

B. G. RICH.
AUXILIARY AIR VALVE.
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1,259,291.

Patented Mar. 12, 1918.

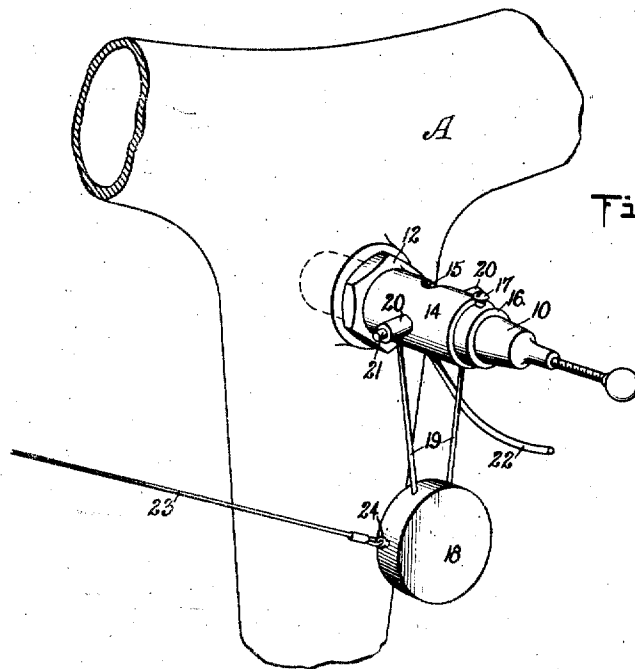


Fig. 1.

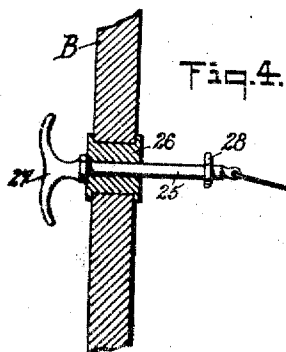


Fig. 4.

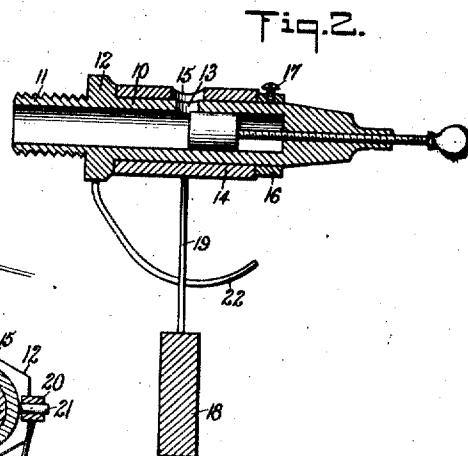


Fig. 2.

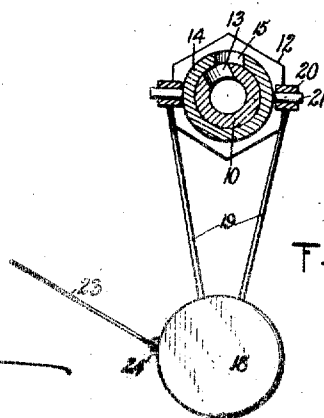


Fig. 3.

WITNESSES
[Signature]
[Signature]

INVENTOR
B. G. Rich
BY *[Signature]*
ATTORNEYS

UNITED STATES PATENT OFFICE.

BRAINARD G. RICH, OF COLVILLE, WASHINGTON.

AUXILIARY AIR-VALVE.

1,259,291.

Specification of Letters Patent.

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Application filed October 3, 1917. Serial No. 194,550.

To all whom it may concern:

Be it known that I, BRAINARD G. RICH, a citizen of the United States, and a resident of Colville, in the county of Stevens and State of Washington, have invented a new and Improved Auxiliary Air-Valve, of which the following is a full, clear, and exact description.

My invention relates to the air valve of internal combustion engines of automobiles and more particularly relates to an auxiliary air valve adapted to be applied to the intake manifold for governing the inlet of air to the fuel mixture before entering the cylinder, to regulate the character of the mixture under given conditions requiring the richness of the mixture to be varied.

An object of the invention is to provide an auxiliary air valve and automatic controlling means therefor, whereby under normal conditions, when the automobile is running on level ground, a regulated quantity of air will be supplied to the intake manifold and whereby the supply of air will be decreased in proportion to the grade of ascent or entirely cut off upon a predetermined grade being reached, the reverse automatically taking place when the automobile is running down grade so that an increased quantity of air will be admitted to reduce the richness of the mixture.

Important objects of the invention also are to provide for automatic valve control through the medium of a pendulous device; to so connect the pendulous device that it will accommodate itself to a lateral tilting of the automobile preventing binding of the valve elements, and to provide for the manual movement of the pendulum for cutting off the supply of air when starting with the engine cold, or running under very cold weather conditions.

An object of the invention also is to provide a valve of the indicated character having an inlet in the valve body or fixed part and an inlet in the automatically movable co-acting controlling element to be brought more or less into or out of register with the first inlet; together with manually controlled regulating means to vary the capacity of the first inlet.

A more specific object of the invention is to provide an auxiliary air valve improved in various particulars with reference to simplicity of construction and with a view to

promote convenience in assembling or adjusting the parts.

Reference is to be had to the accompanying drawings forming a part of this specification in which similar reference characters indicate corresponding parts in all the views, it being understood that the drawings are merely illustrative of one example of the invention.

Figure 1 is a perspective view of an auxiliary air valve embodying my invention, showing the same applied to an intake manifold;

Fig. 2 is a longitudinal vertical section of the valve;

Fig. 3 is a transverse vertical section of said valve;

Fig. 4 is a detail in transverse vertical section indicating the preferred manner of operating the pull cord manually controlling the pendulum.

My improved air valve is designed to be tapped into an intake manifold A, the particular location of the valve depending on the form of manifold employed. In the illustrated example the valve is formed and arranged for use where the intake manifold is on the right hand side of the engine looking from the driver's seat. Said valve includes a tubular body 10 having at the forward end thereof suitable means securing it in position, there being shown a threaded nipple at the forward terminal 11 adapted to engage a tapped hole in the manifold, there being a polygonal flange 12 at the base of the nipple 11 adapted to receive a wrench. The valve body 10 is provided with an inlet orifice to be controlled, the said inlet in the present instance being in the side of the valve body and indicated by the numeral 13. A sleeve 14 is loose on the body 10 and is adapted by turning movement in opposite directions to control the inlet 13. In the present arrangement the sleeve 14 is formed with an inlet port 15 adapted to be brought more or less into or out of register with the inlet 13 or to entirely cut off the latter. The sleeve 14 is held in position between the flange 12 and a set collar 16, the numeral 17 indicating the set screw of the collar.

To automatically turn the sleeve 14 in opposite directions for regulating the flow of air through the valve body I provide a pendulum designated generally by the numeral 18, which has suspending arms 19 formed

with eyes or equivalent formations at the upper end thereof to hang the arms on lateral pins 21 at diametrically opposite sides of the sleeve 14.

5 By the described arrangement it will be clear that oscillations of the pendulum in its own plane, that is to say, in a plane transverse to the axis of the valve, will turn the sleeve 14. Thus, the inlet 15 will partially
10 register with the inlet 13 to allow a limited quantity of air to flow through the valve as when running under normal weather conditions on a level road. Upon the automobile ascending a grade the pendulum will swing
15 rearwardly, thereby turning the sleeve 14 forwardly to gradually reduce the effective area of the inlet or to finally close the inlet upon a predetermined grade having been reached. On the other hand upon the au-
20 tomobile reaching a down grade the pendulum will swing in the opposite direction increasing the area of the inlet to cause an increased dilution of the fuel mixture.

The forward swinging of the pendulum
25 18 is limited by a stop 22 which in the illustrated example is in the form of a wire or bent rod fixed at one end on the valve body, on the flange 12, or other convenient part of the valve body and extends into the path
30 of movement of the forward suspension arm 19 of the pendulum.

To manually swing the pendulum to close the air inlet for starting, or under other conditions requiring the full richness of the
35 fuel mixture, I connect a string, 23, cord, or the like, at one end with the pendulum as at 24 and extend the cord or the like to the dash B or other place for convenient operation, the pull cord 23 in the present example

having an operating rod 25 thereon slidable 40 in a bushing 26 in the dash, said rod having a handle 27 at its rear end at one side of the dash, and a collar 28 or equivalent stop element adapted to contact with the front side of the dash for limiting the pull on the 45 cord.

It will be observed that the eyes of the sleeves 20 are loose on the pins 21 and by reason of this arrangement when the automobile tilts laterally the pendulum may 50 swing outwardly or inwardly transverse to its ordinary plane of oscillation and without imparting any turning movement to the sleeve 14, to prevent the lateral swinging of the pendulum from binding the sleeve on the 55 valve part.

I wish to state in conclusion that although the illustrated example constitutes a practical embodiment of my invention, I do not limit myself strictly to the mechanical de- 60 tails herein illustrated, since manifestly the same can be considerably varied without departure from the spirit of the invention as defined in the appended claim.

Having thus described my invention, I 65 claim as new, and desire to secure by Letters Patent:

An air valve including a valve body, a sleeve loose on the valve body and controlling, by a turning movement, the flow of air 70 through the valve body, and a pendulum hung on the sleeve, the said sleeve being operated by the oscillations of the pendulum in one plane, and said pendulum being adapted to swing at right angles to the first 75 plane independently of the sleeve.

BRAINARD G. RICH