March 11, 1930. W. SCOTT 1,749,893

CARBURETOR

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Fig. 1.

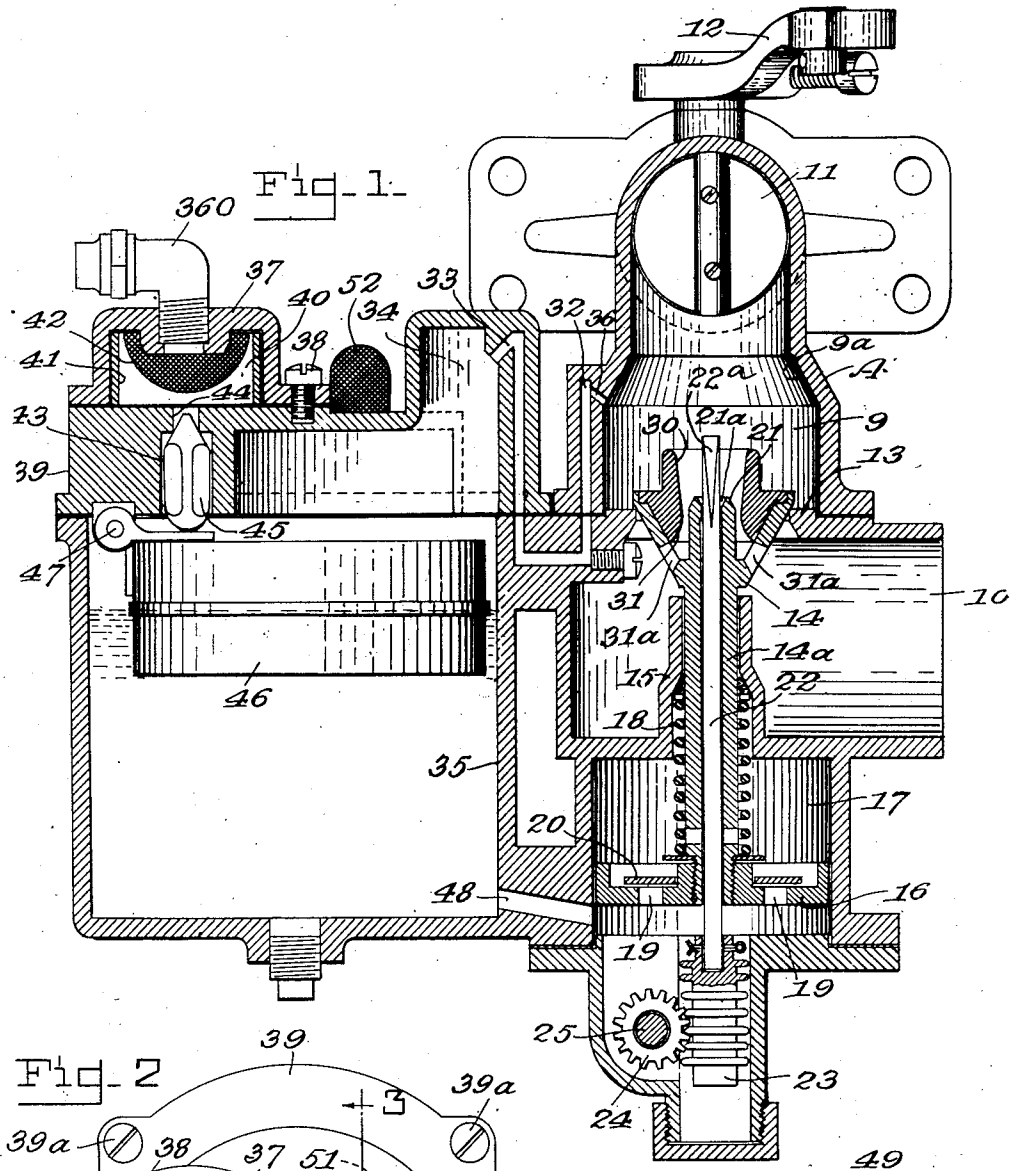


Fig. 2.

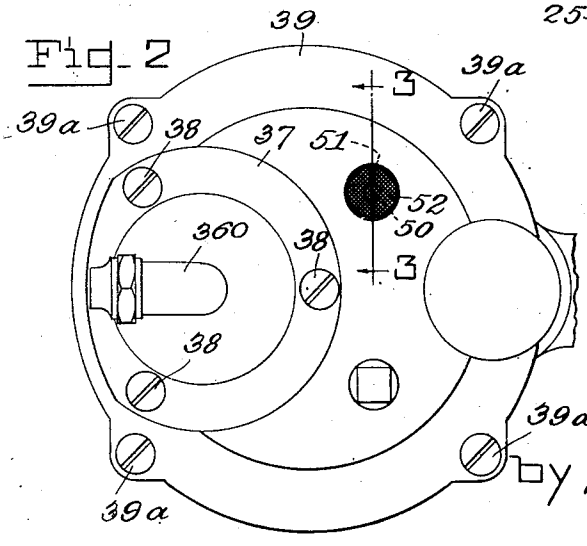
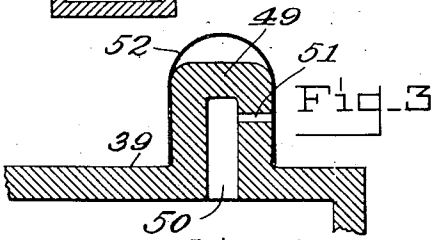


Fig. 3.



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CARBURETOR

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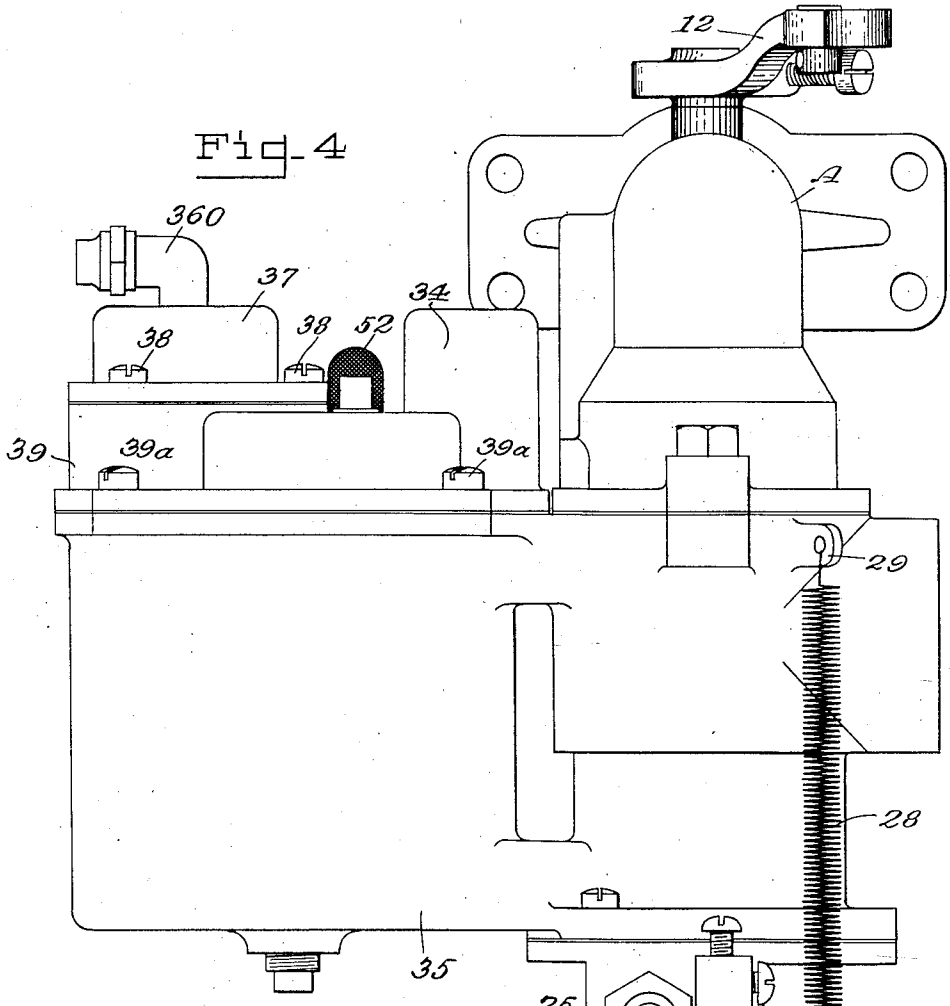
Fig. 4



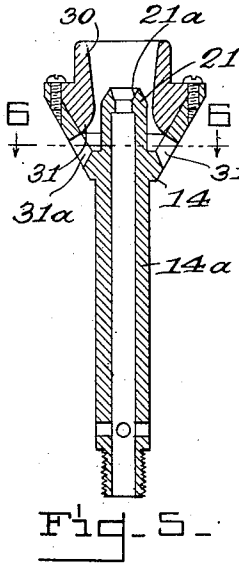


Fig. 5.

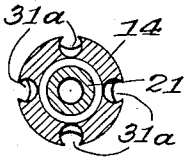


Fig. 6.

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CARBURETOR

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Fig-7-

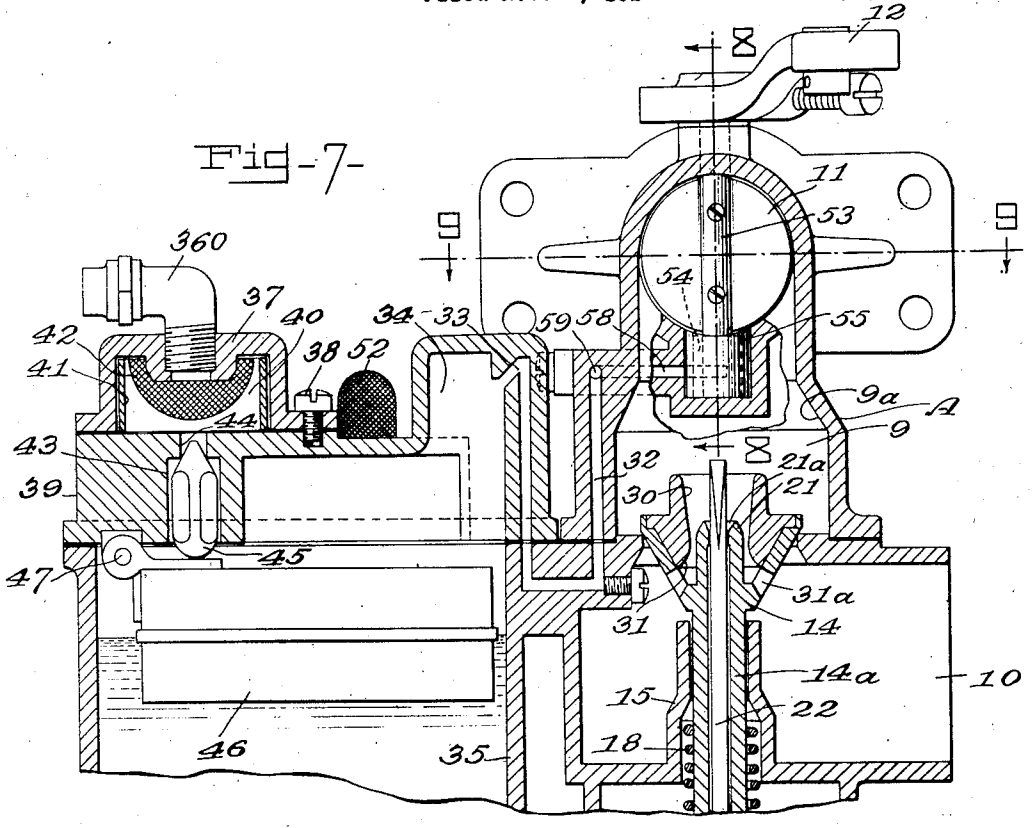


Fig-9-

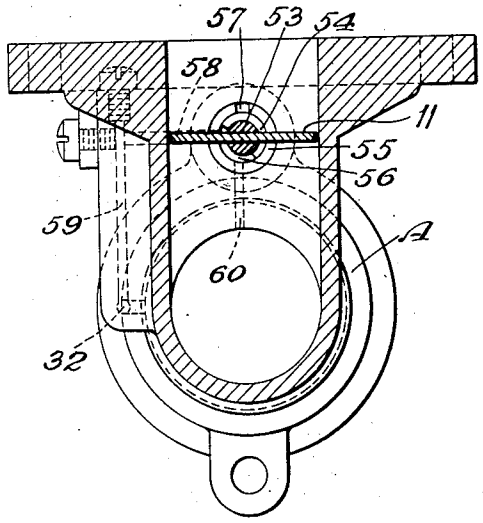
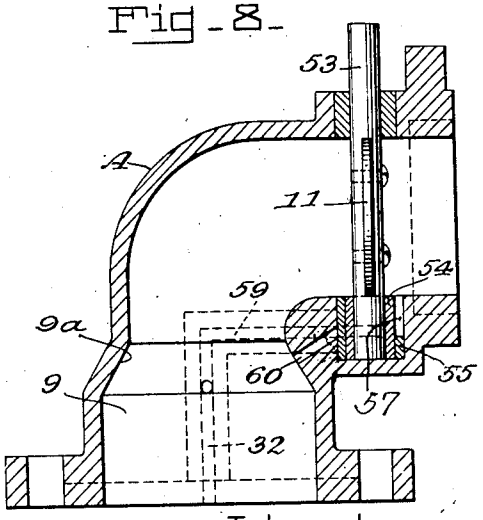


Fig-8-



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Patented Mar. 11, 1930

1,749,893

UNITED STATES PATENT OFFICE

WILLIAM SCOTT, OF MEDFORD, MASSACHUSETTS

CARBURETOR

Application filed November 2, 1927. Serial No. 230,639.

This invention relates to carburetors, especially adapted for use in connection with internal combustion engines, one of the objects of the invention being to provide an improved carburetor constructed to permit fuel to be supplied thereto from a tank at a lower level than the carburetor and under varying operating conditions without the use of the usual vacuum tank. As a result of the invention, the present improved carburetor provides in effect a combined float chamber and vacuum tank and is constructed in such manner as to enable the proper mixture to be obtained at varying engine speeds.

A further object of the invention is to provide a carburetor having a vacuum float or fuel chamber in which the level of the fuel is normally maintained below the spray nozzle orifice and wherein a partial vacuum is maintained in the float and mixing chambers, the difference in the level of the fuel in the float chamber and the level of the spray nozzle orifice being compensated for by the provision of an air vent in the float chamber.

Other objects of the invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification, wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a sectional elevation illustrating the present improved carburetor.

Fig. 2 is a fragmentary top plan view of the float chamber or reservoir.

Fig. 3 is an enlarged fragmentary sectional view showing the air vent into the float chamber.

Fig. 4 is a side elevation illustrating the present improved carburetor.

Fig. 5 is a detail sectional view of the air intake valve.

Fig. 6 is a horizontal section taken on line 6—6, Fig. 5.

Fig. 7 is a view similar to Fig. 1 showing a modified form of construction.

Fig. 8 is a section along the line 8—8 of Fig. 7.

Fig. 9 is a sectional view along the line 9—9 of Fig. 7.

Before explaining in detail the present invention, and the method or mode of operation embodied therein, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practised or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention beyond the terms of the several claims hereto appended or the requirements of the prior art.

Referring to Figs. 1 to 6 inclusive wherein I have illustrated a present preferred form of the invention, the carburetor proper comprises a suitable casing A within which is located the various instrumentalities for providing a proper fuel mixture. In the present instance, the casing A is constructed to provide a mixing chamber 9 having at the upper part thereof a Venturi opening or passage 9^a. The casing is also constructed to provide a suitable air intake passage 10, and mounted at the upper end of the casing is a throttle valve 11 controlled in the usual manner by means of a lever 12. At the base of the mixing chamber 9 there is formed a valve seat 13 and cooperating therewith is a tapered air intake valve 14. This valve comprises a vertically disposed valve stem 14^a extending downwardly through a boss 15 and secured to the lower end of the valve stem 14^a is a dash pot plunger 16 which is located within a chamber or cylinder 17 formed in the lower end of the carburetor casing.

The air intake valve 14 is slidingly mounted within the boss or bearing 15 and is controlled by means of a compression spring 18 surrounding the valve stem 14^a and interposed between the plunger 16 and a tapered interior bore of the boss 15. Suitable ports 19 are provided in the plunger 16 for the passage of fuel, and this is regulated by means of a disk

valve 20. The air intake valve is drilled from top to bottom thereof and is provided at its upper end with a spray nozzle 21 having a suitable orifice 21a. A Venturi member 30 is secured to the upper end of the valve 14 and is formed adjacent the orifice 21a to provide a Venturi opening or passage 31 and below this Venturi opening the valve head 14 is drilled to provide a series of ports 31a communicating with the air intake passage 10.

Extending through the vertical bore in the valve stem 14a and the fuel nozzle 21 is a metering pin 22, the lower end of which is pinned to a rack 23. Meshing with this rack is a gear 24 mounted on a rock shaft 25, this shaft extending through the casing and carrying at its outer end a bell crank lever 26. A suitable wire or cable may be connected to the arm 26a of this lever and operated from the dash of the car. The other arm 26b of the lever is connected to one end of a tension spring 28, the opposite end of which is connected to a lug 29 formed on the casing. From this construction it will be seen that by swinging the lever 26 against the tension of the spring 28 the rack and gear 23, 24 will be operated thereby shifting the metering pin 22 in a vertical direction and regulating the flow of fuel through the orifice 21a. The upper end of the pin 22 is tapered off at opposite sides, as shown at 22a in Fig. 1, so that as the pin is given a vertical movement the size of the orifice 21a is varied.

In the present construction, the wall of the casing is drilled to provide a duct 32 connected by means of a duct 36 with the outlet of the carburetor between the spray nozzle and the intake of the engine. The duct or passage 32 communicates with a duct 33 leading into a vacuum chamber 34 at the top of a float chamber or fuel reservoir 35.

The fuel or float chamber 35 is supplied with fuel from a suitable source of supply through a pipe 360 inserted into the upper end of a cap 37 secured by means of set screws 38 to the head 39 of the float chamber, the latter in turn being secured by means of set screws 39a to the chamber or casing 35. As illustrated in Fig. 1, the cap 37 provides a chamber 40 within which is detachably mounted a ring 41 carrying a screen or strainer 42. The head 39 of the fuel chamber is drilled at 43 and counterbored at 44 to provide a seat for a valve 45. Within the fuel chamber is located a float 46 which is hinged or pivoted at 47 to the chamber and is so positioned as to cooperate with the lower end of the valve 45. As the level of fuel rises or falls within the float chamber, the float 46 will swing slightly on its pivot thereby controlling the opening and closing of the valve 45 and the flow of fuel into the float chamber. The float chamber communicates with the chamber 17 beneath the plunger 16 by means of a passage or duct 48.

The head 39 of the float chamber is provided at its top with a boss 49 drilled to provide a vertical passage 50 and a horizontal communicating port 51 of relatively small size. A screen 52 may be mounted over the boss 49 so as to prevent ingress of foreign particles through the air vent 51.

It will be noted that the inlet valve 45 is positioned at one side of the center of the fuel chamber and in close proximity to the pivot 47 of the float. The latter acts as a lever to control the opening and closing of the valve, and a firm and steady coaction between the float 46 and valve 45 is obtained without substantial influence from engine or vehicle vibrations.

When the engine is idling the air intake valve will be in the position shown in Fig. 1. The engine suction will induce a partial vacuum in the mixing chamber 9 and the vacuum chamber 34 by means of the ducts 32, 33, 36. The flow of fuel to the orifice of the spray nozzle is permitted by the air vent hole 51. Upon opening the throttle additional air is admitted past the valve 14 which will be raised from its seat 13. As the engine suction increases thereby tending to increase the vacuum in chamber 34 and hence raise the level of fuel therein this action will be compensated for by the increased velocity of air through the Venturi opening 31 resulting in increasing the flow of fuel from the spray nozzle. It will therefore be seen that by providing the Venturi opening around the fuel nozzle 21 a constant partial vacuum is maintained within the mixing and float chambers while permitting the proper amount of fuel to be fed from the spray nozzle at varying speeds.

In Figs. 7, 8 and 9 I have illustrated a modified form of the invention. Secured to the lower end of the rotatable spindle 53 of the throttle valve 11 is a sleeve 54. This sleeve turns within a bushing 55 secured within a hole bored in the casing. The sleeve 54 is provided with an arcuate slot 56, and the bushing 55 is provided with a vent slot 57. The casing is drilled at 58 and 59 to provide a passage or duct communicating with the slot 56 at one end and at the opposite end communicating with the duct 32 which in turn leads into the fuel chamber 34 of the fuel reservoir. A hole 60 is drilled in the casing to provide a duct communicating with the slot 56 and leading into the mixing chamber 9. The construction of the slot 56 in the rotatable sleeve 54 and the position of the ducts 58 and 60, and the port 57, are such that when the engine is idling, as shown in Fig. 9, or is running at low speeds the slot 56 will register with the ducts 58 and 60 while the port 57 will be closed off by means of the sleeve 54. Upon further opening the throttle valve, with the engine operating at higher speeds, the slot 56 will register with the duct 58 and

the port 57, closing off the passage 60 into the mixing chamber.

It will therefore be seen by referring to Figs. 7 to 9 inclusive that when the engine is idling or the throttle only partially opened so that slot 56 registers merely with the ducts 58 and 60, the suction of the engine will induce a partial vacuum in chambers 9 and 34 in the same manner as described above in connection with the construction shown in Fig. 1. Upon opening the throttle wider the slot 56 will register with vent 57 and duct 58 so that suction on chamber 34 is increased as compared with chamber 9, and this suction is produced from the engine side of the throttle valve. The purpose of this action is to induce increasing suction on the vacuum chamber 34 at higher speeds to compensate for the increased action on the fuel nozzle by the air passing at greater velocity through the Venturi opening 31.

I claim:

1. In a carburetor, a float chamber, a mixing chamber, a suction passage from the mixing chamber to the top of the float chamber for maintaining a partial vacuum in the latter by engine suction, an air intake passage, a movable air valve interposed between said intake passage and mixing chamber, a fuel nozzle carried by said air valve and having its discharge orifice above the level of fuel in said float chamber, an air port or ports leading through said air valve from the air intake passage, and a Venturi tube carried by the air valve and communicating with said air ports, said Venturi tube surrounding the fuel nozzle and constructed to provide during operation of the engine greater suction at said discharge orifice than in said suction passage.

2. In a carburetor, a float chamber, a mixing chamber, a throttle valve for controlling the flow of mixture from said chamber to the engine, a suction passage from the mixing chamber and a suction passage from the engine side of the throttle valve leading into the top of said float chamber, an air intake passage, a movable air valve interposed between the intake passage and the mixing chamber, a fuel nozzle carried by said air valve and having its discharge orifice normally above the level of fuel in said float chamber, an air port or ports leading through said air valve from the air intake passage, a Venturi tube carried by the air valve and communicating with said air ports, said Venturi tube surrounding the fuel nozzle and constructed to provide greater suction at said discharge orifice than in said suction passages, and means operated by the throttle valve for closing one of said suction passages and opening the other.

3. In a carburetor, a fuel supply chamber, a mixing chamber, an air intake passage leading into said mixing chamber, a suction passage connecting the mixing chamber with the fuel chamber for maintaining a partial vacuum in the latter by engine suction to supply fuel thereto from a source of supply at a lower level, a movable air valve interposed between the air intake passage and mixing chamber, a fuel supply passage through said air valve from the fuel chamber and terminating in a discharge orifice normally above the level of fuel in the fuel chamber, an air duct extending through said air valve from the air intake passage, and Venturi means carried by the air valve and surrounding said orifice for inducing by means of the air passing through said air duct greater suction at said orifice than in said suction passage.

In testimony whereof I affix my signature

WILLIAM SCOTT.