

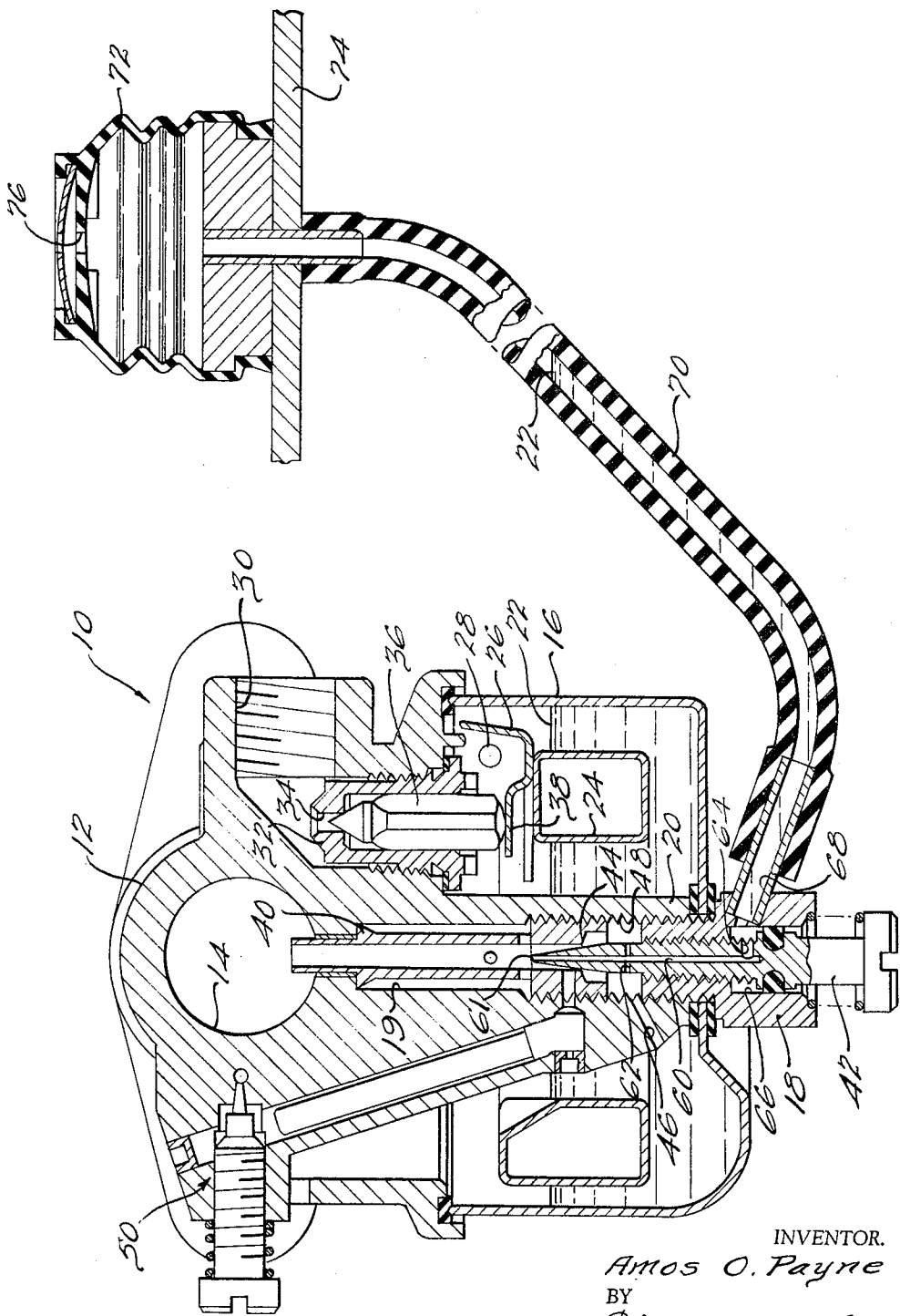
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PRIMER FOR INTERNAL COMBUSTION ENGINE

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PRIMER FOR INTERNAL COMBUSTION ENGINE
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This invention relates to a primer for an internal combustion engine and more particularly to a non-flooding primer for use in starting an engine having a carburetor provided with a float bowl and a fuel nozzle leading to a fuel-air mixture passageway, in which the primer delivers atomized fuel through the fuel nozzle to the mixture passageway or venturi.

The invention comprises a pneumatic air pumping bellows or bulb which is connected by a tube to an axial passage in the needle valve which meters the flow through the fuel nozzle during normal running of the engine. A small bleed orifice in the needle valve communicates with the fuel in the float bowl. The primer bellows is adapted to be depressed to eject an ignitable fuel-air mixture through the needle valve and fuel nozzle into the fuel-air mixture passageway in the carburetor. The needle valve and tube are slowly refilled from the fuel supply by way of the bleed orifice so that repeated actuation of the bellows injects only a small quantity of atomized fuel into the carburetor so as to avoid flooding the engine.

The principal object of the invention is to provide a new and improved primer for use in starting an internal combustion engine.

Another object of the invention is to provide a manually operated primer for atomizing a measured quantity of fuel into the induction system of an internal combustion engine to assist in starting the engine.

A further object of the invention is to provide a primer for an internal combustion engine as described which eliminates flooding of the engine due to repeated priming during starting thereof.

Other and further objects of the invention will be apparent from the following description and claims and may be understood by reference to the accompanying drawing which by way of illustration shows a preferred embodiment of the invention and what I now consider to be the best mode of applying the principles thereof. Other embodiments of the invention may be used without departing from the scope of the present invention as set forth in the appended claims.

The single figure of the drawing is a sectional view of a carburetor with a primer according to the invention.

In the drawing the carburetor 10 is generally of conventional construction and includes a body casting 12 with a fuel-air mixture passageway or venturi 14 which forms part of the induction system leading to the engine combustion chamber. A float bowl 16 is secured to the body 12 by means of plug 18 which is threaded into the cylindrical opening 19 in the downwardly extending tubular portion 20 of the carburetor body. The fuel contained in the float bowl is maintained at level 22 by means of an annular float 24 secured to arm 26 which is pivoted about pin 28. Fuel inlet 30 leads to valve seat 32 containing a fuel passageway 34. A valve member 36 rests on a portion 38 of arm 28 so as to control the flow of the fuel into the float bowl and maintain the fuel level 22.

A fuel nozzle 40 is mounted within the cylindrical opening 19 of the portion 20 of the carburetor and extends into the fuel-air mixture passageway 14. An adjustable needle valve 42 is threadably engaged within plug 18 and cooperates with the metering orifice 44 of the fuel nozzle 40 to control the normal flow of fuel through the

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nozzle. Fuel flows from the float bowl through passageway 46 into an annular chamber 48 and is drawn up therefrom through nozzle 40 and into the venturi. The carburetor is provided with a conventional idling system 50 and passages associated therewith so as to allow the engine to idle.

The needle valve 42 is provided with an axial bore 60, one end of which forms a primer jet 61, and a bleed orifice 62 which connects the axial bore 60 with the annular chamber 48. A radial bore 64 at the lower end of the axial bore 60 leads to an annular chamber 66. A tube 68 in the plug 18 connects priming tube 70 with the annular chamber 66. The other end of the priming tube is secured to a pneumatic bellows or bulb 72 which may be mounted on a structural member 74 located remote from the engine. The bellows 72 is provided with a vent opening 76 which allows for refill of the bellows following use thereof.

The fuel in the float bowl flows through bleed orifice 62, down axial bore 60, and through radial bore 64 so as to fill the annular chamber 66, inlet tube 68, and priming tube 70 to the fuel level 22 maintained in the float bowl. The flexible priming tube 70 is brought up past the level 22 and is adjusted relative to the carburetor so that the volume of the fuel contained within the tube 70 is equal to the amount of air displaced by a single stroke of the bellows 72.

To prime the engine the operator places his finger over the bellows vent 76 and compresses the bellows so as to pressure the fuel in the tube 70 and atomize and eject this fuel through passage 60 and nozzle 40 into the mixture passageway 14 so as to provide a rich starting mixture. Following the initial priming of the engine, the bellows is released and fuel will flow from the float bowl back through bleed orifice 62 and into the needle valve and tube 70. However, this refilling of the tube will occur very slowly since the bleed orifice is small in diameter. Repeated actuation of the bellows 72 does not eject a full measure of fuel, but continues to deliver a small volume of atomized fuel into the carburetor venturi. In this way the invention prevents flooding of the carburetor during starting since the amount of fuel injected into the carburetor on the first stroke of the bellows is measured and it is impossible during starting to subsequently immediately inject an equally large amount of fuel into the carburetor so as to flood the engine. A large amount of air is also supplied to the carburetor during repeated actuation of bulb 72 to insure that the fuel-air mixture will be ignitable.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a carburetor for an internal combustion engine provided with a float bowl containing liquid fuel and a fuel-air mixture passage, a needle valve, a primer for supplying a combustible starting mixture to the mixture passage comprising passage means communicating with said mixture passage in said needle valve, a priming tube connected to one end of said passage means, an air pumping means at the end of said priming tube and operable upon actuation thereof to discharge the contents of said priming tube through said passage means into said mixture passage, and a bleed orifice communicating said passage with the fuel in said float bowl and through which fuel is supplied to said passage means and said priming tube at a measured rate to prevent complete filling of said priming tube immediately after actuation of said air pumping means so as to supply a combustible fuel-air

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mixture to said mixture passage and prevent flooding of the engine upon repeated actuation of said air pumping means.

2. A carburetor according to claim 1 wherein said priming tube extends outside the carburetor and upwardly above the fuel level in said float bowl.

3. In a carburetor for an internal combustion engine provided with a float bowl containing liquid fuel, a fuel-air mixture passage, a fuel nozzle for conducting fuel from the float bowl to the mixture passage and a needle valve controlling the flow of fuel through the fuel nozzle; a primer for supplying a combustible starting mixture to the passage comprising a passage in said needle valve, a priming tube connected at one end to said needle valve passage, an air pumping means at the other end of said priming tube and operable upon actuation thereof to discharge the contents of said priming tube through said passage in said needle valve and into said fuel nozzle and said fuel-air mixture passage, and a metering orifice communicating said passage in said needle valve with the fuel in said float bowl and through which fuel is supplied to said priming tube at a measured rate to prevent complete filling of said priming tube immediately after actuation of said air pumping means so as to supply a combustible fuel-air mixture to said mixture passage and prevent flooding of the engine upon repeated actuation of said air pumping means.

4. A carburetor according to claim 3 wherein said metering orifice is a smaller diameter than said passage in said needle valve.

5. A carburetor according to claim 4 wherein said air pumping means comprises a manually operable bellows and said priming tube extends outside said carburetor with said other end thereof and said bellows disposed above the fuel level in said float bowl.

6. In a carburetor of the type provided with a float bowl containing liquid fuel, a fuel-air mixture passage, a fuel nozzle for conducting fuel from the float bowl to the mixture passage and a needle valve controlling the flow of fuel through the fuel nozzle; a primer for supplying a combustible starting mixture to the mixture passage comprising an axial passage in said needle valve, a priming tube connected at one end to one end of said axial passage and extending outside the carburetor upwardly above the level of fuel in said float bowl, an air pumping means at the other end of said priming tube

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and operable upon actuation thereto to discharge the contents of said priming tube through said passage in said needle valve and into said fuel nozzle and said mixture passage, and a bleed orifice communicating said passage in said needle valve with the fuel in said float bowl and through which fuel is supplied to said axial passage and said priming tube at a measured rate to prevent complete filling of said priming tube immediately after actuation of said air pumping means so as to supply a combustible fuel-air mixture to said mixture passage upon continued actuation of said air pumping means.

7. In a carburetor of the type provided with a supply of liquid fuel, a fuel-air mixture passage, a fuel nozzle for conducting fuel from said supply to the mixture passage and a needle valve controlling the flow of fuel through the fuel nozzle; a primer for supplying a combustible starting mixture to the passage comprising an axial passage in said needle valve, a priming tube connected at one end to said axial passage and extending upwardly above the fuel level, an air pumping means at the other end of said priming tube and operable upon actuation thereof to discharge the contents of said priming tube through said passage in said needle valve and into said fuel nozzle and said mixture passage, and a bleed orifice communicating said passage in said needle valve with the fuel supply and through which fuel is supplied to said axial passage and said priming tube at a measured rate such that subsequent repeated actuation of said air pumping means supplies smaller quantities of a combustible mixture to said mixture passage than is supplied by the initial actuation of said air pumping means.

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