Sept. 8, 1936. G. HAMMOND 2,053,713

CARBURETOR

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Fig. 1.

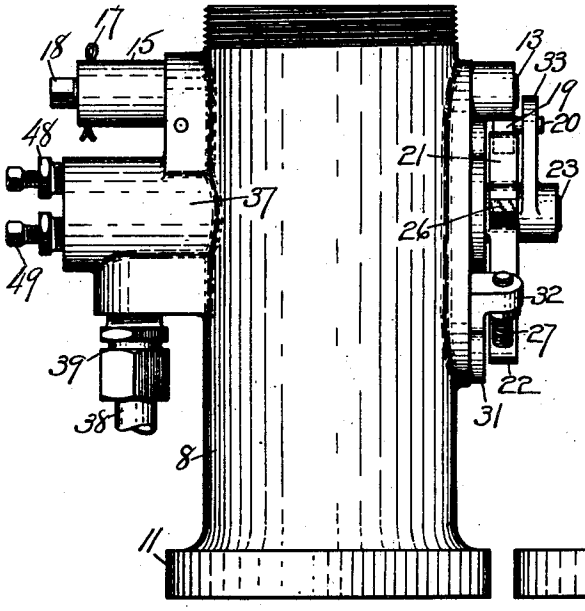


Fig. 2.

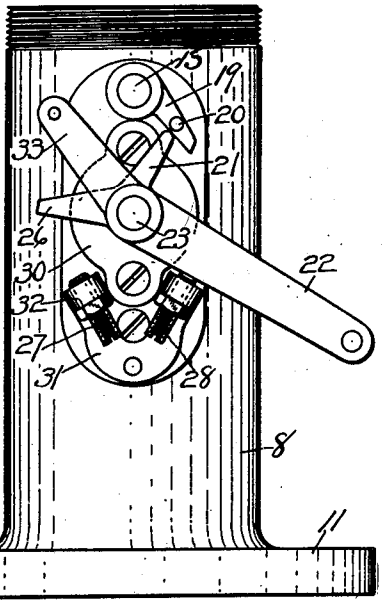


Fig. 3.

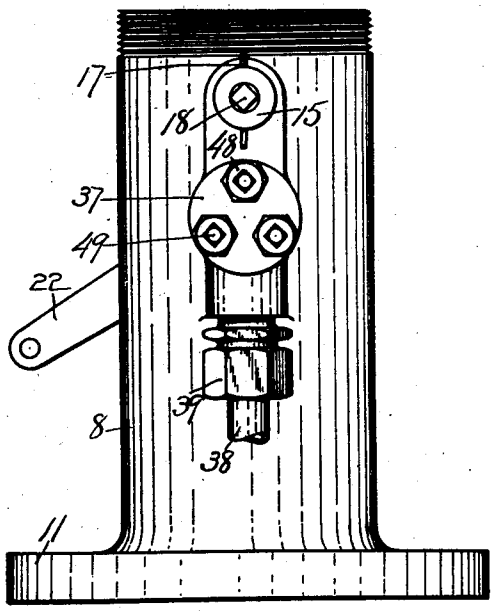
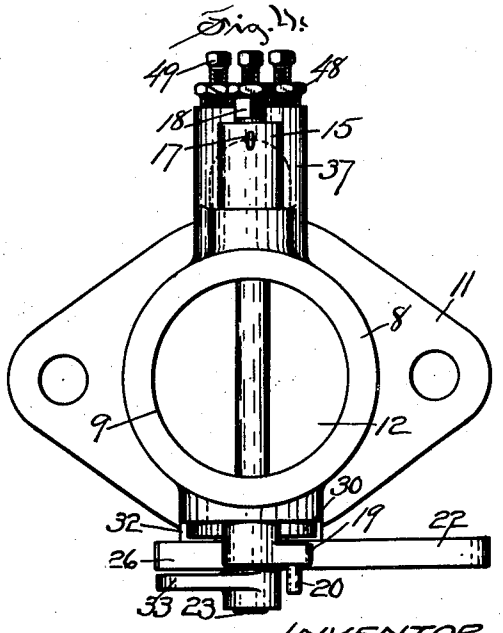


Fig. 4.



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Fig. 5.

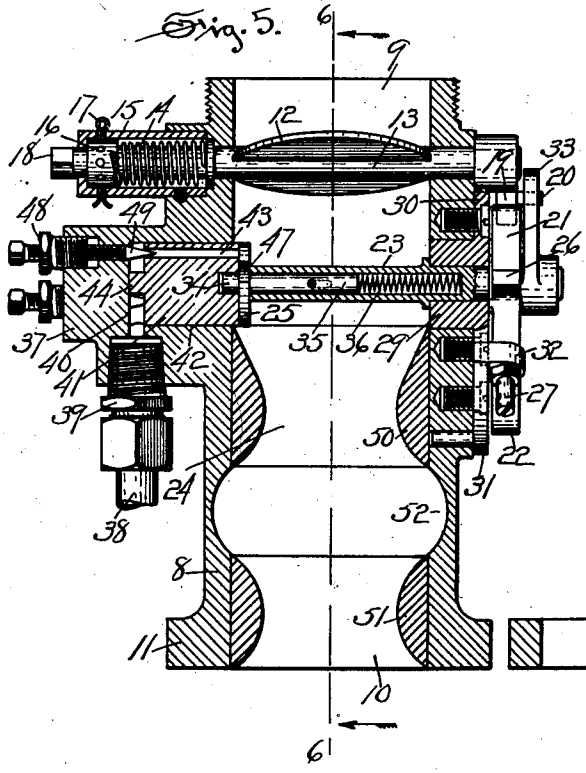


Fig. 6.

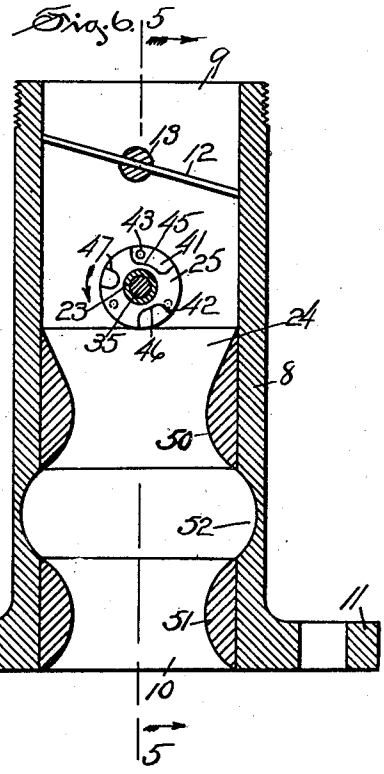
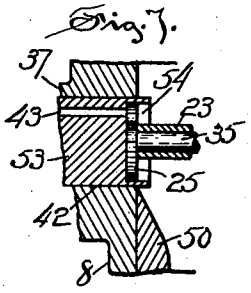


Fig. 7.



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2,053,713

CARBURETOR

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Application July 21, 1933, Serial No. 681,474

12 Claims. (Cl. 261—50)

My invention relates to that class of devices which are employed for mixing the elements of a combustible fluid for delivery to an internal combustion engine or similar device, and an object of my invention, among others, is the production of a device of this type that shall be simple in construction and in operation and particularly effective in the results produced thereby.

One form of a structure embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my improved carburetor.

Figure 2 is a similar view looking at the structure from a point at the right as seen in Fig. 1.

Figure 3 is another similar view looking from a point at the left of the device as seen in Fig. 1.

Figure 4 is an end view.

Figure 5 is a view in central lengthwise section.

Figure 6 is a view in section on a plane denoted by the dotted line 6—6 of Fig. 5, the eccentricity of the valve spindle being exaggerated.

Figure 7 is a detail view showing a modified arrangement of the fuel supply valve.

In the accompanying drawings the numeral 8 denotes the shell of my improved carburetor that is preferably of generally cylindrical form having an opening extending therethrough from the air inlet 9 to the outlet 10. A flange 11 is formed at the outlet end as a means for attachment of the carburetor to the manifold or similar part of an engine.

A throttle valve 12 of disk type is located adjacent the inlet opening 9 said valve being supported by a spindle 13 extending across the opening through the shell into holes on opposite sides thereof. A valve closing spring 14 surrounds the spindle 13, said spring being enclosed in a housing 15 secured in an opening in the side of the shell and projecting outwardly therefrom, as shown in Fig. 5 of the drawings. One end of the spring is fastened to the spindle and the opposite end of the spring is engaged by a head 16 rotatable in the housing independently of the spindle, said head having holes registering with holes in the housing to receive a cotter pin 17. The housing forms a sort of stuffing box construction and a reduced end 18 of the head extends through the end of the housing and is provided with means whereby the head may be turned to vary the tension of the spring. A valve finger 19 is secured to and projects radially from the spindle at that end opposite the housing 15, said finger having a valve pin 20 projecting therefrom for a purpose to be hereinafter described.

A valve actuating finger 21 has its outer end in contact with the valve finger 19 and its opposite end projecting from a valve actuating arm 22 secured to the projecting end of a fuel valve operating shaft 23 extending through the chamber 24 in the shell and having a fuel valve 25 located at the opposite end of the shaft from the arm 22. The arm 22 is provided with means for attachment of a cable or other device for operating it in a manner that will be readily understood. A stop finger 26 also projects from the arm 22 for contact with a stop 27 in the form of a screw located in the path of movement of said finger. Another stop 28 also in the form of a screw is located in the path of movement of the arm 22 to determine its extent of movement.

In the structure herein shown the fuel valve operating shaft 23 is rotatably mounted at its outer end in the hub 29 of a supporting plate 30, as shown in Fig. 5 of the drawings, said supporting plate being secured to a boss on the side of the shell as by means of screws. The stops 27 and 28 are screw threadedly engaged with lugs 32 projecting from the front face of a stop plate 31 also secured to said face.

A choke lever 33 is rotatably mounted on and projects radially from the projecting end of the shaft 23, said lever having means for attachment of a cable for its operation in a manner that will be readily understood. This lever when rotated on the shaft 23 may be brought into contact with the valve pin 20, thereby holding the throttle valve 12 in its closed position for choking purposes.

The valve 25 has a bearing stub 34 projecting from its end opposite the lever 33 and a stem 35 projecting into the shaft 23 which is hollow, as shown in Fig. 5, and which contains a valve spring 36 thrusting against the stem to press the valve against its seat, said stem having a pin projecting into slots in the shaft 23 to permit such endwise movement of the stem 35 as may be required to effect the seating of said valve.

A fuel supply boss 37 constitutes a projection from one side of the shell 8, and preferably integral therewith. A fuel supply pipe 38 is connected with said fuel supply boss as by means of a coupling 39 whereby fuel is supplied to an inlet

chamber 40 formed in said fuel supply boss. A valve supporting fixture 41 is located in a recess 42 in the wall of the chamber 24 opposite the hub 29, the end of said fixture comprising a seat for the valve 25. Inlet passages 43, preferably evenly spaced apart, extend through the fixture 41 from the inlet chamber 40. A projection 44 from the end of the fixture 41 is seated against the bottom of the recess 42 thereby forming the inlet chamber as an annular chamber.

There are a plurality of inlet passages 43, three having been found to satisfactorily answer my purpose. The valve 25 has three ports 45—46 and 47 formed on its seating face which ports open to the periphery of the valve and are adapted to register with the inlet passages 43. Said ports are of different widths so that one or more of the passages 43 may be simultaneously opened to the chamber 24. As an example, referring to Fig. 6, the port 45 may be termed an idling port for the reason that the passage 43 registering therewith is always open. If the valve be now turned in the direction denoted by the arrow a slight distance the port 46 will register with a passage 43, thereby opening two of the ports 43 to the chamber 24.

If the valve be turned a slight distance further the port 47 will register with a passage 43 while the other passages 43 will still register with the ports 45—46. With the valve in this position three of the passages are now open to the chamber 24. Upon turning the valve in the opposite direction to its closed position the idling port 45 will still register with one of the passages 43.

Valve sleeves 48 are threaded into recesses at the outer ends of each of the passages 43 and needle valves 49 are threaded into openings from said recesses into the inlet chamber 40 opposite the inlet passages 43, so that each needle valve controls flow of fuel through one of said passages.

Two Venturi rings 50—51 are placed on opposite sides of an annular recess 52 of circular form in cross section formed in the wall of the shell 8 between said rings, thereby creating a plurality of venturis at the outlet 10 of the shell.

In the structure shown in Fig. 7 the valve 25 is located in a recess 54 in a valve supporting fixture 53, said recess providing the support for the valve in its rotating movement, and the stub 34 being dispensed with.

The vacuum in the carburetor caused by the action of the engine effects opening movement of the valve 12 when such movement is unrestrained and the spring 14 tends to close the valve against force of the vacuum. When the lever 22 is at its closed position contacting the point of the screw 28 the valve 12 is held in its closed position. As the lever 22 is moved upwardly the finger 21 reduces the opposition to opening movement of the valve, provided said fingers 19 and 21 are in contact, and the valve therefore opens under the force of the vacuum to a degree controlled by the finger 21. Should the lever 22 be suddenly moved upward to accelerate the engine for any reason the pressure in the carburetor would be at once reduced to a minimum and the spring 14 would therefore be enabled to close the valve to allow the vacuum to build up.

This regulates the opening of the valve 12 in relation to the movement of the lever 22, but leaves said valve free to turn to its closed position regardless of the position of the lever 22, this being due to the tension of the spring 14 on the valve shaft 13.

The function of this portion of the spring is important, as, by adjusting it, the vacuum tension in the carburetor shell is varied. For instance, if a high vacuum is desired the spring is wound clock-wise and this requires that the needle valve governing the gasoline supply must be adjusted to cut down the amount of gasoline, the size of the openings being reduced by screwing the valve in. The reverse of this action is brought about by weakening the tension of the torsional spring 14 in unscrewing (counter-clockwise movement) the needle valve.

By adjusting these components any desired function of the engine may be obtained.

This device is a self-feeding, open jet carburetor, requiring no gasoline pump, vacuum tank, air pressure, or any intermediate auxiliary device to lift the gasoline to the carburetor.

It will therefore be seen that it is essential that means shall be provided for securing a nice adjustment of the tension of the spring, and this is enabled by the arrangement embodying the head 16 with its fastening means.

In order to prevent entrance of air into the chamber 40 a packing 54 of asbestos, twine or other material, may be inserted under the valve sleeves 48, as shown in Fig. 5 of the drawings. Without this precaution air may be sucked into the chamber 40 and the efficiency of the carburetor be thereby reduced.

I claim:

1. A carburetor including a shell having an air intake and a connection for supply of fuel, a valve to control said air intake, a rotatably mounted shaft for said valve, a valve finger projecting from said shaft, a fuel valve to control said fuel supply, a rotatably mounted shaft for said fuel valve, and an operative connection between said shafts, said shafts including a valve actuating finger projecting from said fuel valve shaft to engage said valve finger to permit movement of said air valve shaft independently of said fuel valve shaft and thereby to effect proportionate supplies of air and fuel.

2. A carburetor including a shell having an air intake and a connection for supply of fuel, a valve to control said air intake, a rotatably mounted shaft for said valve, a finger projecting from said shaft, a fuel valve to control said fuel supply, a rotatably mounted shaft for said fuel valve, and a connection between said last mentioned shaft and said finger including a valve actuating finger projecting from said fuel valve shaft to engage said valve finger and thereby to effect proportionate supplies of air and fuel.

3. A carburetor including a shell having an air intake and a connection for supply of fuel, a valve to control said air intake, a rotatably mounted shaft for said valve, a valve finger projecting from said shaft, a fuel valve to control said fuel supply, a rotatably mounted shaft for said fuel valve, a lever for operating said last mentioned shaft, and an operative connection between said lever and said air valve shaft including a valve actuating finger projecting from said lever to engage said valve finger to permit movement of said air valve shaft independently of said fuel valve shaft and thereby to effect proportionate supplies of air and fuel.

4. A carburetor including a shell having an air intake and a connection for supply of fuel, a valve to control said air intake, a rotatably mounted shaft for said valve, a finger projecting from said shaft, a fuel valve to control said fuel supply, a rotatably mounted shaft for said fuel valve, a lever projecting from said shaft, and an operative connection between said lever and said fin-

ger including a valve actuating finger projecting from said fuel valve shaft to engage said valve finger to permit movement of said air valve shaft independently of said fuel valve shaft and thereby to effect proportionate supplies of air and fuel.

5. A carburetor including a shell having an air intake and a connection for supply of fuel, a valve to control said air intake, a rotatably mounted shaft for said valve, a finger projecting from said shaft, a fuel valve to control said fuel supply, a rotatably mounted shaft for said fuel valve, means for rotating said last mentioned shaft, and an actuating finger projecting from said fuel valve shaft at an angle to and in contact with but disconnected from the finger projecting from said valve shaft to effect proportionate supplies of air and fuel.

6. A carburetor including a shell having an air intake and a connection for supply of fuel, a valve to control said air intake, a rotatably mounted shaft for said valve, an air valve finger projecting from said shaft, a valve pin projecting from said finger, a fuel valve to control said fuel supply, a rotatably mounted shaft for said fuel valve, a lever secured to said shaft to open said fuel valve, a connection between said lever and the finger projecting from the air valve shaft to effect proportionate supplies of air and fuel, and a choke lever rotatably mounted on said fuel supply shaft for contact with said pin to hold the air valve in closed position.

7. A carburetor including a shell having a recess, an air intake, an inlet chamber, and a connection for supply of fuel to said chamber, a fixture in said recess having a plurality of passages for inflow of fuel to said chamber, a disk valve seated against the end of said fixture and having ports adapted to register with one of said passages to vary the amount of fuel supply, and means for operating said valve.

8. A carburetor including a shell having a recess, an air intake, an inlet chamber, and a connection for supply of fuel to said chamber, a fixture in said recess having a plurality of passages for inflow of fuel to said chamber, a disk valve seated against the end of said fixture and having ports of various sizes to register with said passages to successively open said passages for fuel supply, and means for operating said valve.

9. A carburetor including a shell having a recess, an air intake, an inlet chamber, and a connection for supply of fuel to said chamber, a fixture in said recess having a plurality of passages for inflow of fuel to said chamber, one of which is an idling passage, a disk valve seated against the end of said fixture and having ports adapted to register with said passages, one of said ports being in continual registry with the idling passage, and means for operating said valve.

10. A carburetor including a shell having an air intake to the mixing chamber therein and a connection for supply of fuel, a plurality of passages opening through the side wall of said chamber for supply of fuel thereto, a valve shaft projecting through said shell and extending across said chamber, means for operating said shaft, and a disk valve secured to said shaft and having ports of different widths to register with said passages to vary the amount of fuel supply to said chamber.

11. A carburetor including a shell having an air intake to the chamber therein and a connection for supply of fuel, a plurality of passages opening through the wall of said chamber for supply of fuel thereto, a valve shaft projecting into said chamber and having a hole extending lengthwise therein, means for operating said shaft, a valve having a stem projecting into said hole and having a plurality of ports adapted to register with said passages to vary the supply of fuel thereto, and a spring located in said hole to thrust said valve against its seat.

12. A carburetor including a shell having an air intake to the chamber therein and a recess in the wall of said chamber and a connection for supply of fuel, a plurality of passages for inflow of fuel, a valve located in said recess and having a port adapted to register with each of said inlet passages, said ports being of different widths to successively uncover said passages to vary the amount of fuel supply, and means for operating said valve.

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