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H. T. THOMAS

CHARGE FORMING DEVICE FOR INTERNAL COMBUSTION ENGINES

Original Filed June 22, 1920

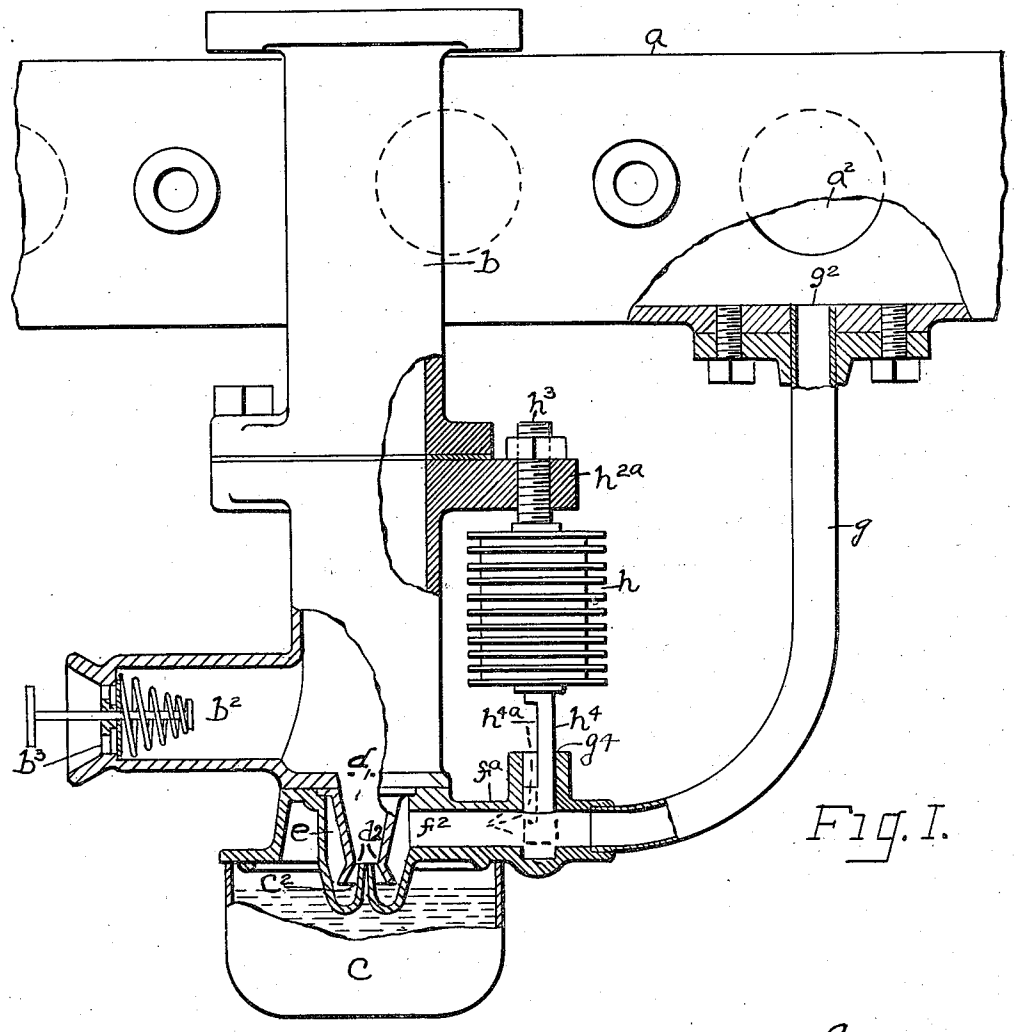


Fig. 1.

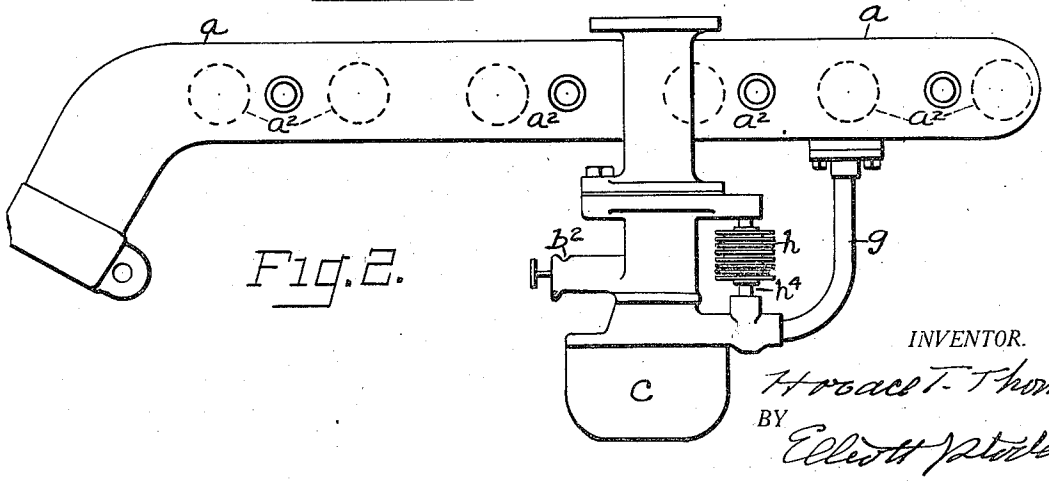


Fig. 2.

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CHARGE-FORMING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

Original application filed June 22, 1920, Serial No. 390,762. Divided and this application filed December 27, 1924. Serial No. 758,476.

My invention relates to a charge-forming device for an internal combustion engine and an object of my improvements is to provide for more complete vaporization of the fuel and uniformity of the mixture. This application is a division of application No. 390,762, filed June 22, 1920. In the accompanying drawing:—

Figure 1, is an elevation partly in section of an apparatus embodying my invention and so much of an internal combustion engine as is necessary to illustrate its connection therewith.

Fig. 2, is an elevation of a complete manifold of an internal combustion engine, the intake pipe and an apparatus embodying my invention connected therewith.

a, indicates the exhaust manifold and *b* the intake pipe or passage. *c*, is a carburetor construction located at, and closing the lower, or entrance end of the passage *b*. *e*, is a chamber formed in the carburetor *c*, having its upper end open, except as hereinafter described, and its lower end closed, except for the spraying jet nozzle, c^2, which opens from the body, or reservoir, of the carburetor *c*, into the chamber *e*.

d, is a tube provided with a circular flange at its upper end, contracted at d^2 near its lower end and from thence gradually expanding to the chamber *e*. The tube *d* gradually expands upwardly from the contraction, d^2, to its open upper end. The nozzle, c^2, has its open, or delivery end, at the center of the contracted part, d^2, of the tube *d*. Thus, the tube *d* forms a Venturi tube closing the upper end of the chamber *e*, and forming the delivery passage from said chamber to the interior of the passage *d*.

h, is an expansible thermostatic chamber adjustably secured to a stationary lug, h^{2a}, by a screw-threaded shank, h^3, and provided with a slide rod, or valve, h^4, fitting and adapted to reciprocate in a lateral passage, g^4, in the tube, or passage, *g*.

f^a, is a passage, the outer end of which fits tight against the end of the passage, *g*. The slidable rod, h^4, is cut away at its side at h^{4a}, so that when it is first actuated, it tends to close the passageway through *g*, and when further actuated, provides a passage through the cut-away portion, h^{4a}, from the outer air to supply an auxiliary quantity of air, as indicated by the broken line arrow in Figure 1.

b^2, is a passageway extending laterally from the passage *b*, and having an automatic inwardly opening valve, b^3, at its outer end. If sufficient gaseous material is not supplied from the chamber *e*, and through the opening, f^2, the valve, b^3, is drawn from its seat by the suction of the engine, and the required quantity of atmospheric air is drawn from the passage, b^2.

I have placed the thermostatic chamber *h* beside of, and close to, the passage *b*, so that its temperature shall closely correspond to the temperature of the passage *b*. Of course, the thermostatic chamber *h* may be located at another place.

The operation of the above described apparatus is as follows:—

When the engine starts in operation, the air and exhaust gases are drawn from the manifold *a* through the passage, *g*, into the lateral passage, f^2, and through the latter into the chamber, *e*, from whence they pass through the tube, *d*, spraying and vaporizing the liquid fuel delivered from the nozzle, c^2, the heat of said gases assisting the vaporization of the sprayed liquid fuel. The hot exhaust gases very completely vaporize the liquid fuel and the incoming air, by the passage, b^2, readily absorbs such completely vaporized fuel into its mass.

The intake passage is connected with the exhaust passage so that a considerable amount of the first charges supplied to the engine shall be drawn from said exhaust passage, that is to say, the intake is at first connected to the exhaust passage by a substantially closed conduit, and after the engine is started, the passage, *g*, is gradually closed and the passage, f^2, connected with the outer air.

What I claim is:—

1. In a charge-forming device for internal combustion engines, the combination of an intake passage, means for delivering liquid fuel in said passage, an exhaust passage, said intake passage being extended to communicate by a substantially closed passage with said exhaust passage upon the side of the delivery point for fuel remote from the engine, and thermostatically-controlled means for admitting air to said closed passage.

2. In a charge-forming device for internal

combustion engines, the combination of an intake passage, means for delivering liquid fuel in said passage, an exhaust passage, said intake passage being extended to communicate by a substantially closed passage with said exhaust passage upon the side of the delivery point for fuel remote from the engine, and thermostatically-controlled means for admitting air to said closed passage, said thermostatically-controlled means being so located that its temperature shall correspond to that of the intake passage to the engine.

In testimony whereof, I sign this specification.

HORACE T. THOMAS.