May 29, 1928. 1,671,288

G. M. HOLLEY

CARBURETOR

Original Filed May 18, 1921

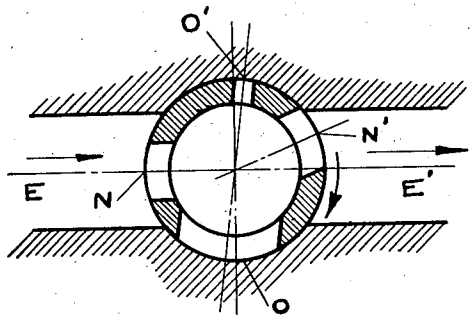


FIG-3

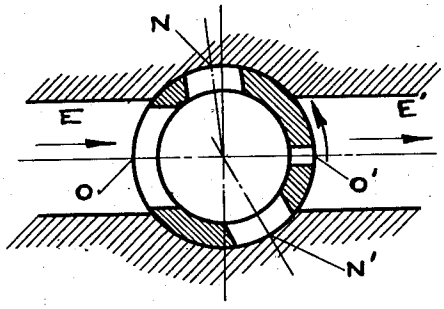


FIG-4

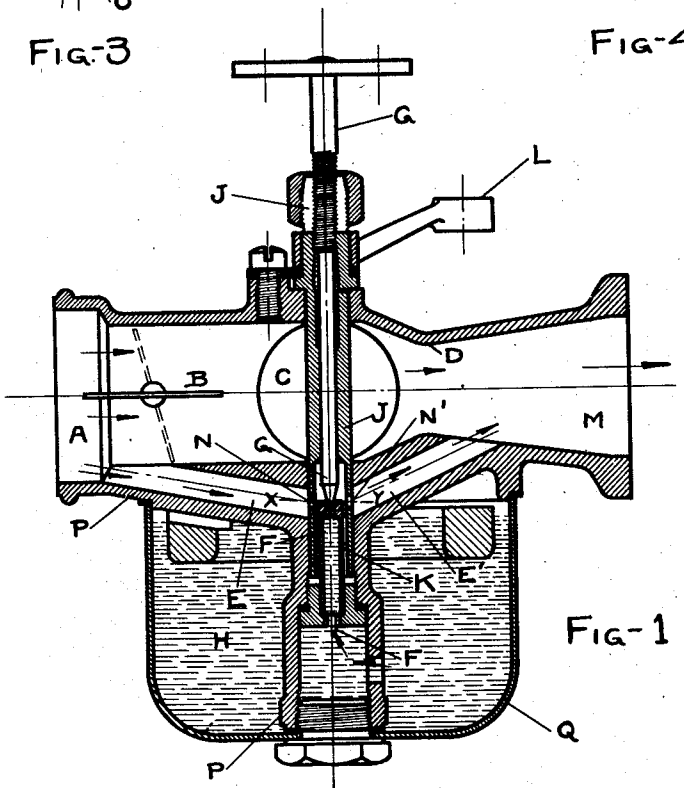


FIG-1

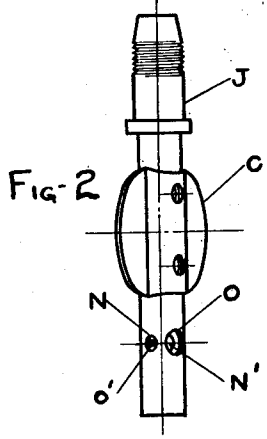


FIG-2

INVENTOR

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UNITED STATES PATENT OFFICE.

GEORGE M. HOLLEY, OF DETROIT, MICHIGAN.

CARBURETOR.

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My invention relates specifically to a carburetor having a main air and primary air passages in which the main air is mechanically controlled by a throttle which also controls the primary air.

Figure 1 shows a longitudinal sectional elevation of a horizontal carburetor.

Figure 2 shows the throttle control isolated from the carburetor for the purposes of illustration.

Figure 3 shows a transverse sectional end view on the plane X—Y of Figure 1 of the primary air throttle as it stands with relation to the primary air passage in a wide open position of the throttle.

Figure 4 is a corresponding view in the closed position of the throttle.

Figure 1 shows at A an air entrance to the carburetor controlled by the usual choke valve B; the air passage passes by the main air throttle C and through the venturi D to the carburetor exit M. Adjacent to and below the main air passage A—M is the auxiliary primary air passage EE′ into which projects the nozzle F controlled by the adjustable needle G. The main air throttle C is carried by a throttle rod J, the hollow end of which K projects into the passage EE′. This hollow extension K receives the nozzle F and has two opposite pairs of ports. These two pairs of ports register with the passage EE′ so that on moving the throttle C the extension valve K, entrance passage E and the exit passage E′ are suitably restricted to correspond with the given position of the throttle C.

Fuel is supplied to the main nozzle F through the float chamber H which maintains the fuel at a constant level in the vicinity of the top of the fuel nozzle F. The throttle rod J is controlled by the throttle lever L.

The main air passage AM, the auxiliary passage EE′ and the fuel nozzle F are all carried in one casting P to which is secured the float bowl Q.

Mode of operation.

Starting.—As the passage EE′ communicates with the main air passage AM, at both ends of the said passage on closing the choke valve B and opening the throttle C, the suction of the engine is concentrated on the fuel nozzle F, thus giving an extremely rich mixture which is necessary for starting.

Normal operation.—The control of the proportion of air to fuel is regulated by the proportions of the ports OO′ and NN′ in the extension K of the throttle rod J and also the angle to which the axes of the said ports bear to the throttle plate C. The proportions and angles of these ports as shown in Figures 3 and 4 will maintain the mixture substantially constant at the various positions of the throttle enabling the engine to run effectively and efficiently at each position to the throttle.

In Figure 3 which shows the wide open position, the air flows through the auxiliary passage E through port N and out of the port N′ to E′.

On closing the throttle, to the port N is added the larger port O and at the same time the port N′ is restricted thus cutting down the supply of fuel.

On turning the throttle to the fully closed position shown in Figure 4, the small port O′ has taken the place of the port N′ and the large port O reduces the suction on the fuel nozzle F to such a point that only the minimum supply of fuel is furnished that is required to idle the engine.

Claims:

1. A carburetor having a main air passage leading to a venturi, an additional air passage communicating at one end with the main air passage and at the other end with said venturi, a fuel nozzle positioned within said additional air passage intermediate the ends of the additional air passage, whereby a mixture of fuel and air is delivered to said venturi, a throttle rod extending through said main air passage and provided with a barrel throttle located in said additional air passage, said fuel nozzle projecting within the confines of said barrel throttle, a plurality of pairs of ports of different relative capacities in said barrel throttle at a point substantially in alignment with the upper extremity of the fuel nozzle, one pair of ports serving at high speed and the other pair of ports serving at low speeds, a throttle valve in the main air passage and secured to said throttle rod, whereby the barrel throttle and the throttle valve in said main air passage are operated together to supply a substantially constant fuel ratio to the said venturi.

2. A carburetor having a main air passage leading to a venturi, an additional air passage communicating at one end with the main air passage and at the other end with

said venturi, a fuel nozzle positioned within said additional air passage intermediate the ends of the additional air passage, whereby a mixture of fuel and air is delivered to said venturi, a hollow throttle rod extending through said main air passage and provided with a barrel throttle located in said additional air passage, said fuel nozzle projecting within the confines of the barrel throttle, said barrel throttle being provided with a plurality of pairs of ports of different relative capacities to control the admission of air to and from the said fuel nozzle, said ports being in substantial alignment with the upper extremity of the fuel nozzle, one pair of the ports serving at high speed and the other pair serving at low speed, a throttle valve in the main air passage and secured to the throttle rod, a needle valve positioned within said hollow throttle rod and screw-threadedly connected therewith, said needle valve cooperating at its lower extremity with the fuel nozzle, said barrel throttle, needle valve, and throttle in the main passage being operated together to thereby secure a substantially constant fuel ratio mixture.

3. A carburetor having a main air passage leading to a venturi, an additional air passage communicating at one end with the main air passage and at the other end with said venturi, a fuel nozzle positioned within said additional air passage intermediate the ends of the additional air passage, whereby a mixture of fuel and air is delivered to said venturi, a throttle rod extending through said main air passage and provided with a barrel throttle located in said additional air passage, said fuel nozzle projecting within the confines of said barrel throttle, a plurality of pairs of ports of different relative capacities in said barrel throttle at a point substantially in alignment with the upper extremity of the fuel nozzle, one pair of ports serving at high speed and the other pair of ports serving at low speed, a throttle valve in the main air passage and secured to said throttle rod, whereby the barrel throttle and the throttle in said additional air passage are operated together to supply a substantially constant fuel ratio to the said venturi, a choke valve located in the main air passage at a point in advance of the end of the additional air passage communicating with the main air passage, said choke valve serving, when closed, to shut off the air passing through the main air passage and divert the air through the additional air passage to the fuel nozzle to deliver a rich mixture to the Venturi tube when starting.

In testimony whereof I affix my signature.

GEO. M. HOLLEY.