Oct. 30, 1928. 1,689,280

I. J. FANSLER, SR

FUEL ECONOMIZER AND AIR INLET VALVE FOR INTERNAL COMBUSTION ENGINES

Filed June 7, 1926

Fig. 1.

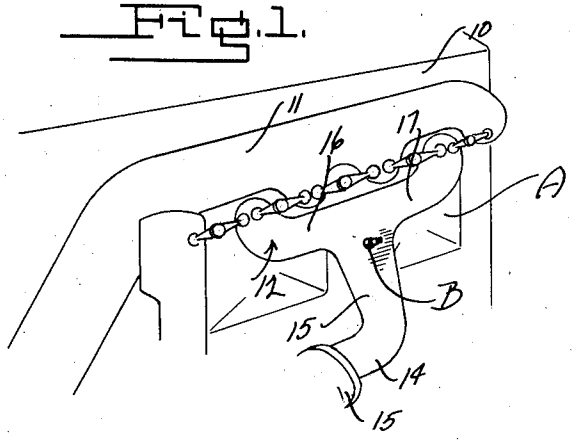


Fig. 2.

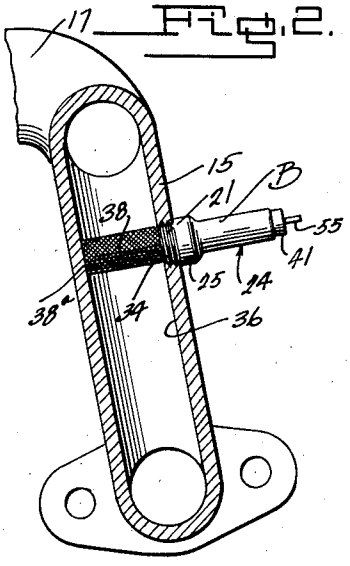


Fig. 3.

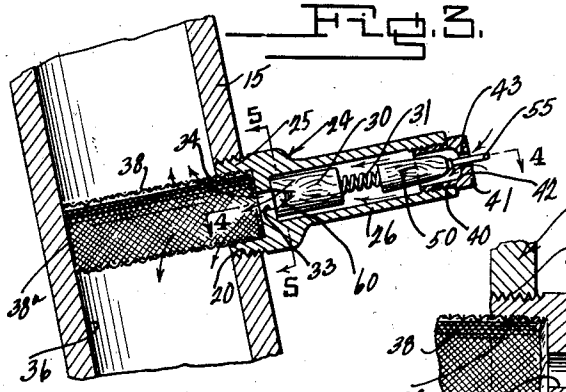


Fig. 4.

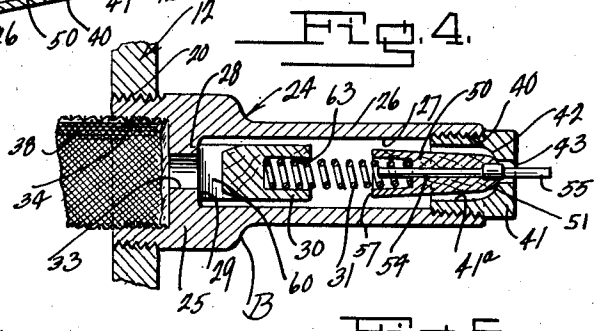


Fig. 6.

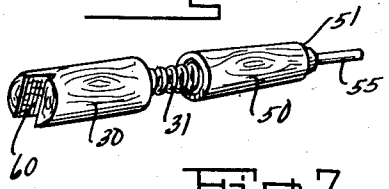


Fig. 5.

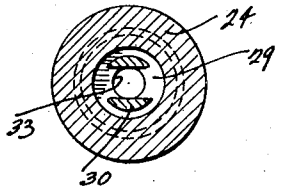
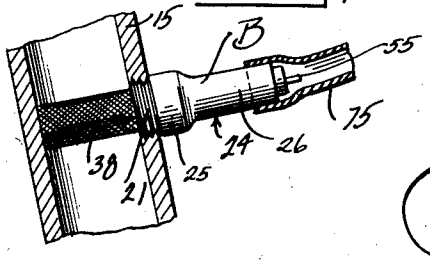


Fig. 7.



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UNITED STATES PATENT OFFICE.

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FUEL ECONOMIZER AND AIR-INLET VALVE FOR INTERNAL-COMBUSTION ENGINES.

Application filed June 7, 1926. Serial No. 114,359.

This invention relates to improvements in means for economizing in the use of fuel for internal combustion engine operation.

The primary object of this invention is the provision of an improved device adapted to automatically supply a quantity of air to the cylinders of an internal combustion engine, during operation, the improved device being placed to feed the air to the fuel charge immediately prior to the forking of the fuel charge to the various cylinders of the engine, and by means of which the maximum efficient amount of air may be fed to the fuel charge, to economically operate the internal combustion engine for obtaining the greatest mileage per gallon of fuel used.

A further object of the invention is the provision of an improved air inlet valve construction adapted to be placed in the intake manifold of internal combustion engines, for automatic operation by engine suction within the intake manifold, to efficiently supply air to the fuel charge, and by means of which the engine may be maintained in efficient operating condition, substantially free of carbon, and obviating the necessity of to frequent cleanings of the spark plugs and grinding of the valves.

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

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a perspective view of an internal combustion engine, showing the position in which the improved fuel economizer or air inlet valve is placed with respect to the intake manifold.

Figure 2 is a vertical sectional view taken thru the intake manifold at the portion thereof between the carburetor and the place where the same forks into the cylinders, showing the preferred positioning of the improved air supply valve.

Figure 3 is an enlarged sectional view showing the details of the engine operated air inlet valve.

Figures 4 and 5 are sectional views taken substantially on their respective lines in Figure 3 of the drawings.

Figure 6 is a perspective view of a novel type of valve member and spring seat therefor.

Figure 7 is a sectional view showing the manner in which the improved air inlet valve may be connected with a hose, for the purpose of forcing a cleansing liquid, such as kerosene into the cylinders of the engine, to maintain them in an efficient operating condition.

In the drawing, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate the internal combustion engine, with which the improved air inlet valve means B is used to insure efficient engine operation.

The internal combustion engine A includes the conventional cylinder housing 10, having an exhaust manifold 11, and the intake manifold 12, the latter including the lower portion 14 which is connected to a carburetor 15 in the usual manner, and from which the intake manifold 14 leads upwardly in the usual vertical portion 15, and forks horizontally at 16 and 17 into the cylinders of the engine. This intake manifold construction may of course be departed from, but it is the preferred and conventional construction, and the improved automatically operated air inlet or valve supply means B is placed in the intake manifold 12, preferably in the vertical tubular portion 15, immediately adjacent the juncture of the portions 16 and 17 which fork toward the cylinders, so that the air in automatically regulated quantities, according to engine speed, will be fed into the fuel charge immediately prior to the time when the fuel charge enters the fork passageways leading to the various cylinders. This insures the efficient admixture of the air and the fuel charge from the carburetor, and in contradistinction to many types of auxiliary air supply valves, which feed the air into the fuel charge immediately after it has left the carburetor, and before the charge is ready to receive the air in efficient proportions.

Referring to the improved air inlet valve construction B, it is preferred to tap the intake manifold 12, and provide a screw threaded opening 20 adapted to detachably receive the hollow cylindrical threaded base 25 of a preferably brass supporting casing or plug 24. The plug 24 includes the base 25 and a reduced sleeve 26 integral therewith, providing a compartment 27 therein, for receiving details of the valve mechanism B to be subsequently described. Within the plug 24, preferably in the enlarged base portion 25, an annular flange 28 is provided, defining

a supporting shoulder 29 for the inner end of the compartment 27, upon which a spring seat 30 rests, for supporting a preferably brass spring 31. Thru the flange 28 a reduced opening 33 is provided, inletting into the enlarged recess 34 in the base end 21 of the plug 24, and in this recess 34 the outer end of a substantially cylindrical shaped gauze screen 38 as soldered.

The plug 24 is of course adapted to be screw threaded at its base 25 in the screw threaded opening 20, and the cylindrical shaped member 38, of fine mesh screen, is securely affixed, as by soldering in the recess 34, as above mentioned, and it extends beyond the plug 24, and is adapted to be inserted into the passageway 36 thru the intake manifold portion 15, until the innermost end 38[a] thereof abuts against the wall of the passageway 36 diametrically opposed to the screw threaded opening 20, for closing the end of the sleeve screen 38 at the end opposite to that end which communicates with the port 33.

The valve receiving sleeve portion 26 at its outer end is internally screw threaded at 40, for detachably receiving a hollow brass nut 41, which is provided with an inner enlarged passageway 41[a], converging to provide an arcuated or tapered seat 42, the nut 41 having a reduced port 43 extending from the seat 42 to communicate with the atmosphere exteriorly of the intake manifold.

An elongated reciprocating valve member 50 is provided, preferably being formed of wood, having a forward arcuated end 51 adapted to be urged by the spring 31 into engagement with the seat 42 to close the port 43 of the nut 41. This valve 50 as above mentioned is elongated, and axially therein is a metal pin 54, which extends outwardly at 55 beyond the seat end 51 of the valve, and is adapted to project in a valve member guiding relation thru the port 43; the diameter of the pin 55 being considerably less than the diameter of the port 43, to permit of the inlet of air thru the port 43 when the valve is off its seat, with the pin 55 still sliding in the port 43. The valve member 50 inwardly from the inner end thereof is recessed at 57 for a short distance, to receive the outer end of the brass spring 31, which is held in a centered relation by the inner end of the pin 54 which projects into said recess end 57.

The seat member 30 is of novel construction, preferably being formed of hard wood, the same as the valve member 50, and being free to reciprocate in the compartment 27 of the valve casing if necessary. The same at its innermost end is provided with a substantially V-shaped slot 60 extending diametrically thereacross from side to side, adapted to straddle the port 33, so that when the spring 31 urges the valve seating member 30 against the shoulder 29, the compartment 27 will always be open to the port 33 and the inside of the intake manifold passageway, thru the port 33, and the port 33 can never be closed by the seated positioning of the valve seat member 30. At its opposite end from the V-shaped slot 60, the hard wood seat member 30 is provided with a recess 63, adapted to receive the inner end of the spring 31.

From the foregoing description it is believed the operation of the improved air inlet device will be obvious. During the operation of the internal combustion engine, the suction in the intake manifold will automatically cause the valve 50 to open against the normal compression action of the spring 31, in order to draw air thru the port 43 into the chamber 27, and thence thru the port 33 thru the screen 38 into the fuel charge just prior to the time when the same forks into the various cylinders, and this inlet of fresh air from the outside is proportionate to the speed at which the engine is operated, since the valve is automatically operated by engine suction, as is readily apparent. If it is desired to speed the engine it is merely necessary to press upon the projecting end of the pin 55, to open the valve, and the supply of air will be increased, which will permit the engine to speed.

Actual use of the improved air inlet and fuel economizing device has demonstrated that in using a conventional automotive vehicle internal combusion engine, the vehicle may be propelled for thirty-five miles per gallon of conventional fuel used.

At periodic intervals, in order to insure the efficient cleaning and operation of the engine, a hose or tube 75 may be connected to the air inlet end of the casing 24, for the purpose of pumping a quantity of kerosene or the like into the cylinders of the engine, to cleanse the same of any carbon deposits. The use of the improved air inlet valve has demonstrated that in addition to being economical in the use of fuel, the same maintains the engine in an efficient operating condition substantially free of carbon, and requires less frequent cleaning of the spark plugs and grinding of the valves.

Various changes in the shape, size, and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the same or the scope of the claims.

I claim:

1. In an air inlet valve construction for supplying air to fuel charges of internal combustion engines the combination of an elongated supporting casing having a compartment therein, means in one end of said casing providing a reduced port communicating with the compartment and providing a shoulder facing into the compartment, means in the opposite end of the casing providing a reduced inlet port and a valve seat facing into the compartment, an elongated reciprocating valve for said valve seat, a member

mounted in said compartment for seating on the shoulder at one end of the compartment, and spring means between said member and the valve for forcing the same in opposite directions to seat the valve in closing relation over said port, the member at the opposite end of the compartment from said valve having a transverse slot straddling the port in the adjacent end of said compartment to prevent closing of said port to said compartment.

2. As an article of manufacture an air inlet valve for internal combustion engines comprising a casing having an elongated compartment therein, means in one end of the casing providing an annular shoulder and an exit port, means in the opposite end of the casing providing a detachable valve seat facing the compartment and a reduced inlet port, a reciprocating valve member in the compartment, a movable seat member in the compartment at the opposite end from said valve, and spring means carried in the seat member between the valve and seat member normally forcing the seat member into engagement with the annular shoulder above mentioned and forcing the valve into engagement with the valve seat to close the port, said spring seat member having a transverse opening therein straddling the exit port to prevent the closing of the exit port to said compartment.

3. As an article of manufacture a valve construction for the intake manifolds of internal combustion engines comprising an elongated casing having an elongated compartment therein providing an annular flange at one end of the compartment which provides an annular shoulder facing said end of the compartment and provides an exit port, a detachable cap at the other end of said casing for said compartment providing an annular seat facing the compartment and a substantially central air inlet port, an elongated hard wood valve member having an extension adapted to slidably extend thru the air inlet port in such relation that the valve member may be seated against the valve seat to close said air inlet port, a spring, a spring seat member in the end of the compartment adjacent the exit port, the spring seat member having a transversely extended slot at the end thereof facing the exit port and adapted to straddle the exit port to prevent closing of the exit port to said compartment, the spring seat in transverse dimension being less than the dimension of the compartment, and the valve and spring seat having facing sockets within which the ends of the spring under compression may seat to force the spring seat in one direction against the annular shoulder about the inlet port and force the valve into valve seating engagement with the valve seat to close the air inlet port.

4. As an article of manufacture an air inlet valve for internal combustion engines comprising an elongated tubular casing having an elongated compartment therein, said casing at one end having an annular flange extending into the compartment to provide a reduced exit port, the opposite end of the casing being internally screw threaded, a detachable cap in said screw threaded opening having a reduced inlet port to the compartment, a valve for cooperation on the cap at the reduced inlet port within the compartment, a bifurcated seat member mounted on the annular flange in the compartment in straddling relation with the exit port, said seat member at the end thereof facing the valve member having a socket therein, and a spring seated in said socket and engage the valve to force the latter to close the air inlet opening.

5. As an article of manufacture an air inlet valve for internal combustion engines comprising a tubular casing having a compartment provided at one end with a reduced exit port and at the opposite end having a detachable cap provided with a reduced inlet port, an elongated valve slidable in said compartment having a rod projecting beyond one end thereof for sliding in the air inlet opening to guide movement of the valve, said valve at the opposite end thereof having a recessed socket into which said rod partially extends, a spider member in the compartment at the end adjacent the exit port, and a spring seated on said spider member and at its opposite end seated in the socket of said valve to urge the latter into a closing engagement against the air inlet port.

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