Sept. 18, 1928.

1,684,550

M. MALLORY

CARBURETOR

Filed May 3, 1926

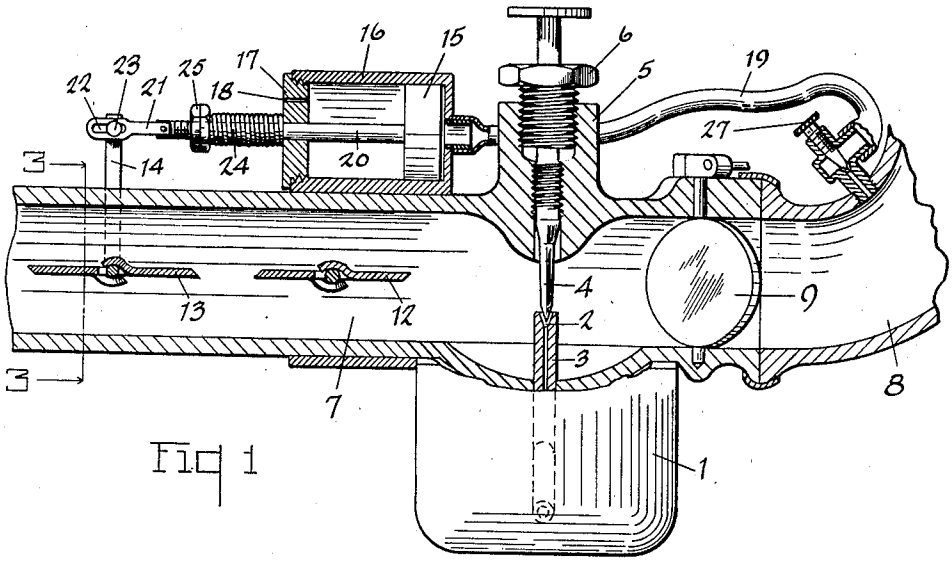


Fig 1

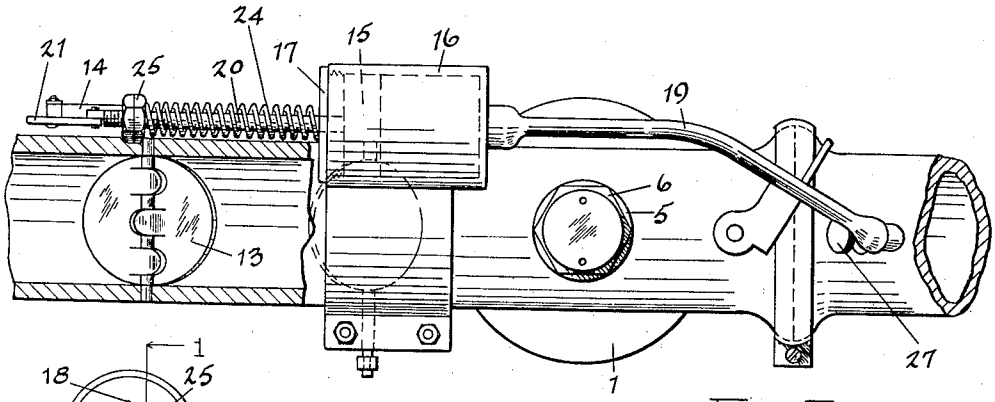


Fig 2

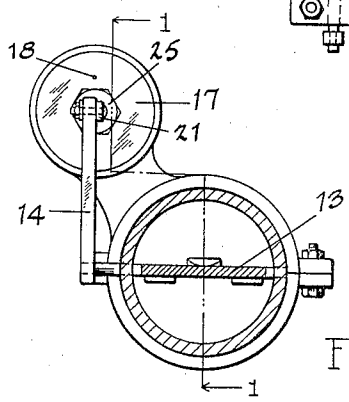


Fig 3

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Patented Sept. 18, 1928.

1,684,550

UNITED STATES PATENT OFFICE.

MARION MALLORY, OF TOLEDO, OHIO.

CARBURETOR.

Application filed May 3, 1926. Serial No. 106,305.

My invention has for its object to provide an automatic fuel regulative device which is dependent on the demand that is made on an internal combustion engine through the operation of the throttle or other device for controlling the engine.

In constructions containing my invention, means is provided for supplying additional fuel to internal combustion engines when the engine is about to, or is carrying an increased load. The invention may be contained in constructions that partake of different forms and to illustrate a practical application of the invention I have selected a construction which is particularly applicable to internal combustion engines of the type commonly used in automobiles as an example of constructions containing my invention and shall describe it hereinafter. The construction selected is shown in the accompanying drawing.

Figure 1 is a view of a section taken on the plane of the line 1—1 indicated in Fig. 3. Fig. 2 is a top view of the construction, a part being shown broken and in section to illustrate the details of the construction. Fig. 3 is a view of a section taken on the plane of the line 3—3 indicated in Fig. 1.

In the particular form of construction shown in the figures, 1 indicates a carburetor which may be of any form suitable for producing a carburetion of the fuel, namely, gasoline with air, the carburetor having a fuel inlet 2. This may be located at the end of the nozzle such as the nozzle 3. The area of the inlet 2 may be adjustably regulated by the needle valve 4 which is adjustably supported in a suitable boss 5 having the packing sleeve 6 in the manner well known in the art. The inlet 2 communicates with the main air passage way through the carburetor that extends from the air inlet of the carburetor through the intake manifold to the engine. In the form of construction shown in the drawing, the passage way 7 extends through the carburetor and the manifold 8 to the engine, while the nozzle 3 extends into the passage way. A means for throttling the engine is located in the passage way at a point between the fuel inlet 2 and the engine. The throttling means may be any form of valve for restricting the movement of the air and fuel to the engine. In the form of construction shown, a butter-fly valve 9 is pivotally supported in the wall of the carburetor and is connected to any suitable means whereby it may be conveniently and manually operated by the driver of the car. Ordinarily when it is desired to increase the speed of the car or when the engine is being subjected to an unusual load, the throttle 9 is opened in order to supply an additional amount of fuel to the engine with the result, however, that while there may be a small increase of the supply of fuel, there is, however, a much greater increase of supply of air which impoverishes the mixture with the result that instead of the car speeding up or carrying its load, it either does not increase its speed or it moves slower for a short period of time. Consequently the car fails to "pick up" which is due to the leanness of the mixture which is momentarily created by opening the throttle valve. By my invention, I have provided a means for automatically regulating the supply of air upon opening the throttle valve which is so constructed and adjusted that a proper fuel mixture will be supplied to the engine in order that it may "pick up" promptly or carry an increased load to which it is subjected.

The air passage way 7 is provided with the usual choke 12 which may be in the form of a butterfly valve that is pivotally supported in the wall of the carburetor or the wall that forms a part of the pasage way 7 and is connected with a means for conveniently and manually operating the choke in order to supply a rich mixture to the engine such as is commonly done in starting the engine. The passage way 7 is also provided with an auxiliary choke which may be in the form of a butterfly valve 13 that may be pivotally supported in the wall that forms the passage way 7. The butterfly valve 13 is operated to automatically restrict the effective area of the passage way when there is a marked rise of pressure within the passage way 7 at a point between the throttle 9 and the engine which would ordinarily be produced by opening the throttle 9 which is usually done to materially increase the speed of the

engine or when the engine is subject to a material increased load such as when an automobile moves up an incline.

An arm 14 is connected to the butterfly valve 13. The arm 14 is operated by a piston 15 which is located in and substantially fits a cylinder 16. One end of the cylinder is provided with a plug or cap 17 which has one or more openings 18. The other end of the cylinder is connected by means of a pipe 19 to the passage way 7 at a point between the throttle 9 and the engine. It may be connected to the intake manifold 8 of the engine. The effective area of the pipe may be adjusted by means of the needle valve 27. The piston rod 20 extends through the cap 17 of the cylinder and its outer end is provided with a link 21 which is adjustably connected to the arm 14, the end of the link having a slot 22 in which is located a bolt 23 that passes through the arm 14 and thus the relation between the arm 14 and the piston 15 may be adjusted to obtain the desired relation between the butterfly valve 13 and the piston 15. A spring 24 is located on the piston rod 20 and between the cap or head 17 of the cylinder and a nut 25. The outer end of the rod 20 is threaded for receiving the nut 25 whereby the tension of the spring 24 may be readily adjusted to cause the butterfly valve 13 to respond to the desired pressures that may exist at the point of connection of the pipe 19 with the passage way 7 whereby the choke 13 will be operated to restrict the effective area of the passage 27 when the pressure in the passage way at a point between the throttle and the engine rises to above a certain point which is determined by the adjustment of the spring 24.

In the operation of the device and, particularly, when the engine is moving at a comparatively slow speed, that is, when the load is comparatively light, the throttle 9 will be located in a comparatively closed position. When, therefore, it is desired to speed up the engine, the throttle 9 will be opened which will raise the pressure in the passage way 7 on the engine side of the throttle to nearly atmospheric. The only difference between the pressure at this point and atmospheric will be that, that is caused by the resistance to the free air movement through the passage way 7 and through the carburetor. This would ordinarily result in drawing for a very short period of time a large quantity of air in proportion to the amount of gasoline into the engine. In other words, the mixture becomes momentarily exceedingly lean and the engine is working at a disadvantage until it can get its speed up to that which would increase the vacuous condition about the fuel inlet sufficient to obtain from the fuel supply a sufficient amount of gasoline to produce the proper mixture. In the construction shown, the increased pressure between the throttle and the engine permits the spring 24 to move the choke 13 towards the closed position to restrict the affective area of the passage way 7 and prevent a large influx of air with the result that the vacuous condition at the fuel inlet approximates the vacuous condition on the engine side of the throttle and an additional amount of fuel is drawn into the passage way 7, which amount, according to the adjustment of the parts will be the proper amount to produce the most effective fuel mixture. The engine immediately speeds up or continues to carry an increased load without materially affecting its speed. If the engine speeds up, the vacuum will build up and the choke 13 will be opened more and more until the piston is drawn to the end of the cylinder.

I claim:

1. In a carburetor for an internal combustion engine, the carburetor having a passage-way communicating at one end with the intake of the engine, the carburetor having a fuel inlet communicating with the passage-way, a throttle valve located in the passage-way, the wall of the carburetor being closed as against entrance of air as between the fuel inlet and the throttle valve, a choke valve for closing the entrance of air to the passage-way and located on the side of the fuel inlet opposite to that on which the throttle valve is located, and a pneumatic means responsive to the pressure in the passage-way at a point between the throttle and the engine for closing the choke valve as the pressure at said point is increased.

2. In a carburetor for an internal combustion engine, the carburetor having a passage-way communicating at one end with the intake of the engine, the carburetor having a fuel inlet communicating with the passage-way, a throttle valve located in the passage-way, the wall of the carburetor being closed as against entrance of air as between the fuel inlet and the throttle valve, a choke valve for closing the entrance of air to the passage-way and located on the side of the fuel inlet opposite to that on which the throttle valve is located, a pneumatic means responsive to the pressure in the passage-way at a point between the throttle and the engine for closing the choke valve as the pressure at said point in increased, and a second choke valve for closing the said passage-way and a manual means for operating the said second choke valve.

3. In a carburetor for an internal combustion engine, the carburetor having a passage-way communicating at one end with the intake of the engine, the carburetor having a fuel inlet communicating with the passage-way and an air inlet for said passage-way on the side of the fuel inlet opposite to that where the carburetor is connected with the intake of the engine, the said passage-way

being closed as to any opening to the exterior between the fuel inlet and the engine, a throttle valve located in the passage-way, a choke valve located between the fuel inlet and the air inlet of the passage-way, and a pneumatic means responsive to the pressure in the passage-way at a point between the throttle and the engine for operating the choke valve to reduce the effective area of the passage-way at the choke valve.

In testimony whereof I have hereunto signed my name to this specification.

MARION MALLORY.