Feb. 7, 1933. G. PIRINOLI 1,896,557

CARBURETOR

Filed Sept. 23, 1931

Fig. 1

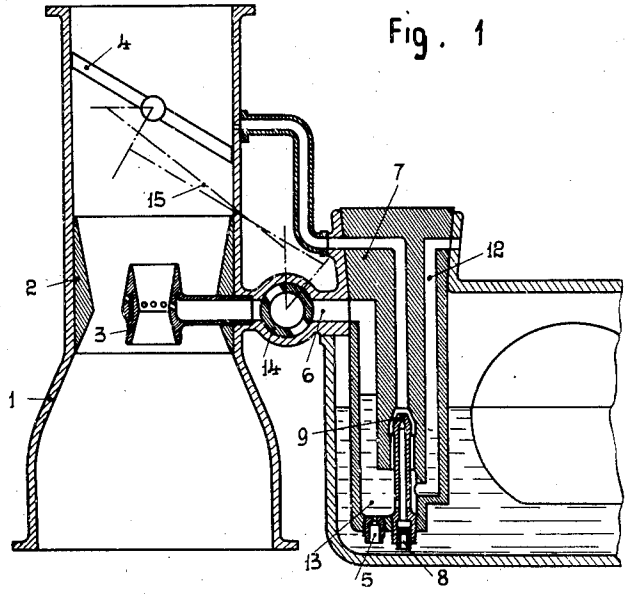



Fig. 2

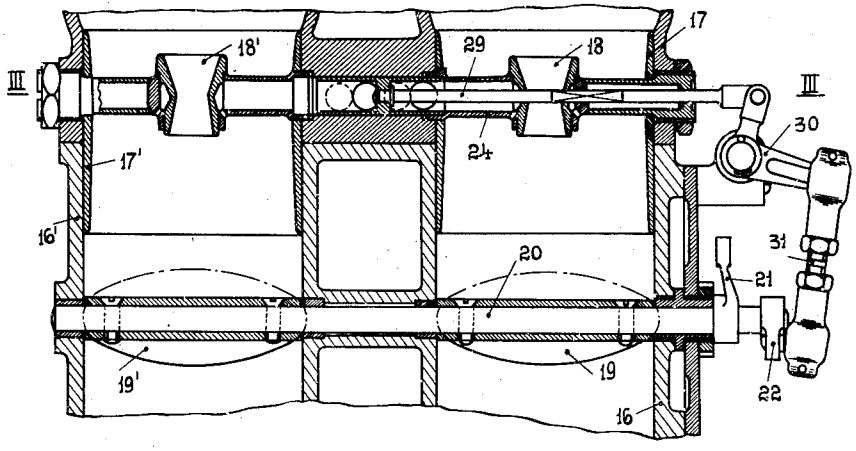
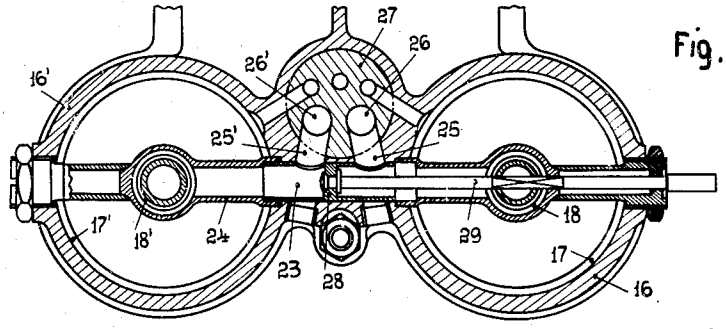



Fig. 3




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# UNITED STATES PATENT OFFICE

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## CARBURETOR

Application filed September 23, 1931, Serial No. 564,655, and in Italy July 13, 1931.

In carburetors of known types for internal combustion engines it is not possible to proportion the explosive mixture in a constant determined relation to the number of turns of the engine.

The object of this invention is to provide a device whereby the fuel delivery is adjusted according to the degree of opening of the suction pipe. I arrange for this purpose in the pipe leading from the spray nozzle to the Venturi tube means for adjusting the opening of said pipe proportionally to the variation in the opening of the suction pipe.

According to this invention a valve arranged in the feed pipe of the Venturi tube and the valve of the suction pipe are interconnected in such manner that, when this latter is operated, the former is acted upon according to a predetermined relationship.

The accompanying drawing shows by way of example two constructions of the device according to this invention in connection with a carburetor. The first construction employs a cock valve and the second construction employs a slide valve.

Figure 1 shows diagrammatically a partial cross section of the first construction.

Figure 2 is a partial axial section of the second construction for a carburetor having a double carbureting chamber.

Figure 3 is a section on line III—III of Fig. 2.

Referring to Figure 1, 1 denotes the suction pipe, 2 the main Venturi tube, 3 the central Venturi tube and 4 the throttle valve of a carburetor of the usual type. The central Venturi tube 3 is connected to the main spray nozzle 5 through the feed conduit 6. This latter is formed partly in the plug 7 carrying the main spray nozzle 5, the auxiliary compensating spray nozzle 8 and the slow speed nozzle 9. The chamber 13 of the main and compensating spray nozzles communicates with the outside through the conduit 12.

A cock valve 14 is arranged in the conduit 6 and is connected with the throttle valve 4 by means of an articulated parallelogram 15 (denoted in the drawing by dash-and-dot line) so as to reduce the opening of the conduit 6 as the valve 4 reduces the opening of the conduit 1.

When the carburetor is of the multiple body type comprising a constant level chamber with a plurality of carbureting chambers, a slide valve can advantageously be employed for controlling the opening of the feed pipes of the Venturi tubes. A construction of this type is shown in Figures 2 and 3 in connection with a carburetor having a double body with one constant level chamber and two carbureting chambers. The carburetor shown is of the inverted type. 16 and 16′ denote the coupled suction conduits, 17 and 17′ the main Venturi tubes, 18 and 18′ the central Venturi tubes, 19 and 19′ the throttle valves of the suction conduit. The throttle valves are mounted on a single spindle 20 carrying at one end an arm 21 for the operating rod and a second arm 22 transmitting motion to the valve of the feed pipe of the Venturi tubes. This valve comprises a cylindrical body 23 sliding in a tubular conduit 24, which is connected by ports 25 and 25′ to the conduits 26 and 26′ formed in the plug 27 carrying the two main spray nozzles (not shown) at the ends of the conduits 26 and 26′, respectively. The cylindrical slide valve 23 is divided by a central diaphragm 28 into two parts, each of which is provided with a hole co-operating with the ports 25 and 25′, respectively. The cylindrical valve body 23 is secured to a stem 29 traversing the tubular body 24 and is connected to a bell-crank lever 30, which is connected in turn to the arm 22 by means of a rod 31 adjustable in length articulated at its ends by means of ball joints.

This device works in a manner similar to that described in connection with Figure 1 for controlling the explosive mixture as the opening of the throttle valve varies.

When the throttle valves are in their closed position, the fuel supply is fed in the usual manner through the slow speed nozzles, the sleeve valve 23 being in the closed position as shown in Figure 2. When changing from idle running to effective running, the throttle valves 19, 19′ are gradually opened by acting on their common shaft 20 through the lever 21; by this operation, owing to the con-

nection 22, 31, 30 and 29, the sleeve 23 is displaced to the left so as to gradually uncover the openings 25 and 25′ communicating with the chamber of the main nozzles. The fuel is thus supplied to the Venturi spray tubes 18 and 18′. Under full swing, namely when the throttle valves 19, 19′ are completely open, the sleeve 23 will be in the fully opened position shown in Figure 3.

What I claim is:

1. In a carburetor, in combination with a constant level chamber and a conduit having a main Venturi tube, a central spray Venturi tube, and a throttle valve, a connecting member connecting said conduit with said chamber, an adjusting valve in said connecting member, a pipe projecting from said connecting member into said conduit and serving for supporting and connecting said central Venturi tube with the outlet of said valve, a plug in said chamber, a main nozzle, a compensating nozzle and a slow-speed nozzle in a chamber at the lower end of said plug, said plug having passages for connecting said last-named chamber with the inlet of said adjusting valve and with the atmosphere and means for operatively connecting said adjusting valve with said throttle valve.

2. In a carburetor, in combination with a constant level chamber and with a plurality of conduits each having a main Venturi tube, a central spray Venturi tube and a throttle valve, a connecting member connecting said chamber with said conduits, a sleeve valve in said connecting member, a pipe extending through said connecting member and said conduits for supporting said central spray Venturi tubes and connecting them with said sleeve valve, a plug in said connecting member, a main nozzle, a compensation nozzle and a slow-speed nozzle in a chamber at the lower end of said plug, said plug having passages for establishing communication between said last named chamber and said conduits respectively through said sleeve valve and means for operatively connecting said sleeve valve with said throttle valve.

In testimony whereof, I hereunto affix my signature.

GUGLIELMO PIRINOLI.