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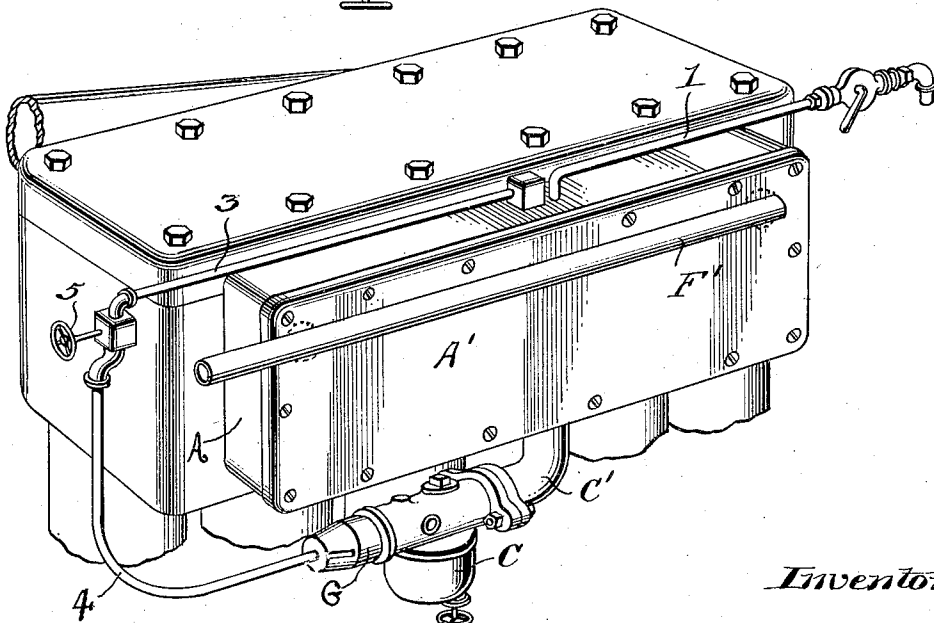
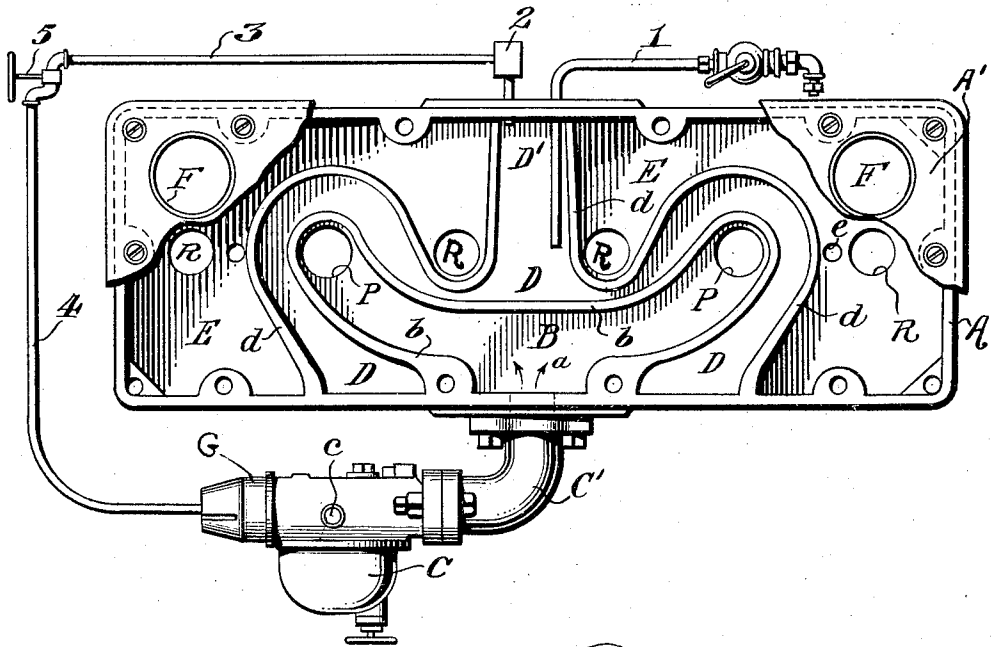
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HUMIDIFYING DEVICE FOR INTERNAL COMBUSTION ENGINES

Filed Dec. 7, 1929

Fig. 1.



Inventor:

Fig. 2.

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UNITED STATES PATENT OFFICE

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HUMIDIFYING DEVICE FOR INTERNAL-COMBUSTION ENGINES

Application filed December 7, 1929. Serial No. 412,559.

My invention relates to combined intake and exhaust manifolds for internal combustion engines, and its primary object is to provide an improved humidifying device therefor, comprising an outer casing divided into a plurality of chambers attached to the engine, one of said chambers comprising an intake manifold; a pair of chambers comprising an exhaust manifold, and a boiler chamber intermediate said chambers to generate steam, as hereinafter more particularly set forth, and stated in the appended claim.

My invention is illustrated by the accompanying drawings in which similar letters and figures of reference indicate like parts. Referring thereto, Fig. 1 is a plan view of my invention with the front side cover cut away for better illustration of the internal mechanism. Fig. 2 is a perspective view of the upper part of an ordinary automobile engine having the manifold case attached thereto for service, and the manifolds indicated by dotted lines. The case sits up against the side of the cylinders of the engine, and as usually constructed, is secured thereto by bolts, and in such relation thereto as to have its ports register with the ordinary ports which lead into the cylinders, and need no further description.

In the drawings A, represents the case of my device, its walls being about two inches high. It is constructed so as to be air and water tight, and has a removable front cover A' parts of which are shown in Fig. 1, solidly secured on the case by screws or bolts threaded into the same.

The case is divided into three compartments or chambers by thin partitions *b* and *d* which are curved so as to form an intake manifold B and a pair of exhaust manifolds E, E, and an intervening boiler chamber D, substantially as shown in Fig. 1.

The intake manifold B has two ports P, P, opposite each other, each port answering for two cylinders of the engine, which need not be shown, being well understood, and the thin wall *b* of the manifold bends around the ports, respectively; and its opposite ends unite with the case wall, the latter being perforated with an orifice between said ends to

admit the fuel mixtures from the carbureter C thru the elbow pipe joint C', into the intake manifold, as indicated by the arrow *a*.

The exhaust manifolds E, E, are each provided with a pair of ports R, R, which register with and lead from the exhaust pipes of the respective engine cylinders to the exhaust chambers aforesaid; and the exhaust gases pass therefrom thru the two larger ports F, F, and escape thru the outer exhaust pipe F' in the usual way of escape.

The said exhaust chambers E, E, are thus heated from the exhaust of the engine, and the thin walls *d*, *d*, of the exhaust manifolds convey the heat by radiation into the enveloped boiler chamber D, their ends uniting with the case walls.

The boiler chamber D being thus located between the walls *b* and *d* of the intake and exhaust manifolds, respectively, is comparatively long and narrow and winding around the intake manifold B, which is almost completely surrounded, as aforesaid, is thereby kept constantly heated to a high temperature, particularly in the space between the exhaust manifolds.

Hot water is supplied to the boiler chamber thru the control pipe 1, which leads from the usual water jacket of the engine (not shown), and keeps the boiler chamber nearly filled.

Steam arising therein presses into the boiler dome D', and when admitted by the valve feed 5 at the instrument board of the automobile, as usually constructed, it passes thru the steam pipes 2, 3 and 4 to the air intake G of the carbureter C and therein is mixed with the fuel gas which enters thru the port *c*, converting the latter into a moist vapor mixture, and so passes from the carbureter into the explosive chambers of the respective engine cylinders thru the ports P, P, in the usual manner of supplying gas thereto.

Such steam being a well known decarbonizer, diminishes the accumulation of carbon substances in the engine cylinders, tending to keep the same clean and frictionless.

The contour of the several partitions within the case, may be modified, if desired, without disturbing the arrangement of the sev-

eral chambers, and the supply pipes may be located to suit the particular engine and automobile body, and my claims are not limited to mere form, but what I claim is—

5 In an internal combustion engine, humidifying device comprising an outer casing divided into a plurality of chambers, and attached to an engine, one of said chambers constituting an intake manifold located at the
10 interior of said outer casing and enclosed by thin walls, a pair of ports, one at each end of said chamber leading inwardly, a pair of chambers of similar structure constituting an exhaust manifold—and a boiler chamber
15 intermediate said pair, and means for conveying hot water from the water jacket of the engine to said boiler chamber.

In witness whereof, I hereunto set my hand this 6th day of December, 1929.

20 JOHN S. FUNALMAN.

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