UNITED STATES PATENT OFFICE.

WRIGHT E. HOWES, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESSRS. ASSIGNMENTS, TO ANGO-AMERICAN AERATOR CO., OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

AUXILIARY AIR-SUPPLY FOR INTERNAL-COMBUSTION ENGINES.


To all whom it may concern:

Be it known that I, Wright E. Howes, a citizen of the United States, residing at San Francisco, in the county of San Francisco, and State of California, have invented new and useful Improvements in Auxiliary Air-Supply for Internal-Combustion Engines, of which the following is a specification.

The present invention relates to improved means for supplying air for the combustion of fluid hydrocarbon in internal combustion engines especially engines used for the propulsion of automobiles.

With carburetors as usually constructed, if sufficient air be mixed in the carburetor with gasolene vapor to effect combustion thereof when the engine is starting, then, after the engine has been started and is running at full speed, the air supplied to the carburetor is not sufficient to effect such perfect combustion and consequently the full value of the gasolene is not obtained therefrom.

One object of my invention is to provide means for remedying this defect.

A further object of the invention is to provide means for accomplishing the above results which, when required, can also be used as an air brake.

A further object is to provide a device of this character which will be simple and inexpensive and can be adopted for use with carburetors and manifolds of engines at present in use.

In the accompanying drawing, Figure 1 is a perspective view of my improved apparatus, the internal combustion engine itself being shown in dotted lines; Fig. 2 is an enlarged perspective view of the device detached: Fig. 3 is an enlarged vertical sectional view; Fig. 4 is a detail-side view of the inner tube detached: Fig. 5 is a similar view of the mediate tube; Fig. 6 is a cross section on the lines 6-6 of Fig. 3, showing the valves in the position when the engine is stationary; Fig. 7 is a similar view of said valves, when the engine has started; Fig. 8 is a similar view, when the valves are in the position to cause the apparatus to perform the function of a brake.

Referring to the drawing, 1 indicates the carburetor of an internal combustion engine, shown at 2 in dotted lines, and connected to 3 said engine by a manifold 4. Said carburetor is regulated by a crank arm 4 connected to one end of a link 5, operated in the usual manner from a point in proximity to the steering wheel.

6 indicates the ordinary air inlet of the carburetor.

Into the manifold 3 is screwed the thread-ed lower end 7 of an inner tubular conduit 8, having a closed upper end centrally apertured, a screw 9 being screwed into said aperture. In the side of said inner tube is formed an elongated aperture 10 of considerable size, (Fig 4) to admit air to the manifold and thus to the several combustion chambers of the engine. Surrounding said inner tube is a mediate tubular valve 11 (Fig. 1) having an upper closed end formed with a central aperture through which the screw 9 passes, said mediate tubular valve fitting closely around the inner tube 8 and its lower end being in close proximity to a hexagonal flange 12 formed on said inner tube. In the side of said mediate tube 11 is formed an elongated aperture 13 registering with the aperture 10. Around the upper end of said mediate tube 11 is clamped, by means of a screw 14, a collar 15 extended to form an arm 16 for turning said mediate tube.

The arm 16 is formed with a hole 17, to which is attached one end of a spring 18, the other end of which is attached to any suitable part of the engine casing, and this spring, being under tension, tends to rotate 19 the tube 11 in a right-handed direction. Said rotation, however, is limited by a rod 19, of which one end is connected with said arm by means of a hole 20 in its end, and the other end passes through a lug 21 upon the engine casing and is threaded. A thumb nut 22 is screwed on said threaded end and abuts against said lug 21 to limit the rotation of said arm. Said arm is connected, by means of a third hole 23 therein, to one end 24 of a link 25 the other end of which is attached to an arm 26 of a foot lever 28.

Fitting closely and rotatable, around the
mediate tube is an outer tubular valve 27, contained between the hexagonal flange 12 and the collar 15, and formed with an elongated aperture 28 adapted to register with the aperture 13. Extending transversely from the outer tube and formed integral therewith is an arm 29 formed with a series of holes 30 for the selective attachment thereto of one end of a link 31, the other end of which is pivotally attached to a sleeve 32 secured upon the link 5.

The apertures 10, 13 and 28 are made tapering equally toward both ends, so that they can be applied equally well to manifolds where it is necessary to rotate the tubes 11 and 27 in one direction as in the other direction. Also the collar 15 can be attached to the mediate tube 11 so as to project in any direction therefrom, and it can be applied with either face upward, or so that the hole 17 lies on either side of the line between the holes 20 and 23.

The following is the mode of operation of my improved apparatus. When the engine is stationary, the parts are in the position shown in Fig. 6, in which the aperture 28 is out of register with the aperture 13. When the throttle is operated to open the carbureter valve and admit more mixture to the engine, automatically therewith the tube 27 is rotated to the right and the aperture 28 is brought partly into register with the aperture 13 to admit air into the conduit 8 to give perfect combustion of the mixture.

The amount of air, however, which should be admitted, depends upon varying conditions of the atmosphere or on the work to be done by the engine, and to adjust the device to these conditions the angular position of the mediate tube is regulated by the adjusting nut 22, so that, for instance, when climbing a hill, less air may be admitted in proportion to the mixture, while on level ground more air is admitted; or, again, on high levels, at which the air is of reduced density, more air will be admitted; or if the temperature of the surrounding air be low, then less air would be admitted.

When it is desired to check the speed of the automobile in descending a hill or at other times, the foot lever 26 is pressed, and at the same time the gas throttle is closed. This action causes the tube 11 to be rotated to the left, so that the aperture 13 is brought into full registry with the aperture 28. Air only is then drawn into the combustion chambers of the engine. The air so admitted forms cushions for the pistons of the engines, and the work which has to be done by the engine in compressing the air so admitted serves as a very effective brake in checking the motion of the automobile, and in many cases dispenses with the necessity of using the ordinary brake.

In the claims I use the word “manifold” only as a convenient expression to indicate the tube by which the carbureted air flows from the carbureter to the engine, whether this engine have only one cylinder or a plurality thereof.

I claim:

1. In combination with a carbureter, a manifold leading therefrom, means for regulating the supply of mixture flowing from the carbureter to the manifold and a link connected to said regulating means for operating the same from a distant point, a tube secured around an aperture in the side of said manifold and having an opening for admission of air into the tube, movable means for variably said opening to reduce the size thereof, a second covering means covering the first covering means and having an opening registering with the opening therein, an arm extending from said second means, and a second link connected at one end to said arm, and movably connected at the other end to the first-named link.

2. In combination with a carbureter, a manifold leading therefrom, means for regulating the supply of mixture flowing from the carbureter to the manifold and a link connected to said regulating means for operating the same from a distant point, a tube secured around an aperture in the side of said manifold and having an opening in its side for admission of air into the tube, a second tube surrounding the first tube and having an opening adapted to register with the first-named opening, means for moving the second tube over said first-named tube to limit the maximum size of the passage through said tubes, an outer tube around the second-named tube and having an opening therein adapted to register with the opening in said second-named tube, an arm extending from said outer tube, and a second link connected at one end to said arm, and movably connected at its other end to the first-named link.

3. In means for supplying a fuel mixture, a carbureter, a manifold leading from the carbureter, and means for regulating the supply of mixture flowing from the carbureter to the manifold, a conduit having an air inlet above the throttle valve of the carbureter and arranged to conduct air to mingle with said mixture, a valve for controlling the entrance of air into said conduit, means, operated in one movement with said regulating means, for opening said valve, and means, operative without actuating said regulating means, for opening wide said air inlet.

4. In means for supplying a fuel mixture, a carbureter, a manifold leading from the carbureter, and means for regulating the supply of mixture flowing from the carbureter to the manifold, a conduit arranged...
to conduct air to mingle with said mixture, and having an aperture in its side, a mediate tube around said conduit and having an aperture adapted to register with the aperture in the conduit, an outer tube around the mediate tube and having an aperture adapted to register with the aperture in the mediate tube, means for adjusting the position of said mediate tube upon the conduit, and means, operating in unison with the supply regulation, for rotating said outer tube so that the apertures in the outer and mediate tubes partly coincide.

5. In means for supplying a fuel mixture, a carbureter, a manifold leading from the carbureter, and means for regulating the supply of mixture flowing from the carbureter to the manifold, a conduit arranged to conduct air to mingle with said mixture and having an aperture in its side, a mediate tube around said conduit and having an aperture adapted to register with the aperture in the conduit, an outer tube around the mediate tube and having an aperture adapted to register with the aperture in the mediate tube, means for rotating said mediate tube independently of the actuation of said regulating means, and means, operating in unison with the supply regulation, for rotating said outer tube so that the apertures in the outer and mediate tubes partly coincide.

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

WRIGHT E. HOWES.

Witnesses:
FRANCIS M. WRIGHT,
D. B. RICHARDS.