Jan. 20, 1931. W. A. HEIDE 1,789,652

AIR CONTROLLING MEANS FOR CARBURETORS

Filed April 25, 1928 3 Sheets-Sheet 1

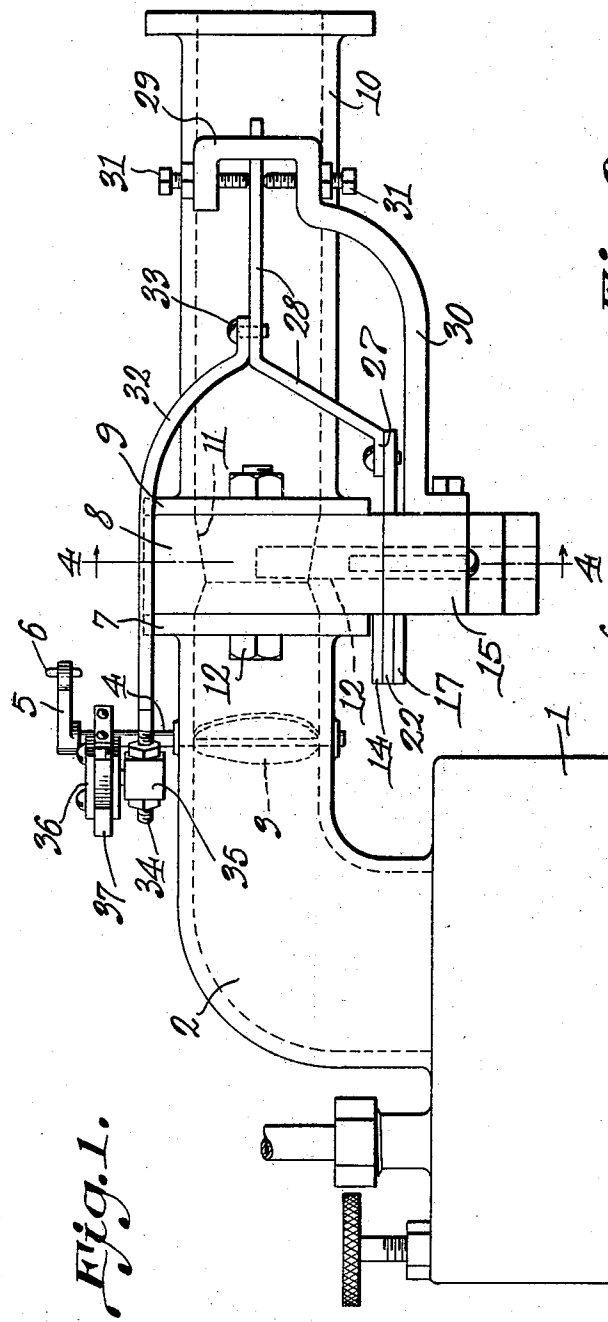


Fig. 1.

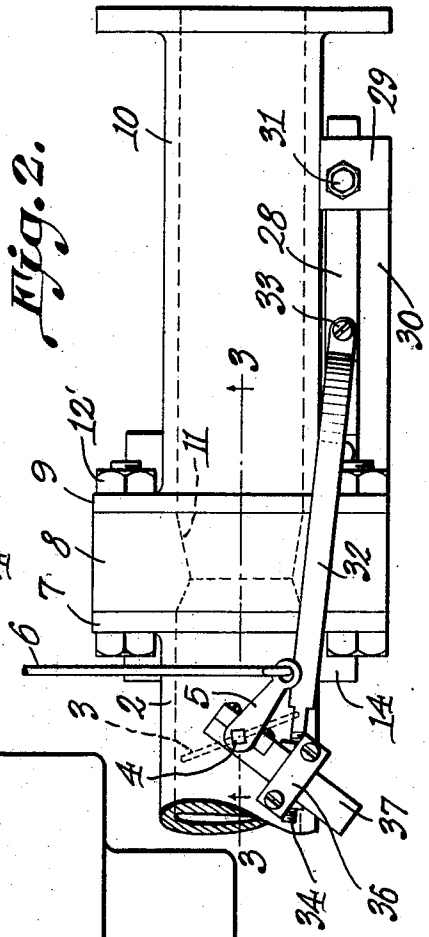


Fig. 2.

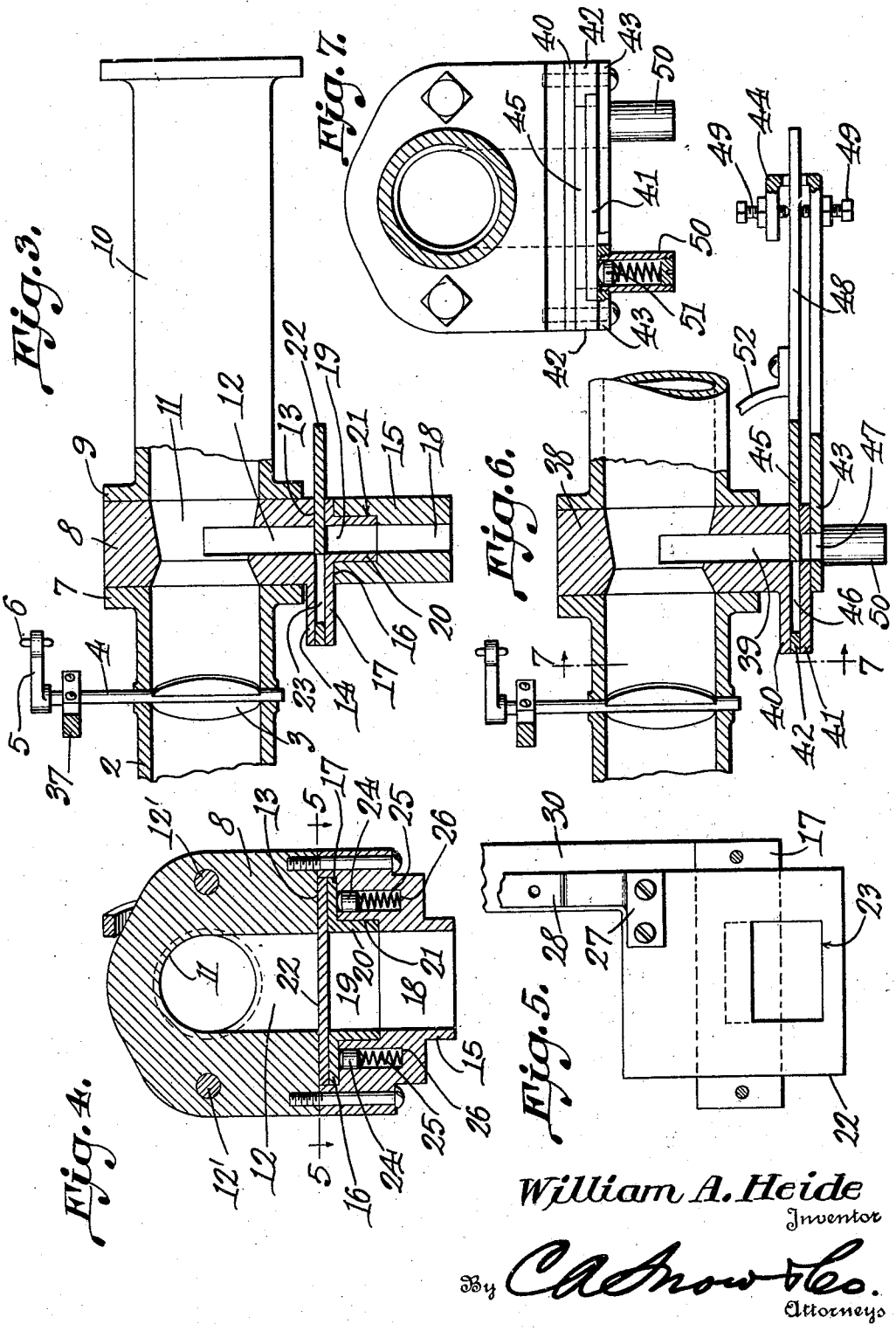
William A. Heide
Inventor

By C. A. Snow & Co.
Attorneys

Jan. 20, 1931. W. A. HEIDE 1,789,652

AIR CONTROLLING MEANS FOR CARBURETORS

Filed April 25, 1928 3 Sheets-Sheet 2



William A. Heide
Inventor

By C. A. Snow & Co.
Attorneys

Jan. 20, 1931. W. A. HEIDE 1,789,652

AIR CONTROLLING MEANS FOR CARBURETORS

Filed April 25, 1928 3 Sheets-Sheet 3

Fig. 10.

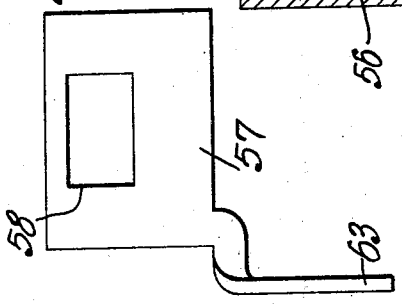


Fig. 9.

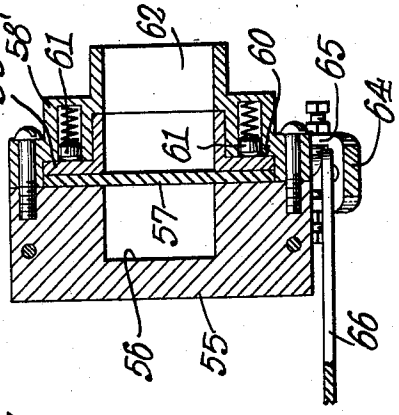
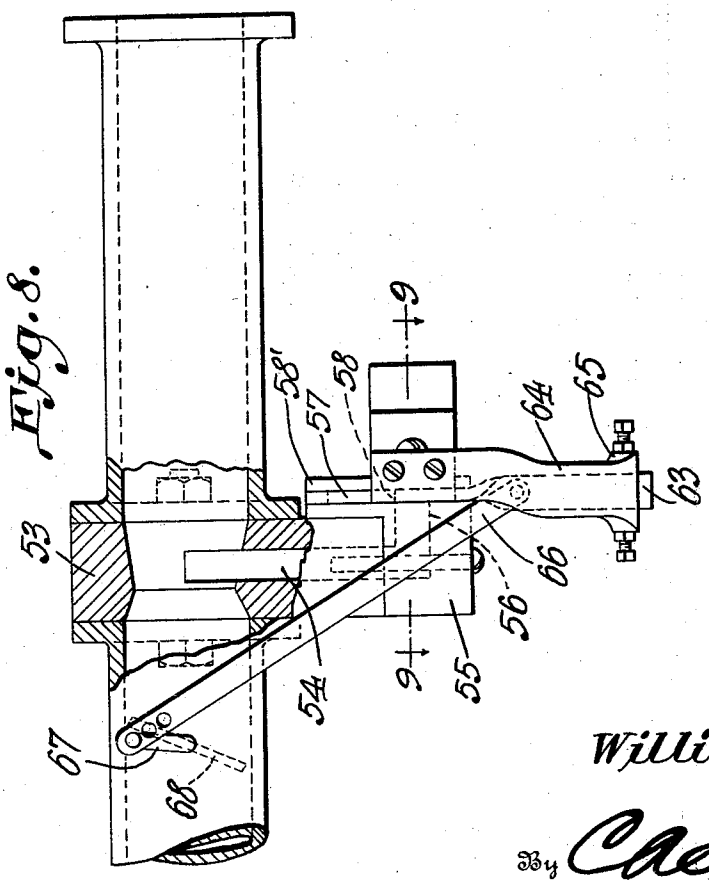


Fig. 8.



William A. Heide
Inventor

By Cushman & Co.
Attorneys

Patented Jan. 20, 1931 1,789,652

UNITED STATES PATENT OFFICE

WILLIAM A. HEIDE, OF DETROIT, MICHIGAN

AIR-CONTROLLING MEANS FOR CARBURETORS

Application filed April 25, 1928. Serial No. 272,739.

This invention relates to carburetors, and more especially to means whereby the admission of fresh air into the carburetor can be controlled by the actuation of the butterfly valve, it being possible to adjust the parts so that the proportion of air and gas can be varied according to the position of the butterfly valve.

A further object is to provide a carburetor from which the fresh air supply will be cut off when the butterfly valve is set in proper position for starting the motor, the mechanism being such that as the butterfly valve is advanced from starting position, air is admitted in increasing quantities.

A still further object is to provide a structure of this character the parts of which can be adjusted readily to insure the proper mixture during the actuation of the valve.

With the foregoing and other objects in view which will appear as the description proceeds the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred forms of the invention have been shown.

In said drawings—

Figure 1 is a side elevation of a carburetor having the present improvements incorporated therein.

Figure 2 is a top plan view thereof.

Figure 3 is a longitudinal section through a portion of the structure, said section being taken on the line 3—3, Figure 2.

Figure 4 is a section on line 4—4, Figure 1.

Figure 5 is a section on line 5—5, Figure 4.

Figure 6 is a section similar to Figure 3 showing a slightly modified construction.

Figure 7 is a section on line 7—7, Figure 6.

Figure 8 is a view similar to Figures 3 and 6 showing another modified structure.

Figure 9 is a section on line 9—9, Figure 8.

Figure 10 is an elevation of the slide valve used in the structures shown in Figures 8 and 9.

Referring to the figures by characters of reference 1 designates the carburetor casing having a tubular arm 2 extending therefrom and constituting the outlet. This arm is provided with a butterfly valve 3 the stem 4 of which is extended outside of the arm and having crank arm 5 adapted to be engaged by an actuating wire 6 which can be operated in the usual or any preferred manner. A flange 7 is provided at the outlet end of the arm and engages one side of a block 8 the other side of which is engaged by a flange 9 provided at one end of the tube 10 extending to the intake manifold of an engine. Block 8 has an opening 11 therethrough in communication with the outlet arm 2 and the tube 10 and forming a Venturi passage. It is to be understood that the block 8 and the flanges 7 and 9 are held together detachably in any suitable manner, as by means of bolts 12' extending therethrough.

Formed in the block is an air inlet port 12 which opens into the Venturi passage 11 and has its outer end opening through a flat bearing surface 13 formed by one wall of the block 8 at a point beyond the flanges 7 and 9. This bearing surface has an extension tongue 14. A retaining block 15 is adapted to be bolted to the block 8 and has a recess 16 in which is removably seated a wear plate 17. An air inlet port 18 is extended through the block 15 and alined with the port 12, and formed in the wear plate 17 is an opening 19 alining with the port 12 and opening 18 and provided with a boss or extension 20 seated in a recess 21 provided therefor in the block 15. A valve 22 in the form of a plate is slidably mounted between the wear or bearing surface 13 and the tongue 14 at one side and the block 15 and its wear plate 17 at the other side. This slide valve has an opening 23 adapted, when the valve is moved from one position to communicate with the port 12. Normally, however, the valve is in closed position as shown in Figure 3. The wear plate 17 is yieldingly supported by pins 24 mounted on springs 25

within bores 26 of the block 15. These pins constantly thrust against the wear plate 17 so as to insure a tight bearing between the slide valve 22 and the parts with which it cooperates. By providing the wear plate with the extension 20 it will be apparent that movement of the wear plate 17 under the action of the spring pressed pins 24, will not result in leakage around the valve.

The slide valve 22 has an arm 27 extending therefrom and this arm, in turn, has an angular tongue 28 attached thereto. One end portion of this tongue is adapted to slide within a guide 29 carried by a bar 30 which is secured to the block 15. This guide is in the form of a yoke and has oppositely extending set screws 31 attached thereto for engaging opposed faces of the tongue 28 thereby to hold said tongue properly centered in its guide. A link 32 is pivotally connected to the tongue 28 as shown at 33 and has a screw threaded end 34 adjustably mounted in a block 35. This block is pivotally connected to a clamp 36 and adjustably mounted on an arm 37 which is secured to and extended from the stem 4. Clamp 36 can be adjusted longitudinally of the arm 37 and the link 32 can of course be adjusted longitudinally relative to the block 35. Thus the butterfly valve 3 and the valve 22 are capable of being so adjusted as to positively insure a predetermined movement of the valves when the butterfly valve is actuated. It will be understood that when the butterfly valve is set for starting the motor the air controlling valve 22 will be closed. However, when the butterfly valve is advanced away from starting position motion will be transmitted therefrom to the slide valve 22 so as to partly or entirely open the air inlet port and insure a proper mixture of air and gas.

As a modification of the structure just described the device can be made as illustrated in Figures 6 and 7. In this structure the block 38 has an air inlet port 39 opening through the bearing end of the block which, as shown, has an extension 40. A wear plate 41 is spaced from the adjacent end of the block 38. A spacer 42 is interposed between the block and a bottom plate 43. This bottom plate is fastened to the block as shown in Figure 7 and serves to support the wear plate 41 which, in turn, engages the slide valve 45. This slide valve has an opening 46 adapted to move into and out of register with the port 39 and with an opening 47 extending through the plates 41 and 43. A tongue 48 is extended from the slide valve 45 between guide screws 49 carried by a yoke 44 which is connected to the plate 43. Depending from the plate 43 are tubular holders 50 in each of which is mounted a yieldingly supported thrust pin 51 which presses upwardly against the bearing plate 41 and insures a tight fit between said plate and the valve and between the valve 45 and the block. A link 52 connects the tongue 48 to the butterfly valve and corresponds with the link 32 heretofore described. By providing tubular holders 50 it becomes unnecessary to use a thick block with bores therein as shown in Figure 4.

In Figures 8, 9, and 10 a further modification of the invention has been illustrated. In this structure the block 53 having the air inlet port 54, has an extension 55 attached to it and in this extension is formed a port 56 which opens into port 54 and backwardly through one face of the block 55. On this back face of the extension 55 is arranged a slide valve 57 having an opening 58 adapted to move into and out of register with the port 56. This slide valve is mounted between the extension 55 and a retaining block 58′, there being a wear plate 59 supported within a recess 60 in block 58′ and bearing against the valve 57. Spring pressed pins 61 are mounted in the block 58′ and bear against the wear plate 59 so as to form a tight fit of valve 57 under all conditions. Block 58′ has a port 62 through which air is supplied to the port 56 when the valve 57 is in open position. For the purpose of actuating the slide valve 57 an arm 63 is extended therefrom and mounted in a guide 64 having a yoke 65 similar to the yoke 29 heretofore described. This arm 63 is connected by a link 66 to a bell crank 67 which rotates with the butterfly valve 68.

What is claimed is:

1. The combination with a tubular member for the passage of gas and a butterfly valve mounted for rotation therein, of a member having a Venturi passage opening into the tubular member, an air inlet port opening into said Venturi passage at the outlet side of the butterfly valve, a slide valve for controlling the flow of fresh air into said port, a yieldingly pressed wear plate engaging the slide valve, and an operative connection between the butterfly valve and the slide valve.

2. The combination with a tubular member constituting a gas outlet and a butterfly valve mounted for rotation therein, of an air inlet port opening into said outlet, a slide valve normally closing said air inlet port, a guide block for holding the slide valve in proper position relative to the port, a yieldingly pressed wear plate carried by said block and slidably engaged by the valve, an extension on the wear plate for extending into the block for sealing the connection between the block and wear plate, and an operative connection between the butterfly valve and the slide valve.

3. The combination with a tubular member constituting a gas outlet and a butterfly valve mounted for rotation therein, of an air inlet port opening into said outlet, a slide valve

normally closing said air inlet port, a guide block for holding the slide valve in proper position relative to the port, a yieldingly pressed wear plate carried by said block and slidably engaged by the valve, an extension on the wear plate for extending into the block for sealing the connection between the block and wear plate, an operative connection between the butterfly valve and the slide valve, said connection including a tongue extending from the slide valve, a guide for the tongue, a bell crank rotatable with the butterfly valve, and a link connection between the tongue and bell crank.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

WILLIAM A. HEIDE.