March 31, 1931. A. J. DE SOUSA 1,798,727

FUEL SAVER FOR INTERNAL COMBUSTION ENGINES

Filed Nov. 14, 1929

Fig. 1.

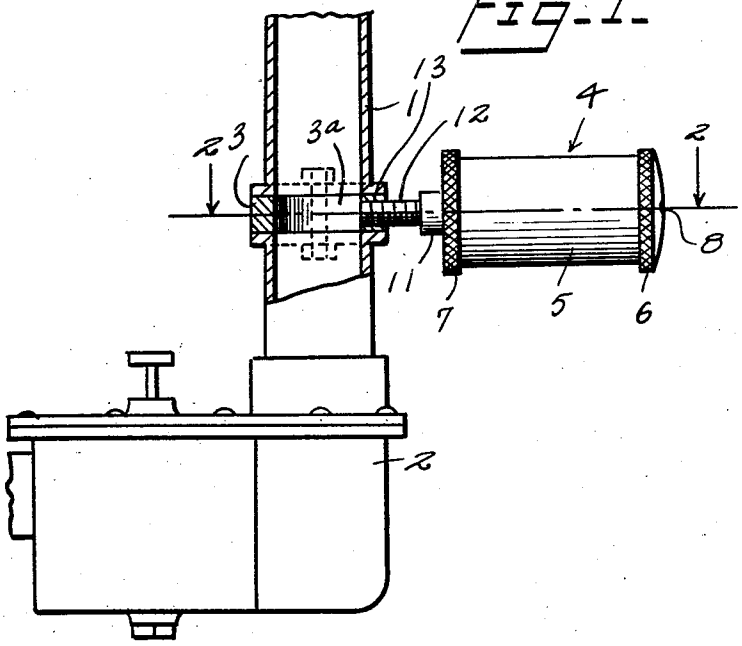


Fig. 2.

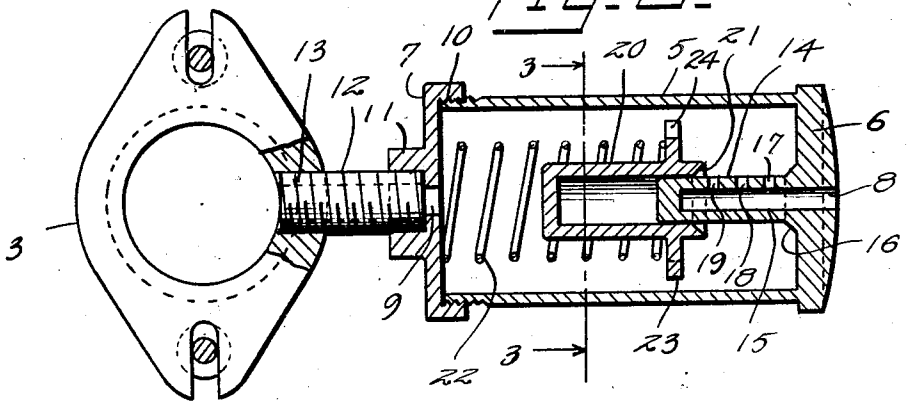
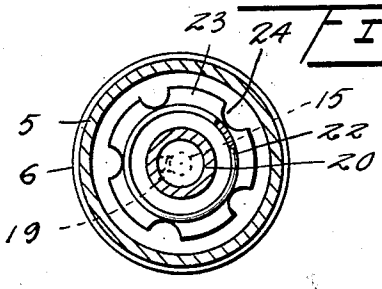


Fig. 3.



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UNITED STATES PATENT OFFICE

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FUEL SAVER FOR INTERNAL-COMBUSTION ENGINES

Application filed November 14, 1929. Serial No. 407,182.

This invention relates to a fuel saver for internal combustion engines and has for one of its objects to provide a novel device of this character which shall be especially adapted for use in connection with the internal combustion engine of an automobile and which, in order to effect a saving in fuel, shall be adapted, after the engine has been started, to admit air to the intake manifold of the engine at a point beyond the carbureter and throttle valve.

The invention has for a further object to provide a device of the character stated which shall be adapted, when the engine is operating at maximum speed for any opened position of the throttle valve, to admit a predetermined amount of air to the intake manifold and to decrease the amount of air admitted to the manifold as the speed of the engine decreases from any cause other than the changing of the position of the throttle valve.

The invention has for a further object to provide a device of the character stated which shall be simple, durable and highly efficient, which shall be capable of being manufactured and sold at a comparatively low cost, and which shall be adapted to be readily connected to the intake manifold.

With the foregoing and other objects in view, the nature of which will appear as the description proceeds, the invention consists in the construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawing, wherein:—

Figure 1 is a view partly in vertical section and partly in side elevation illustrating the manner in which the fuel saver is adapted to be connected to the intake manifold of an engine;

Figure 2 is a sectional view taken on the plane indicated by the line 2—2 of Figure 1, and

Figure 3 is a sectional view taken on the plane indicated by the line 3—3 of Figure 2.

Referring in detail to the drawing, 1 designates a fragmentary portion of the intake manifold, and 2 the carbureter of an internal combustion engine. 3 designates a gasket arranged in the manifold 1 between the throttle valve, not shown, and the engine and 4 designates the fuel saver which is carried by the gasket.

The fuel saver 4 comprises a cylindrical casing 5 having a fixed head 6 and a removable head 7. The head 6 is provided at the center thereof with an air inlet port 8, and the head 7 is provided at the center thereof with an air outlet port 9. The head 7 is screw threadedly engaged, as at 10, with the casing 5, and it is provided with a hollow boss 11 which surrounds the outlet port 9 and is internally screw threaded. A nipple 12 engaged with the boss 11, and engaged with the gasket 3, as at 13, connects the casing 5 to the gasket and establishes communication between the outlet port 9 and the opening 3^a of the gasket.

A stem 14 extends axially into the casing 5 from the head 6, and it is preferably formed integrally with the head. The stem 14 is provided with a passage 15 which extends longitudinally thereof, is closed at its inner end, and communicates at its outer end with the inlet port 8. The stem 14 is provided at its outer end with a conical valve seat 16, and it is provided inwardly beyond the valve seat with longitudinally spaced and radially disposed air jet ports 17, 18 and 19 which establish communication between the passage 15 and the interior of the casing 5.

A hollow cylindrical valve 20, which is closed at its inner and open at its outer end, is slidably mounted upon the stem 14 for movement toward and away from the seats 16 to effect the covering and uncovering of the jet ports 17—19. The outer end 21 of the valve 20 is of conical formation in order to permit it, when the valve is in fully closed position, to fully contact with the seat 16 and thus prevent the escape of air past the valve.

The valve 20 is constantly urged in the direction of its seat 16 by a light coil spring 22 which is arranged between the head 7 and an annular flange 23 formed on the valve near the outer end of the latter. The flange 23 is provided with notches 24 in order to reduce the area of the flange to the minimum and

thus insure the free passage of air through the casing 5.

In practice, when the engine is operating at maximum speed under a given load for any opened position of the throttle valve, the valve 20 of the fuel saver is in a position to uncover one or more of the ports 17 to 19. When the speed of the engine decreases without any change in the position of the throttle valve, which decrease in speed will take place as the result of an increase in the load brought about by the automobile ascending a grade, the valve 20 moves in a direction to close one or more of the ports 17 to 19.

The air entering the intake manifold through the uncovered port or ports of the fuel saver 1 will reduce the suction in the carbureter 2, and will mingle with the vaporized fuel delivered by the carbureter to the manifold, with the result that the consumption of the fuel is reduced and the fuel used is rendered more combustible.

It should be understood from the foregoing description, taken in connection with the accompanying drawing, that the device will function automatically to provide a lean mixture when the engine is operating at maximum speed for any opened position of the throttle valve, that it will function automatically to increase the richness of the mixture as the speed of the engine decreases from a cause other than the altering of the position of the throttle valve, and that as the result, a material saving in fuel is effected. It will be also understood that the device may be connected to the intake manifold of an engine as shown or in any other suitable manner, and that, in addition to saving fuel, it prevents the formation of carbon in the engine cylinders and causes the engine to operate smoothly and quietly.

While I have described the principle of the invention, together with the device which I now consider the preferred embodiment thereof, it is to be understood that the device shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the invention as claimed.

I claim:—

1. A fuel saver adapted to be connected to the intake manifold of an internal combustion engine, comprising a casing having an inlet port open to the atmosphere and an outlet port communicating with the manifold, a stem extending longitudinally of the casing and provided with a longitudinal passage closed at one end and communicating at its other end with the inlet port, the stem being provided with a series of longitudinally spaced and radially arranged air jet ports communicating with the interior of the casing and said passage, a valve closing the air jet ports and slidable on the stem for movement by engine suction to successively uncover said ports, and a spring constantly tending to close the valve.

2. A fuel saver adapted to be connected to the intake manifold of an internal combustion engine, comprising a casing having a head provided with an inlet port open to the atmosphere and a head having an outlet port communicating with the manifold, a stem carried by said first head and extending therefrom into the casing, the head being provided with a longitudinal passage closed at its inner end and open at its outer end and communicating at said last end with the inlet port, the stem being provided with a series of longitudinally spaced and radially arranged air jet ports communicating with the casing and said passage, a conical valve seat at the outer end of the stem, a cylindrical valve slidably mounted upon the stem and closed at its inner end, the valve having a conical outer end adapted when the valve is in closed position to contact with said seat, the valve being adapted when in said position to cover the air jet ports and adapted to be moved from said position by engine suction to successively uncover said ports, and a spring constantly tending to close the valve.

3. A fuel saver adapted to be connected to the intake manifold of an internal combustion engine, comprising a casing having a head provided with an inlet port open to the atmosphere and a head having an outlet port communicating with the manifold, a stem carried by said first head and extending therefrom into the casing, the head being provided with a longitudinal passage closed at its inner end and open at its outer end and communicating at said last end with the inlet port, the stem being provided with a series of longitudinally spaced and radially arranged air jet ports communicating with the casing and said passage, a conical valve seat at the outer end of the stem, a cylindrical valve slidably mounted upon the stem and closed at its inner end, the valve having a conical outer end adapted when the valve is in closed position to contact with said seat, the valve being adapted when in said position to cover the air jet ports and adapted to be moved from said position by engine suction to successively uncover said ports, an annular flange formed on the valve near its outer end and provided with peripheral notches, and a coil spring positioned between said second head and flange and adapted to constantly urge the valve into closed position.

In testimony whereof I hereunto affix my signature.

ANTONIO J. DE SOUSA.