

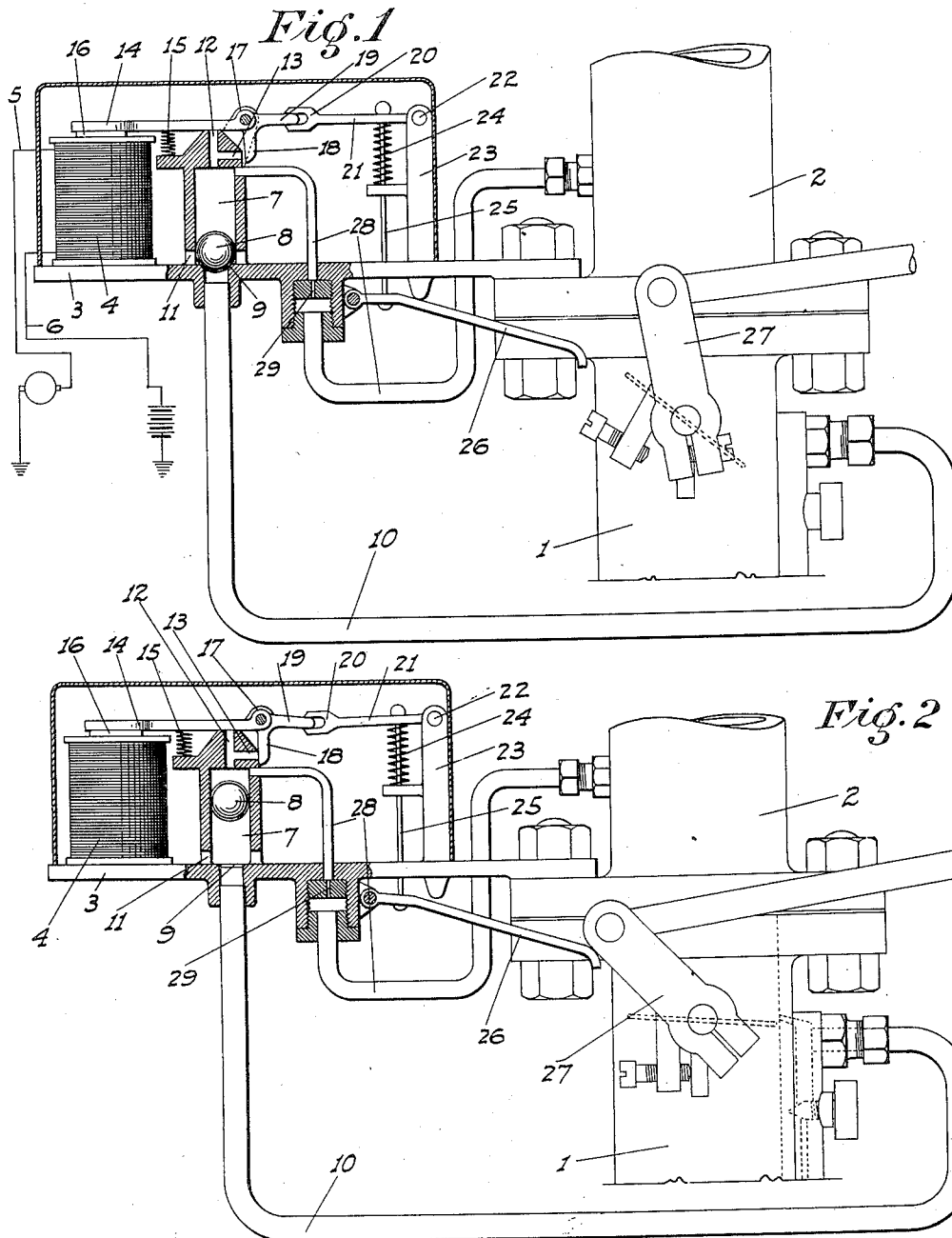
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FUEL CONTROL ATTACHMENT FOR CARBURETORS

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FUEL-CONTROL ATTACHMENT FOR CARBURETORS.

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This invention relates to the internal combustion engine art and particularly to an automatic dilution device or apparatus for cooperation with the carburetor of the engine to prevent the passing of fuel into the motor of an internal combustion engine on a motor vehicle, while the vehicle is in motion when the throttle is closed, but at the same time allowing fuel to reach the motor for idling the same if the vehicle is de-clutched or if the speed of the vehicle drops below a predetermined mileage per hour. It is well known to those skilled in the art that when a motor vehicle is suddenly decelerated and coasts under compression for a considerable distance, as for instance when driving through traffic or coasting down grades, the action of the motor draws in a considerable amount of raw fuel through the carburetor and into the cylinders of the motor. This results in consumption of fuel which is of no value in the operation of the motor, and also tends to work down the piston walls between the pistons and such walls and wash off the lubricant thereon, with the consequent possibility of scoring of the cylinders, and likewise dilutes the lubricant in the crank-case, requiring a frequent changing of the oil therein.

By avoiding the drawing of this unused and raw fuel the deleterious effects on the motor are overcome and also a great economy is effected both in the saving of fuel and of motor oil.

It is therefore the object of my invention to provide an automatic means for diluting the fuel charge passing through the carburetor whenever any of the temporary conditions above enumerated are present, while at the same time providing means for admission of fuel to the motor for idling the same under normal conditions.

While the application of my improved device will be herein specifically described in connection with a motor vehicle still in practice it might well be attached to an internal combustion engine used in any capacity whatever, as will be obvious.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of

parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a sectional view of the apparatus showing the position of the parts when my improved automatic charge diluter is in action.

Fig. 2 is a similar view showing the parts in the position they assume for the purpose of diluting the fuel charge.

Referring now more particularly to the characters of reference marked on the drawings, the numeral 1 designates the carburetor of the motor, and 2 the connection to the intake manifold.

Considering now my improved structure, I first provide a bracket or a support of any desired form found adaptable and on this I mount a small electro-magnet having wires 5 and 6 respectively leading from the generator on the motor or from any other suitable source of energy. This electro-magnet is connected in series between the generator and battery of the motor.

The numeral 7 designates a ball valve having its ball 8 normally seated over an outlet port 9 from which a pipe or tube 10 leads to a connection with the carburetor 1 at a point between the fuel supply and the intake manifold 2 of the motor.

At the lower end of the ball valve structure 7 adjacent the normal seated position of the ball 8 are air inlet ports 11 which admit air therethrough and into the tube 10 when the ball 8 is lifted from its seat, which air when drawn into the carburetor will dilute the fuel mixture in a manner as will be presently explained. At the opposite end of the valve 7 are two bleed ports 12 and 13 respectively. A yieldable closure plate 14 normally extends across the port 12 but is held from closing same by the spring 15. The free end of the plate 14 has a contact element 16 normally within the field of influence of the electro-magnet 4.

The opposite end of the plate 14 is hinged as at 17 and intimately connected at the same hinged point is a closure plate 18 projecting over the port 13. This plate has a bellcrank arm 19 connected through the medium of an elbow joint 20 to a rod 21 hinged at 22 on a suitable bracket 23. A spring 24

normally holds the arm 19 in such position as to hold the cover plate 18 normally clear of the port 13.

A pull pin 25 is connected with the rod 21 and with a small lever 26 projecting in the path of the throttle arm 27 on the carburetor.

A tube 28 leads from the intake manifold 2 to a point intermediate the normal position of the ball 8 and the bleed ports 12 and 13 with an intermediate restricted passage-way 29.

The operation of the device is as follows:

Assuming that the motor vehicle is travelling at a speed at which the motor is turning over fast enough to then cause the generator to charge, the parts of the apparatus are in the position shown in Fig. 1. In this position the electro-magnet 4 is energized and is holding in contact the element 16 which causes the plate 14 to normally close the port 12. The throttle arm 27 is advanced to hold the throttle of the carburetor open, which leaves the lever 26 free, and the spring 24 is therefore pressing against the arm 19, which through the connected parts described holds the closure plate 18 clear of the port 13. This allows almost atmospheric pressure to be present in the valve chamber 7 and therefore the ball 8 is seated on its seat 9 closing the tube 10. Due to the restricted port 29 the suction from the intake manifold through the tube 28 is insufficient under these conditions to lift the ball 8.

We will now assume that the operator of the vehicle suddenly decelerates for any reason while the vehicle is still travelling at a rate of speed sufficient to cause the generator to charge. Under these conditions the port 12 will be held closed and with the deceleration the arm 27 will drop into contact with the lever 26. This will pull on the pin 25 and through the medium of the arm 19 and other connected parts the cover plate 18 will be brought into closed position over the port 13. Both ports 12 and 13 then being closed (see Fig. 2) the depression within the intake manifold 2 through the tube 28 causes a drop in pressure in the valve chamber 7 resulting in the ball 8 rising from its seat. Thereupon atmospheric pressure through ports 11 and tube 10 into the carburetor above the fuel reservoir will so dilute the fuel charge that none of the raw fuel will be drawn into the motor.

This condition will continue as long as the vehicle is proceeding at the predetermined speed necessary to keep the electro-magnet 4 energized. When, however, the speed of the vehicle drops below that predetermined amount and the charging of the generator cuts out the electro-magnet 4 will become de-energized. The spring 15 will then immediately lift the cover plate 14 to open the port 12. Thereupon the ball 8 will drop to

closed position and the dilution of the fuel supply will cease and normal idling gas mixture will be established.

The above described action will be alternately repeated according as to the vehicle is speeded up or slowed down, and will result in the saving of fuel and oil already set forth, and the wear and tear on the motor parts will likewise be greatly reduced for the reasons stated.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. The combination with a motor having a fuel intake, of a means controllable by the speed of the motor to dilute the fuel drawn to the motor when the motor is operating under forced momentum instead of under load and above a predetermined speed, and to arrest such fuel dilution when the motor drops below such predetermined speed.

2. The combination with a motor, a fuel supply means and an intake member between the fuel supply and the motor, the intake member having an air port, of means normally closing the air port when the motor is operating under load, and means for admitting air to the port to dilute the fuel drawn to the motor when the motor is operating only under forced momentum above a predetermined speed, and to arrest the admission of air to the port when the motor drops below such predetermined speed.

3. The combination with a motor, a fuel supply means and an intake member between the fuel supply and the motor, the intake member having an air port, of means normally closing the air port when the motor is operating under load, means for admitting air to the port to dilute the fuel drawn to the motor when the motor is operating under forced momentum and above a predetermined speed, such means including a valve in the port normally closed by atmospheric pressure, and means to release such pressure as the motor ceases to operate under load and is operated under forced momentum and above such predetermined speed, and means to reestablish such pressure and arrest such fuel dilution when the motor drops below such predetermined speed.

4. The combination with a motor, a fuel supply means and an intake member between the fuel supply and the motor, the intake

member having an air port, of means normally closing the air port when the motor is operating under load, means for admitting air to the port to dilute the fuel drawn to the motor when the motor is operating under forced momentum, such means including a valve in the port normally closed by atmospheric pressure, means to release such pressure as the motor ceases to operate under load and is operated under forced momentum, such latter means including a valved inlet into the first valve through which atmospheric pressure is normally admitted, means to close the latter valve as the motor moves under forced momentum, and suction means to then open the first valve.

5. The combination with a motor, a fuel supply and a fuel intake between the fuel supply and motor, means to dilute the fuel drawn from the fuel supply into the motor whenever the motor is operated under forced momentum instead of under load and above a predetermined speed, such means including a normally closed air valve connected with the fuel intake, and means to open the valve and admit air to the fuel intake member whenever the motor ceases to move under load and is moved under forced momentum and above such predetermined speed, and means to close the valve and arrest such fuel dilution when the motor drops below such predetermined speed.

6. A fuel diluter for the purpose described including a valve casing having a ball closed outlet, and air ports to communicate with the outlet when the valve is open, and a pair of atmospheric bleed ports communicating with the valve casing on the opposite side of the ball, means for closing either or both of the latter ports, and means for establishing a vacuum in the casing to lift the ball when both of the latter ports are closed.

7. A fuel diluter for the purpose described including a valve casing having a ball closed outlet, and air ports to communicate with the outlet when the valve is open, and a pair of atmospheric bleed ports communicating with the valve casing on the opposite side of the ball, a yieldable cover plate for each of the latter ports, an electro-magnet to close one plate over its port when energized, and a lever means operable to close the other plate over its port, and means to establish a vacuum in the casing when both the latter ports are closed.

8. The combination with a motor having a

fuel supply and a fuel intake member from the supply to the motor, and a generator, of an air tube in communication with the fuel intake member, a valve, such valve including a casing, communicating with the tube and atmosphere adjacent the tube, a ball normally closing communication between the tube and atmosphere, the casing having two atmospheric bleed ports on the opposite side of the ball, a cover plate for each of the latter ports, an electro-magnet adapted to be energized by the operation of the generator, means whereby when energized the magnet holds one cover plate closed over its port, means connected between the other plate and the throttle control of the fuel supply whereby when the latter is closed the last named plate will close over its port, and means connected between the casing and intake member to establish a vacuum in the casing when both of the latter ports are closed to lift the ball and allow air to be admitted to the intake member to dilute the fuel passing therethrough.

9. A fuel diluter for the purpose described including a valve casing having a normally closed valve outlet, and air ports to communicate with the outlet when the valve is open, and a pair of atmospheric bleed ports communicating with the valve casing, the valve over the outlet being normally held closed by atmospheric pressure through such bleed ports, means for closing either or both of the latter ports, and means for establishing a vacuum in the valve casing when the latter ports are closed whereby to lift the closure from the first named outlet.

10. A fuel diluter for the purpose described including a valve casing having a normally closed valve outlet, and air ports to communicate with the outlet when the valve is open, and a pair of atmospheric bleed ports communicating with the valve casing, the valve over the outlet being normally held closed by atmospheric pressure through such bleed ports, a yieldable cover plate for each of the latter ports, an electrically controlled element to close one plate over its port when the element is energized, and a lever means operable to close the other plate over its port, and means to establish a vacuum in the valve casing when both ports are closed, whereby to lift the closure from the first named outlet.

In testimony whereof I affix my signature.
FRED BARDEN.