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E. DUNFORD

CARBURETOR AIR CONTROL

Filed Oct. 27, 1924

FIG. 1.

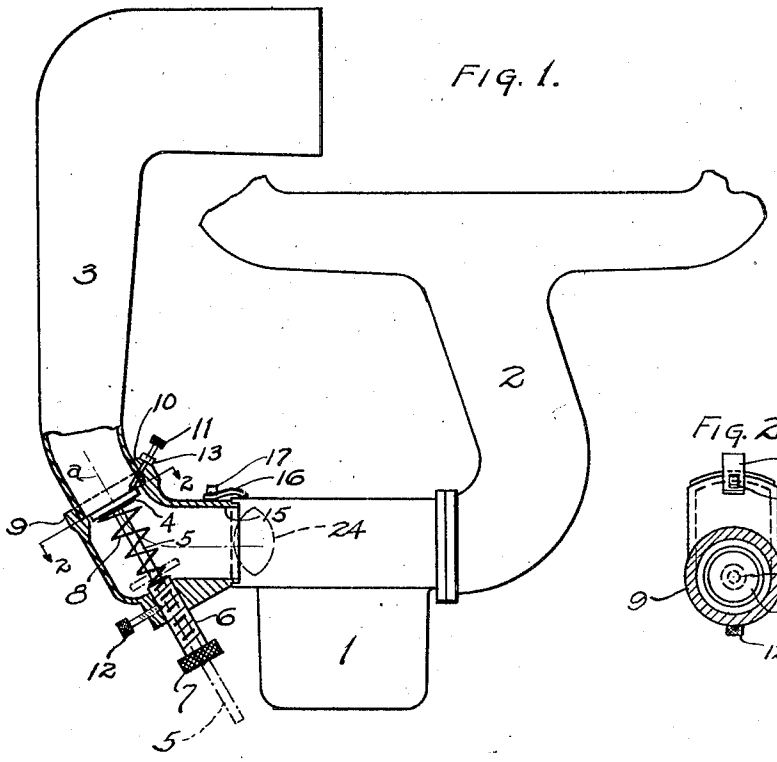


FIG. 2.

FIG. 3.

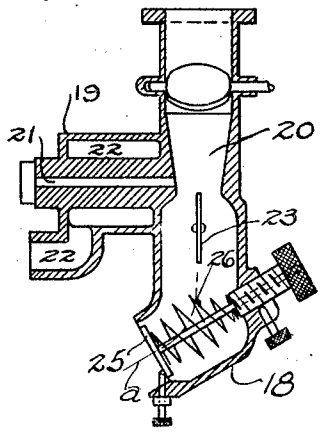
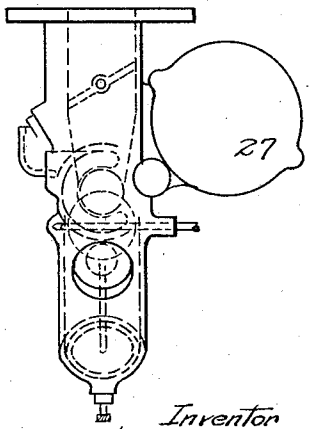


FIG. 4.



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ERNEST DUNFORD, OF ST. LOUIS, MISSOURI.

CARBURETOR AIR CONTROL.

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My invention relates to internal combustion engines and consists in an improved air control device for regulating the mixture of air and fuel gas delivered by the carburetor to the engine intake manifold.

As is well known, the most economical mixture of air and gas is that in which the proportion of air is the largest and, when the motor is traveling at a fair speed, such a proportion is also the most efficient. However, when the motor speed is reduced to the extent necessary in traffic, turning corners, taking bumps or hills, the most economical and normally efficient mixture of air and gas will not be rich enough to enable the motor to perform and it is, therefore, the practice to reduce the proportion of air in the mixture to a point which will give satisfactory performance under all conditions and this means that in straightaway driving around twenty miles an hour or more the carburetor is supplying a much larger proportion of gas than is necessary.

The main object of my invention is to provide a device which will automatically control the proportions of air and gasoline supplied by the carburetor according to the requirements of the engine.

Additional objects of my invention are to produce a device which may be applied to carburetors now in use, to produce a device, the operation of which may be visibly inspected and which may be regulated or adjusted while in use.

An additional object of my invention is to produce a device which is economical to manufacture and simple in installation and operation so that its distribution may be facilitated and it may be installed by the ordinary operator without the aid of a mechanic.

While in my preferred form my device is an accessory which may be applied to carburetors now in use, my invention is also adapted to form a part of a carburetor.

In the accompanying drawings illustrating the preferred form of my invention and modification—

Figure 1 is a side view of the intake air heater pipe, standard carburetor and intake manifold of a Ford engine to which my invention is applied, the invention being shown in section.

Figure 2 is a cross section taken on line 2—2 of Figure 1.

Figure 3 is a section through a gas heating device including my present invention.

Figure 4 is a side elevation of the structure shown in Figure 3.

In Figure 1 a carburetor is illustrated at 1, the intake manifold to which the carburetor is attached it shown at 2, and the intake air heating pipe is shown at 3. Pipe 3 resembles the pipe usually supplied with Ford cars except that the lower end of the pipe instead of extending into the air inlet of the carburetor terminates a short distance therefrom. The space thus provided is occupied by my air control device, the body of which resembles a forty-five degree elbow and consists in a curved air passage shouldered to receive the end of pipe 3 and leading from the pipe to the inlet of carburetor 1, the passage being substantially circular in cross section. A disk-shaped valve head 4 substantially closes the inlet end of the air passage but is small enough to permit the passage of some air between its periphery and the inner wall of the air passage. The valve 4 is mounted on a straight stem 5 extending tangentially to the axis *a* of the air passage and projecting through the wall of the body of the device.

A hollow screw 6 having a knurled head 7 is threaded in the wall of the device and provides a journal for the valve stem 5. A light spring 8 is seated on the inner end of screw 6 and the underside of valve head 4 and provides pressure sufficient to raise the valve to passage-obstructing position when the engine speed is insufficient to provide a strong draft of air through the device. This is the condition when the engine is starting, or laboring when the car is mounting a hill or traveling very slowly. When the car and engine speeds are increased, the vacuum created in the manifold tube causes a stronger passage of air through the device and spring 8 is compressed until the valve head offers practically no obstruction to the passage of air through the device. This position of the valve is indicated by the dot-and-dash lines in Figure 1.

One side of the inlet collar 9 of the device is provided with a flange 10 through which

a screw 11 extends diagonally. Screw 11 also passes through a hole provided in pipe 3 and retains the pipe and device in assembled position. The screw 11 also constitutes a stop for valve head 4.

By means of screws 6 and 11 the total movement of the valve and the resistance of spring 8 may be controlled and as both of these screws are accessible from the exterior of the device, it is obvious that this regulation may be made while the device is functioning during the operation of the engine. Screw 6 is provided with a lock screw 12 and screw 11 is provided with a lock nut 13 for holding their respective parts in adjusted position. The discharge collar 15 of the device is provided with a clamp 16 and screw 17 for securing the device to the inlet collar of the carburetor 1.

Obviously, the device may be applied to the standard Ford intake pipe and carburetor by cutting away a portion of the standard intake pipe. It is likely, however, that it would be more advantageous for manufacturers to furnish a new intake pipe as such part is a light stamping and the cost not great enough to add materially to the price of the air controlled device.

In the construction shown in Figure 3, the air control device 18 is formed integrally with a gas heating chamber 19 and an intake Venturi tube 20. The gasoline is drawn from the caburetor float chamber 27 through a restricted vaporizing passage 21 which is partially surrounded by a passage 22 through which a portion of the exhaust gases of the engine are discharged.

The device is provided with a choked valve 23 corresponding to the choke 24 forming a part of carburetor 1.

The air control valve 25 is mounted in the device and functions similarly to the valve 4 previously described. The valve spring 26 is shown of a slightly different form than that of spring 8 but it will be noted that both of these springs are so shaped that when fully compressed they occupy very little room longitudinally of the valve stem and permit the movement of the valve head to the bottom of the recess formed in the side of the device.

Obviously, various modifications may be made in the details of my device without departing from the spirit of my invention as claimed, and I contemplate the use of such details as may be suggested in the manufacture of my invention.

I claim:

1. In a carburetor air control device, an air passage, a valve therein, an adjustable stop for positively engaging said valve in various closing positions, a spring for moving said valve toward said stop, an adjustable seat for said spring, said stop and seat being adjustable from the exterior of said device.

2. In a carburetor air control device, an air passage, a valve therein, an adjustable stop for positively engaging said valve in various closing positions, a spring for moving said valve toward said stop, an adjustable seat for said spring, said stop and seat being adjustable from the exterior of said device, and locking elements for securing said adjustable seats in desired positions.

3. In a carburetor air control device, an air passage, a spring supported stemmed valve normally substantially closing said passage with its stem slidably mounted in the wall of said passage, said valve being moved by intaken air into a recess formed in one side of said passage so as to afford a substantially unobstructed passage for air through the device.

4. In a carburetor air control device, an air passage having a circular cross section terminating in inlet and outlet collars adapted, respectively, to receive and be received in the circular tubular ends of a heater pipe and a carburetor, means on said collars for securing them to the parts assembled therewith, and a spring-pressed valve between said collars normally closing said passage but movable out of the path of air drawn through the passage.

5. In a carburetor air control device, an air passage, a valve, a spring normally moving said valve toward an end of said passage, a flange at said end of the passage, a screw threaded in said flange and extending diagonally of said flange to serve as an adjustable stop for said valve and to secure said device to a pipe with which it is assembled.

In testimony whereof I hereunto affix my signature this 21st day of October, 1924.

ERNEST DUNFORD.