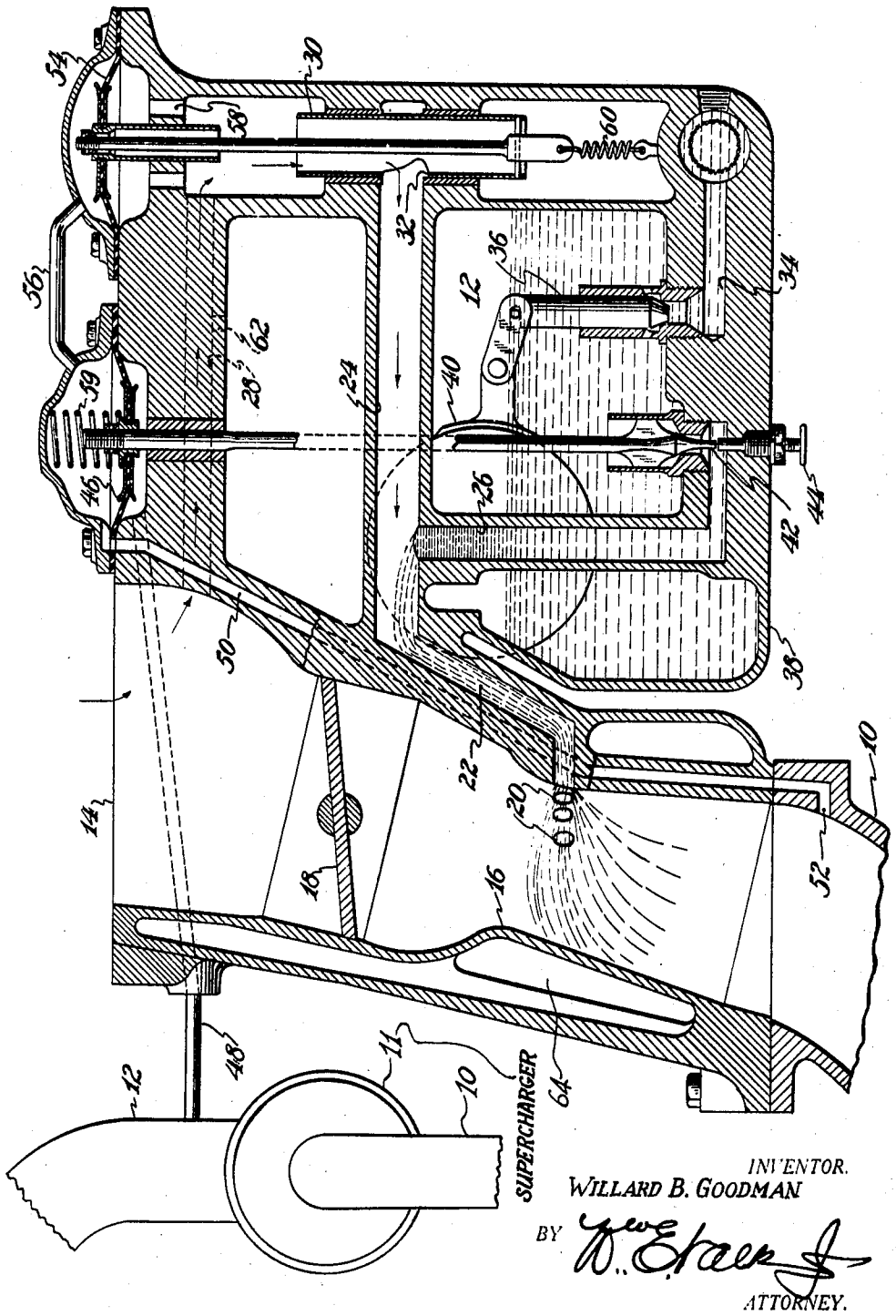
Feb. 9, 1937. W. B. GOODMAN 2,070,009

ANTERIOR THROTTLE CARBURETOR

Filed Feb. 12, 1935



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Patented Feb. 9, 1937

2,070,009

UNITED STATES PATENT OFFICE

2,070,009

ANTERIOR THROTTLE CARBURETOR

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Application February 12, 1935, Serial No. 6,155

8 Claims. (Cl. 123—119)

This invention relates to carburetors in general and more specifically to an anterior throttle carburetor having new and improved automatic metering characteristics particularly suited for supercharged engines.

With current carburetors on such engines, the fuel-air ratio is influenced by the amount of supercharging used, requiring a new set of adjustments when the supercharger pressure rise is increased.

A prime object of the present invention is to provide a carburetor having the metering characteristics automatically compensated for supercharger pressure rise.

A further object is to provide an anterior throttle carburetor wherein the throttle is subject to air flow only, and thus to remove the throttle icing hazard present when this member is cooled by the evaporating fuel.

The anterior location of the throttle subjects the jet to vacuum under part-throttle conditions and to compensate for this, the carburetor of this invention incorporates an air metering valve operated from the pressure drop across the throttle.

Other objects and advantages will be obvious from the following description, with reference to the figure, which represents an inverted type of carburetor secured to the inlet 10 of an engine supercharger 11 which delivers to the engine through the usual inlet pipes, one of which is indicated diagrammatically at 12.

The carburetor body has a main down-draft passage extending from the entrance 14 to the supercharger intake 10 forming a choke or venturi 16 above which there is disposed a throttle 18. The jets are indicated as holes 20 drilled through the side of the venturi 16 and communicating by way of a passage 22 with an air-bleed channel 24 into which a main fuel channel 26 delivers. Air enters the air-bleed channel 24 through an atmospheric passage 28 and via an air-bleed valve 30 which is provided with an air metering port 32.

Fuel is supplied to the carburetor through a passage 34 via a conventional float valve 36 which controls the fuel level in a float chamber 38 by means of a float 40 in the usual way.

Metering of the fuel quantity is through a metering valve 42 which is equipped with a stop 44 comprising an idling adjustment.

The metering valve 42 is operated by a diaphragm 46, the under side of which is connected with the pressure side of the supercharger as by a connection 48 shown as communicating with the inlet pipe 12. The upper side of this diaphragm is connected by a passage 50 to the supercharger entrance near 10, between the carburetor and the supercharger, the lower end of this passage being indicated at 52. This supercharger inlet pressure is also effective on the upper side of an air-bleed valve diaphragm 54 by way of a connecting pipe 56 while the lower side of this diaphragm 54 is connected to the atmospheric carburetor air entrance passage 28 through holes 58.

The fuel metering valve 42 is equipped, above its diaphragm 46, with a spring 59 tending to keep the valve against the idling stop 44, while a tension spring 60 tends to keep the air-bleed valve 30 in its downward position.

The float chamber is provided with an atmospheric vent 62 and the venturi 16 is provided with a heating jacket 64.

It will be seen from the above that the fuel metering valve 42 is controlled by the differential in pressure existing between the supercharger inlet 10 beneath the throttle 18 and the inlet pipe 12. In other words, the diaphragm 46 is subject to a pressure proportional to the supercharger pressure rise acting in opposition to the spring 59, to increase the fuel passing area at the fuel metering valve.

The air-bleed valve 30 is operated by the differential in pressure between the supercharger inlet 10 and the atmospheric carburetor inlet. In other words, the air-bleed is controlled by the pressure drop across the throttle. Thus, by changing the relative contours of the air-bleed port 32 and of the metering valve 42, the fuel-air ratio characteristics of the carburetor may be set as desired, thus greatly reducing the number of setting adjustments required as compared to many of the carburetors in the prior art.

It should be noted that the pressure rise through a supercharger varies with the atmospheric density. That is to say, with other conditions unchanged, the pressure rise becomes less as the altitude increases. Thus, the pressure beneath the diaphragm 46 through the connection 48 from the manifold 12 will decrease with altitude, lowering the metering valve 42 and reducing the fuel quantity as necessary to automatically compensate for the richening effect of altitude. This automatic air density correction is also effective as to changes in density due to changes in atmospheric temperature, thus automatically compensating for both air temperature and density variations for which purpose manual mix-

ture controls are relied on in conventional carburetors.

It should also be noted that the air-bleed valve 32 will be shut off when the engine is stopped or turning over the cranking speeds whereat there is very low velocity at the jets 20 which causes a deficiency in the fuel supply in normal carburetors for starting, for which reason priming is usually resorted to. However, the closing of the air-bleed valve 32 will apply a direct suction to the jets in the carburetor of this invention, giving automatic priming.

While I have described my invention in detail in its present preferred embodiment, it will be obvious to those skilled in the art, after understanding my invention, that various changes and modifications may be made therein without departing from the spirit or scope thereof. I aim in the appended claims to cover all such modifications and changes.

What is claimed is:

1. A carburetor for an engine having a supercharger including in combination, a fuel jet, a throttle anterior to said jet with respect to said supercharger, a fuel metering valve, and means to control said valve responsively to the pressure difference created by said supercharger.

2. A carburetor for an engine having a supercharger including a fuel metering valve, means responsive to the pressure rise through said supercharger to control the opening of said valve, an air-bleed metering valve, and means responsive to the pressure at the intake of said supercharger to control the opening of said air-bleed valve.

3. A carburetor for an engine having a supercharger, including in combination a jet, a throttle anterior to said jet, fuel and air-bleed metering valves, and means to vary the opening of said valves proportional to the pressure differences set up by said supercharger and throttle respectively.

4. A carburetor for an engine having a supercharger creating air pressure rise, including in combination, a jet, a throttle creating an air pressure drop at said jet, and fuel and air-bleed metering means operated respectively from said rise and drop.

5. A carburetor for an engine having an induction system including a manifold, a venturi, a throttle at the air entrance side of said venturi, means for bleeding fuel and air into said venturi, and means responsive to pressure differences between different portions of said induction system for controlling the air-bleed and fuel flow.

6. A carburetor for an engine having a supercharger on the downstream side thereof, said carburetor having a venturi and a fuel jet thereat, an air-bleed fuel jet adapted to direct air and fuel to said venturi, and means controlled by the pressure difference between the ambient air and the pressure side of said supercharger for governing the rate of fuel flow through said air-bleed fuel jet.

7. A carburetor for an engine including in combination, a venturi, an air-bleed and fuel nozzle opening into the neck of said venturi, a throttle on the upstream side of said venturi, an air-bleed control valve, and means for adjusting said valve responsive in its action to the difference in pressure between the upstream side of said throttle and the downstream side of said venturi.

8. A carburetor for an engine including in combination, a venturi having a low pressure neck, an air-bleed fuel nozzle opening into said neck, a throttle on the upstream side of said venturi, an air-bleed valve, and means for controlling said valve responsive in its action to the pressure difference between the upstream side of said throttle and the downstream side thereof, at a point remote from said venturi neck.

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