Aug. 2, 1927. 1,637,941

I. J. HUNTER

VAPOR UTILIZING DEVICE

Filed Oct. 7, 1925 2 Sheets-Sheet 1

Fig. 1.

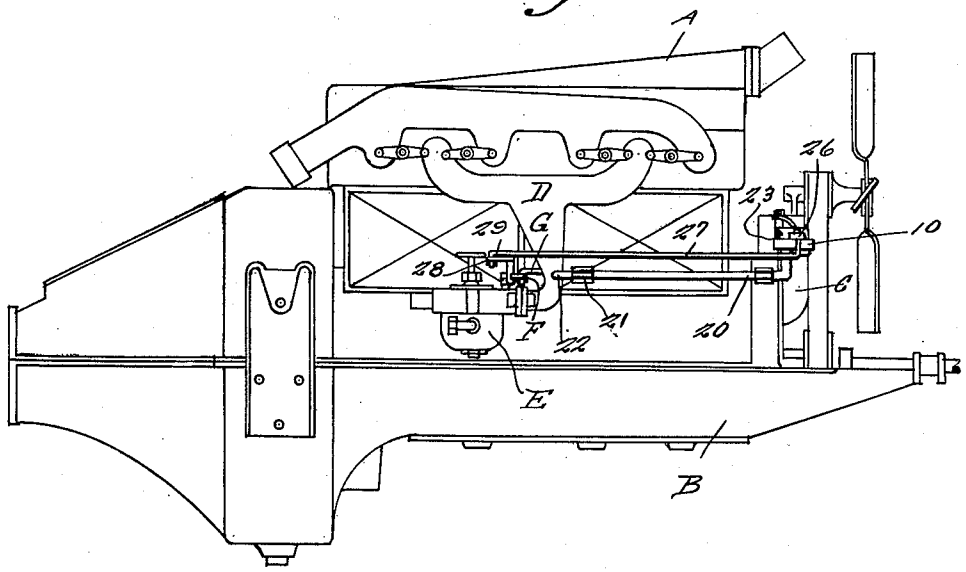


Fig. 2.

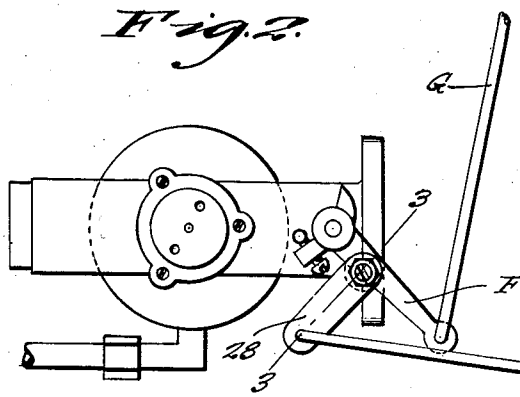
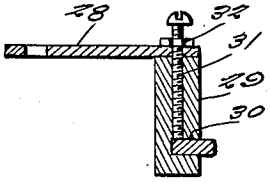


Fig. 3.





R. Q. Thomas

WITNESS:

Irving J. Hunter INVENTOR

BY Victor J. Evans

ATTORNEY

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Fig. 4.

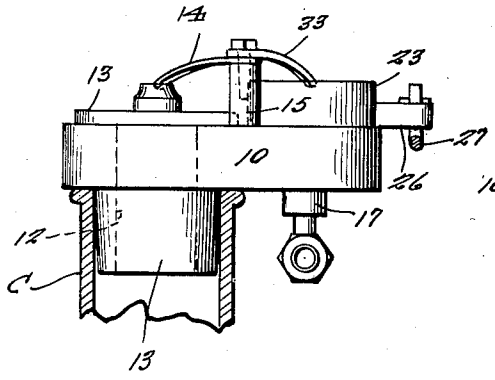


Fig. 7.

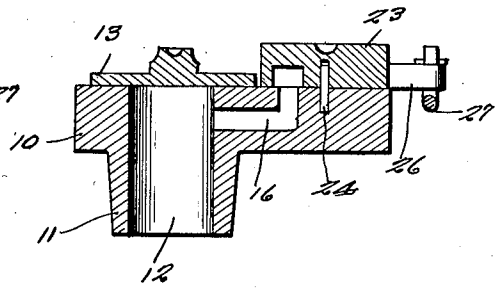


Fig. 5.

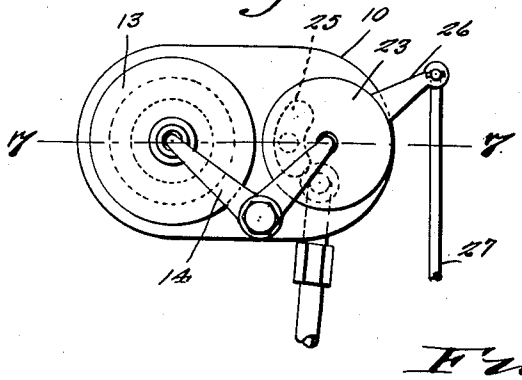


Fig. 6.

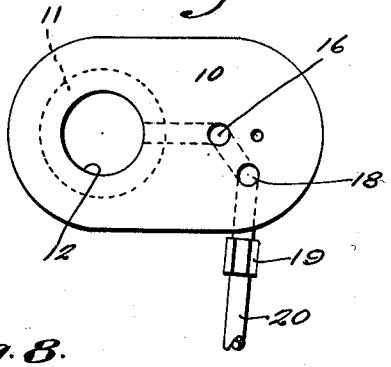
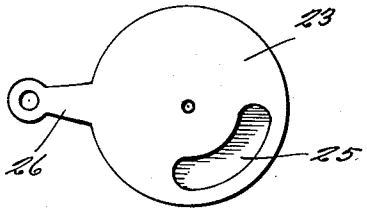


Fig. 8.



R. A. Thomas

WITNESS:

Irving J. Hunter INVENTOR

BY Victor J. Evans

ATTORNEY

Patented Aug. 2, 1927.

1,637,941

UNITED STATES PATENT OFFICE.

IRVING JAY HUNTER, OF MEDINA, NEW YORK.

VAPOR-UTILIZING DEVICE.

Application filed October 7, 1925. Serial No. 61,060.

This invention relates to attachments to or accessories for use in connection with internal combustion engines and has for its object the provision of novel means whereby the waste gases accumulating within the crank case may be utilized by conducting them into the intake manifold of the engine along with the stream of combustible mixture passing therethrough from the carbureter.

An important object is the provision of a device of this character adapted to be mounted at some convenient location upon the crank case of the engine and embodying a valve mechanism operatively connected with the carbureter throttle control whereby the valve of the vapor utilizing device will be controlled automatically in accordance with the speed of the engine, it having been found by experimentation that a variable control is advantageous.

Another object of the invention is to provide a device of this character which may be applied as an attachment to the breather pipe of an engine and which will therefore not necessitate the making of any changes or alterations in the construction of the engine itself.

An additional object is to provide a device of this character which will be simple and inexpensive in manufacture, easy to install, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction, the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of an engine equipped with my device.

Figure 2 is a top plan view of the carbureter thereof showing the attachment connected with the throttle arm.

Figure 3 is a detail cross section taken on the line 3—3 of Figure 2.

Figure 4 is a vertical section through the breather pipe showing a side elevation of the valve device mounted therein or thereon.

Figure 5 is a plan view of the structure shown in Figure 4.

Figure 6 is a detail view showing a portion of the mechanism.

Figure 7 is a vertical section taken on the line 7—7 of Figure 5, and

Figure 8 is a detail view of the rotary control valve member.

Referring more particularly to the drawings, the letter A designates an internal combustion engine of a well-known type; B represents the crank case thereof equipped with the usual breather pipe C; D designates the intake manifold and E the carbureter connected therewith and provided with the usual throttle having a throttle arm F for moving the same by whatever means is provided, the means including a rod G connected with the throttle arm F.

In carrying out the invention, I provide a body member 10 having a depending extension 11 adapted to be fitted within the upper end of the breather pipe C subsequent to the removal of the usual cover or cap therefrom. This body 10 and the extension 11 thereof are both formed with a bore 12 provided for the purpose of permitting the feeding of oil into the breather pipe when supply needs replenishing. Under ordinary circumstances, this bore 12 is covered by means of a cap 13 disposed upon the top of the body and held in place by the free end of a spring arm 14 suitably mounted upon an upstanding post 15 carried by the body 10 and secured thereto in any desired manner. The body is also formed with an L-shaped passage 16 leading from the bore 12 to the top of the body at a point spaced outwardly of the cap member 13. On the underside of the body 10 outwardly of the extension 11 thereon is an extension 17 formed with an L-shaped bore or passage 18 which opens out at the top of the body at a point spaced from the point of opening of the passage 16.

Suitably connected with the extension 17, as by a nipple 19 is a pipe or tube 20 which extends rearwardly and which is connected

as by a union 21 with a member 22 which is tapped into or otherwise secured to the intake manifold D and in communicating relation thereto.

The control means comprises a valve member which is in the present instance represented as formed as a disk 23 rotatably mounted upon one end portion of the top of the body 10 as for instance by means of a pivot pin 24. The underside of the disk 23 is formed with an arcuate grove or recess 25 adapted to establish communication between the passages 16 and 18 to a greater or less extent as will be explained. At one side, the disk 23 is formed with an extension or arm 26 with which is pivotally connected a rearwardly extending rod 27 in turn pivotally connected with an arm 28 suitably secured upon the throttle arm F. The exact manner of mounting the arm 28 upon the arm F is more or less immaterial but in the present instance, I have represented the arm 28 as carried by a post-like member 29 notched at 30 to receive the arm F and having threaded therethrough a screw 31 carrying a jam or lock nut 32, this screw serving not only to hold the arm 28 to the post-like member 29 but also to clamp both upon the arm F of the carbureter throttle control.

In the operation of the device, it will be seen that when the throttle arm F is in throttle closing position the rotary control valve 23 will be in such position that the arcuate groove or recess 25 therein will be out of registration or communication with the passage 18 so that no vapor will be drawn from the breather pipe. When the engine is in operation and the throttle is opened to a greater or less extent it is quite obvious that the movement of the arm F will cause movement of the rod 27 and consequently rotative movement of the disk 23 so that the arcuate groove or recess 25 therein will be brought more or less into registration with the passage 18 while remaining always in communication with the passage 16. The result will be that the waste gases of all kinds which accumulate within the crank case of the engine will be drawn upwardly, by the suction of the engine pistons through the bore 12, L-shaped passages 16, arcuate groove or recess 25, passage 18, and pipe or tube 20 into the intake manifold of the engine, the inrushing stream of air mixed with vapors from the crank case impinging at right angles against the stream of combustible mixture supplied by the carbureter. The result will be that the fuel will be more efficiently broken up and made much more combustible than is ordinarily the case. Owing to the utilization of the waste gases from the crank case it is clear that a leaner mixture may be used which will work for economy in fuel consumption. Owing to the positive connection between the throttle control arm and the control valve of the attachment, it is clear that the rate of use of the waste gases from the crank case will be directly proportional to the speed of the engine, it having been discovered that this is a highly advantageous feature. Attention is directed to the fact that a leaf spring 33 is provided for holding the rotary valve member 23 in position, this spring being anchored upon the post 15 which holds the spring member 14. By this arrangement it is evident that the rotary valve may be removed for cleaning whenever necessary and that by springing the arm 14 upwardly and moving it to one side the cap 13 closing the breather cap bore 12 may be removed so as to permit the oil supply to be replenished. It is believed that the construction, operation and advantages will be readily apparent to one skilled in the art without further explanation.

While I have shown and described the preferred embodiment of the invention, it should be understood that I reserve the right to make such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:—

1. In combination with the intake manifold, throttle control mechanism and breather pipe of an internal combustion engine, a member mounted upon the open upper end of the breather pipe and provided with a lateral extension having a passage therein communicating with a port in its upper surface, a cap normally closing said member, a valve member rotatably mounted upon said lateral extension and operatively connected with the throttle control mechanism of the carbureter, said rotary member having a passage on its face engaging the lateral extension of said member, said lateral extension having a second port therein, a tubular conduit connected and communicating with said second named port and with the intake manifold of the engine, the passage in said rotary member being adapted to be brought more or less into registration with both of said ports.

2. In combination with the carbureter, intake manifold, carbureter control mechanism and breather pipe of an internal combustion motor, the breather pipe having a normally open upper end, means for utilizing the waste gases accumulating within the crank case of the engine, comprising a body member having a reduced cylindrical extension telescopically received within the open upper end of the breather pipe, said body member having a bore and a lateral passage therein communicating with the bore and opening out to the top through a port, means on the body member for normally

closing the bore, a rotary valve member journally mounted upon said lateral extension, an operative connection between said rotary valve member and the throttle control mechanism, said body member having a second port and an outlet passage communicating therewith and connected by a tubular conduit with the intake manifold of the engine, and said rotary valve member being provided at its underside with a curved passage adapted to establish a variable degree of communication between said first and second named ports.

In testimony whereof I affix my signature.

IRVING JAY HUNTER.