Dec. 19, 1933. G. HAMMOND 1,940,253

CARBURETOR

Filed May 7, 1931

Fig. 1.

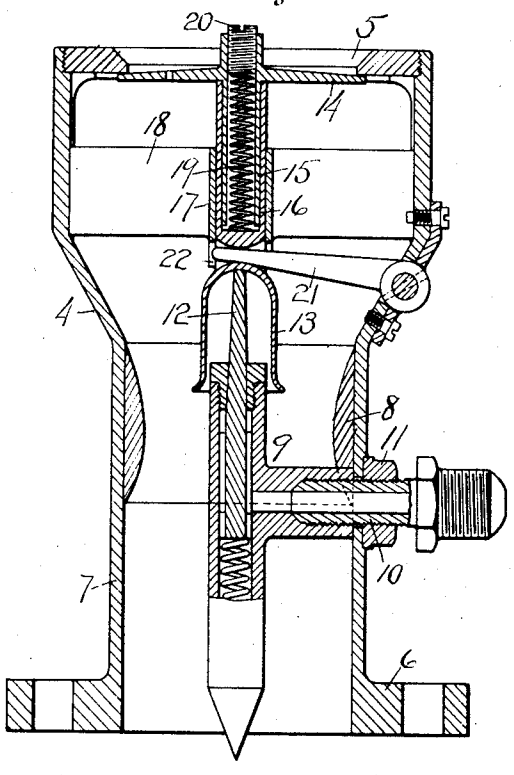
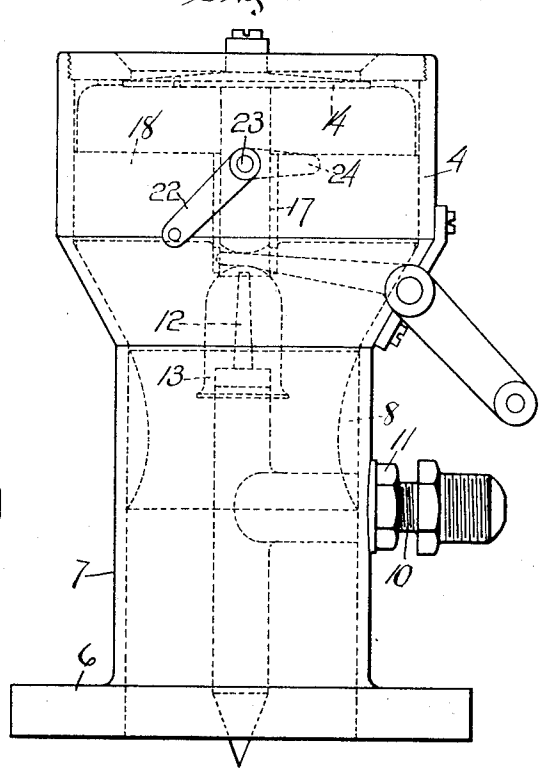


Fig. 2.



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CARBURETOR

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13 Claims. (Cl. 261—50)

My invention relates to that class of devices which are employed for mixing air and a combustible fluid, more particularly for use in internal combustion engines, and an object of my invention, among others, is to provide a device of this class that shall be extremely simple in construction and especially efficient in operation.

One form of a carburetor 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 drawing, in which—

Figure 1 is a view in central lengthwise section through the same.

Figure 2 is a side view of my improved carburetor.

In the accompanying drawing the numeral 4 indicates a case or shell that is generally round in cross section and that may be composed of any suitable material, said case having an opening extending therein from end to end with a mouth 5 for the entrance of air into said opening that constitutes a chamber within the shell. A flange 6 is provided at the opposite end from the mouth, with holes in said flange for reception of bolts to secure the case to a manifold or other part of an internal combustion engine. The case may be reduced in diameter at that end opposite the mouth, as at 7, and a Venturi tube 8 may be secured in this reduced portion, as shown in Figure 2 of the drawing. An inlet tube 9 of T-shape is secured within the chamber in the case, and in the reduced portion thereof, the stem of this T-shaped tube being internally screw threaded to receive a screw threaded nipple 10 projecting out of the case and fitted at its outer end to receive a tube by means of which a combustible fluid is supplied to the carburetor. A lock nut 11 may be employed to secure the nipple firmly in place. The cross part of the T-shaped tube contains a needle valve 12 projecting out of said tube and formed therein in a manner that will be readily understood to control flow of fuel from the tube, a detailed illustration and description of this being omitted herein as not necessary to a clear understanding of the invention. A vacuum cup 13 is secured to the end of the needle valve and is preferably flared at its outer end, the tube 9 projecting into this cup a short distance.

An air inlet valve 14 is formed and fitted to close the mouth or opening 5, this valve being closed when the engine is not running and it may have a small hole drilled through it to supply air when in idling position. This valve is a vacuum retaining valve and it will be opened to a greater or lesser extent when the engine is running depending upon conditions existing within the case, such conditions effecting automatic operation of the valve to supply air to the case in such amounts as the conditions may require. It may be said that the faster the engine is running the more air will be required and the wider open will be the valve, and, contrariwise, the slower the speed of the engine the less air will be required and the less will the valve be opened.

In the arrangement herein shown the valve 14 has a hollow stem 15 extending into a hole formed in the stem 16 of the vacuum cup which stem 16 is preferably made integral with the vacuum cup and this stem 16 is supported for free sliding movement in a supporting hub 17 at the center of a comparatively thin supporting web 18 secured to the inside of the case and extending thereacross as shown in Figure 1 of the drawing, the hollow stem of the vacuum cup forming a guide tube or sleeve in which the stem 15 of the air inlet valve operates with a free sliding fit. Thus the hub of the web 18 forms a guide for the stem of the vacuum cup 13, and the stem of the vacuum cup forms a guide for the stem of the air inlet valve 14.

A spring 19 is enclosed within a chamber in the stem 15, thrusting at its inner end against the end of the hole in the stem 16 and at its opposite end against a plug 20 screw threadedly secured in a hub in the valve 14 to adjust the tension of the spring. The spring is of such strength as to permit the valve to readily open as may be required under conditions created in the case.

The sleeve 17 projects beyond the inner edge of the web 18 and has a slot 22 to receive the end of a throttle valve actuating arm 21 pivotally mounted in the case and arranged for operation in any desired manner by means of a connection with a throttle operating member conveniently located for manual operation as will be readily understood. The inner end of this arm extends into a hole in the cup structure, which hole defines the bottom of the cup 13 and the end of the socket 16. As the throttle valve actuating arm is operated to open the needle valve the tension of the spring 19 is lessened, thereby reducing the power required to open the valve 14 and conditioning said valve to enable it to readily respond to conditions created in the case for the supply of air thereto, it being noted that the throttle valve actuating arm operates only on the needle valve, leaving the air inlet

valve 14 free to operate as conditions may require.

In the operation of motor vehicles it frequently happens that increased power will be suddenly required as in encountering an upgrade, or mud, or sand, and in carburetors now in common use, if, at such time, the throttle be suddenly opened, the vacuum in the manifold will be destroyed, and as it is this vacuum that draws the fuel into the manifold for supply to the engine the destruction of the vacuum cuts off the supply of fuel and the engine becomes stalled. In the use of my improved carburetor, herein illustrated and described, under such conditions, if the arm 21 be suddenly operated to admit more liquid fuel the valve 14 being closed to the position it takes when the engine is idling and when the vacuum in the manifold is at its highest point, thereby maintaining this high vacuum which instantly acts to supply the added amount of fuel to the engine without increasing the amount of air, thus enriching the mixture at just the time that such is required, the valve now opening automatically according to engine speed to thereafter supply the engine with the correct proportion of air and gasolene vapor as may be required under varying conditions.

It will be noted that the tension on the valve spring 19 is regulated in accordance with the amount of air required in the case. That is, as the throttle valve actuating arm is operated to increase the speed of the engine, the more air will be required, and in this operation of said arm the tension on the spring being lessened, the freer will be the movement of the valve to supply the added amount of air. A choke lever comprising an operating arm 22 secured to the end of a shaft 23 rotatably mounted in the case 4 and sleeve 17, and a valve holding arm 24 may be employed to prevent opening movement of the valve 14 when desired for choking purposes.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative, and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim:

1. A carburetor including a case having an air intake solely for supply of air and a connection for supply of fuel, a vacuum maintaining valve to close said air intake, a member rigidly connected with said valve to unyieldingly hold it closed but releasable therefrom and movable independently thereof and operating solely to control supply of fuel through said connection, and means resistive to conditions created within the case to prevent instantaneous opening movement of said valve upon sudden increase of supply of fuel.

2. A carburetor including a case having an air intake solely for supply of air and a connection for supply of fuel, a single valve movable to open said air intake to control supply of air to said case, a member movable during running operations of an engine to which the carburetor is connected and operable independently of said valve to increase the supply of fuel to said case without opening movement of said valve, and means resistive to conditions created within the case to prevent instantaneous opening movement of said valve in advance of such operation of said member to increase the supply of fuel.

3. A carburetor including a case having an air intake solely for supply of air and a connection for supply of fuel, a single valve to control supply of air to said case, a member to control regular running operations of an engine to which the carburetor is connected and operable independently of said valve to control supply of fuel to said case, and means connected with said member to be operated thereby to hold the valve closed for some purposes, said means being resistive to conditions created within the case to prevent instantaneous opening movement of said valve upon sudden increase of fuel in the case.

4. A carburetor including a case having an air intake solely for supply of air and a connection for supply of fuel, a vacuum maintaining valve to close said air intake, a member operatively connected with said valve to positively hold it in a closed position and operable independently thereof to control supply of fuel from said connection, and means resistive to conditions created within the case to prevent instantaneous opening movement of said valve in advance of the operation of the member controlling the supply of fuel when said member is operated to supply such fuel.

5. A carburetor including a case having an air intake solely for supply of air and a connection for supply of fuel, a single valve to solely control supply of air to said case, a member rigidly connected with said valve to unyieldingly hold it closed but releasable therefrom and movable independently of said valve to control supply of fuel to said case, and means to prevent opening movement of said valve during the initial opening of the fuel supply by the operation of said member controlling said fuel supply.

6. A carburetor including a case having an air intake and a connection for supply of fuel, a valve to close said air intake, a spring to force said value to a closed position, a lever rigidly connected with said valve to unyieldingly hold it closed but releasable therefrom and operating to tension said spring, and a needle valve to control flow of fuel to said case, said needle valve being connected with said lever for opening movement thereby, and the tension of said spring being lessened in the operation of said lever to open said needle valve.

7. A carburetor including a case with an air inlet opening thereto and a connection for supply of fuel, a valve to control supply of air through said opening, and a member engaged with said valve to unyieldingly hold it closed and to release it for opening movement, and said member also operating to control supply of fuel to said case when releasing said valve.

8. A carburetor including a case having an air intake and a connection for supply of fuel, an air valve for said air intake, a needle valve to control supply of fuel, a hollow stem projecting from said air valve, a spring within said stem, a socket enclosing said stem, and receiving the thrust of said spring, and a lever interposed between said needle valve and said socket to operate said needle valve and to permit operation of the air valve.

9. A carburetor including a case having an air intake and a connection for supply of fuel, an air valve for said air intake, a needle valve to control supply of fuel, a hollow stem projecting from said air valve, a spring within said stem,

a socket enclosing said stem and receiving the thrust of said spring, a web having a sleeve to receive and support said socket for sliding movement therein, and a lever interposed between said needle valve and said socket to operate said needle valve and permit operation of said air valve.

10. A carburetor including a case having an air intake and a connection for supply of fuel, an air valve for said air intake, a needle valve to control supply of fuel, a hollow stem projecting from said air valve, a spring within said stem, a socket enclosing said stem and receiving the thrust of said spring, a web projecting across said case and having a sleeve to receive said socket for sliding movement of the latter, said sleeve having a projecting flange with a slot therein, and a lever interposed between said needle valve and said socket and extending into said slot, said lever operating said needle valve and permitting operation of said air valve.

11. A carburetor including a case having an air intake solely for supply of air and a connection for supply of fuel, a vacuum maintaining valve to close said air intake, a member adapted to control the fuel supply and movable independently of said valve from a position corresponding to a closed position of the fuel supply and operating solely to control supply of fuel through said connection, and means for operatively connecting said member and said valve to hold the latter closed and to permit independent movement of said valve only when said member is moved relative to said valve from closing position.

12. A carburetor including a case having an air intake for supply of air and a connection for supply of fuel, a vacuum maintaining valve to close said air intake, a member movable to control supply of fuel through said connection, and a connection between said valve and said member to hold said valve rigidly closed when said fuel supply member is in closed position but to release said valve for independent movement upon movement of said supply control member from closed position.

13. A carburetor including a case having an air intake solely for supply of air and a connection for supply of fuel, a single suction operated valve to solely control supply of air to said case, a member rigidly connected with said valve to unyieldingly hold it closed but releasable therefrom and movable independently of said valve to control supply of fuel to said case, and means to prevent opening movement of said valve during the initial opening of the fuel supply by the operation of said member controlling said fuel supply.

GRANT HAMMOND.