing from the spirit and scope of my invention. Hence
50 I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is—

1. An internal-combustion engine comprising a cylinder, a piston fitted to reciprocate
55 therein, a valve-box in open communication with the cylinder, inlet and exhaust valves for the valve-box, a vaporizer located above the valve-box in position to drain the excess hydrocarbon into the valve-box and not into the
60 cylinder and means for injecting the liquid hydrocarbon into the vaporizer.

2. An internal-combustion engine comprising a cylinder, a piston fitted to reciprocate
65 therein, a valve-box in open communication with the cylinder, inlet and exhaust ports for the valve-box, a vaporizer in open communication with the valve-box and an injector-nozzle located in the valve-box entirely exterior to the vaporizer and arranged to direct the liq-
70 uid hydrocarbon into the vaporizer.

3. An internal-combustion engine comprising a cylinder, a piston fitted to reciprocate therein, a valve-box, inlet and exhaust valves therefor, a removable cover for the valve-box,
75 a vaporizer carried by the cover exterior to the valve-box and in open communication therewith and means for injecting the liquid hydrocarbon into the vaporizer.

In testimony that I claim the foregoing as
80 my invention I have signed my name, in presence of two witnesses, this 19th day of November, 1902.

CHARLES J. EVERETT.

Witnesses:

FREDK. HAYNES,
HENRY THIEME.