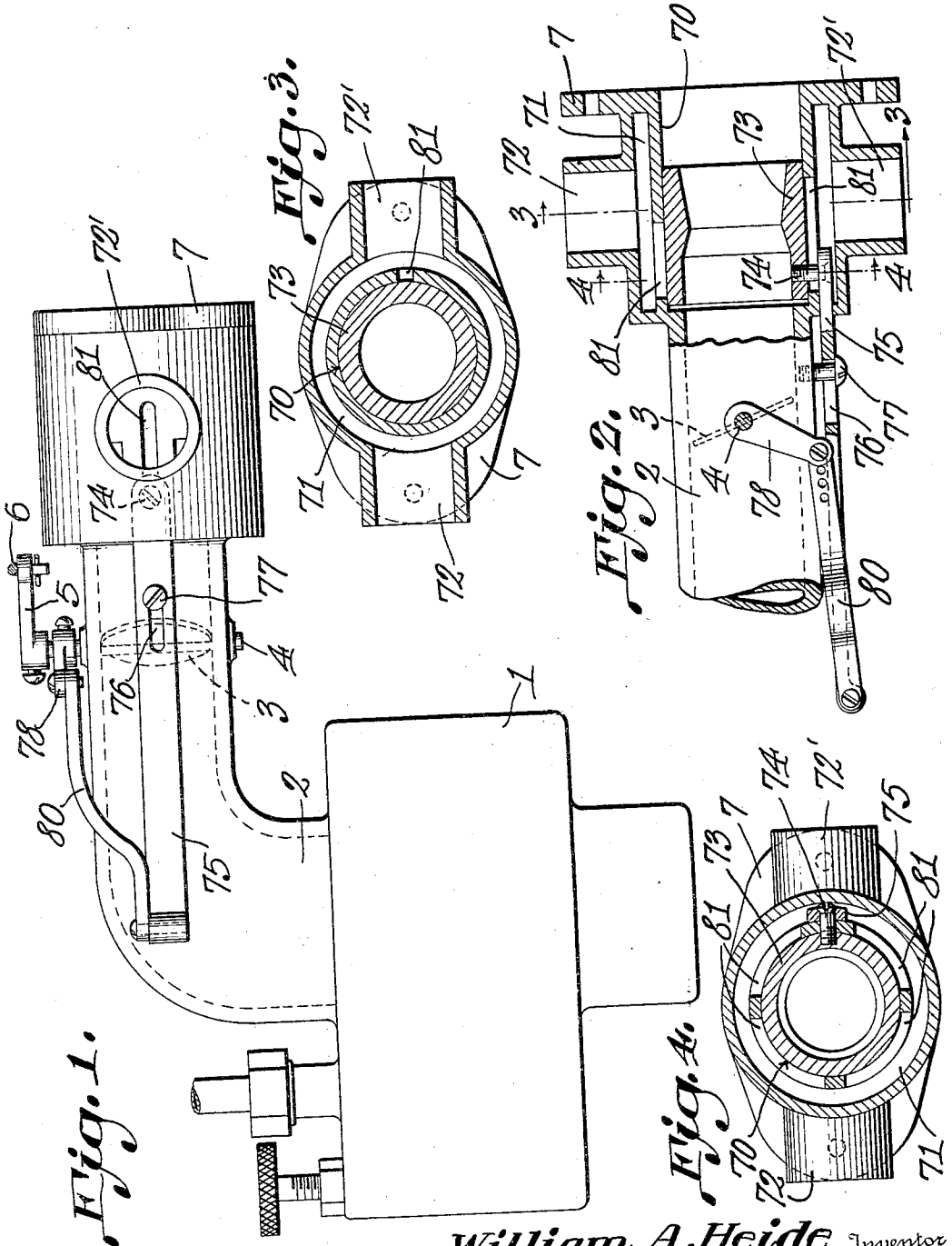
March 14, 1933. W. A. HEIDE 1,901,810

AIR CONTROLLING MEANS FOR CARBURETORS

Original Filed April 25, 1928



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UNITED STATES PATENT OFFICE

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AIR CONTROLLING MEANS FOR CARBURETORS

Original application filed April 25, 1928, Serial No. 272,739. Divided and this application filed June 10, 1929. Serial No. 369,814.

This invention relates to air controlling means for carburetors and is more especially a division of an application filed by me on April 25, 1928, Serial Number 272,739.

It is an object of the invention to provide a device of this character utilizing a combined Venturi tube and valve for controlling the admission of air to the outlet of a carburetor.

Another object is to provide a means whereby the said valve will be shifted to cut off the supply of fresh air 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.

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 drawing the preferred form of the invention has been shown.

In said drawing,

Figure 1 is a side elevation of a carburetor having the present improvement combined therewith.

Figure 2 is a longitudinal section through the combined valve and Venturi tube and adjacent parts.

Figure 3 is a section on line 3—3, Figure 2.

Figure 4 is a section on line 4—4, Figure 2.

Referring to the figures by characters of reference, 1 designates a carburetor casing having a tubular arm 2 constituting the outlet thereof. In this arm is provided a butterfly valve 3 the stem 4 of which is extended outside of the tubular arm 2 and has a 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 located at the outlet end of the tubular arm 2 and is adapted to be secured in the usual way to the intake manifold of an engine.

The tubular outlet arm 2 of the carburetor has a counterbore 70 partly surrounded by a hot air chamber 71 having ports 72 and 72′ to which heated fresh air is supplied from any suitable source. A Venturi tube 73 is slidably mounted in the counterbore, this tube having a stud 74 extending through the wall of the counterbore and pivotally engaged by a rod 75 in which is formed a longitudinal slot 76. A guide stud 77 extends into this slot from the tubular arm 2. The bell crank 78 of the butterfly valve 3 is connected by a link 80 to the rod 75 so that when the butterfly valve is rotated a right line movement will be imparted to the Venturi tube. Air inlet ports 81 can be formed in the wall of the counterbore 70 and so located that when the Venturi tube is in one extreme position the ports will be closed. However, when the tube is thrust to the right from the position shown in Figure 2, these ports will be uncovered and air will be free to enter the device across one end of the Venturi tube.

When the device is in operation, suction from the cylinder of an internal combustion engine will draw gas of a rich mixture from the carburetor casing 1 through the tubular member 2.

The drawing shows the device in starting position, wherein it will be observed that the butterfly valve 3 is nearly closed and the Venturi tube 73 is located near to the inner end of the counterbore 70. In this position air is prevented from entering the ports 81 from the hot air chamber 71 by the Venturi tube.

This adjustment supplies a rich mixture of gas to the engine, as is desirable when starting, and as the butterfly valve is opened further the Venturi tube is moved by the rod 75 to uncover the air inlet ports 81. In this position of the device, heated air is admitted in a continuous flow through the circumferential ports 81. When the Venturi tube 73 is moved further to the right, as viewed in Figure 2, a greater amount of heated air is admitted to mix with the added supply of rich gas from the butterfly valve 3, as engine speed requires.

It will be noted that this heated air is supplied between the buterfly valve 3 and the Venturi tube 73, permitting an uninterrupted flow of gas from the butterfly valve to the cylinder of the motor.

It will also be noted that no nozzles or other means of deflecting a smooth flow of gas are present in the path of the gas before or after it meets the heated air.

It will further be noted that the rich mixture of gas traverses the tubular member 2 toward the Venturi tube 73, until it meets the circumferentially disposed incoming jets of heated air which will entirely surround the flow of rich mixture to prevent condensation at this point.

This heated air mixes with the rich mixture of gas to reduce it to its predetermined proportions and keeps the temperature of the mixture from falling as the gas is speeded up by the well known Venturi action.

All of the actions just described combine to produce and deliver to the engine cylinder a constant flow of gas of a combustible temperature and a homogeneous mixture.

What is claimed is:

1. In a carburetor a tubular member having a passage for the flow of gas of a rich mixture, a counterbore in one end of the member, a butterfly valve spaced from the counterbore, a Venturi tube slidable in the counterbore, inlet ports in the counterbore circumferentially disposed and longitudinally spaced from one end of the counterbore, lever and link connections between the butterfly valve and the Venturi tube whereby both are adjusted simultaneously, said Venturi tube being movable outwardly of the counterbore to admit air to the counterbore between the butterfly valve and the Venturi tube, for thinning the said rich mixture, and a hot air chamber surrounding a portion of the tubular member adjacent the air inlet ports.

2. In a carburetor a tubular member having a passage for the flow of gas of a rich mixture, a counterbore in one end of the member, a butterfly valve in the member and spaced from the counterbore, a Venturi tube in the counter bore, and circumferential ports in the counterbore for receiving hot air, the Venturi tube being capable of closing said ports in one position and capable of admitting air through the ports to the tubular member between the butterfly valve and the Venturi tube inlet during progressive movement of the Venturi tube away from the butterfly valve.

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

WILLIAM A. HEIDE.