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W. G. MARSH

AUXILIARY AIR CONTROL FOR GASOLINE ENGINES

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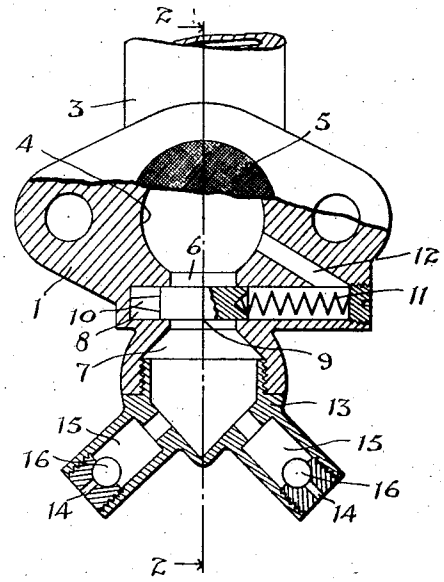


Fig. 1.

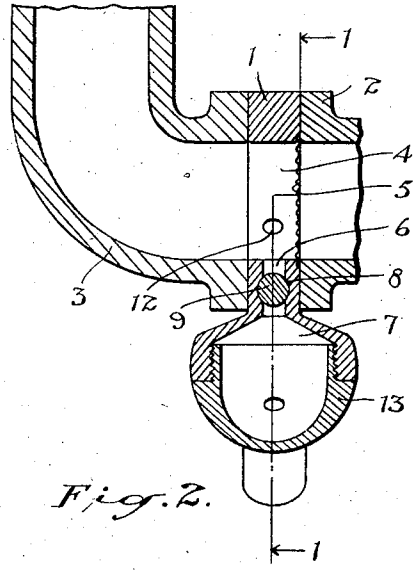
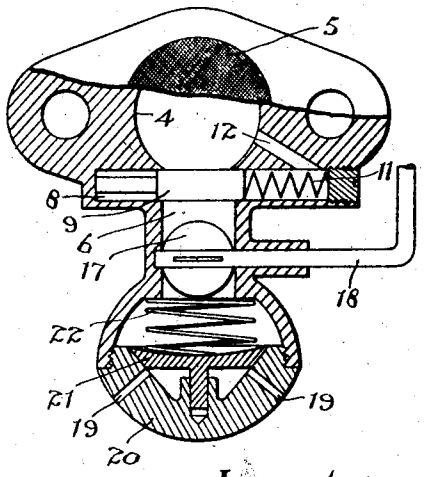


Fig. 2.

Fig. 3.



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AUXILIARY AIR CONTROL FOR GASOLINE ENGINES.

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The principal objects of the invention are, to effect economy in the consumption of fuel in the operation of motor cars, thereby increasing the mileage per gallon and further to eliminate operating difficulties incident to improper carburetion of the air taken into the engine.

The principal feature of the invention consists in the novel construction and arrangement of an auxiliary air inlet to the intake manifold of an engine, whereby the volume of auxiliary air is automatically controlled by the speed of the engine.

In the drawings, Figure 1 is a vertical sectional view through the line 1—1 of Figure 2.

Figure 2 is a vertical sectional view through the line 2—2 of Figure 1, showing the arrangement of the device between the carburetor and the manifold.

Figure 3 is a view similar to Figure 1 of a modified structure.

Numerous forms of means for introducing auxiliary air into the manifold of motor car engines have been proposed but the principal difficulty has been the lack of control and this invention proposes to control the air in such a manner that it will be added in direct proportion to the engine speed.

In the form of the device shown in Figures 1 and 2 a block 1 shaped to fit between the flange 2 of the carburetor and the flange of the intake manifold 3 is provided with a transverse opening 4 corresponding with the passage of the carburetor and manifold and it is preferably covered by a fine wire mesh screen 5.

A laterally extending passage 6 leading from the opening 4 enters an enlargement 7 of the block and this passage is intersected by a cylindrical chamber 8 traversing the passage 6 longitudinally and extending beyond the ends thereof and it is wider than the passage 6.

Within the chamber 8 is slidably mounted a piston 9 which is provided with a reduced extension 10 at one end which holds the piston in position to completely close the passage 6 as illustrated in Figure 1.

A coil spring 11 is arranged in the chamber 8 to hold the piston in its closed position.

A passage 12 leads from the opening 4 in the block 1 to the outward end of the chamber 8. The suction of the engine drawing through the passage 12 and chamber 8 pulls upon the piston against the pressure of the spring 11 and draws it longitudinally of the chamber to open the passage 6.

The enlarged end 7 of the block 1 has threaded in it a block 13 provided with a pair of openings 14 which lead to the valve chamber 15 in which are arranged the ball check valves 16.

Upon the piston 9 being drawn to open the passage 6 air is immediately drawn in past the check valves through the openings 14 and through the passage 6 to mingle with the carbureted air flowing from the carburetor.

It will be of course understood that when the engine is operated at slow speed the suction will not be sufficient to move the piston 9 but as the engine speed increases the suction will increase and will draw the piston backwardly to open the passage 6 with an increasing area as the speed accelerates.

In the form illustrated in Figure 3 the passage 6 is enlarged to a circular cross section below the piston 9 and a butterfly valve 17 is arranged therein having the stem 18 extending outwardly from the block and adapted to be manually controlled.

The air inlet passages 19 in the block 20 are controlled by a disc valve 21 which is held to its seat by a spiral spring 22.

An engine fitted with an auxiliary air control such as herein described obtains the maximum quantity of oxygen mixed with the atomized fuel that the speed of the engine will sustain. The consequence is that the engine develops the maximum power for the minimum applied fuel and as practically complete combustion results the formation of carbon in the cylinders is obviated.

The device is extremely simple and it can be very readily inserted between the carburetor and the intake manifold without interfering with or altering the construction of any of the standard apparatus.

What I claim as my invention is:—

1. An auxiliary air control for gasoline engines, comprising a block adapted to be inserted between the carburetor and intake manifold of an engine and having a transverse passage therethrough extending between the carburetor and intake manifold, a passage extending outwardly from said transverse passage and communicating with the atmosphere, a cylindrical passage in said block intersecting said outwardly extending

passage and being closed to atmosphere at each end, a piston in said cylindrical passage, a spring in said cylindrical passage pressing said piston to normally close said outwardly extending passage, and a suction passage connecting one end of said cylindrical passage with said transverse passage to effect the movement of said piston against said spring pressure to open said outwardly extending passage.

2. An auxiliary air control for gasoline engines, comprising a flat block adapted to be inserted between the intake manifold and the carburetor and having an opening corresponding with the manifold opening, a passage extending laterally from said opening to atmosphere, a cylindrical passage intersecting said lateral passage, a direct passage connecting one end of said cylindrical passage with the manifold opening in said block, a piston slidably arranged in said cylindrical chamber and yieldingly sealing said lateral passage connected with the manifold and adapted to regulate the area of opening of said lateral passage in proportion to the speed of the engine, and a coiled compression spring arranged in said cylindrical passage in the end having the direct connection with the manifold opening and engaging the inward end of the piston.

3. An auxiliary air control for gasoline engines, comprising a block adapted to be inserted between the carburetor and intake manifold and having a transverse opening therethrough, a passage leading laterally from said opening, a valve chamber extending transversely of said passage, a suction passage in said block closed to atmosphere and extending between said transverse opening and said lateral passage, a spring actuated slide valve operable in said chamber and adapted to be moved in one direction by the suction of the engine, spring means for moving said valve in the opposite direction, and a manually operated valve in said passage arranged between said intersecting valve chamber and the atmosphere.

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