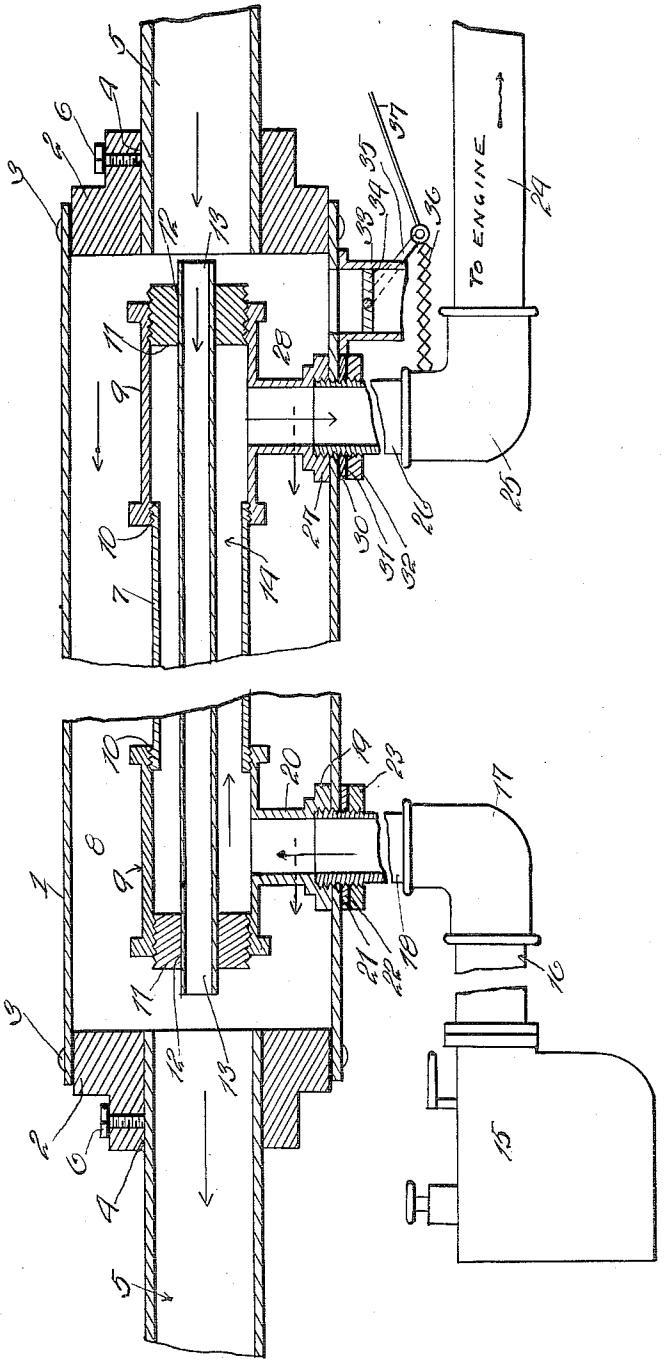
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VAPORIZER FOR INTERNAL COMBUSTION ENGINES.

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1,319,628. Patented Oct. 21, 1919.



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VAPORIZER FOR INTERNAL-COMBUSTION ENGINES.

1,319,628. Specification of Letters Patent. Patented Oct. 21, 1919.

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To all whom it may concern:

Be it known that I, LAWRENCE C. SIMMONS, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Vaporizers for Internal-Combustion Engines, of which the following is a specification.

My invention relates to apparatus for heating the carbureted air passing from the outlet side of a carbureter, to thoroughly vaporize the fine particles of liquid fuel contained therein, prior to the passage of the charge to the cylinder or cylinders of the engine.

An important object of the invention is to provide apparatus of the above mentioned character, which is highly efficient in operation, inexpensive to manufacture, and convenient in use.

A further object of the invention is to provide an apparatus of the above mentioned character, adapted for connection with or in the exhaust pipe of an internal combustion engine, for heating the carbureted air by means of the heated gases of the exhaust, and which apparatus may be constructed in any convenient or desired length.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the drawing forming a part of this specification, the figure is a central vertical longitudinal sectional view through apparatus embodying my invention, parts being shown in elevation.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 1 designates an outer tubular casing, constituting the body portion of the apparatus. Disposed within the opposite ends of the tubular body portion 1 are heads 2, held therein by screws 3 or the like. These heads have openings 4, receiving the ends of sections 5 of the exhaust pipe of the engine. These sections are clamped within the openings 4 by screws 6 or the like. It is thus apparent that the outer tubular casing 1 is connected in series with the exhaust pipe sections 5, and constitute in effect a portion of the exhaust pipe. The exhaust pipe section 5, at the right, leads to the exhaust manifold of the engine, while the exhaust pipe section 5 to the left is connected with the muffler, as is obvious. Disposed concentrically within the outer tubular casing 1 and extending longitudinally thereof is an outer tube 7, having a substantially smaller diameter than the outer tubular casing 1, affording a large space 8 thereabout. The outer tube 7 is in longitudinal alinement with the exhaust pipe sections 5, and has connection with the inner ends of T-couplings 9, as shown at 10. The outer ends of the T-couplings 9 are arranged inwardly of and spaced a slight distance from the heads 2, and receive plugs 11, screw-threaded therein, and having apertures 12 to receive the end portions of an inner tube 13. The tube 13 is preferably brazed within the apertures 12. The ends of the inner tube 13 are open, as shown, and project a slight distance beyond the plugs 11. The inner tube 13 has a substantially smaller diameter than the outer tube 7 and T-couplings 9, and therefore forms a considerable space 14, surrounding the inner tube.

The numeral 15 designates a carbureter of any well known or preferred construction, and this carbureter discharges the carbureted air into a pipe 16, connected with a coupling 17. The coupling 17 is connected with a pipe 18, the end of which is screw-threaded in an enlargement 19 of the lateral extension 20 of the T-coupling 9. The pipe 18 extends through an opening 21 in the tubular outer casing 1 and a packing ring 22 surrounds the pipe 18 at this point and is engaged by a ring 23. The numeral 24 designates a pipe which is connected with the intake manifold of the engine, and this pipe is connected with an elbow 25, connected with a pipe 26. The pipe 26 is screw-threaded within an enlarged end 27 of the lateral extension 28 of the T-coupling 9. The pipe 26 extends through an opening 30 in the outer tubular casing 1, and a packing ring 31 surrounds the pipe 26 at this point and is engaged by a nut 32, screw-threaded upon the pipe 26, as shown. The numeral 33 designates a laterally extending cut-out pipe, leading into the outer tubular casing 1. This pipe is normally closed by a swinging valve or throttle 34, moved by a crank 35. The crank 35 is held in the closed posi-

tion by means of a retractile coil spring 36 and the valve 34 is opened by pulling upon a cable 37 or the like, extending to a point in convenient reach of the operator.

The operation of the apparatus is as follows:

When the engine is operating, the heated exhaust gases pass through the exhaust pipe section 5 to the right and into the outer tubular casing 1. Some of these exhaust gases pass through the casing 1, exteriorly of the outer tube 7, while some pass through the inner tube 13. The heated exhaust gases then pass through the exhaust pipe section 5 to the left and into the muffler. The carbureted air from the carbureter 15 passes through the pipe 16, elbow 17, and pipe 18 into the outer tube 7, thereby entering the space 14. It is obvious that this carbureted air is heated upon the inner and outer sides, to wit, by the heated gases passing through the inner tube 13 and by the heated gases passing through the outer tubular casing 1. A particular advantage is gained by my construction inasmuch as the heating area of the apparatus may be increased at will by simply constructing the tubulr casing 1, the outer tube 7 and the inner tube 13 of greater length. The carbureted air which is thus heated has the particles of liquid fuel therein thoroughly vaporized and the explosive charge passes through the pipe 26, elbow 25 and pipe 24 to the intake manifold of the engine.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In apparatus of the character described, an outer tubular casing, elements arranged within the ends of the outer tubular casing and having openings formed therein, a pipe leading into the opening of one element and receiving the heated exhaust gases from the engine, an outer tube extending longitudinally within the outer tubular casing in alinement with the openings of the elements, an inner tube extending longitudinally within the outer tube and projecting outwardly beyond the closed ends thereof and having both ends open and in alinement with the openings of said elements, means for connecting one end of the outer tube with a carbureter, means for connecting the opposite end of the tube with the intake of the engine, and a valve connected with the outer tubular casing near the intake end of the inner tube and adapted to place the interior of the outer tubular casing in communication with the atmosphere, thereby regulating the volume of heated gases passing through the inner tube.

2. In a device of the type described, a tubular casing having alined openings formed in the side walls thereof, T-couplings mounted within the casing, nipples extending through said alined openings and having threaded engagement with the lateral extensions of said T-coupling, an outer tube having threaded engagement with the inner ends of said T-couplings, plugs closing the outer ends of said T-couplings and provided with a central aperture, a tube arranged within said apertures and secured to said plugs and reducer plugs mounted in the ends of said tubular casing.

In testimony whereof I affix my signature this 8 day of April, 1918.

LAWRENCE C. SIMMONS.