Aug. 10, 1926. 1,595,509

H. G. FIELD ET AL

APPARATUS FOR SUPPLYING MOISTURE TO INTAKE MANIFOLDS OF INTERNAL COMBUSTION ENGINES

Filed April 10, 1925

Fig. 1.

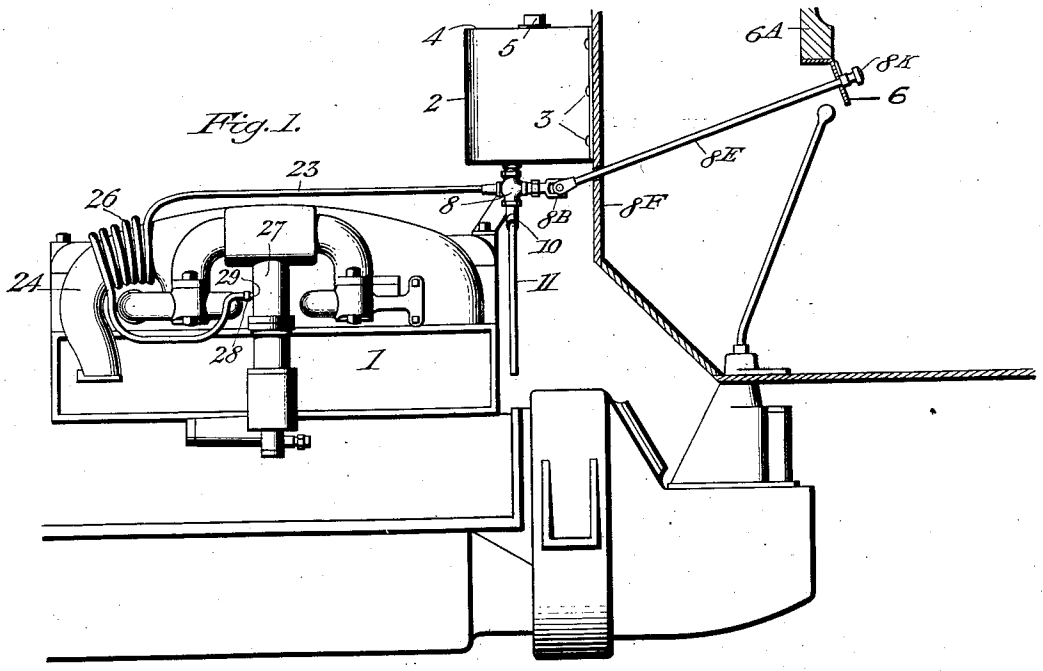


Fig. 4.

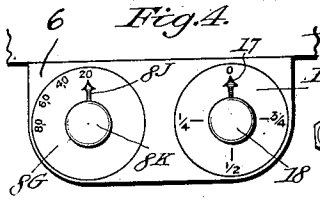


Fig. 5.

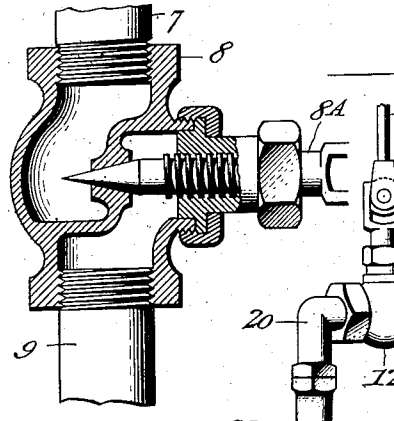


Fig. 2.

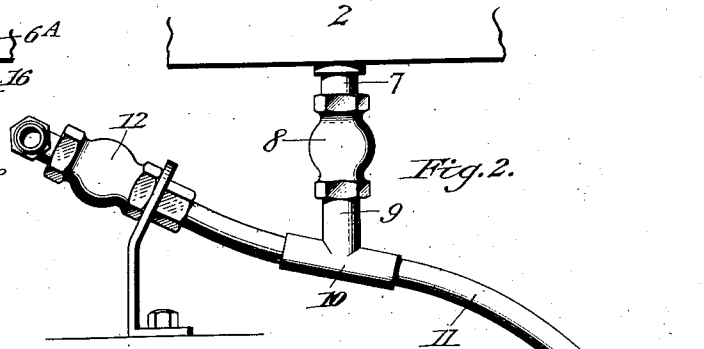
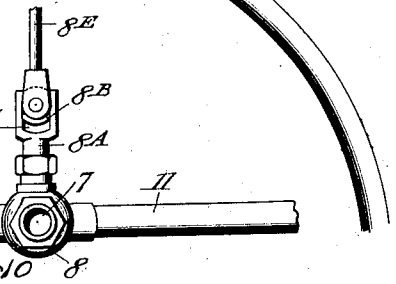


Fig. 3.



INVENTORS

Hardin G. Field.

David C. Mayfield

By H. S. Bailey. ATTORNEY

Patented Aug. 10, 1926. 1,595,509

UNITED STATES PATENT OFFICE.

HARDIN G. FIELD AND DAVID C. MAYFIELD, OF DENVER, COLORADO.

APPARATUS FOR SUPPLYING MOISTURE TO INTAKE MANIFOLDS OF INTERNAL-COMBUSTION ENGINES.

Application filed April 10, 1925. Serial No. 22,214.

Our invention relates to a method and apparatus for generating humidity, and for discharging it into the intake manifolds of internal combustion engines, from which it is drawn into the cylinders of the engine by the suction strokes of their pistons.

And the objects of our invention are:

First. To provide an apparatus for introducing steam into the intake manifolds of automobiles above the point in the manifold where the explosive mixture from the carburetor enters it; whereby the explosive mixture from the carburetor flows up into and mixes with the steam or moisture entering the manifold from the moisture generating apparatus.

Second. To provide a supply of water, and apparatus for turning the water into moisture or steam and introducing the same into the intake manifold above the intake entrance of the explosive mixture from the carburetor; whereby the explosive mixture flows into and through and commingles with the moisture or steam and they are drawn together into the cylinders by the suction strokes of the pistons of the engine as a moist explosive mixture that will prevent carbon from sticking to and hardening on the inner wall of the cylinder, and on the piston head, and on the piston rings.

Third. To provide means for commingling with the explosive mixture of automobile engines in their intake manifolds moisture in the form of steam that saturates the explosive gas which, when drawn into the cylinders of the engine by the suction strokes of the pistons acts to prevent the carbon that results from imperfect vaporization and volatilization of the gasoline and the carbon that results from imperfect combustion when the explosions take place in the cylinders, from hardening upon the inner surface of the cylinder and on the piston rings which bear against and reciprocate against the wall of the cylinder and onto the piston head, and the elimination of the carbon by our moist air and explosive gas results in a much higher efficiency in the power developed by the engine and also the use of the hot moisture mixed with the explosive gas in the cylinders and on the piston rings, enables the engine to run without perceptible wear for several years longer without the cylinders needing re-boring and without new rings being fitted to them, than when carbon accumulates and hardens on them.

We attain these objects by the mechanism illustrated in the accompanying drawings in which:

Figure 1 is a side elevation partly in section, showing the manner of connecting our improved device to the intake manifold and exhaust pipe of an internal combustion automobile engine, and the means for controlling the same.

Figure 2 is an enlarged front view showing the parts of the device comprising the air pipe, the valved water pipe connected therewith, and the valved connection between the air pipe and the pipe for conveying moisture to the intake manifold.

Figure 3 is a top view of the arrangement of valved pipes shown in Figure 2.

Figure 4 is a front view showing the graduated dials which indicate the water supply to the air pipe, and the control of the water supply to the intake manifold, and

Figure 5 is an enlarged sectional view of the needle valve for controlling the water supply.

Similar letters of reference refer to similar parts through the several views.

Referring to the drawings, the numeral 1 illustrates a left hand side view of the six cylinder engine of a Studebaker automobile; and in this view the numeral 2 designates a water holding tank that is filled with water and is replenished from time to time as it gets low.

This water holding tank 2 is secured to outside surface of the dashboard of the automobile by screws 3, and it is provided with a closed top 4 and with a water inlet opening and a cap 5, that is removably threaded to the water inlet.

To the bottom of the water holding tank we threadedly secure one end of a nipple 7, the opposite end of which is threadedly connected to a valve, preferably a globe valve 8, and the globe valve is connected to the vertical member 9 of a T 10 in one end of which is inserted an air inlet pipe 11, which extends down through the supporting frame or bed plate of the engine 1 and its lower end is open to the atmosphere. The valve 8 has a valve stem 8^A that projects from it toward the instrument board, and we connect to its end by a universal joint 8^B, part of

which is formed in a space 8^C, that is formed in the outer end of the stem 8^A, one end of a rod 8^E, the opposite end of which extends to and through the dashboard 8^F, and to and beneath the instrument board, and forms the axial center of a circular dial 8^G that is graduated by numbers 20 to 80, to indicate the various amounts of water, in drops, which may be supplied to the air pipe from the tank 2, by turning the needle valve 8 The dial 8^G is displayed on a metal plate 6, which is secured to the lower edge of the instrument board 6^A.

A pointing hand 8^J is secured to the rod to point to the numbers on the dial, and a finger grasping knob 8^K, is secured to the end of the rod to enable it to be grasped by the fingers of the operator of the car and be turned to adjustably open and close water inlet valve to admit water, preferably drop by drop, as will be explained more fully hereinafter.

The object of this needle valve is to admit such a small amount of water through it from the water holding tank 2 into the air pipe as will be equivalent to preferably about 60 drops of water per minute when the automobile is running from about 20 to 35 miles per hour. For higher speeds more water or drops of water per minute would be required, and less than 60 drops of water or its equivalent amount would be required for slower speeds than the above.

A short pipe 10^A connects the T 10 with an air controlling globe valve 12, which is also provided with a threaded stem 13 that projects from it and to the outer end of this valve stem 13, I connect by a universal joint 14, which is formed partially in the end of the stem 13, and in one end of a rod 15 that extends to and through the dashboard and to and beneath the instrument board and into and through a circular dial 16, of which it forms the axial shaft, and the dial is graduated to indicate four quarter rotations of the stem 13, as represented by 0, ¼, ½ and ¾ respectively, and a pointing hand 17 is secured to the rod 15, in position to move over the dial and a finger grasping knob is secured to the rod 15, by which the rod, with the hand 17, is turned.

By turning the rod 15, the stem 13 is thereby turned to permit air and water to flow through the valve 12 for a purpose to be explained hereinafter, and the stems of both the water and air valves are turned to the left by the driver of the car to open them, and to the right to close them, and the two dials are therefore graduated to read from right to left as the driver of the car faces them.

To the air valve 12 is secured an elbow 20, and to the elbow is secured a coupling 22, which is connected to one end of a pipe 23, that extends along over the exhaust manifold 24 to its forward portion, where it is turned underneath the manifold and is wound around it several times in a plurality of coils 26, six coils being shown. From the end of the coil this pipe 23 extends to the intake manifold 27 of the engine and is threadedly connected through a coupling 28, that is connected to the end of the pipe 23 and a nipple 29, that is threaded to the coupling 28, and also into a threaded hole in the intake manifold that is made to receive it.

The coils 26 are the steam generating boiler portion of our moisture producing apparatus, and it converts the water into steam and at the same time adds to the water and commingles with it air enough to form a very closely mixed spray of air and water that mixes with the gas and flows with it up through the intake manifold and into the cylinders of the engine, and thus makes and delivers to the spark plugs a slightly moist explosive mixture that will prevent the carbon in it from sticking and drying onto the wall of the cylinder and in fact the carbon is so moistened and softened that it is ejected from the cylinders with the gases of combustion at each exhaust stroke of the pistons and the walls of the cylinders and of the piston head and its rings are kept entirely free from it. The two dials 8^G and 16, are displayed on the plate 6, that is secured to the instrument board, as previously mentioned.

When the driver of a car starts his engine running, he opens the air valve 12 as much or as little as he pleases, but usually to about three-quarters wide open, which requires that he turn the finger button and the dial pointer towards the left to preferably the three-quarter mark on the air valve dial, and then he turns the finger button of the water valve until the pointer points to the number 60 on the water dial, which indicates that the rod has been turned enough to open the needle valve sufficiently to allow 60 drops or that equivalent amount of water to flow through it and the valve from the water tank into the air pipe, but the amount of water and also the amount of the air can be increased or diminished as desired by manipulating these two valves by turning their pointers around their dials which also turns their rods and their valve stems and consequently either opens or closes their valves and thus regulates the amount of both air and water flowing into the air pipe and from it to the steam generating boiler forming pipes 26 and which flows with the explosive gas into the cylinders of the engine.

When the engine is stopped running, any water in the air inlet pipe 11, will run out upon the ground, and no water can enter the pipe 23, while the engine is not running even

though the valves 8 and 12 should be left open, as the said pipe 23 is on a higher plane than the T 10 through which water from the reservoir enters the the air inlet pipe 11. Consequently, the operation is as follows: The driver of a car simply turns the hand pointers to the left as he faces the instrument board, which opens the air and the water valves, and to the right to close them, and he manipulates to give him that amount of moisture which will give him the largest mileage from a gallon of gasoline; and that will prevent carbon from forming on the walls of the cylinders and piston rings and the piston heads of his engine, and that will give him the greatest speed and power his engine is capable of developing.

Our invention provides a very simple and highly efficient apparatus for generating and conveying steam or moisture to the cylinders of automobile engines that can be placed on cars in use at very little expense and in a few hours' time.

And while we have illustrated and described the preferred construction and arrangement of our apparatus for generating moisture and for feeding it into the cylinders of automobile engines along with the explosive gas, we do not wish to be limited to the construction and arrangement shown as many changes may be made without departing from the spirit of my invention.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

In apparatus of the character described, the combination with an internal combustion engine having inlet and exhaust manifolds; of a pipe connected at one end of the intake manifold, its other end being open to the atmosphere, an intermediate portion of said pipe being coiled about the exhaust manifold, a valve in said pipe for opening communication between the atmosphere and the intake manifold, a water tank, a valved connection between the tank and said pipe at a point between the air valve and the open end of the pipe, said air valve being on a higher plane than the point where the water enters said pipe, said pipe having a downward inclination from said air valve, said valves being manually operated.

In testimony whereof we affix our signatures.

HARDIN G. FIELD.
DAVID C. MAYFIELD.