Oct. 22, 1946. J. HUTCHINSON 2,409,937

CARBURETOR ATTACHMENT

Filed Dec. 12, 1944

Fig. 1.

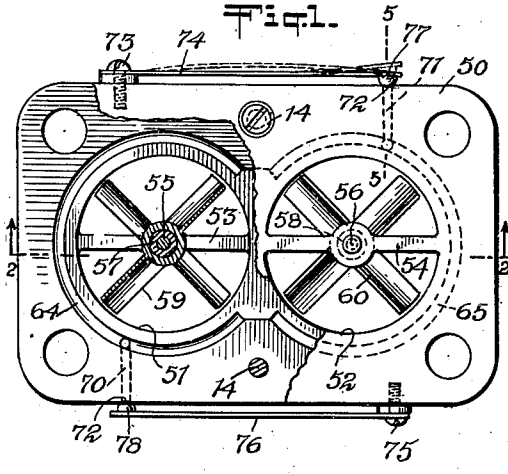


Fig. 6.

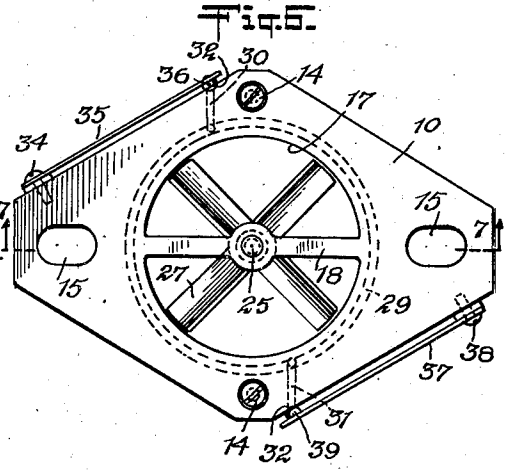


Fig. 2.

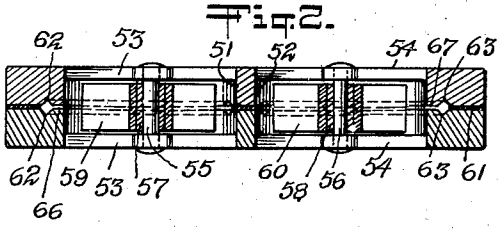


Fig. 7.

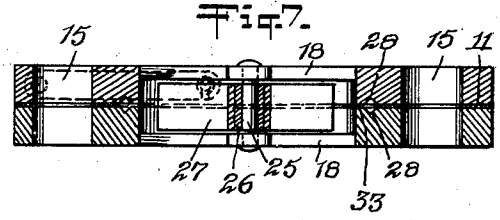


Fig. 3.

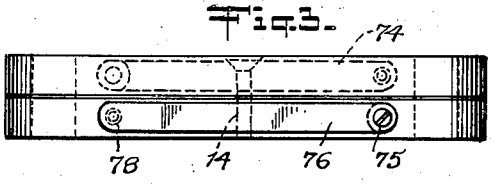


Fig. 5.

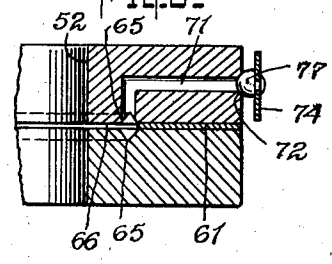


Fig. 4.

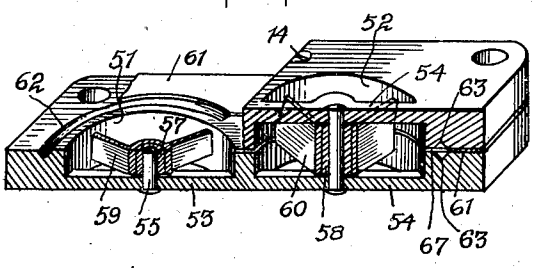
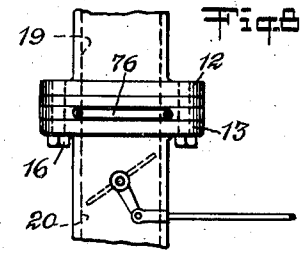


Fig. 8.



INVENTOR.
Job Hutchinson
BY
Munn, Liddy & Glascum
Attorneys

Patented Oct. 22, 1946

2,409,937

UNITED STATES PATENT OFFICE

2,409,937

CARBURETOR ATTACHMENT

Job Hutchinson, Great Neck, N. Y.

Application December 12, 1944, Serial No. 567,870

2 Claims. (Cl. 48—180)

1

The present invention relates to attachments for carburetors.

It is known that in cold weather automobile engines are difficult to start. A standard method of facilitating the starting of cold engines is to cut off or choke off the air intake at the carburetor. When the engine is warmed to a normal operating temperature, the choke is released and air is permitted to enter the carburetor thereby providing a leaner explosive mixture.

The present device is intended to be used in conjunction with conventional carburetors and including carburetors in automobiles which are not provided with automatic choking means.

Essentially, this invention comprises a device for automatically admitting an auxiliary flow of air into the passage through which the explosive mixture from the carburetor to the intake manifold passes, when the engine is warm and for automatically cutting off said auxiliary flow of air when the engine is cold.

Its principal object, therefore, is the provision of a device for automatically rendering the explosive mixture leaner when the engine is operating at its normal functioning temperature, thereby providing a better mixture at a considerable saving of gasoline.

Another object is the provision of a device of the character described which contains auxiliary automatically operated air supply means and auxiliary automatically operated explosive mixture mixing means functioning in conjunction with said first mentioned auxiliary means.

These and other objects are attained by mechanism illustrated in the accompanying drawing in which—

Fig. 1 is a plan view of one of the embodiments of the device, partly broken away to expose one of the auxiliary air distributing grooves;

Fig. 2 is a vertical longitudinal section on the line 2—2 of Fig. 1;

Fig. 3 is a side elevational view of the device shown in Fig. 1;

Fig. 4 is a perspective view of that part of the device which is shown in Fig. 2, partly broken away to expose the auxiliary air distributing groove shown in Fig. 1;

Fig. 5 is a detailed sectional view on the line 5—5 of Fig. 1 showing one of the thermostatically controlled valve units;

Fig. 6 is a plan view of a second embodiment of the device;

Fig. 7 is a vertical longitudinal sectional view on the line 7—7 of Fig. 6; and

Fig. 8 is a fragmentary side view of the device

2

shown in Fig. 6 shown fixed between the carburetor and the intake manifold.

The device shown in Figs. 1 to 5 inclusive is intended for use on eight cylinder automobiles and the device shown in Figs. 6 to 8 inclusive is intended for use on four to six cylinder automomiles. In Fig. 8 the normally adjoining parts of the carburetor and intake manifold of a six cylinder automobile are shown, the second embodiment being sandwiched in between said normally adjoining parts.

Referring now to Figs. 6 and 7, the device therein shown has a pair of upper and lower plates 10 and a thin gasket 11 sandwiched in between said plates. The overall dimensions of the plates correspond to the dimensions of flange 12 of the intake manifold and flange 13 of the carburetor. Screws 14 hold the two plates together. Oppositely situated holes 15 in said plates register with corresponding holes in the above mentioned flanges and accommodate in association with said flange holes screws or bolts 16. It is these bolts that hold the device in place between said flanges.

It will be seen that in the center of each said plate 10 is a somewhat large circular aperture 17 and that a bridge 18 integral with said plate spans said circular aperture on a line passing through its center. The shape and dimensions of circular aperture 17 correspond to the cross sectional shape and dimensions of passage 19 of the manifold and passage 20 of the carburetor through which the explosive mixture normally passes. When the device is fixed to the flanges of the manifold and carburetor as shown in Fig. 8, passages 19 and 20 and circular aperture 17 register with one another.

A pin 25 is fixed at one end to the center portion of bridge 18 of upper plate 10 and at the other end to bridge 18 of the lower plate 10. Mounted on said pin is a self-lubricating bearing 26 and mounted on said bearing is a fan 27, said fan being rotatably mounted with respect to pin 25.

It will be seen in the drawing that a circular groove 28 of a diameter somewhat larger than the diameter of circular aperture 17 is formed on the meeting faces of plates 10 in concentric relation to said circular aperture, the groove on the upper face registering with the groove on the lower face and forming therewith a single groove 29. A passage or boring 30 formed in the upper of plates 10 provides communication between grooves 28 and the atmosphere. A second passage or boring 31 formed in the lower of plates 10 also provides communication between grooves 28 and the at-

mosphere. A small depression or ball-valve seat 32 is formed at the atmosphere end of passages 30 and 31 for a purpose which will hereinafter appear.

It will be seen in Fig. 7 that gasket 11 extend from the edges of plates 10 to the outer circumference of single groove 29 and not beyond said groove to circular aperture 17. A space or slit 33 will therefore be formed between plates 10 of a depth corresponding to the thickness of gasket 11, between groove 29 and circular aperture 17. Communication will thereby be effected between said groove 29 and said circular aperture 17. The function of said slit will hereinafter be set forth.

Affixed to one of the side edges of the upper of plates 10 by means of screw 34 is a bi-metallic strip 35 having a freely movable end on which a ball 36 is affixed. An identical bi-metallic strip 37 is affixed at one end by means of screw 38 to the opposite side edge of the lower of said plates 10. It, too, is provided at its freely movable end with a ball 39. The choice of metals is such in said bi-metallic strips that a change in temperature will cause outward movement of the free ends of said strips away from the plates to which they are respectively affixed. It will be noted that when these bi-metallic strips—which of course comprise thermostatic members—are in their normal uncurved state, their respective balls 36 and 39 rest snugly against seats 32 in said plates, thereby effectively shutting off communication between the atmosphere and groove 29 through passages 30 and 31.

The device operates as follows:

When the engine is cold, or the temperature of the outside air is below 32° F., the bi-metallic strips 35 and 37 will maintain their normal uncurved position, thereby maintaining their respective ball members in close contact with seats 32. When these bi-metallic strips are so situated, air cannot pass from the atmosphere into and through passages 30 and 31. When the temperature of the engine increases, however, or when the air is warmer than 32° F., bi-metallic strips 35 and 37 will be caused to bend or curl outwardly, thereby disengaging ball members 36 and 39 from their respective seats 32. Communication between the atmosphere and groove 29 through passages 30 and 31 would thereby become established. Since there is communication between groove 29 and circular opening 17 through slit 33, communication between circular aperture 17 and the atmosphere will be effected by the departure of balls 36 and 39 from their respective seats 32. The suction that draws the explosive mixture from the carburetor through passage 20 of the carburetor will also draw said mixture through the circular aperture 17 and the manifold passage 19. In consequence of said action, air will be drawn in from the atmosphere through passages 30 and 31 into groove 29 thence through slit 33 and finally into circular aperture 17. The newly admitted air will be mixed with said explosive mixture by the action of fan 27, which fan is caused to rotate by the same suction which draws the explosive mixture out of the carburetor and the additional air out of the atmosphere.

Referring now to the embodiment of the invention shown in Figs. 1 to 5 inclusive, it will be seen that the basic principle and basic elements of said embodiment are identical with those of the embodiment first above described. The embodiment now under consideration comprises a pair of upper and lower plates 50 which are substantially rectangular in shape. The reason for this configuration is that the normally adjoining flange members of the carburetor and intake manifold of conventional eight cylinder automobiles are of corresponding rectangular shape. In place of circular aperture 17 of the embodiment first above described, the present embodiment has two circular apertures 51 and 52 formed in each of said plates 50. Bridges 53 and 54 respectively, span the circular apertures of plates 50. A pin 55 is fixed to bridges 53 and pin 56 is fixed to bridges 54 in the same manner and place as pin 25 in the bridges of the first embodiment.

Mounted on pins 55 and 56 are self-lubricating bearings 57 and 58 respectively, and mounted on said bearings are fans 59 and 60 respectively. Like fan 27, fans 59 and 60 are freely rotatable relative to their respective pins.

Plates 50 are separated by means of a thin gasket 61 which performs the same function as gasket 11 of the first described embodiment. Corresponding to grooves 28 of the first described embodiment are C-shaped grooves 62 and 63 formed on the meeting faces of plates 50. They are concentric with circular apertures 51 and 52 and are in registration, respectively, with each other thereby forming grooves 64 and 65 respectively. They are not completely circular grooves for the reason that the close proximity of circular aperture 51 to circular aperture 52 renders this impossible. Like the gasket in the first described embodiment, gasket 61 extends from the outer edges of plates 50 to the outer circumference of grooves 64 and 65. In consequence, a narrow slit 66 is formed between groove 64 and circular aperture 51 and a second slit 67 is formed between groove 65 and circular aperture 52. These slits are in communication with each other in the area separating circular aperture 51 from circular aperture 52. Communication between groove 64 and the atmosphere is provided by passage or boring 70, and communication between groove 65 and the atmosphere is provided by passage or boring 71. Each said boring is provided at its outer end with a small depression or ball-valve seat 72 which corresponds in function to ball-valve seats 32 of the embodiment first above described.

Affixed at one end to the upper of plates 50 by means of screw 73 is a bi-metallic strip 74, and affixed at one end to the lower of plates 50 by a means of screw 75 is a bi-metallic strip 76. A ball 77 is fixed to the free end of bi-metallic strip 74 and a ball 78 is affixed to the free end of bi-metallic strip 76. It will be seen in Fig. 1 that said bi-metallic strips bend in both directions. When it is cold, that is when the engine is cold, or when the temperature of the outside air is below 32° F., the strips bend inwardly and cause their respective ball members to enter into close contact with their respective seats, thereby effectively shutting off communication between the atmosphere and grooves 64 and 65. When the temperature of the outer air rises above 32° F. or when the engine is warmed up, the bi-metallic strips bend outwardly thereby causing their respective ball members to disengage their respective seats. Air is therefore free to flow through passages 70 and 71 into grooves 64 and 65 and thence through slits 66 and 67 into circular apertures 51 and 52. Such flow is induced as above mentioned by the suction of the engine which draws the ex-

plosive mixture from the carburetor. The suction also causes rotation of fans 59 and 60 thereby effectively mixing the newly admitted air with the explosive mixture.

The embodiments above described are but preferred embodiments of the invention. Constructional modifications may be incorporated therein without departing from the basic principles thereof. For example, there is nothing critical about the precise shape of plates 10 and plates 50. They may be made to conform to whatever shape the normally adjoining carburetor and intake manifold flanges are fashioned. Other types of thermostatically controlled valves may be used in place of the thermostatically controlled ball-valve shown and described. The gasket may be made of material that conducts heat well or of material that does not conduct heat well, depending upon whether it is desired to have both plates receive heat by conduction from the manifold or whether it is desired to have only one of the plates receive such heat—the other plate being exposed only to the heat of the air. A gasket may be interposed between the device as a whole and the intake manifold flange, thereby effectively removing said device from thermal contact with the manifold. In such case, the thermostatically controlled valves on said devices would be subject solely to the temperature conditions of the air surrounding them and not to the heat which in the other embodiments is conducted to them from the manifold.

Although a temperature of 32° F. has herein been mentioned, said temperature is not critical, and the thermostatically controlled valves may be designed to open at any other temperature.

I claim:

1. A carburetor attachment for insertion between the carburetor and the intake manifold of an internal combustion engine, said attachment having a passage through which the explosive mixture from the carburetor passes to the manifold, an air distribution chamber surrounding said passage and communicating therewith, a pair of oppositely situated passages which provide communication between said distribution chamber and the atmosphere, a pair of thermostatically controlled valves on said pair of passages which open at a predetermined temperature to permit an auxiliary supply of air to be drawn into said first passage through said pair of passages and said distribution chamber, and a freely rotating fan in said first passage which mixes the auxiliary supply of air with the explosive mixture, each of said thermostatically controlled valves comprising a bi-metallic strip having thermostatic properties, affixed at one end to said attachment and having a plug affixed to its free end registering with the particular passage which the valve controls.

2. A carburetor attachment for insertion between the carburetor and the intake manifold of an internal combusion engine, said attachment having a plurality of passages through which the explosive mixture from the carburetor passes to the manifold, air distribution chambers surrounding said passages and communicating with them, secondary passages which provide communication between said distribution chambers and the atmosphere, thermostatically controlled valves on said secondary passages which open at a predetermined temperature to permit an auxiliary supply of air to be drawn into said first mentioned passages through said secondary passages and said distribution chambers, and freely rotating fans in said first mentioned passages which mix the auxiliary supply of air with the explosive mixture, each of said thermostatically controlled valves comprising a bi-metallic strip having thermostatic properties, affixed at one end to said attachment and having a plug affixed to its free end registering with the particular passage which the valve controls.

JOB HUTCHINSON.