June 9, 1931. H. H. TIMIAN 1,809,648

CARBURETOR

Filed March 17, 1928

Fig. 2.

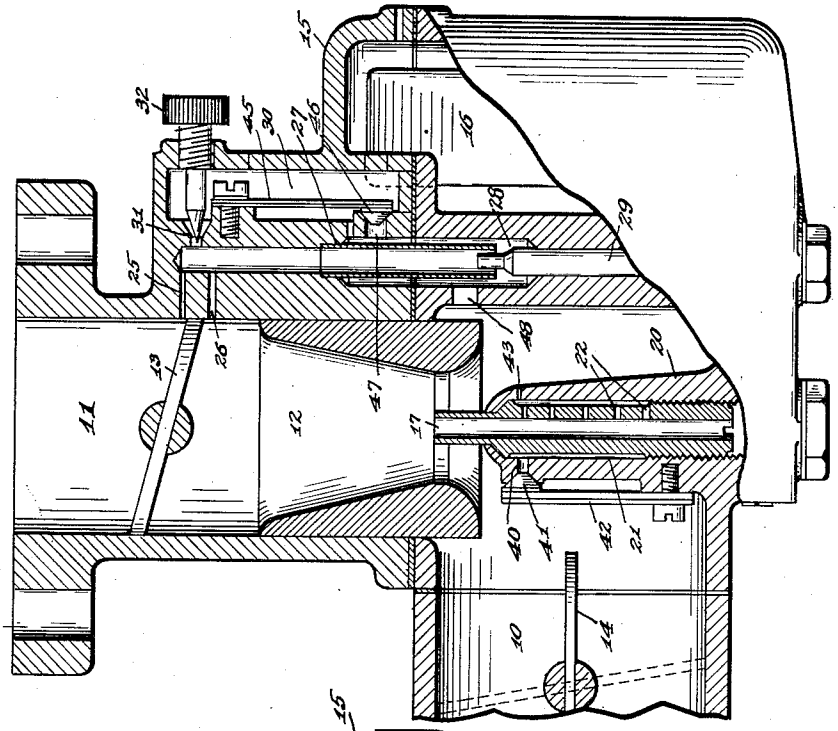
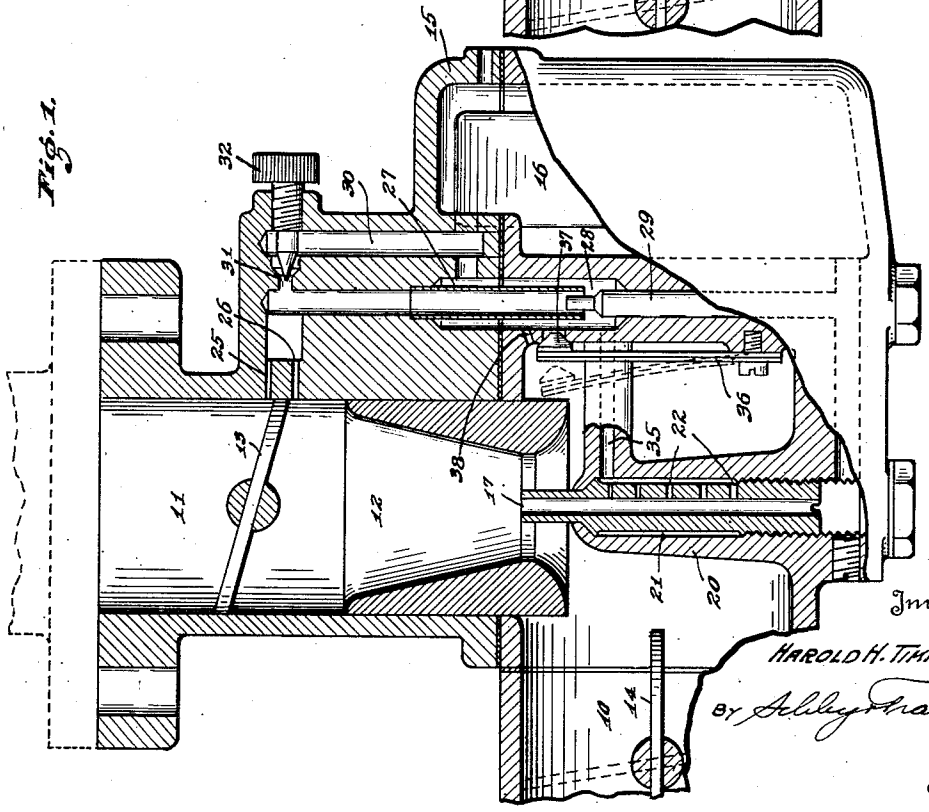


Fig. 1.



Inventor

HAROLD H. TIMIAN,

By Ashley Thrash

Attorney

Patented June 9, 1931 1,809,648

UNITED STATES PATENT OFFICE

HAROLD H. TIMIAN, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE WHEELER-SCHEBLER CARBURETOR CO., OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA

CARBURETOR

Application filed March 17, 1928. Serial No. 262,518.

It is the object of my invention to produce a carburetor adaptable for use in connection with internal combustion engines, which carburetor will produce a mixture of suitable proportions under varying conditions including temperature changes. More specifically, it is my object to produce a carburetor which will produce a richer mixture at low temperatures and, more particularly, to produce such a carburetor in which the control of mixture proportions in accordance with temperature is effected through relatively simple means which do not unnecessarily complicate the structure of the carburetor and which do not interfere with the efficiency thereof.

I accomplish the above objects by providing an air-bled carburetor with temperature responsive means for controlling the amount of air-bleeding. If my invention is embodied in a carburetor having a main and idling jet, I may control the air bleeding of the two jets separately by separate temperature-responsive means, or I may provide a single temperature-responsive means adapted to control both jets jointly.

The accompanying drawings illustrate my invention: Fig. 1 is a vetrical section through a carburetor embodying a single temperature-responsive means for controlling air bleed of both the main and the idling jets; and Fig. 2 is a vertical section through a modification of my invention in which I employ individual temperature-responsive means for controlling the air bleeding of the two jets.

My invention is not limited in its application to any particular type of carburetor. The carburetor shown in the drawings has an air inlet 10, a mixture discharge outlet 11, and a venturi 12 loaded between the air inlet and the mixture outlet. The mixture outlet has associated with it the usual throttle 13, and the air inlet may be provided with a choke valve 14. The carburetor has the usual float chamber 15 containing a float 16 which through suitable well known mechanism (not shown) controls the admission of liquid fuel to the float chamber. The float chamber communicates with a discharge nozzle 17 having its outlet located in or near the choke of the venturi 12.

The nozzle 17 is preferably mounted in an upwardly extending boss 20; such boss being provided with a central recess having a diameter slightly larger than the external diameter of the nozzle body in order to provide an annular space or well 21. A plurality of air bleed openings 22 located at different levels connect the annular well 21 with the fuel passage through the nozzle 17. Near the top of the well 21 I provide an air admission opening through which may be admitted the air which passes the air bleed openings 22 into the nozzle 17.

The idling jet is desirably a double one formed by two passages 25 and 26 communicating with the conduit through the carburetor on opposite sides of the throttle when the throttle is closed. The two passages 25 and 26 communicate with a tube 27 which is mounted in the carburetor body and extends downward into a chamber 28 formed therein. Projecting upward through the bottom of this chamber and desirably extending for a short distance into the lower end of the tube 27 is a fuel discharge nozzle 29 adapted to be supplied with fuel from the float chamber. The chamber 28 has an air admission opening in order that air may be drawn into the tube 27 together with fuel discharged from the nozzle 29, the amount of air thus drawn in being limited by the size of the annular opening between the inner wall of the tube 27 and the outer surface of the discharge nozzle 29. To provide an additional air bleed for the idling jets 25 and 26, I provide a bypass 30 connecting the chamber 28 and an air bleed opening 31, the effective size of which may be regulated by a suitable screw 32.

The features just described are common to both modifications of my invention shown in the accompanying drawings. The differences between the two modifications illustrated arise from the different means employed for effecting a control of the mixture ratio in accordance with temperature variations.

In the carburetor illustrated in Fig. 1, a single thermostat controls the air bleeding of both the main and the auxiliary jets. To this end, I provide an air passage 35 through which air is admitted to the annular well 21 from the chamber 28, and I provide a thermostatic device for varying the amount of air admitted to the chamber 28. This thermostatic device may take the form of a bi-metallic strip 36 secured at one end to the carburetor body and having at its other end a conical valve 37 which operates to vary the effective size of the air admission opening of the chamber 28 as the bi-metallic strip 36 bends as a result of temperature changes. As it is usually desirable that some air bleeding occur even although the temperature is low enough to close the valve 37, I may provide the chamber 28 with an auxiliary air admission opening 38 which is not controlled by the valve 37.

In the operation of the carburetor just described, the richness of the mixture produced will depend upon the extent of air-bleeding, which is controlled by the position of the valve 37. Under relatively low temperatures, the valve 37 is closed, and the only air bleeding is that resulting from the passage of air through the opening 28; but an increase in temperature will result in the bending of the bi-metallic strip 36, thus causing the valve 37 to leave its seat and to increase the amount of air admitted to the chamber 28. The amount of this increase for any given temperature is dependent upon the taper of the conical face of the valve 37, a steep taper giving a relatively large increase in air-bleeding, and a gradual taper giving a relatively small increase. The maximum amount of air bleeding is limited by the size of the opening controlled by the valve 37. The taper of this valve can be arranged to suit the characteristics of the carburetor to which the invention is to be applied. The increase in the amount of air admitted to the chamber 28 also increases the amount of air bled into the liquid fuel issuing from the main jets 17 and from the idling jets 25 and 26.

In the modification of my invention illustrated in Fig. 2, separate thermostats are provided for controlling the air bleeding of the main and idling jets. In this construction, the well 21 surrounding the main nozzle has an air admission opening 40 the effective size of which is controlled by a valve 41 mounted on the free end of a bi-metallic strip 42. At low temperatures, the bi-metallic strip serves to hold the valve 41 nearly or entirely closed, thus preventing admission of air through the opening 40 into the well 21. Upon an increase in temperature, the bi-metallic strip 42 bends outward and moves the valve 41 away from its seat to increase the amount of air which may pass into the well 21 and thus to provide a leaner mixture. If desired, an auxiliary air admission opening may be provided for the well 21 in order to permit a limited air bleed even though the valve 41 is completely closed.

To control the extent of air bleeding in the idling jets, I may provide a second bi-metallic strip 45, the free end of which carries a valve 46 adapted to limit the effective size of an opening 47 through which communication is effected between the chamber 28 and the bypass 30. In this construction, air is admitted to the chamber 28 through an admission opening 48, some of such air entering the tube 27 through the space surrounding the discharge end of the nozzle 29. If the temperature is relatively high and the valve 46 is away from its seat, additional air passes through the opening 47, bypass 30, and bleed opening 31 to produce a further dilution of the fuel discharged through the idling jets 25 and 26. The extent of air flow through the bleed opening 31 is controlled by the position of the valve 46 which is moved in accordance with temperature changes to increase the air bleeding and decrease the richness of the mixture as the temperature increases.

It will be evident that in the constructions described the thermostatic means employed to vary the mixture proportions is relatively simple and does not complicate the working parts nor interfere with the efficiency of the carburetor.

I claim as my invention:—

1. In a carburetor, an air and mixture conduit, a main fuel nozzle arranged to discharge thereinto, an idling jet also arranged to discharge into said conduit, said main nozzle and idling jet being provided with air bleed openings having fixed sizes to provide for a maximum amount of air-bleeding, and thermostatic means for varying the flow of air through said fixed air bleed openings.

2. In a carburetor, an air and mixture conduit, a main fuel nozzle arranged to discharge thereinto, an idling jet also arranged to discharge into said conduit, passages for fuel leading from a source of supply to said nozzle and said jet, means common to said passages to bleed air thereinto, and thermosensitive means responsive to the temperature of the air within the carburetor for modifying the effectiveness of said bleed means.

3. In a carburetor, an air and mixture conduit, a main fuel nozzle arranged to discharge thereinto, an idling jet also arranged

to discharge into said conduit, passages for fuel leading from a source of supply to said nozzle and said jet, means common to said passages to bleed air thereinto, and thermosensitive means responsive to the temperature within the carburetor for modifying the effectiveness of said bleed means.

In witness whereof, I have hereunto set my hand at Indianapolis, Indiana, this 9th day of March, A. D. one thousand nine hundred and twenty eight.

HAROLD H. TIMIAN.