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COMBINED CARBURETOR CHOKE AND NOZZLE

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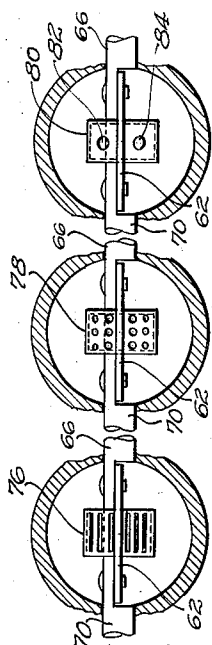


Fig. 3 Fig. 4 Fig. 5

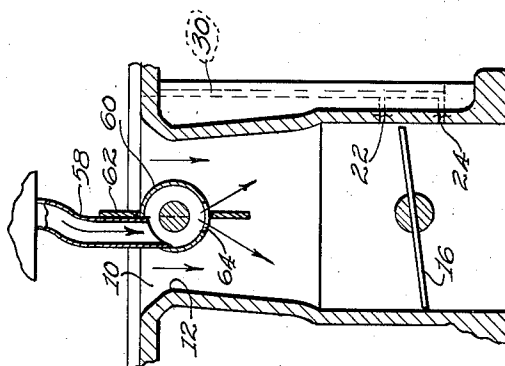


Fig. 2

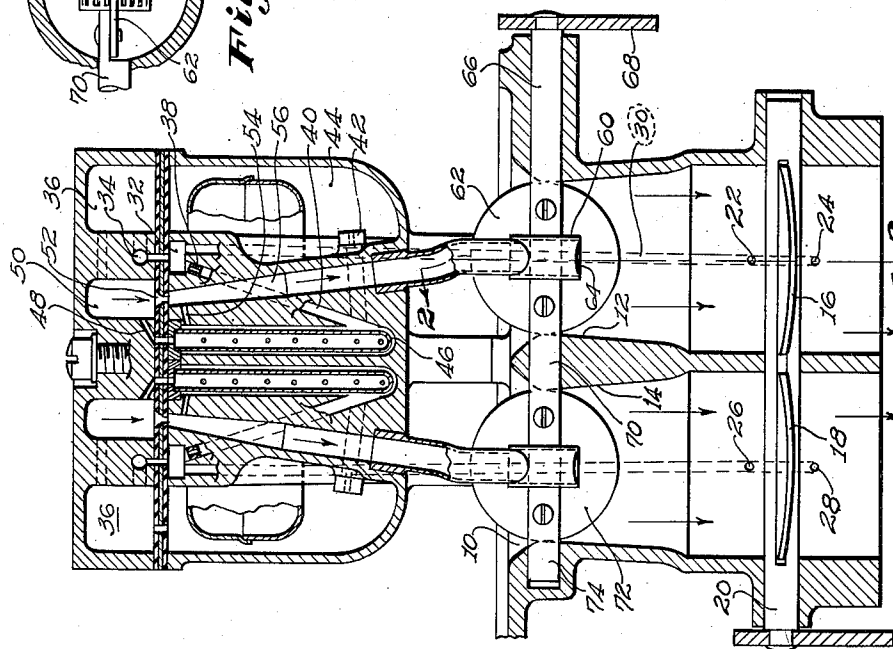


Fig. 1

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## UNITED STATES PATENT OFFICE

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## COMBINED CARBURETOR CHOKE AND NOZZLE

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6 Claims. (Cl. 261—23)

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The object of this invention is to improve a type of carburetor in which the fuel discharges at a point located on the centerline of the choke plate. If the discharge nozzle intersects the centerline of the choke plate it cuts through the choke shaft which means that the choke shaft must be made in several pieces, resulting in a difficult assembly problem and also a weak construction that is difficult to keep in proper alignment so that it will work freely. The purpose of this invention is to permit the use of a one piece choke shaft and still have the point of fuel discharge located on the centerline of the choke plate. This is accomplished by the use of a hollow spool which fits over the choke shaft and to which the discharge nozzle is connected at a point not on the centerline. The fuel is then carried around the choke shaft and discharged at a point on the centerline of the choke plate, thus accomplishing the desired purpose. An additional advantage also is obtained since the arrangement of the fuel discharge holes in this spool is subject to a great number of variations which are very useful in controlling the distribution of fuel to the engine.

Fig. 1 shows in cross-sectional elevation the preferred form of my invention.

Fig. 2 shows a cross-sectional elevation on plane 2—2 of Fig. 1.

Fig. 3 shows an alternative nozzle construction in partial cross-sectional plan view.

Fig. 4 shows another alternative nozzle construction.

Fig. 5 shows still another alternative nozzle construction.

In the figures, 10 is the air entrance. 12 is the right hand venturi of Fig. 1. 14 is the left hand venturi of Fig. 1. 16 is the right hand throttle below venturi 12. 18 is the left hand throttle below the venturi 14. 20 is the throttle shaft for both throttles 16 and 18. 22 and 24 are the two low speed orifices cooperating with the throttle 16. 26 and 28 are the two low speed orifices cooperating with the throttle 18. 30 is the low speed passage connecting the orifices 22 and 24 with the chamber 32. 34 is a restricted air passage which derives its air from the chamber 36. Restriction 38 is a fuel restriction from a well 40. The well 40 derives its fuel from a restricted orifice 42 which is located in the constant level float chamber 44. Dipping into the well 40 is a perforated tube 46 which is in restricted communication through a restricted passage 48 which derives its air from the air chamber 50. The air chamber 50, in its turn,

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derives its air from the annular air chamber 36 which is at atmospheric pressure. The fuel is drawn out of the upper end of the well 40 and the downstream edge of the restricted air orifice 52 through a fuel and air passage 54 in the inclined passage 56. This inclined passage 56 terminates in the bent pipe 58. This bent pipe 58 engages with a drum 60. This drum 60 is located within the central portion of the butterfly choke 62. In the position in which the choke 62 is shown, that is the wide open position, the lower lip of the butterfly choke 62 splits the opening 64 of the drum 60. The elements to the left of Fig. 1 have the same characteristics and function exactly the same as those to the right.

The choke shaft 66 and the choke lever 68 drive the intermediate shaft 70 which shaft drives the left hand choke 72 and the left choke shaft 74. Actually, however, the shaft 66, 70 and 74 are made out of one shaft. The left hand choke 72 is an exact counterpart of the right hand choke 62.

Fig. 3 shows an alternative construction in which a drum 76 with narrow lateral slots in it replaces the drum 60 with the large circular opening 64 shown in Figs. 1 and 2.

In Fig. 4 a perforated drum 78 replaces the drum 60 which has but one opening 64.

Fig. 5 shows a drum 80 replacing drum 60 and having two openings 82 and 84 to replace the single opening 64 of Fig. 2.

The choke 62 in each case is identical with the choke 62 shown in Figs. 1 and 2.

The shaft 66 is identical in these three figures with the choke shaft 66 of Figs. 1 and 2.

The intermediate shaft 70 is identical with the intermediate shaft 70 of Fig. 1.

The shafts 66 and 70 might be made integral as shown in Figs. 1 and 2.

## Operation

In the operation, as the choke 62 is rotated clockwise in Fig. 2 the opening 64 is subjected to the full suction of the engine and the rich starting mixture is drawn down the twisted tube 58 and the inclined passage 56. When the choke valve 62 is placed in the wide open position, in which it is shown, the rich mixture that is discharged from the twisted tube 58, to the inside of the drum 60, escapes into the venturi 12 through the opening 64. The result of this is that this fuel is divided equally into the air stream and a uniform mixture results. The operation of the low speed connections 22, 24,

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26, 28 and the low speed passage 30 are those in general use and form no part of this invention.

In the case of Figs. 3, 4 and 5 a still greater atomization of the fuel descending the twisted tube 58 is made. The object of these alternative constructions is to increase the atomization and thereby improve the distribution of the fuel in the air stream.

What I claim is:

1. In a carburetor for an internal combustion engine having an air entrance passage, a fuel mixture outlet and a throttle valve therein, the improvement comprising a combined choke valve and fuel nozzle, said fuel nozzle comprising a hollow cylindrical drum symmetrically located in said air entrance passage with its axis extending transversely thereof, a shaft extending axially and rotatably through said drum, a butterfly choke valve mounted radially on said shaft and having a rectangular opening closely embracing said drum, means for conducting fuel to the hollow interior of said drum, fuel discharge means on the downstream side of said drum, said fuel discharge means being arranged to discharge fuel on both sides of the downstream lip of said choke valve when said choke valve is in open position and on the engine side thereof when said choke valve is closed.

2. A device as set forth in claim 1 in which said fuel discharge means comprises an opening through the wall of said drum, said opening having a portion lying on each side of the plane of

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said choke valve when said choke valve is in open position.

3. A device as set forth in claim 1 in which said fuel discharge means comprises a plurality of circumferentially spaced axial slots through the peripheral wall of said drum.

4. A device as set forth in claim 1 in which said fuel discharge means comprises a plurality of openings through the peripheral wall of said drum, said openings being symmetrically arranged on the downstream side of said drum.

5. A device as set forth in claim 1 wherein there are two identical air entrance passages and fuel mixture outlets adjacent each other and wherein said shaft extends through both said passages, there being one of said choke valves and one of said nozzles in each of said passages.

6. A device as set forth in claim 1 wherein said air entrance passage comprises a Venturi restriction and wherein the axis of said drum lies substantially in the plane of the minimum diameter of said restriction.

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