

Jan. 2, 1940.

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2,185,501

BREATHER SYSTEM FOR INTERNAL COMBUSTION ENGINES

Filed May 15, 1939

2 Sheets-Sheet 1

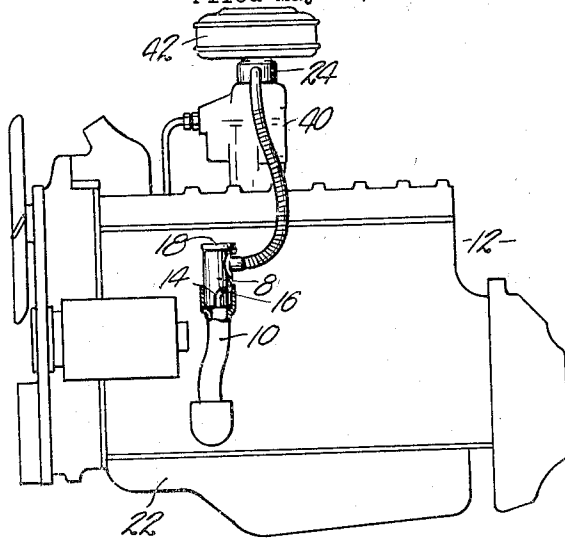


Fig. 1.

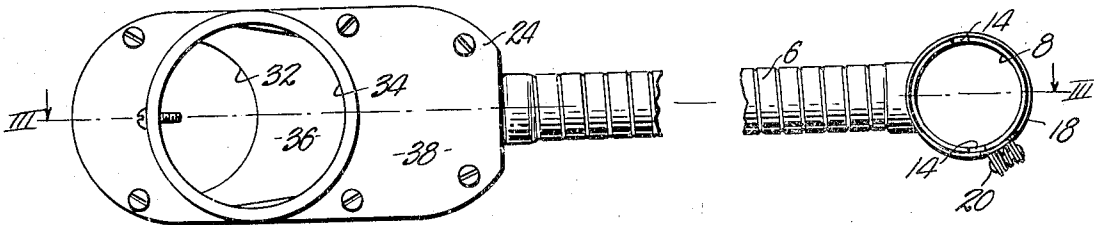


Fig. 2.

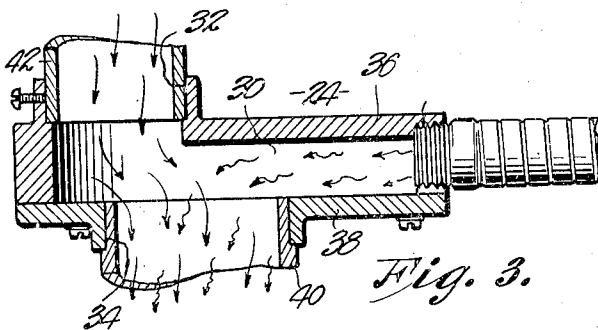
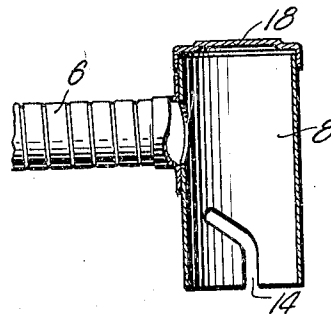


Fig. 3.



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2 Sheets-Sheet 2

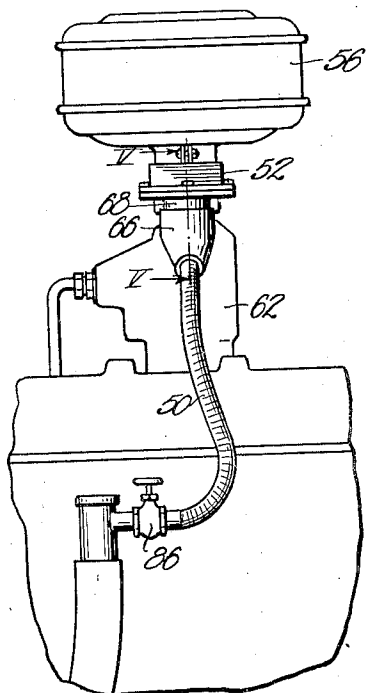


Fig. 4.

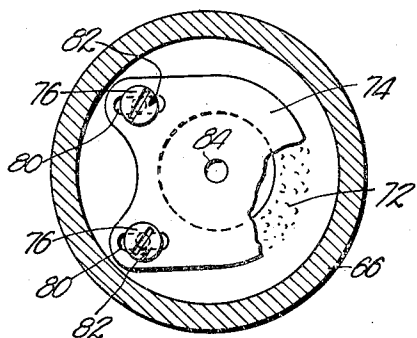


Fig. 6.

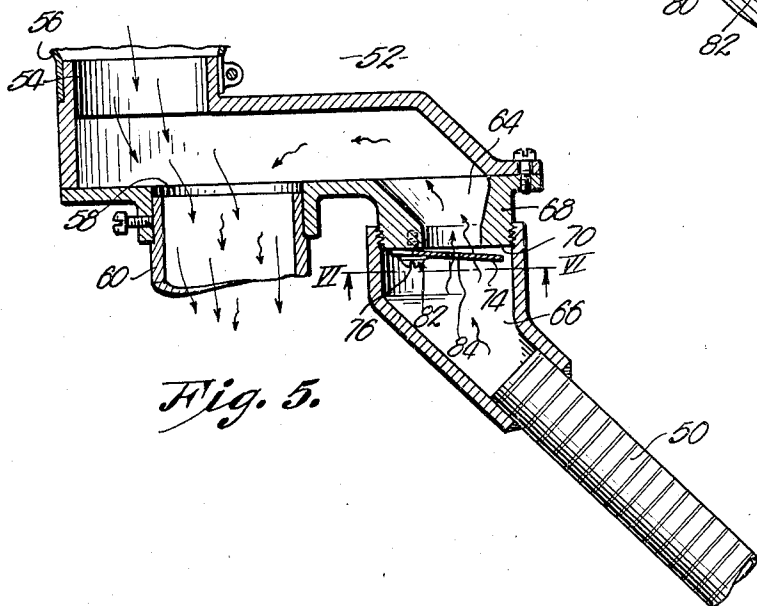


Fig. 5.

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2,185,501

BREATHER SYSTEM FOR INTERNAL COMBUSTION ENGINES

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Application May 15, 1939, Serial No. 273,650

2 Claims. (Cl. 123—119)

This invention relates to internal combustion engines and particularly attachments for the conventional type of gasoline engines employed in automotive equipment, and the primary object is to provide an attachment which supplements the conventional breather and air intake elements to the end that vapors evolved in the crank case and communicating cavities are drawn therefrom and mixed with air entering the carburetor.

One of the important aims of the present invention is to provide a breather system for internal combustion engines that includes means for interconnecting and placing into communication the conventional breather opening and the air intake of the carburetor serving the engine.

This invention has for an even further object the provision of means for so interconnecting the breather cap and carburetor of an internal combustion engine that evolved vapors will draw by vacuumatic action into the stream of air entering the carburetor before the said air reaches the venturi thereof.

Another aim of this invention is to provide novel and effective means for interconnecting the crank case and carburetor of an internal combustion engine, which means includes a specially formed chambered head having a series of ports arranged to uniquely employ the force of incoming air to establish suction whereby evolved vapors formed within the crank case are drawn to and comingled with the air supply of the carburetor prior to its passing the venturi of the carburetor.

A further object of this invention is to provide an internal combustion engine with a breather system adapted to withdraw vapors from within the crank case, which system has a specially formed head and with means for automatically precluding the movement of air and vapors from the crank case to the carburetor when the vacuumatic pressure or suction created by air entering the carburetor reaches a predetermined point.

Another object of the invention is to provide a system of the aforementioned character wherein is included a cock for the purpose of controlling the volume of air and vapors passing from the crank case to the chambered head of the system, said cock being operable in combination with a perforated flap valve that is held open by the action of gravity and through which may pass a relatively small stream of air and vapors after it has been moved to the closed position by

an excess of suction established by air drawn into the carburetor.

Minor objects of the invention will appear during the course of the following specification, referring to the accompanying drawings wherein but one embodiment of the invention is illustrated and wherein:

Figure 1 is a side elevation of an internal combustion engine having the breather system operably associated therewith.

Fig. 2 is an inverted plan view of the means for interconnecting the breather pipe and carburetor of an internal combustion engine.

Fig. 3 is a fragmentary longitudinal sectional view through the same.

Fig. 4 is an elevational view of a portion of an internal combustion engine showing a breather system in place, which system has control means forming a part thereof.

Fig. 5 is an enlarged fragmentary sectional view through the head of the system illustrating a modified form of the invention, taken on line V—V of Fig. 4; and,

Fig. 6 is an enlarged fragmentary detailed view taken on line VI—VI of Fig. 5.

Those familiar with the operation of internal combustion engines realize that the lubricating oil in the crank case thereof, is diluted because of the condensation of moisture in such case, and because of a certain percentage of the fuel passing into the case from the cylinders. Normal action of the engine, especially as regards agitating the oil within the crank case, produces in the lubricant an objectionable substance known as "sludge". The elimination of the constituent ingredients of this sludge is desirable, and the employment of a breathing system embodying this invention will, to an appreciable extent, evacuate the crank case and cavities of the engine block so that foreign matter will not collect and combine with the oil.

Evolved vapors within the crank case and other cavities of the engine block that are in communication with the crank case, are drawn from their point of origin before condensation occurs and therefore, the detrimental effects of these vapors and the sludge resulting from the condensation thereof are overcome.

Heretofore, most types of ventilating systems have been tried with internal combustion engines in order to remove vapors, gases and other products that collect in the crank case of the engine during its operation. Most of these systems require that the vehicle be in motion before adequate ventilation can occur. When the engine

is most in need of an efficient ventilating system, during idling or slow forward movement of the vehicle, the vapors created are not removed prior to condensation and therefore, substances known to be harmful to the internal parts of the engine are allowed to collect.

The means embodying this invention is designed to forcibly draw all objectionable vapors from within the engine crank case as they are created, regardless of the speed of the engine or vehicle. So long as air is being drawn into the carburetor, evacuation of crank case and cavities within the engine block will occur and therefore, a constantly operating and highly efficient system is provided.

The illustrated embodiment shown in the drawings comprises a conduit 6 having at one end thereof the specially formed structure 8 through the medium of which the conduit may be attached to breather tube 10 of engine 12. In the instance shown, structure 8 is in the nature of a short tube having a slot 14 formed therein which engages a pin 16 carried by breather tube 10.

A cap 18 hingedly mounted as at 20 may be lifted to uncover the end of tube 8 so that oil may be introduced into crank case 22 without disconnecting conduit 6 and the structure at the end thereof which is employed to operably mount that end.

The other end of conduit 6 has a specially formed head 24 thereon which head may be case or otherwise formed of metal or some durable substance. Head 24 has an opening 26 on side 28 thereof, and this last mentioned end of conduit 6 is secured to head 24 in the manner illustrated in Fig. 3. Obviously, conduit and head 6 and 24 respectively, may be joined together in any suitable fashion so long as chamber 30 formed within head 24 is in communication with conduit 6.

Head 24 has an intake port 32 and an outlet port 34 formed therein through opposite sides respectively thereof. Intake port 32 is provided in side 36 which is normally the upper side when the device is in use, and port 34 is provided in side 38 which is usually the bottom of the head when the same forms a connection between conduit 6 and carburetor 40.

An air filter 42 of convention type is in connection with head 24 and when the engine is in operation, air will pass through air filter 42, head 24 and into carburetor 40, as indicated by the arrows in Fig. 3.

Intake port 32 and outlet port 34 are offset but slightly overlapping so that the paths through which the incoming air is drawn are disposed at an angle across chamber 30. Thus, conduit 6 is vacuumized to positively draw evolved vapors from within the crank case. Obviously, the end of conduit 6 having structure 8 thereon, may be placed in communication with any of the cavities in engine 12 as well as in communication with crank case 22 so long as the vapors which it is desired to withdraw are able to reach that end of the conduit.

When installing the breather system, attachment to carburetor 40 should be made at a point where vapors will enter the incoming air prior to their passing the venturi and fuel jets of the carburetor. It would not be practical to inject the vapors from within crank case into the air after it has passed through the carburetor and therefore, this zone of connection should be carefully observed. The adjustment of carburetor 40

need not be changed when head 24 is secured in place.

The cross sectional area of conduit 6 is appreciably less than the same area of ports 32 and 34, not only for the purpose of maintaining a constant vacuumatic pressure but to insure that the amount of air reaching the carburetor is not greatly altered by the introduction of the vapors which pass through conduit 6. The suction created through the conduit is not great enough to draw lubricating oil or objectionable solids into the carburetor and as long as the engine is operating a forced draft must be established.

In some installations, it is desirable to preclude the passage of lubricating oil and other solids to the carburetor. The vacuumatic pressure established by the passage of air through the head of the system rises to such a point that oil is sucked through the conduit and thence into the carburetor horn where destructive reaction may effect the efficiency of the engine with which the system is combined.

The modified form of the invention illustrated in Figs. 4 to 6 inclusive, makes provision for overcoming the objection which might arise in the event suction becomes too great at the point where conduit 50 connects with head 52. This head 52 follows the general characteristic of head 24, illustrated in Figs. 1 to 3 inclusive, in that it has an intake port 54 in communication with air filter 56 and an outlet port 58 in communication with horn 60 of carburetor 62. The opening 64 which communicates with conduit 50 through the medium of coupling 66, is created in a normally horizontal portion 68 of head 52.

The lower face 70 of portion 68 is roughened as at 72 so that when flap valve 74 is moved thereagainst the latter will not have a tendency to adhere to face 70.

Flap valve 74 may be made of any suitable material which is not effected by oil, oil vapors or heat. It is freely hung on securing members 76 which pass through slots 80 formed in valve 74 near one edge, heads 82 of members 76 being large enough to insure freedom of movement toward and from surface 70.

A perforation 84 formed through flap valve 72 at a place where air may pass into head 52 when the valve is closed, maintains a constant circulation without entirely interrupting the flow of air from the crank case to head 52 when the suction through the system has become great enough to overcome the action of gravity on flap valve 72 and move it to the closed position.

The weight of flap valve 74 may be altered to suit conditions met by particular installations, and after a flap valve 74 has once been installed, the cock 86 is employed to control the volume of air and vapors entering conduit 50 from the crank case. This cock 86 is set and unlike flap valve 74, will remain in place until manually manipulated to again change the opening there-through which controls the passage of air through the system.

When both valve 74 and cock 86 are used in the system, a fine adjustment is possible and no amount of fluctuation in the vacuumatic action through head 52 will introduce objectionable liquids or solids to the carburetor from the other parts of the engine with which it is connected by the component elements of the system.

The concepts of this invention are broad enough to permit embodying the same in struc-

tures other than those illustrated and described, and therefore, it is desired to be limited only by the spirit of the invention and scope of the appended claims.

5 Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. The combination with an internal combustion engine having a carburetor provided with an air intake, a crank case for holding lubricating oil, and a block having cavities formed therein in communication with the crank case, of means for conveying vapors evolved within the crank case and said cavities to the air intake of the carburetor, said means including a conduit; a chambered head on one end of the conduit provided with an air intake port, an air outlet port, and an opening for receiving one end of the conduit; and structure on the other end of the conduit for placing the latter in communication with the crank case and cavities in the block, said ports being disposed to create vacuumatic action at the said opening when air is passing to the carburetor, said head having a perforated flap valve loosely mounted therein for movement to and from a position for partially closing the opening when the vacuumatic action reaches a predetermined point, said valve being held open

by the action of gravity thereon when the vacuumatic action ceases.

2. The combination with an internal combustion engine having a carburetor provided with an air intake, a crank case for holding lubricating oil, and a block having cavities formed therein in communication with the crank case, of means for conveying vapors evolved within the crank case and said cavities to the air intake of the carburetor, said means including a conduit; a chambered head on one end of the conduit provided with an air intake port, an air outlet port, and an opening for receiving one end of the conduit; and structure on the other end of the conduit for placing the latter in communication with the crank case and cavities in the block, said ports being disposed to create vacuumatic action at the said opening when air is passing to the carburetor, said head having a perforated flap valve loosely mounted therein for movement to and from a position for partially closing the opening when the vacuumatic action reaches a predetermined point, said valve being held open by the action of gravity thereon when the vacuumatic action ceases, said head having a roughened surface engageable by the flap valve when the latter is closed.

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