Oct. 2, 1928. 1,685,985

C. H. DEARBORN

CRANK CASE VENTILATOR SHUT-OFF VALVE

Filed Sept. 6, 1927

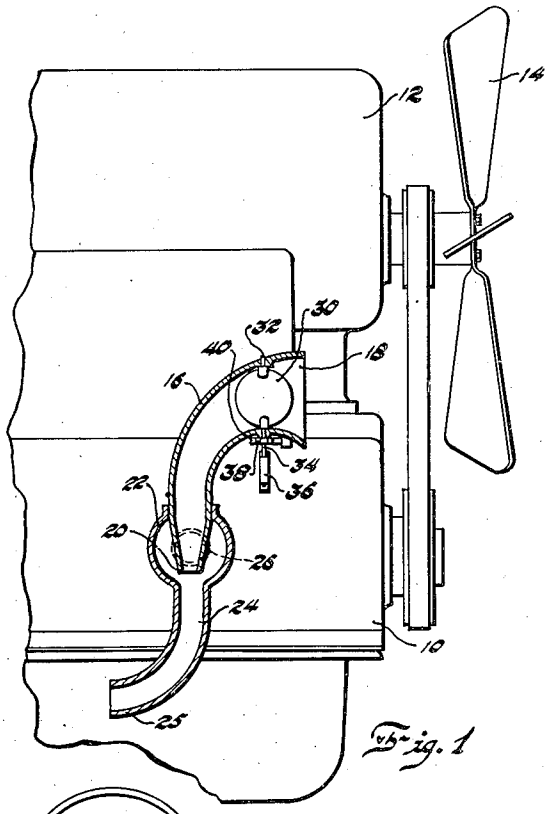


Fig. 1

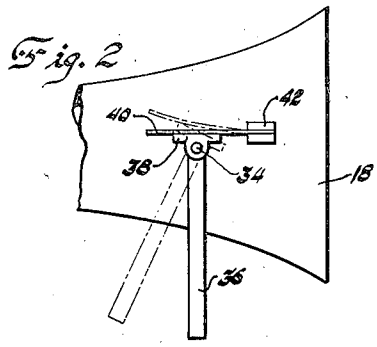


Fig. 2

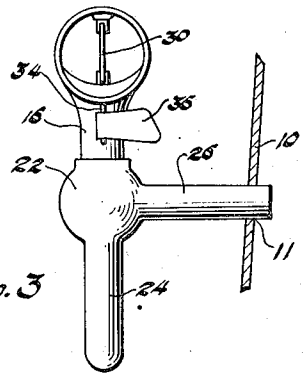


Fig. 3

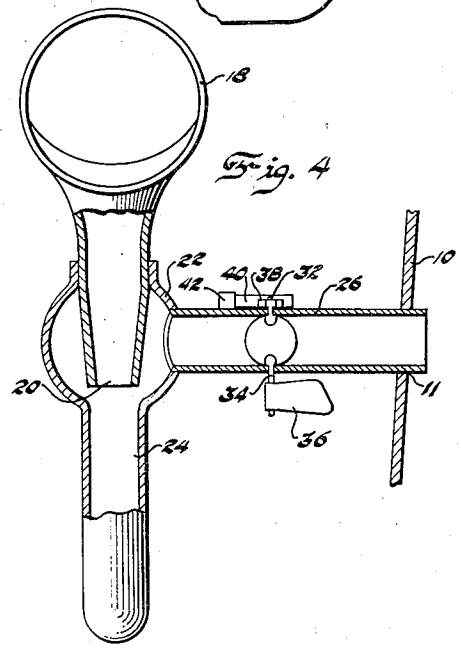


Fig. 4

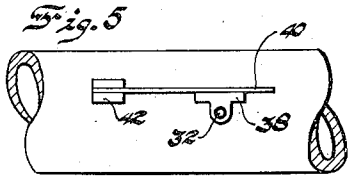


Fig. 5

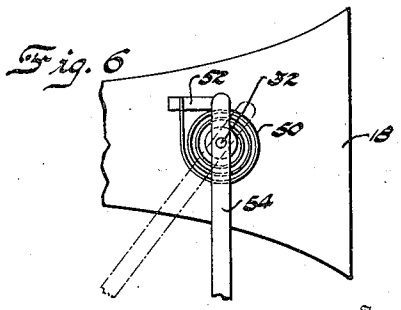


Fig. 6

Inventor

Clinton H. Dearborn

By Macleod, Spencer & Fleit

Attorneys

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UNITED STATES PATENT OFFICE.

CLINTON H. DEARBORN, OF HAMPTON, VIRGINIA, ASSIGNOR TO A C SPARK PLUG COMPANY, OF FLINT, MICHIGAN, A CORPORATION OF MICHIGAN.

CRANK-CASE-VENTILATOR SHUT-OFF VALVE.

Application filed September 6, 1927. Serial No. 217,713.

This invention relates to a ventilating means for the crankcase of an internal combustion engine and more particularly to ventilating means for the crankcase of the engine of an automotive vehicle.

It is an object of this invention to provide an effective ventilating device which is actuated by the passage of air through the hood space. I accomplish this by providing a venturi at the side of the engine and in the path of the current of air through the hood space. Since the rate of travel of the air current through the hood is directly proportional to the speed of the car, and since the suction of the venturi is directly proportional to the speed of the air current, I find it necessary to limit the suction of the venturi in order to avoid drawing oil out of the crankcase when the car is moving rapidly.

A further object is to provide a suction ventilating device as described which will give adequate ventilation at low car speeds and which will compensate for increased speed of the car by automatically reducing the normal increase in the suction or by actually reducing the amount of suction.

Other objects and advantages of the invention will appear in the course of the following description, taken in connection with the accompanying drawing and appended claims.

In the drawing—

Fig. 1 is a side elevation partly in section;

Fig. 2 is an enlarged bottom plan view of the valve control device;

Fig. 3 is a front elevation of the structure shown in Fig. 1;

Fig. 4 is a front view with parts broken away, showing a modified form of my invention;

Fig. 5 is a plan view of the connecting pipe and valve control device shown in Fig. 4; and

Fig. 6 is a view similar to Fig. 2 but showing a modified form of valve control device.

Referring to the drawing, I have illustrated in Fig. 1 part of a conventional internal combustion engine comprising a crankcase 10 and engine block 12. At the side of the crankcase is the venturi which comprises an upper member 16 having an upper enlarged forwardly opening end 18 and a lower restricted open end 20 and a lower member 24, the lower end 20 being fixed within the enlarged part 22 of the lower member 24. A tube 26 supports the venturi and connects the enlarged part 22 of the lower member with the crankcase 10, as at 11. The lower member 24 opens rearward as at 25.

In the embodiment disclosed in Figs. 1, 2 and 3, there is mounted in the enlarged end 18 a butterfly valve 30 provided with upper and lower pivot pins 32 and 34 respectively, journaled in bearings in the enlarged end 18 of the member 16. Connected with the lower pivot pin 34 is a vane 36 which extends laterally or in a plane perpendicular to the direction of travel of the machine. A cam 38 perpendicular to the vane 36 is non-rotatably fixed to the pivot pin 34 and abuts against and is normally held in fixed position by the leaf spring 40, one end of which is fixed to the lower side of the large end 18, as at 42.

As the blast of air on the mouth of the venturi increases, due to the increased speed of the fan or of the car, the vane is gradually pushed back against the tension of the spring 40 and moves the butterfly valve 30 to progressively restrict the passage of air through the venturi, thus decreasing the suction thereof.

The structure illustrated in Fig. 4 is the same as that shown in the first three figures except that the damping valve is in the pipe connecting the venturi with the crankcase instead of in the venturi itself. The valve is exactly the same except for the immaterial variation that the cam 38 and control spring 40 are on the side opposite the vane instead of on the same side. With the structure just described the damping action takes place in the connection instead of in the venturi itself.

In the modification shown in Fig. 6, the valve is controlled by a flat coil spring 50 connected at one end to the lug 52 on the venturi and at the other end to the pivot pin 32. The arm 54 carrying the vane is normally held by the tension of the coil spring in the full line position illustrated, in which one end abuts against the lug 52. As the blast of air increases, the vane rotates toward the dotted line position and moves the valve to restrict the passage of air through the venturi.

In any embodiment of my invention the exact location of the venturi is immaterial, it

being necessary only to so locate it that the large end 18 will receive a blast of air directly proportional to the speed of the engine.

I claim:

1. In combination with an internal combustion engine including a crankcase, means operated by the flow of air past said engine for drawing air from the crankcase, and means operated by an increase in the rate of flow of the air for reducing the normal increase in the amount of air drawn from said crankcase.

2. In an automotive vehicle, an internal combustion engine including a crankcase, a suction device comprising a venturi mounted adjacent and connected with said crankcase, and means operated by an increase in the rate of flow of air past said suction device for reducing the normal increase in the amount of air drawn from said crankcase.

3. In an automotive vehicle, an internal combustion engine including a crankcase, a suction device comprising a venturi mounted adjacent and connected with said crankcase, a damper within said suction device, and means operated by the rate of flow of air past said suction device for regulating the position of said damper.

4. In an automotive vehicle, the combination of an internal combustion engine including a crankcase, means operated by the flow of air past said engine for drawing air from said crankcase, and means controlled by the current of air past said engine for regulating the rate at which air is drawn from said crankcase.

5. In combination with an internal combustion engine including a crankcase, a suction device comprising a venturi mounted adjacent said engine and connected with the crankcase, a vane mounted adjacent said suction device, means for resiliently holding said vane in the current of air passing adjacent said engine, and means operated by the movement of said vane against said resilient means for retarding the operation of said suction device.

In testimony whereof I affix my signature.

CLINTON H. DEARBORN.