

March 29, 1966

W. M. BLACKER
CARBURETOR ATTACHMENT
Filed May 19, 1964

3,242,915

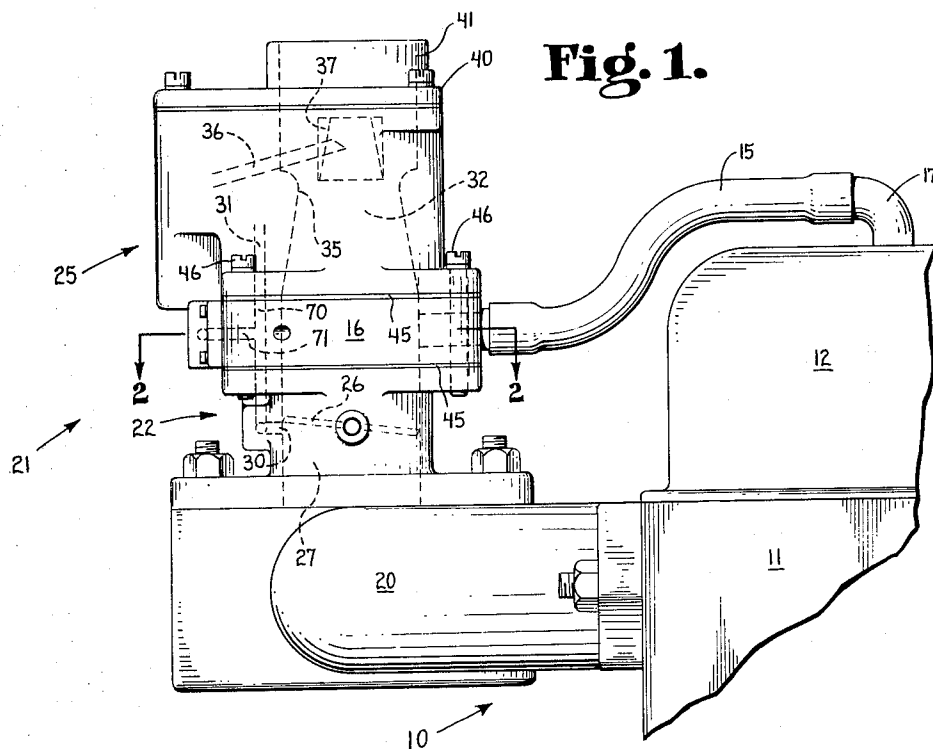
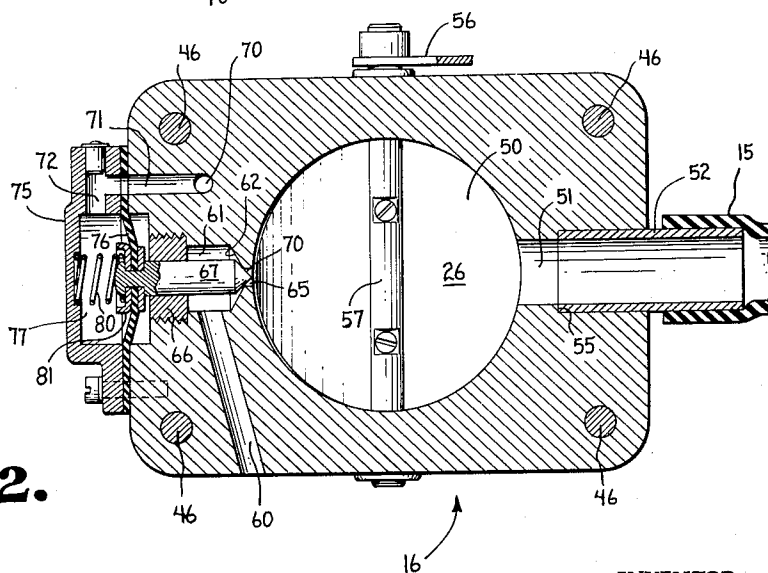


Fig. 2.



INVENTOR.
WILLIAM M. BLACKER

BY
Lockwood, Woodard, Smith & Weikert
Attorneys

1

3,242,915

CARBURETOR ATTACHMENT

William M. Blacker, Fillmore, Ind., assignor, by direct and mesne assignments, of five percent to Georgia C. Gakle, nine and one-sixth percent each to James A. Briggs, James K. Sommer, and Richard P. Tinkham, Jr., six percent to John C. Geupel, five percent to Alex Sommerville, four and one-half percent to Southern Indiana Railway, Inc., four and one-half percent to William F. Welch, trustee, all of Indianapolis, Ind., and seven and one-half percent to Mark O. Hooton, Chicago, Ill.

Filed May 19, 1964, Ser. No. 368,512

7 Claims. (Cl. 123—119)

The present invention relates to a carburetor attachment.

One of the problems in present day automobile engines is that of "blow by" or partially burned gases moving past the pistons and into the crankcase and exiting through the breather into the air. Not only is such "blow by" harmful to humans if breathed in large quantities but also such "blow by" is a waste of perfectly good combustible material in its most conveniently used gaseous form. An important object of the present invention is to provide an improved device for eliminating such "blow by."

Another object of the invention is to provide a carburetor attachment which increases gasoline mileage without reducing other engine operating characteristics such as top speed and acceleration capability.

A further object of the invention is to provide a device for burning "blow by" and for automatically adjusting the air content of the "blow by" according to the type of operation desired.

Related objects and advantages will become apparent as the description proceeds.

One specific embodiment of the present invention might incorporate in an internal combustion engine with carburetor including a base and a bowl each having a passage therethrough, said bowl having a venturi formed in said bowl passage, a main fuel jet mounted in said bowl and leading into said bowl passage upstream of said venturi, a butterfly valve mounted on said base and controlling flow through said base passage, said base having a second passage therein leading from the base passage toward said bowl, the improvement which comprises a block mounted between said base and bowl and having an opening therethrough which connects the passage of said bowl with the passage of said base, a conduit providing closed communication between the crankcase of the engine and said block, said crankcase being otherwise sealed to the atmosphere, said block having a third passage leading from said opening to atmosphere, said third passage tapering from a small size adjacent said opening to a larger size away from said opening, a pointed valve element received in said third passage and movable toward and away from said tapering portion of said third passage to control flow of air into said opening through said third passage, a diaphragm mounting said valve element, said block having a fourth passage therein leading from said second passage to said diaphragm and conducting vacuum to said diaphragm from said base passage for opening said valve element to permit greater flow of air through said third passage to said opening when the vacuum increases downstream of said butterfly in said base passage.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

2

FIG. 1 is a side elevation of an internal combustion engine and carburetor with the carburetor attachment of the present invention mounted thereon.

FIG. 2 is an enlarged section taken along the line 2—2 of FIG. 1 in the direction of the arrows.

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiment illustrated in the drawing and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring more particularly to the drawings, there is illustrated an internal combustion engine 10 including a head 11 and a valve cover 12 sealed by suitable gasket means to the head 11. The interior of the valve cover 12 communicates in conventional fashion with the crankcase of the engine whereby oil may be placed within the engine by pouring through a suitable pipe (not shown) leading into the valve cover.

It should be understood that the pipe used for the adding of oil is sealed off when the present invention is in operation. Furthermore, the breather for the crankcase is also sealed off or may be used as the connecting means for a conduit 15 which provides closed communication between a block 16 and the breather pipe 17. Except for the conduit 15 through which "blow by" is conveyed, all exits and openings to atmosphere from the crankcase and the valve cover are sealed off.

Fixedly mounted in conventional fashion upon the head 11 is an intake manifold 20 which has, in turn, a carburetor 21 including a base 22 and a bowl 25 mounted thereon. The carburetor 21 is conventional except for the block 16 and incorporates a butterfly valve 26 received within a passage 27 leading through the base 22. Downstream of or below the butterfly valve 26, there is located a passage 30 which leads upwardly within the base and in the conventional carburetor communicates with a passage 31 which may, for example, communicate with a conventional acceleration plunger.

The bowl 25 of the carburetor includes a conventional passage 32 with a venturi shape 35. Above the venturi 35 and opening into the passage 32, there is mounted a main fuel jet 36 which may, for example, discharge within a secondary venturi 37 fixedly mounted centrally of the passage 32.

Fixed to the top of the bowl 25 is a cover plate 40 having integrally formed thereon a flange 41 which may be used to mount in conventional fashion an air cleaner (not shown). The block 16 is not conventional and is inserted or sandwiched between the bowl 25 and base 22 by the use of suitable gaskets 45 and longer-than-conventional bolts 46. The block 16, which is shown in more detail in FIG. 2, has an opening 50 therethrough which is coextensive with the openings 27 and 32 in the base 22 and bowl 25, respectively. The block 16 has formed therein a passage 51 which communicates with the opening 50 and with the conduit 15. A suitable cylindrical member 52 may be force fitted within a counterbore 55 to facilitate mounting of the conduit 15.

FIG. 2 also illustrates the throttle linkage 56 which is operatively connected to a slotted shaft 57, the slot (not shown) of which receives the butterfly valve 26. The

block 16 also has formed therein a passage 60 which leads from atmosphere to an enlarged portion 61 of the passage 60 and then tapers in a frusto-conical configuration at 62 to a cylindrical portion 65 which opens into the opening 50.

A bearing 66 is threadedly received within the block 16 and reciprocally mounts a valve element 67 having a pointed conical head 70 which cooperates with the tapered frusto-conical surface 62.

The valve element 67 operates to control the amount of air moving into the opening 50 through the passage 60 and thus operates to control the richness or leanness of the "blow by" mixture moving from the opening 50 downwardly into the passage 27. It will, of course, be understood that a certain amount of oil vapor will also be sucked through the conduit 15 along with the "blow by." It has been found, however, as will appear in the actual operating data given below, that the amount of oil vapor so consumed is not substantial. In any event, the use of the term "blow by" in this application also may refer to a certain amount of oil vapor.

It is desirable that the "blow by" mixture moving downwardly into the passage 27 be rich when the engine is accelerating and be lean when the engine is moving, for example, at constant cruising speed. When the engine is accelerated, the butterfly valve 26 will be relatively vertical as viewed in FIG. 1 so that the vacuum in the passage 27 below the butterfly valve is relatively small, i.e., the pressure is relatively high. In such an operating condition, the valve element 67 is approximately in the position illustrated in FIG. 2 whereby little or no air is permitted to enter the opening 50 through the passage 60.

On the other hand, when the butterfly valve 26 is in the position illustrated in FIG. 1 or in a position close to that illustrated in FIG. 1 and the engine is cruising with no acceleration, the vacuum downstream of the butterfly valve in the passage 27 will be relatively high, i.e., the pressure will be low. This low pressure is used to open the valve element 67 and to therefore permit a relatively large amount of air to enter the passage 60 and to mix with the "blow by" moving into the block 16 and down into the base 22.

This operation is achieved by the passage 70 in the block 16 which provides communication between the passages 30 and 31. A further passage 71 in the block 16 communicates with the passage 70 and leads into a passage 72 in an attached member 75. Between the attached member 75 and the block 16, there is fixedly received a diaphragm 76 which mounts the valve element 67. The attached member 75 has formed therein a recess 77 which acts as a vacuum chamber and is in communication with the passage 72.

A compression spring 80 bears against the attached member 75 and the cup-shaped element 81 fixed to the valve element 67. The compression spring 80 normally maintains the valve 67 in closed condition except when the vacuum within the chamber 77 becomes sufficiently great to overcome the spring force and open the valve 67. It will be understood that the spring rate of the spring 80 operates to permit various intermediate settings of the valve element 67 depending upon the butterfly valve setting and the amount of vacuum in the chamber 77.

It should be understood that the present invention can be constructed in various forms. For example, one actual embodiment of the invention which has been operated and tested incorporates two openings 50 and is used upon a two-barrel carburetor forming a part of a 398 cubic inch V-8 1960 Plymouth engine. This 1960 Plymouth engine is completely conventional with the exception that the above described arrangement is incorporated therein. At the various miles per hour speeds set forth below, the various miles per gallon also set forth were achieved. A comparison column illustrates the miles per gallon

achieved without the carburetor attachment described above. It should also be mentioned that the present embodiment of the invention gave the same acceleration and the same top speed with and without the above described carburetor attachment. Furthermore, with the above described carburetor attachment, the Plymouth engine used only one-half quart of oil per 4,000 miles.

Automobile Speed (m.p.h.)	Miles Per Gallon Without Carburetor Attachment	Miles Per Gallon With Carburetor Attachment
30.....	21.4	28.8
40.....	20.8	28.0
50.....	19.0	25.4
60.....	16.0	24.3
70.....	14.6	22.8
80.....		20.8
100.....		16

It should also be mentioned that in the V-8 engine used for the above test, the oil fill pipe was not sealed off inasmuch as the oil fill pipe was located on the opposite bank from the conduit 15. Thus, the conduit 15 drew through the oil breather cap, the valve cover on one bank, the crankcase and the valve cover on the other bank and the breather vent (which was otherwise sealed) in that order.

It will be evident from the above description that the present invention provides a carburetor attachment which increases gasoline mileage without reducing other engine operating characteristics such as top speed and acceleration capability. It will also be evident that the present invention provides an improved device for eliminating "blow by" and for making good use of such "blow by." It should also be mentioned that the present invention increases engine life because it provides lubricating oil in vapor form from the crankcase to the intake manifold whereby it moves into the combustion chambers for lubrication of the pistons.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention and the scope of the claims are also desired to be protected.

The invention claimed is:

1. A carburetion system comprising an internal combustion engine having a crankcase and an intake manifold, a carburetor having a fuel mixture supply passage leading to said intake manifold, a fuel jet mounted on said carburetor and discharging in said passage, a valve downstream of said jet and controlling flow through said passage, a conduit communicating between said crankcase and said carburetor and opening into said carburetor between said jet and valve, said carburetor having a vent leading from atmosphere to said passage and opening between said jet and valve, and means responsive to vacuum in said passage downstream of said valve for controlling the amount of air passing through said vent.

2. In an internal combustion engine with carburetor including a base and a bowl each having a passage there-through, said bowl having a venturi formed in said bowl passage, a main fuel jet mounted in said bowl and leading into said bowl passage upstream of said venturi, a butterfly valve mounted on said base and controlling flow through said base passage, the improvement which comprises a block mounted between said base and bowl and having an opening therethrough which connects the passage of said bowl with the passage of said base, and a conduit providing closed communication between the crankcase of the engine and the opening of said block, said crankcase being otherwise sealed to the atmosphere.

3. In an internal combustion engine with carburetor in-

5

cluding a base and a bowl each having a passage there-
through, a fuel jet mounted in said bowl and leading into
said bowl passage, a butterfly valve mounted on said base
and controlling flow through said base passage, the im-
provement which comprises a block mounted between
said base and bowl and having an opening therethrough
which connects the passage of said bowl with the passage
of said base, a conduit providing closed communication
between the crankcase of the engine and the opening of
said block, said crankcase being otherwise sealed to the
atmosphere, said block having a second passage leading
from said opening to atmosphere and, means responsive
to the vacuum in said base passage downstream of said
butterfly valve for controlling the flow of air through
said second passage.

4. In an internal combustion engine with carburetor
including a base and a bowl each having a passage there-
through, a fuel jet mounted in said bowl and leading into
said bowl passage, a butterfly valve mounted on said base
and controlling flow through said base passage, said
base having a second passage therein leading from the
base passage downstream of said butterfly valve toward
said bowl, the improvement which comprises a block
mounted between said base and bowl and having an open-
ing therethrough which connects the passage of said bowl
with the passage of said base, a conduit providing closed
communication between the crankcase of the engine and
the opening of said block, said crankcase being otherwise
sealed to the atmosphere, said block having a third pas-
sage leading from said opening to atmosphere, said third
passage tapering from a small size adjacent said opening
to a larger size away from said opening, a pointed valve
element received in said third passage and movable
toward and away from said tapering portion of said third
passage to control flow of air into said opening through
said third passage, and a diaphragm mounting said valve
element on said block, said block having a fourth pas-
sage therein leading from said second passage to said
diaphragm and conducting vacuum to said diaphragm
from said base passage for opening said valve element to
permit greater flow of air through said third passage to
said opening when the vacuum increases downstream of
said butterfly valve in said base passage.

5. In an internal combustion engine with carburetor
including a base and a bowl each having a passage there-
through, said bowl having a venturi formed in said bowl
passage, a main fuel jet mounted in said bowl and leading
into said bowl passage upstream of said venturi, a butter-
fly valve mounted on said base and controlling flow
through said base passage, said base having a second
passage therein leading from the base passage downstream
of said butterfly valve toward said bowl, the improvement
which comprises a block mounted between said base and
bowl and having an opening therethrough which connects
the passage of said bowl with the passage of said base,
a conduit providing closed communication between the
crankcase of the engine and the opening of said block,
said crankcase being otherwise sealed to the atmosphere,
said block having a third passage leading from said open-
ing to atmosphere, said third passage tapering from a small
size adjacent said opening to a larger size away from said

6

opening, a pointed valve element received in said third
passage and movable toward and away from said tapering
portion of said third passage to control flow of air into
said opening through said third passage, and a diaphragm
mounting said valve element on said block, said block
having a fourth passage therein leading from said second
passage to said diaphragm and conducting vacuum to
said diaphragm from said base passage for opening said
valve element to permit greater flow of air through said
third passage to said opening when the vacuum increases
downstream of said butterfly valve in said base passage.

6. A carburetor attachment comprising a block adapted
for mounting between the base and bowl of a carburetor
and having an opening therethrough adapted for connect-
ing the passage of said bowl with the passage of said
base, a conduit for providing closed communication be-
tween the engine crankcase and the opening of said block,
said block having a first passage leading from said open-
ing to atmosphere, said passage tapering from a small
size adjacent said opening to a larger size away from said
opening, a pointed valve element received in said pas-
sage and movable toward and away from said tapering
portion of said passage to control flow of air into said
opening through said passage, a diaphragm mounting
said valve element on said block, said block having a sec-
ond passage therein leading to said diaphragm for con-
ducting vacuum to said diaphragm for opening said valve
element to permit greater flow of air through said first
passage to said opening when the vacuum increases
downstream of said butterfly in said base passage.

7. A carburetor attachment comprising a block adapted
for mounting between the base and bowl of a carburetor
and having an opening therethrough adapted for connect-
ing the passage of said bowl with the passage of said
base, a conduit connected to said block for providing
closed communication between the engine crankcase and
the opening of said block, said block having a passage
leading from said opening to atmosphere, and vacuum
responsive means adapted to receive vacuum from the car-
buretor passage downstream of the carburetor butterfly
valve for controlling flow of air through said block pas-
sage.

References Cited by the Examiner

UNITED STATES PATENTS

2,274,894	3/1942	Gray	123—119
2,281,124	4/1942	Westcott	123—119
2,291,879	8/1942	Chandler	123—119
2,489,230	11/1949	Winkler	123—119
2,737,935	3/1956	Olson	123—119
2,971,505	2/1961	Fortney	123—119
3,030,942	4/1962	Thompson	123—119
3,059,628	10/1962	Linn	123—119
3,066,660	12/1962	Matz	123—119
3,077,871	2/1963	Daigh	123—119
3,105,477	10/1963	Lowther	123—119
3,116,727	1/1964	Dietrich	123—119
3,123,060	3/1964	Daigh	123—119

KARL J. ALBRECHT, *Primary Examiner.*