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NONICING THROTTLE VALVE

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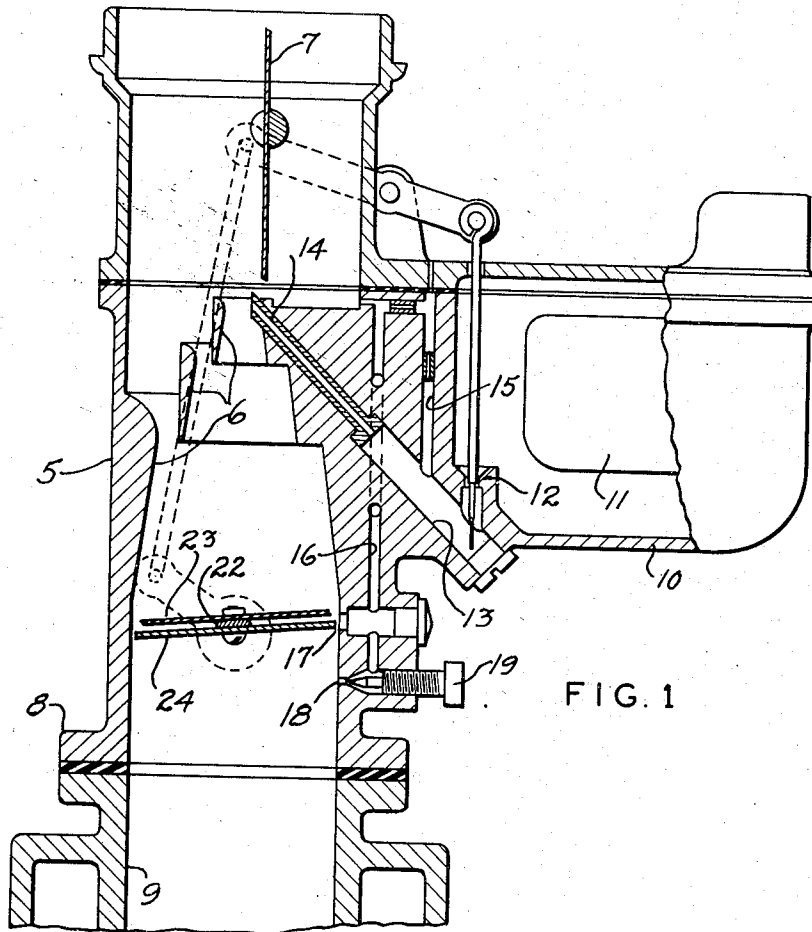


FIG. 1

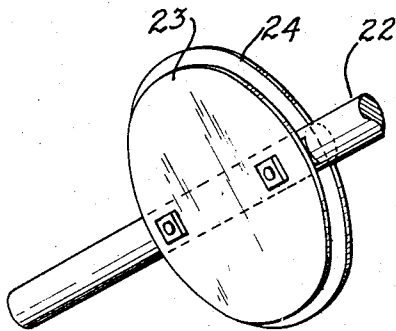


FIG. 2.

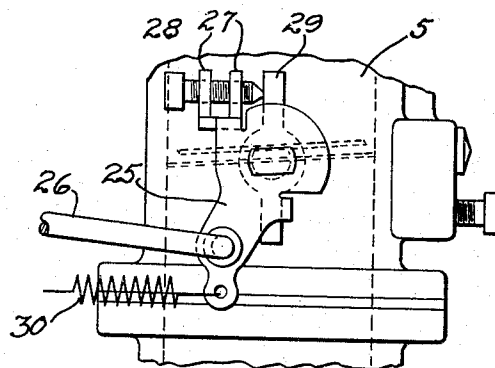


FIG. 3.

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NONICING THROTTLE VALVE

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2 Claims. (Cl. 261—41)

This invention relates to ice resisting throttle valves for internal combustion engines.

A carburetor of this type is customarily provided with a butterfly throttle valve for controlling the discharge of combustible mixture to the engine cylinders, and an idling port located so as to discharge posterior to the throttle when closed. In the normal idling position of the valve, the throttle is held slightly open so that the air which passes the same mixes with the very rich mixture emitting from the port to form the combustible idling mixture. The air which passes around the throttle expands greatly, producing a refrigerating effect upon the throttle plate and this effect is enhanced by the vaporization of the idling fuel. Under low temperature conditions, particularly before the engine becomes fully heated, this refrigeration of the throttle valve frequently causes condensation and freezing of the moisture content of the entering air and the resulting ice crystals may seriously restrict the idling port so that the engine fires erratically or stalls.

The main object of the present invention is to design a throttle valve which will substantially resist the formation of ice under low temperature idling conditions and thereby avoid erratic idling and stalling at such times.

In the accompanying drawing which illustrates the invention

Fig. 1 is a sectional view of a carburetor including the novel ice resisting throttle valve shown in idling position.

Fig. 2 is a perspective view of the throttle valve disassembled from the carburetor.

Fig. 3 is an enlarged side view of the lower part of the carburetor showing the throttle operating part.

The carburetor shown includes a downdraft mixture barrel 5 including multiple venturis 6 and a butterfly choker valve 7 for restricting the entry of air during starting. The barrel is flanged, as at 8, at its lower end for attachment to the usual intake manifold 9. At the side of the barrel there is provided a bowl 10 within which fuel is maintained at a substantially constant level by a float 11 and the usual needle valve mechanism (not shown). Fuel is supplied to the barrel through a main metering orifice 12 and upwardly inclined main fuel passage 13 discharging into smallest venturi 6 by means of a main nozzle 14. An idling passage 15 extends upwardly from main fuel passage 13 and thence downwardly as at 16 and discharges into the barrel through 55

idling ports 17 and 18, port 18 being provided with a mixture adjusting screw 19.

A shaft 22 is journaled in the barrel wall substantially at the level of port 17 and has opposite flat sides to which are secured the spaced throttle valve discs 23 and 24. Lower disc 24 extends radially beyond upper disc 23 and, in the idling position, as shown in Fig. 1, splits idling port 17 so that a portion thereof opens into the barrel posterior to the throttle valve. In this position of the throttle, plate 24 is slightly spaced from the barrel wall to admit idling air to the cylinders. During the first part of the opening and the last part of the closing movement of the throttle, the posterior, larger disc 24 sweeps port 17 so as to control the idling discharge.

One end of throttle shaft 22 extends outside of the barrel and rigidly mounts an arm 25 to which is secured a link 26 extending to the accelerator pedal located in the driver's compartment. A pair of ears 27 on the arm mount a screw 28 which cooperates with a fixed stop 29 to adjust the idling position of the throttle valve and, consequently, the idling speed of the engine. A throttle return spring is diagrammatically represented at 30.

It has been found that this form of throttle valve, having an air layer between spaced discs, the anterior disc shields the port controlling posterior disc and substantially resists and delays the formation of ice crystals on the posterior disc and around the idling port so that no idling difficulties are experienced as a result of icing at any temperature. The invention has particular advantage when used with automotive carburetors, in which icing ordinarily usually occurs only before the engine reaches normal running heat after starting. The novel throttle valve effectively prevents the formation of ice during this warming up period.

Experiments have further shown that a throttle provided with an air layer between the discs is much more effective for this purpose than one having an intermediate layer of insulating material such as asbestos. The invention may be modified in various respects as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. In a carburetor, means forming a mixing conduit having a main fuel nozzle and an idle port posterior to said nozzle, a throttle shaft transversely mounted in the walls of said mixture conduit, a throttle valve comprising a posterior

disk fixed to said shaft and having an edge constructed and arranged to substantially close said mixing conduit and to sweep said port, and an anterior disk carried by said throttle shaft in a position substantially parallel to but spaced from said throttle.

2. In a carburetor, a mixture conduit having a throttle valve comprising spaced discs with an air layer therebetween, one of said discs extending radially a slight distance beyond the other, 10

and an idling port in the wall of said conduit adjacent the edge of said larger disc which moves anteriorly during opening of the throttle so as to be swept by said larger disc for controlling the idling fuel discharge, said smaller disc shielding said port controlling disc from the moisture laden entering air to reduce the deposit of ice on said larger disc.

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