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CARBURETOR STEP-UP DEVICE

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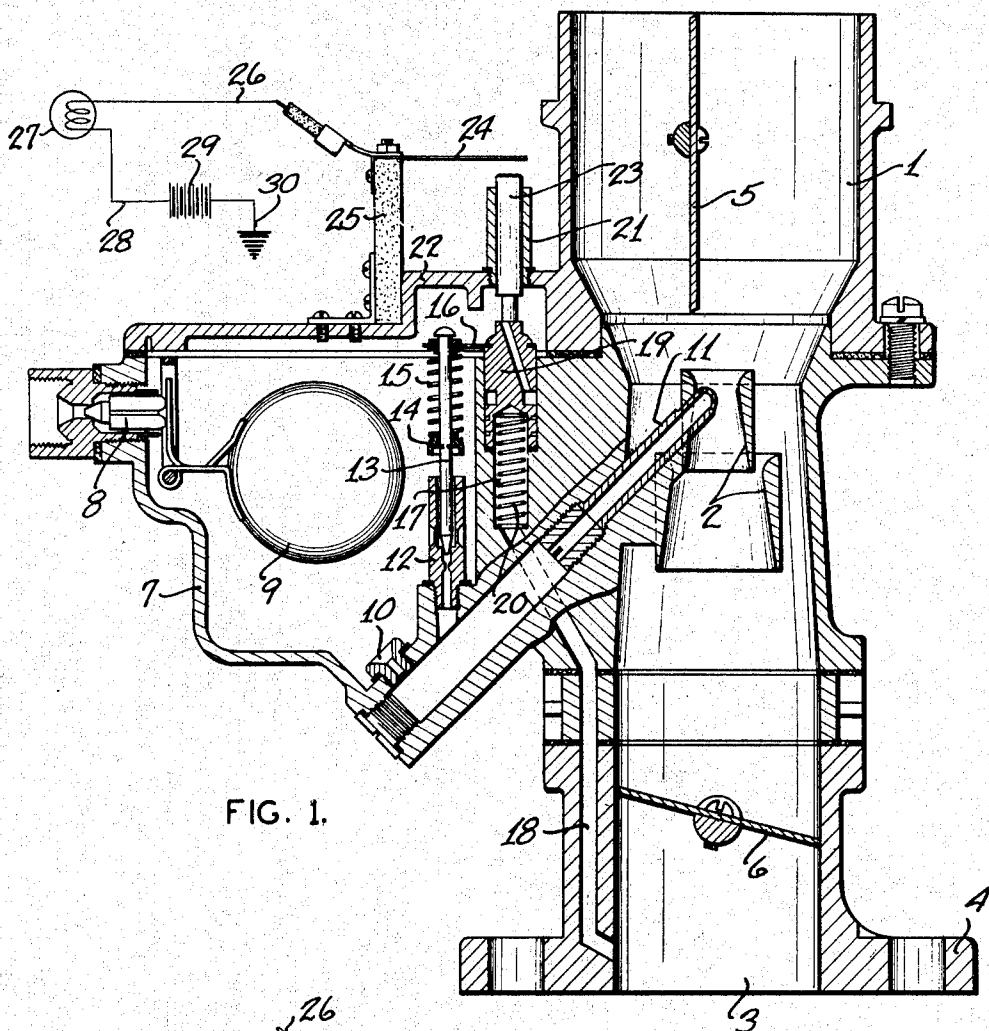


FIG. 1.

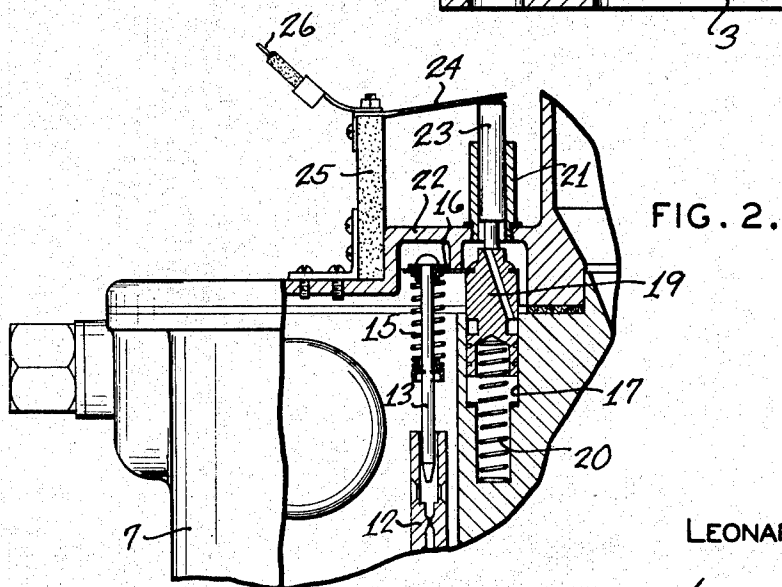


FIG. 2.

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CARBURETOR STEP-UP DEVICE

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1 Claim. (Cl. 261-69)

This invention relates to carburetors for internal combustion engines and particularly to the means for enriching the mixture when the associated engine is subjected to a relatively heavy load.

Most automotive carburetors now in use are provided with means for supplying additional fuel to the engine intake when the engine is subjected to a relatively heavy load. Such means may take the form of a suction operated device for supplying the additional mixture when relatively low suction conditions prevail in the mixture conduit, or the enriching device may be operated mechanically from the throttle valve. The step-up may comprise an extra metering jet in the carburetor float bowl, controlled either by a suction device or by the throttle, or it may constitute a metering pin or rod associated with the main metering jet and stepped or tapered to enrich the mixture as desired. Under most operating conditions, the carburetor will operate satisfactorily without using the extra mixture which is supplied by the step-up device, since this device is necessary only under extreme load conditions to permit the engine to develop its maximum horse power. The operator may prevent the operation of either a mechanical or suction step-up device by limiting the degree to which the throttle valve is opened, but it is practically impossible for the operator to determine this point while driving a car. Obviously, greater economy could be obtained if means were provided to prevent operation of the step-up except when it is absolutely necessary.

Accordingly, the object of the present invention is to provide means for indicating to the operator of a vehicle, the operative condition of the step-up device so that, in case maximum economy is desired, he may refrain from opening the throttle valve beyond the position where the step-up is rendered operative.

This object and other more detailed objects hereafter appearing are obtained substantially by the device illustrated in the accompanying drawing in which:

Fig. 1 is a vertical transverse section illustrating a carburetor embodying the invention.

Fig. 2 is a view of a portion of the structure shown in Fig. 1, but with parts in different operative positions.

The carburetor shown includes an air horn 1, venturis 2, and outlet portion 3 forming a mixture conduit, the outlet portion being flanged as at 4 for attachment to the intake manifold (not shown) of an associated internal combustion engine. A choke valve 5 is mounted in the air horn

and a throttle valve 6 is located near the outlet portion. Adjacent the mixture conduit is a bowl 7 within which fuel is maintained at a substantially constant level by the usual needle valve mechanism 8 controlled by a float 9. Fuel for normal operation is supplied to the mixture conduit through a calibrated metering orifice member 10 and main nozzle 11 terminating at the throat of upper venturi 2.

There is also provided a suction step-up device including an additional orifice member 12 opening into the main nozzle passage and controlled by a needle 13 extending through a guide 14 and secured at its upper end through a coiled spring 15 to a strap 16. Adjacent needle 13 is a cylinder 17 communicating through passage 18 with the carburetor mixture conduit posterior to throttle 6. A piston 19 is slidable in cylinder 17 and constantly urged upwardly by a coiled spring 20. Strap 16 is secured to piston 18 whereby needle 13 reciprocates vertically with piston 19 responsive to suction conditions in the mixture conduit. The various parts are constructed so that when the engine intake suction drops below a predetermined value, on the order of two inches of mercury, spring 20 will force piston 19 and needle 13 upwardly, opening auxiliary orifice member 12 to supply additional fuel to the mixture conduit.

Slidably mounted in a bearing 21, carried by cover portion 22 of the float bowl, is a reach pin 23 which rests on piston 19 and terminates, when piston 19 is depressed below a metal strap 24 carried by a block 25 of insulating material projecting above the bowl cover (Fig. 1). Strap 24 is electrically connected by means of lead 26 to an electric light 27 and through lead 28 to battery 29, grounded at 30. Reach pin 23 is grounded through the carburetor and engine so that when this pin is moved into contact with strap 24 (Fig. 2), as when the suction step-up device is operative to enrich the mixture, a circuit will be completed through lamp 27 so as to afford a visual indication of the operative condition of the step-up. Preferably, lamp 27 is located on the dash of the automobile or at another position readily visible to the operator from the driving seat.

If desired the indication may be audible instead of visual and this may be effected by means of a suitable buzzer or other noise maker. I also contemplate using the device with any type of step-up mechanism which includes a member movable when the auxiliary fuel supply means is rendered operative, this member being arranged to actuate the indicator means.

Various features of the carburetor are not es-

sential and the indicating mechanism may be varied as will occur to those skilled in the art. The exclusive use of all modifications as come within the scope of the appended claim is contemplated.

5 I claim:

10 In combination with an internal combustion engine intake conduit, a manually actuated throttle therein, a carburetor for association with said intake conduit including a float bowl and a cover therefor, a main fuel passage for admitting fuel from said bowl to said conduit during normal operation of the engine, an auxiliary fuel passage opening into the main fuel passage for enriching the mixture in said conduit, a valve associated with said auxiliary fuel supply passage, suction responsive means including a piston for actuating said valve in response to suction variations in said conduit to automatically enrich the mixture

in said conduit when the suction therein has reached a predetermined value, an opening in the cover of said float bowl, a guideway positioned adjacent said opening, said guideway and the walls of said opening being in vertical alignment with said plunger, a grounded reach pin arranged to travel in said guideway and to extend into the bowl of said carburetor for normal engagement with said plunger and movement therewith, an insulated support on said bowl, a contact element carried by said support for engagement with said reach pin at a point in its travel determined by the open position of said valve in said auxiliary fuel passage, and an indicator circuit connected with said contact whereby the passage of auxiliary fuel to the conduit will be indicated to permit the relative regulation of the manually actuated throttle.

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