E. T. SCUDDER.

AUTOMATIC AIR VALVE FOR GAS MANIFOLDS.

APPLICATION FILED MAR. 15, 1913.

1,088,302. Patented Feb. 24, 1914.

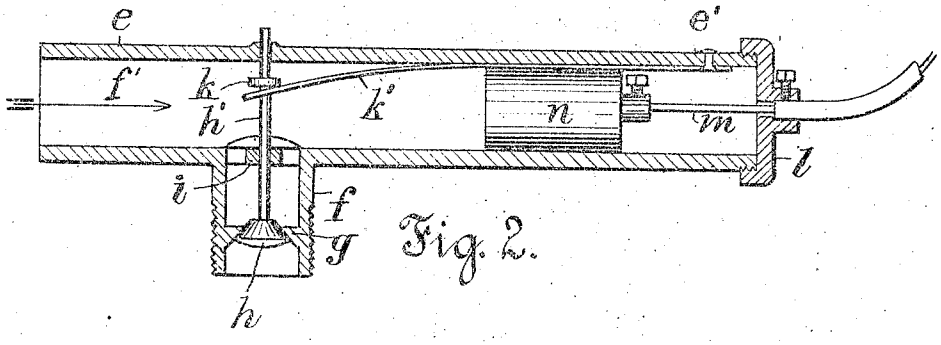


Fig. 2.

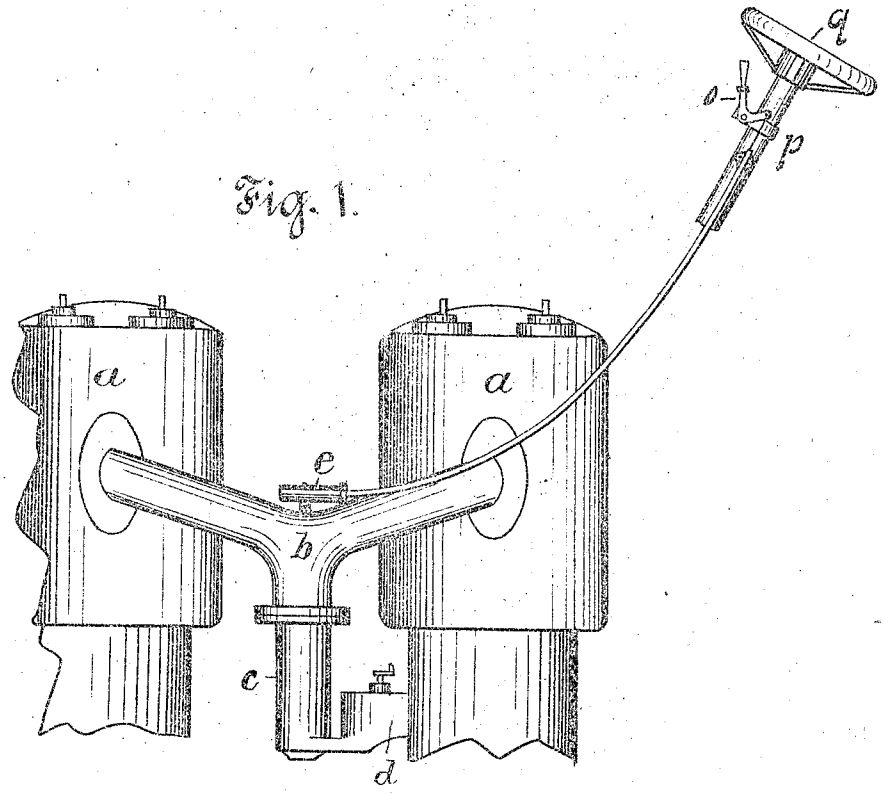


Fig. 1.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC AIR-VALVE FOR GAS-MANIFOLDS.

1,088,302. Specification of Letters Patent. Patented Feb. 24, 1914.

Application filed March 15, 1913. Serial No. 754,457.

To all whom it may concern:

Be it known that I, EUGENE T. SCUDDER, a citizen of the United States, residing at 27 East Park street, Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Automatic Air-Valves for Gas-Manifolds, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to a means for modifying the richness of the explosive mixture which is supplied to the cylinders of internal combustion engines upon motor cars, and the object of the invention is to furnish an air-valve which may normally operate in an automatic manner to dilute the gases on their way to the cylinders, but which may be adjusted, when required, to vary the opening of the valve and consequent delivery of air to the gases.

The device is formed as an attachment to the gas-manifold, and has a valve held upon its seat by spring-pressure and opened automatically by the suction of the engine pistons; and the invention comprises a special construction for the air-valve and the means of varying or changing the spring-pressure when desired, to modify the opening of the valve and the consequent supply of air to the gases.

The construction will be understood by reference to the annexed drawing, in which—

Figure 1 is a diagram illustrating the connection of a carbureter and manifold to the engine cylinders, and the application of the air-valve to the gas-manifold; and Fig. 2 is a longitudinal section of the air-valve and its connections.

a designates the engine-cylinders to which the opposite ends of the gas-manifold *b* are connected.

A mixing-chamber *c* is secured to a branch-pipe at the bottom of the manifold and the carbureter *d* is connected therewith and delivers a mixture of air and gas into the same, from which it is drawn into the manifold by the charging movement of the engine-pistons.

The attachment is shown as an air-pipe *e* having at one side a nozzle *f* threaded to screw into the top of the manifold, such nozzle having a valve-seat *g* therein with a valve *h* seated thereon and formed to open under the pressure of the atmosphere. The valve-stem *h'* extends across the air-pipe *e*, and a bridge *i* is provided to guide it in its movements. One end of the air-pipe is open where an arrow *f'* is shown leading inwardly to indicate the entrance of air, and the opposite end is closed and constructed with a guide *l* through which a rod *m* is movable.

The valve-stem is provided with a collar *k*, and a leaf-spring *k'* is secured within the air-pipe and forked at its free end to press against such collar and hold the valve *h* elastically upon its seat. The spring is extended toward the guide *l* and is secured to the pipe *e* by screw or rivet *e'*. A regulator-block *n* is movable within the tube and holds the spring close to the side of the tube wherever the block is adjusted, and the spring is sloped or curved away from the side of the tube toward the under side of the collar *k*, so that the movement of the block toward the valve-stem operates upon the inclined surface of the spring and presses it more closely to the inner side of the tube. This presses the forked end of the spring toward the collar and thus increases the pressure of the valve upon its seat.

The rod *m* is extended to a hand-lever *o* upon the steering-head *p* of the motor car, in proximity to the steering-wheel *q*; so that the operator can vary the adjustment of the regulator-block *n* whenever desired.

It is well known that the explosive character of the mixture supplied to the motor-cylinders is affected in its operation by the character of the atmosphere, when the same varies in dryness or moisture, or is more or less dense or rarefied by barometric variations, but the attachment, comprising the valve *h* and its regulated spring-pressure, furnishes a means of varying the flow of air which is drawn into the gas-manifold past the valve *h*, and thus produces the desired mixture in the cylinders.

The opening of the valve varies inversely with the pressure of the spring *k'* upon the collar *k* of the valve-stem, and the adjustment of the regulator-block thus determines the volume of air that is supplied to the gas-manifold through such valve. The regulator-block is adjusted by the operator until the operation of the engine is satisfactory, and does not thereafter require adjustment for a considerable time, until atmospheric conditions or some variation in the quality of the gasolene affects the mixture which is supplied to the gas-manifold

by the carbureter. When such variation arises the supply of air through the valve *h* can again be modified by adjusting the regulator-block, and the adjustment thus furnishes a means which operates automatically in its normal state, but the automatic operation of which may be varied at the pleasure of the operator.

The attachment is cheap in construction and readily applied to any gas-manifold by merely tapping a hole in the top of the same, and it furnishes a very valuable attachment for securing the desired operation of the motor-engines.

I am aware that an air-valve controlled by a variable spring-pressure has been used in combination with a throttle-valve, and a hand-lever which varies the spring-pressure when moving such throttle-valve; whereas my invention requires no throttle-valve, but consists in a special construction of the air-valve and the means for varying its spring-pressure.

The attachment is obviously applicable to the gas-manifold of any internal combustion engine in which a gas-manifold is connected to the cylinders, so that the attachment may operate to deliver air equally to the mixture which is supplied to all of the cylinders.

Having thus set forth the nature of my invention what is claimed herein is:

1. The air-valve for gas-manifolds comprising the air-pipe *e* open at one end and closed at the opposite end, and having a nozzle *f* at one side with the valve-seat *g* therein, the valve *h* seated thereon and having a valve-stem extended across the air-pipe and opened by atmospheric pressure, a spring located in the air-pipe and operating to hold the valve elastically upon the seat, and means operating in the closed end of the air-pipe, with connection to a hand-lever, for operating upon the spring to vary its pressure on the valve.

2. An attachment for gas-engines, comprising an air-valve with aperture to receive the air and an outlet provided with a valve-seat, a valve seated thereon and opened by atmospheric pressure and having a valve-stem extended across the air-pipe and provided with a collar, a valve-spring secured inside the air-pipe with its free end engaging the said collar, and a regulator-block movable in the air-pipe in contact with the spring to vary its effect upon the valve-stem.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EUGENE T. SCUDDER.

Witnesses:
L. LEE,
THOMAS S. CRANE.