

F. O. KILGORE.
ATTACHMENT FOR INTERNAL COMBUSTION MOTORS.
APPLICATION FILED JULY 16, 1917.

1,403,693.

Patented Jan. 17, 1922.

Fig. 1

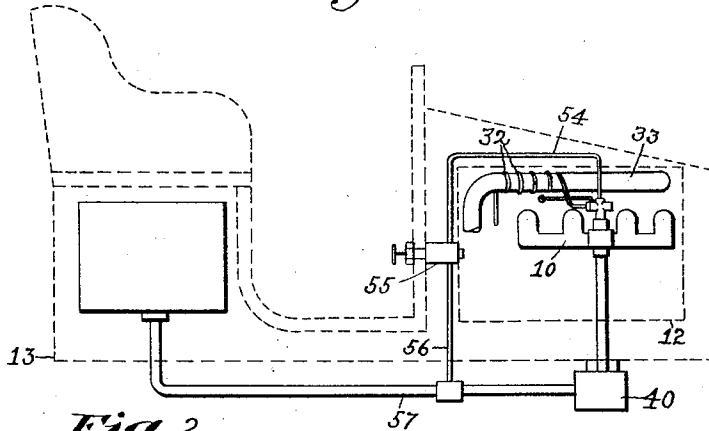


Fig. 2

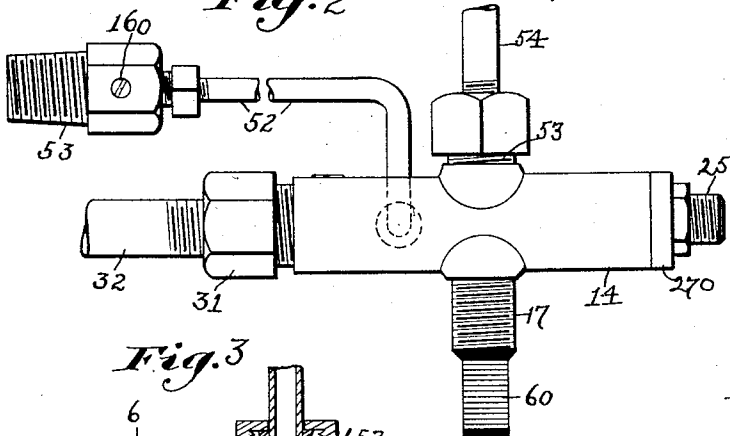


Fig. 3

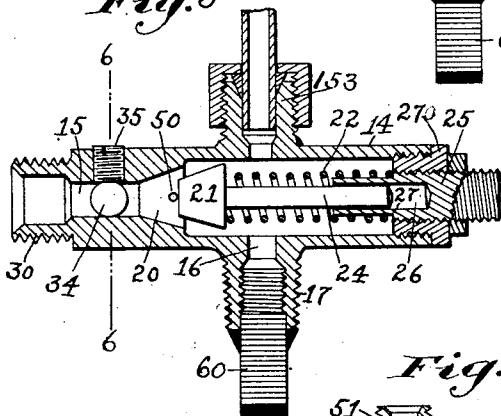


Fig. 4

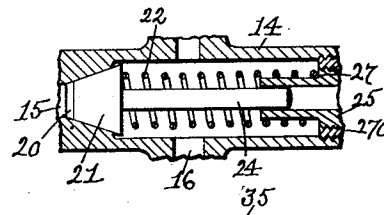


Fig. 6

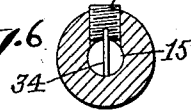
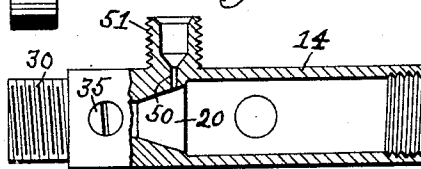


Fig. 5



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ATTACHMENT FOR INTERNAL-COMBUSTION MOTORS.

1,403,693.

Specification of Letters Patent. Patented Jan. 17, 1922.

Application filed July 16, 1917. Serial No. 180,851.

To all whom it may concern:

Be it known that I, FREDERICK O. KILGORE, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Attachments for Internal-Combustion Motors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a device for attachment to the intake pipe or manifold of an internal combustion engine or motor, for reducing the cost of operating and increasing the efficiency of said motor.

To this end the device is provided with a casing having an air inlet and a separate air outlet, which latter is designed to communicate with the manifold of the motor.

The air inlet has co-operating with it a valve which is opened by the suction of the motor and is closed by a spring located within the casing and capable of being adjusted to hold the valve closed against a weak suction and to permit the valve to be opened by a relatively strong suction.

The device may also be provided with a water inlet port for a purpose as will be described and which is also controlled by said valve.

The device may further be provided with a gasoline inlet, which enables the device to be used for priming purposes, and may also be provided with a valve for regulating or adjusting the size of the air inlet port to adjust the device to different sizes and makes of motors or to positively close the air inlet for testing or other purposes.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Fig. 1 represents a sufficient portion of a motor vehicle provided with a fuel saving and decarbonizing device embodying this invention to enable it to be understood.

Fig. 2, a side elevation of the device shown in Fig. 1.

Fig. 3, a longitudinal section of the device shown in Fig. 2.

Fig. 4, a detail in section of the device with the air valve in its closed position.

Fig. 5, a detail in elevation and section of the casing of the device shown in Fig. 2, and Fig. 6, a section on the line 6—6, Fig. 3.

In the present instance, I have illustrated the device as attached to the manifold 10 of the internal combustion motor 12 of an automobile 13. The device referred to, consists essentially of a casing 14, preferably cylindrical in shape and provided at one end with an air inlet port or passage 15 and at one side with an air outlet port or opening 16, with which communicates a laterally extended nipple or hollow boss 17 formed on the casing 14 and externally threaded for connection with the manifold 10.

The air inlet port or passage 15 terminates as herein shown, in an enlarged conical seat 20 for a conical valve 21, which is normally seated by a spring 22 located within the casing 14 and encircling a stem or rod 24 on said valve, and a guide rod 25 provided with a bore 26, into which is extended the stem 24, said spring having one end bearing against the valve 21 and its other end against a shoulder 27 on said guide rod.

The rear end of the guide rod 25 is screw-threaded and engaged with internal screw-threads of a cap 270 for the rear end of the valve casing, and is extended through the same, for a purpose as will be described.

The air valve 21 is normally seated by the spring 22 and is designed to be opened by the suction of the motor 12, with which the air outlet port 16 is in communication at all times.

The casing 14 may and preferably will be provided at its air inlet end with a nozzle or threaded hollow boss 30 with which may be coupled by a nut 31, a pipe 32, which is arranged so as to be heated by the exhaust pipe 33 of the motor and which is herein shown as coiled about said exhaust pipe (see Fig. 1). The air inlet port or passage 15 may be provided with a damper or valve 34 having a threaded stem 35, which engages a threaded opening in the casing 14, and by means of which the air inlet passage 15 may be manually closed when desired.

The apparatus as thus far described, is capable of being used as a gas saver, and when so used, it co-operates with the carbureter 40 of the motor to not only effect a

material saving in the gasoline or other motive fluid, but also to assist in obtaining a smoother running motor and to reduce to a minimum carbonization of the cylinders and valves thereof.

As now commonly practised, the carbureter 40, which may be of any suitable or desired construction, such as now commonly used, is adjusted to give the leanest mixture of gasoline and air, that will make the motor run steady when the car is at rest and the motor is running idle. The mixture, which for convenience may be termed the gas, must be rich enough to enable it to be ignited by the spark so as to start the motor. The carbureter must also be adjusted, so that with the throttle wide open, the gas must be rich enough to obtain maximum power, as when climbing a hill.

When the carbureter is adjusted for the two extremes, it permits a surplus of raw gas, that is a mixture having a surplus of gasoline, to be sucked by the motor when the car is running on level roads, with the throttle partially closed, for in this case, the suction of the motor exerts a greater part of its force on the carbureter and draws a surplus of gasoline and an insufficient amount of air. The result is that the gas or mixture taken into the motor is over rich, consequently making the motor sluggish in action and produces carbonization of the cylinders and valves and waste of gas.

When climbing hills with the throttle wide open, the motor sucks in a large amount of air from the auxiliary air valve and from the usual butterfly valve of the carbureter, which results in decreasing the vacuum in the motor, and consequently the suction on the carbureter and therefore a leaner mixture or gas is supplied to the motor.

By the use of the device above described, when the car is running on level roads with the throttle partially closed, the suction of the motor is sufficiently strong to overcome the spring 22 and to open the air valve 21, which permits air to be drawn through the port or passage 15 into the casing 14 and out therefrom through the air outlet port 16 and nipple 17 into the manifold, where it admixes with the raw gas and supplies the same with air which reduces the mixture to the proper consistency, to obtain a strong explosion and the necessary or desired power without a decrease in waste of gas and carbonization of cylinders and valves.

When the car is climbing a hill with the throttle wide open, the suction of the motor opens the valve 21 wide and thereby reduces the vacuum some but not to the same extent as in its absence, for even when the vacuum is reduced by the air admitted into the manifold, it still remains high enough to draw gasoline from the carbureter 40 but

not sufficiently strong to open wide the auxiliary air valve and butterfly valve of the carbureter which latter being of usual construction is only conventionally shown.

As a result the motor is supplied with a richer and therefore more powerful mixture or gas, which is what is desired, for hill climbing.

When the suction of the motor is reduced as by closing the throttle valve, the spring 22 acts to close the valve 21 more or less and thereby automatically adjusts the supply of air according to the suction of the motor.

Between the two extreme adjustments of the carbureter above noted, the suction of the motor varies greatly and is constantly varying according to the speed at which the car is being driven and the road conditions, and between these two extremes, the gas-saving device becomes effective as above described.

The gas-saving device may also be provided with means whereby steam may be supplied to the manifold and thereby to the cylinders of the motor, so that the carbon deposited on the walls of the cylinders may be shattered and removed therefrom, and further carbonization reduced to a minimum.

For this purpose, the casing 14 is provided with a substantially small water inlet port 50 (see Figs. 3 and 5), which communicates with a hollow boss or nipple 51 extended laterally from the casing, and which is designed to be connected by a pipe 52 and nipple 53 with the water jacket of the motor 12 or with any other source of water supply. The water inlet port 50 is shown as terminating in the seat 20 for the air valve 21, and as being controlled thereby.

When the air valve 21 is moved by the suction of the motor 12 so as to admit air into the casing 14, the water inlet port 50 is also uncovered and a small quantity of water is drawn into the casing and passes into the motor, where it meets the carbon on the cylinders of the motor and shocks the same, so that in a short time, the carbon becomes broken up and detached from the cylinders and is blown out through the exhaust thereof.

If it is desired not to use the decarbonizer feature of the apparatus, the nipple or boss 51 may be closed by a suitable cap in a manner well understood.

The casing 14 may also be provided with a hollow nipple or boss 153 through which gasoline may be supplied to the casing for priming purposes, and in Fig. 1, the nipple 153 is represented as connected by a pipe 54 with a priming pump 55, which is connected by the pipe 56 with the supply pipe 57 for the carbureter, and the air outlet nipple 17 may have attached to it a device for spray-

ing the gasoline used for priming the motor, which spraying device may be of any suitable construction and is shown as a coiled spring 60 closed at its outer end and attached at its inner end to the outlet nipple or boss 17. By means of the manually operated valve 34, the air inlet passage 15 may be closed and the car run with the motor supplied with gas from the carbureter in the usual manner, and after the car has been run in this manner, the valve 34 may be opened more or less so as to bring the automatic air valve 21 into service, and a comparison can thus be made between the running of the car with the gas-saving device cut out of service and when cut into service.

Furthermore the size of the air passage 15 can be cut down more or less by the valve 34 to suit different kinds or makes of motors. The supply of water to the valve casing 14 may be adjusted by a screw valve 160 in the nozzle 53, or it may be entirely cut off in a manner similar to that of the valve 34.

When the cars are provided with a vacuum feeding system for supplying gas to the

carbureter, the air suction pipe of such system can be connected with the nipple 53 of the device herein shown if desired. 30

Claim:

A casing normally open at its rear end and provided at its front end with an air inlet and having between its ends a laterally extended threaded nipple for attachment to the intake pipe of an internal combustion motor, said casing also having a fluid inlet at the rear of said air inlet which is in direct communication with said threaded nipple through said casing, a valve insert- 40 able into and removable from said casing through said open rear end and co-operating with said air inlet to open and close the same, a spring to normally close said valve, means for closing the rear end of said casing 45 and accessible from outside the casing at the rear end thereof for adjusting the strength of said spring, and means accessible from outside of the casing at the rear end thereof for closing said valve 50 independently of said spring.

In testimony whereof, I have signed my name to this specification.

FREDERICK O. KILGORE.