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CARBURETOR STRUCTURE

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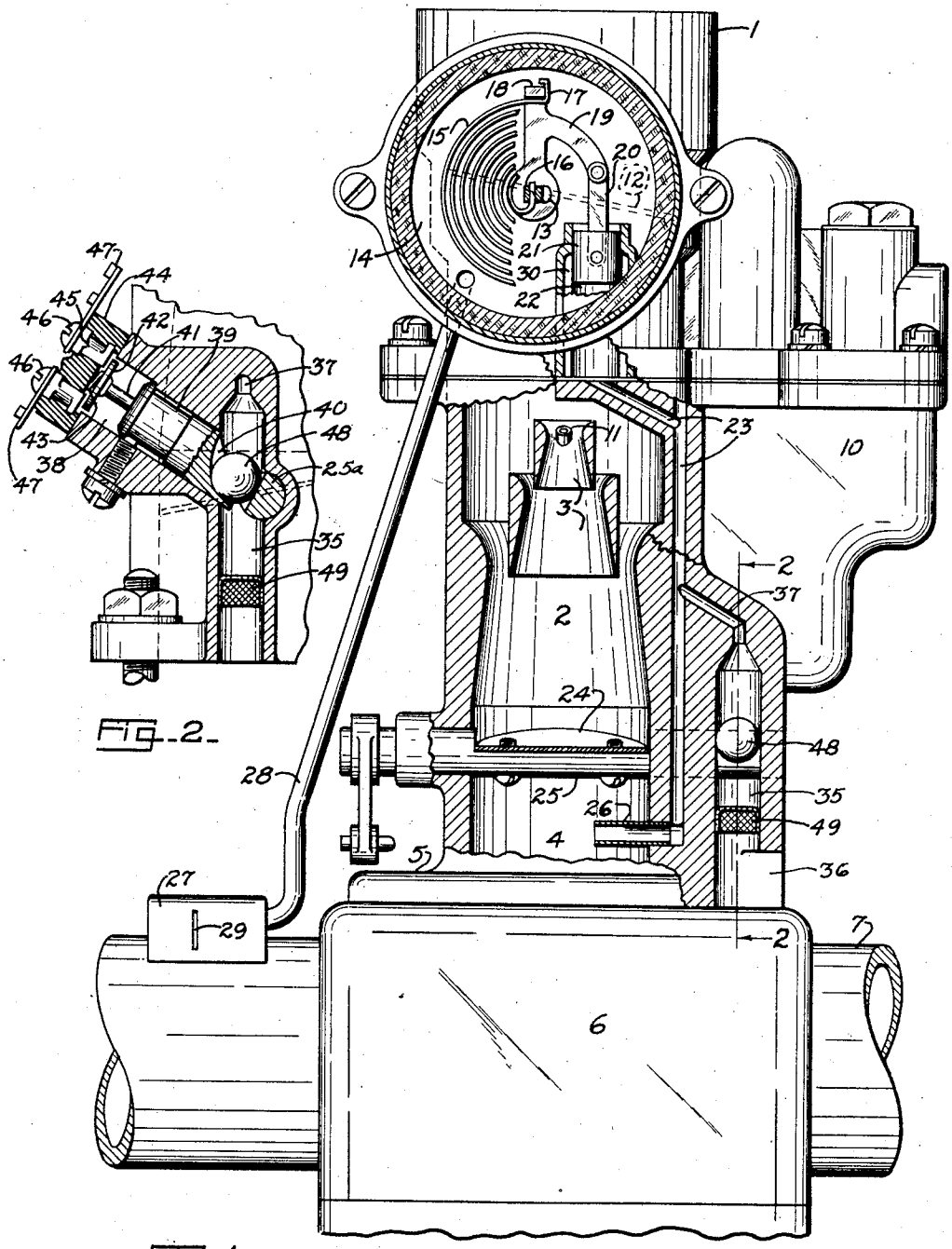


FIG. 2.

FIG. 1.

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CARBURETOR STRUCTURE

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Application March 26, 1940, Serial No. 325,966

1 Claim. (Cl. 261—63)

This invention relates to carburetors for internal combustion engines and consists particularly in novel means for avoiding the whistling or sucking noise which frequently occurs where a suction passage functioning as an adjunct of the carburetor opens into the carburetor mixture conduit and discharges air thereinto during operation of the carburetor.

An arrangement of the above type is illustrated in a co-pending application of Irven E. Coffey, Serial No. 293,297, filed September 2, 1939, wherein an automatic starting switch device, influenced jointly by the carburetor throttle valve and by suction posterior to the throttle valve is mounted on the body of the carburetor itself. In this device, particularly during the starting operation, a relatively large quantity of air is drawn through the starting device and into the carburetor, which volume of air, after the engine has started and the throttle is released, serves to lift a ball or plunger to a position to render the throttle control of the starting switch ineffective. The large volume of air drawn into the carburetor during starting produces an annoying sucking or whistling sound.

It is an object of the present invention to eliminate the noise so produced.

These and other more detailed objects hereafter appearing are attained substantially by the structure illustrated in the accompanying drawing in which:

Fig. 1 is a side view of a carburetor and portions of the associated engine manifolding, parts of the carburetor being broken away and sectioned for clearer disclosure.

Fig. 2 is a detail sectional view taken substantially on line 2—2 of Fig. 1.

The carburetor illustrated in Fig. 1 includes a downdraft mixture conduit formed of an air inlet horn 1 at the upper end, an intermediate mixing chamber 2 enclosing venturis 3 and an outlet portion 4 at the lower end having flange 5 bolted to "hot spot" 6 communicating with the intake manifold (not shown) and exhaust manifold 7.

Adjacent the mixture conduit or barrel portion of the carburetor is a bowl 10 within which fuel is maintained at a constant level, preferably by well known float and needle mechanism (not shown). Fuel is supplied to the mixture conduit from the bowl 10 through the main nozzle 11. Hot gases from exhaust manifold 7 circulate through "hot spot" 6, as is well known, for heating the fuel and air mixture supplied by the carburetor.

An unbalanced choke valve 12 is pivoted in air horn 1 on shaft 13 which has one end protruding beyond the air horn and into an insulated cylindrical housing 14 secured to one side of the air horn. A thermo-sensitive, bi-metallic coil 15 is enclosed in housing 14 and is secured at its inner end to a pintle 16 projecting inwardly from the cover of the housing. The outer end of coil 15 is hooked, as at 17 for engaging a finger 18 on curved crank 19 secured at one end to the end of choke shaft 13 within the housing. The other end of crank 19 is secured by a link 20 to a piston 21 slidably received in a small cylinder 22 within the housing. Cylinder 22 at its lower end communicates through its suction passage 23 with a portion of the carburetor mixture conduit posterior to the usual throttle valve 24 mounted on throttle shaft 25. The portion of the suction passage communicating with the mixture conduit is formed by a separate tube 26 extending from passage 23 inwardly substantially beyond the conduit wall. The open end of tube 26 preferably faces directly across the conduit or, in other words, parallels the axis of the mixture conduit. The tube is inserted through the outlet end of the carburetor barrel and is preferably pressed into position.

A stove 27 is secured to exhaust manifold 7 and is connected to housing 14 by means of a tube 28. The stove is in constant communication with the atmosphere through the slot 29 and serves to confine a body of air to be heated by the hot exhaust gases. Cylinder 22 into which piston 21 loosely fits, is provided with longitudinal grooves 30 in the inner wall thereof so that a portion of the suction communicated to the cylinder escapes past the piston and is available for drawing air from the stove past the thermostat and thence into the mixture conduit. Automatic choke control mechanism of the type herein shown is more fully disclosed and claimed in a Patent #2,085,351 issued in the name of Irven E. Coffey.

Mounted on the carburetor body is a starting device which includes a chamber 35 formed in the mixture conduit wall and communicating with the atmosphere, at its lower extremity, by means of an opening 36. At its upper extremity, this chamber connects by means of a duct 37 with automatic choke suction passages 23 and thence communicates with the mixture conduit through projecting tube 26.

One end of throttle shaft 25 is cut away to form a semi-circular section 25a as shown in Fig. 2. Extending outwardly and upwardly from chamber 35 adjacent throttle shaft section 25a is a second chamber 38 which slidably receives

a plunger 39 having a dished inner end 40. The outer end of plunger 39 is adapted to telescopingly receive a short shaft 41 carrying a resilient switch blade 42, outward movement of plunger 39 being resisted by a spring 43 in insulator cap 44. Cap 44 is of suitable insulating material, such as Bakelite or hard rubber, and mounts threaded bushing 45 receiving terminal screws 46 under the heads of which are secured terminal clips 47. Bushings 45 extend entirely through insulating cap 44 and are disposed to be engaged by switch blade element 42 when the latter is propelled outwardly.

Loosely received in chamber 35 is a ball 48 which, when the carburetor is inactive, and the throttle closed, lodges between the projecting, dished end of plunger 39 and section 25a at the end of the throttle shaft. When the throttle is then opened, as for starting, throttle shaft element 25a, ball 48, and plunger 39 cooperate to force switch blade 42 to close the starter switch. During this operation, the substantial volume of air sucked past the ball through passage 23, due to cranking of the engine, both from the thermostat housing and through chamber 40, but for tube 26 extending into the mixture conduit, would produce a very noticeable and objectionable whistling sound which is likely due, in part, to the conflicting air currents emerging from passage 23 and those travelling down the mixture conduit wall around the throttle disc. When the throttle is closed after the start, the ball is picked up by suction to seat against the lower extremity of duct 37 and acting as a valve to cut off the flow of air therepast.

I have found that by projecting suction passage 23 into the mixture conduit as by means of tube 26, and out of the direct path of the downward current of air passing between the edge of the throttle disc and the mixture conduit wall, the outlet of passage 23 and the air stream emerging therefrom is shielded by the throttle and the objectionable noise is entirely eliminated.

The invention has utility in other associations than those shown. Obviously, the carburetor, automatic choke, and starting switch devices, per se, are not essential and may be modified as desired. The exclusive use of all modifications as come within the scope of the appended claim is contemplated.

I claim:

In combination, a carburetor for an internal combustion engine having a mixture conduit, a butterfly throttle in said conduit, a suction influenced device including a suction duct with its inner end opening into said conduit and terminating substantially flush with the inner wall thereof posterior to the throttle, and its outer end exposed to an atmospheric zone outside said conduit, said duct forming an open communication between said conduit and said zone whereby a stream of air flows through said duct into said conduit, an extension tube for the inner end of said duct attached to the wall of the mixture conduit for extending the duct inwardly of said wall whereby said throttle will partially shield the duct extremity to prevent the conflicting currents of the air streams causing undesirable noise at the duct opening.

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