Oct. 1, 1929. C. H. CLAUDEL 1,730,191

CARBURETING APPARATUS

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Fig. 1

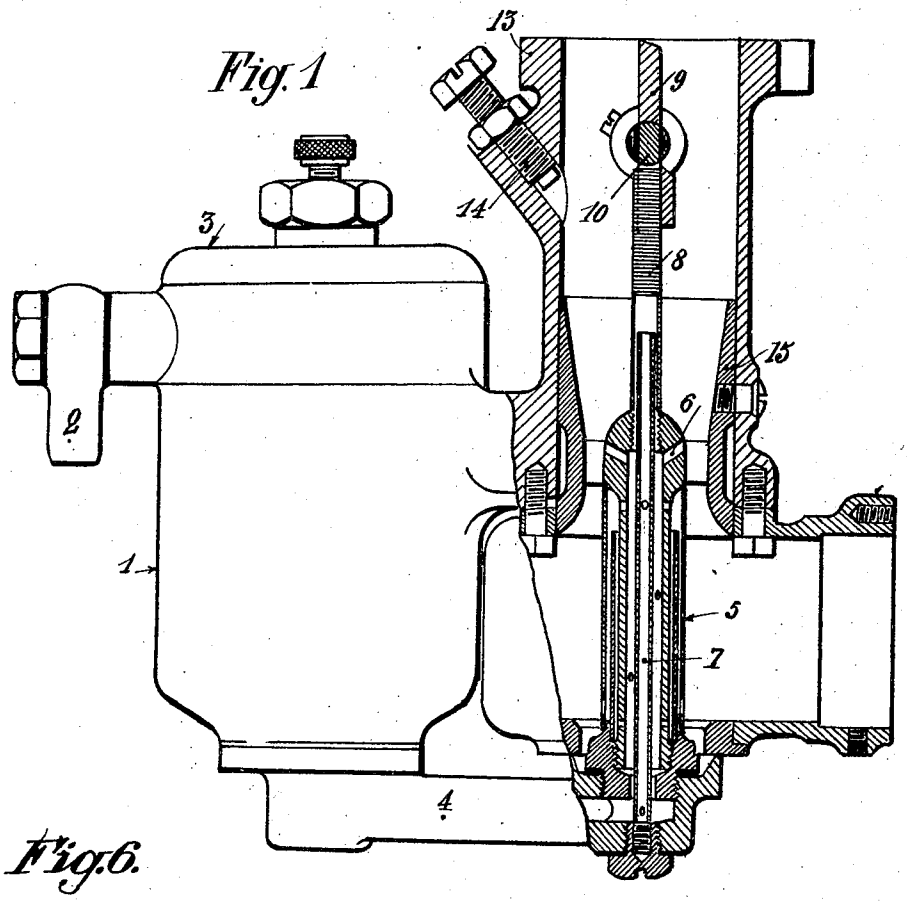
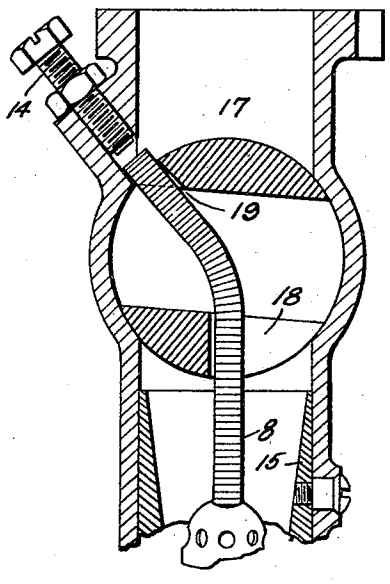


Fig. 6.



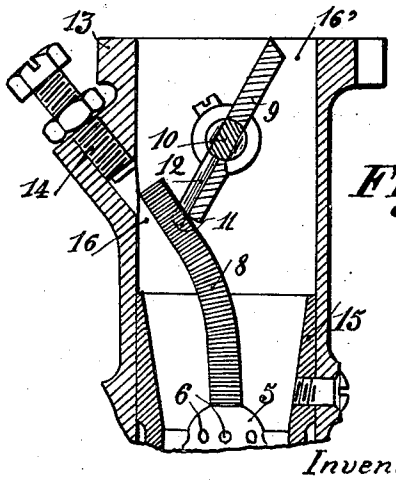


Fig. 3.

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Fig. 2

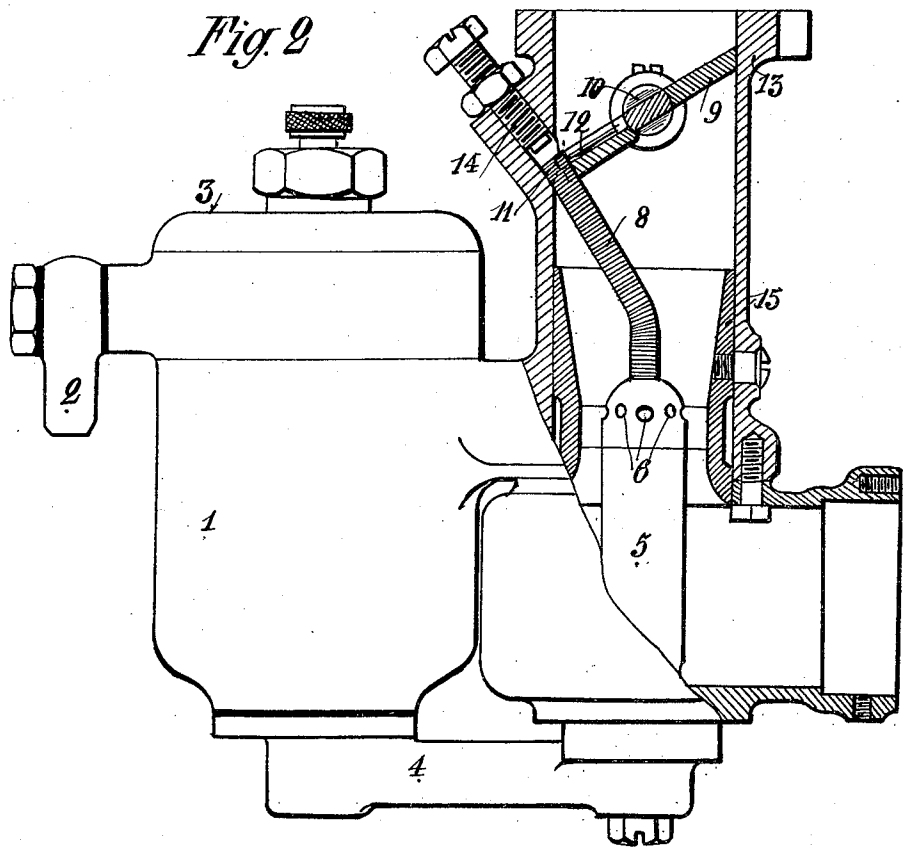


Fig. 5

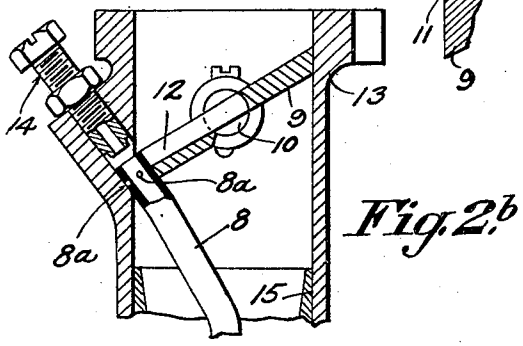
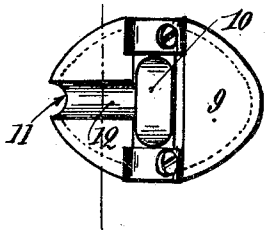


Fig. 2b



Fig. 4



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UNITED STATES PATENT OFFICE

CHARLES HENRI CLAUDEL, OF NEUILLY-SUR-SEINE, FRANCE

CARBURETING APPARATUS

Application filed June 30, 1925, Serial No. 40,560, and in France January 26, 1925.

The present invention relates to carbureting apparatus for internal combustion engines and has for its object to provide an improved carburetor.

According to the invention, a carburetor comprising a main jet or nozzle arranged coaxially in a casing with a throttle valve arranged beyond the main nozzle is provided in which a starting or slow-speed fuel nozzle comprises a flexible or articulated tube, one end of which is rigidly mounted on the main jet or nozzle so that the tube normally maintains a central position coaxial with the main jet or throttle valve, the other end of the said tube being free and capable of being moved aside as the throttle valve is closed and this end then communicating with the space beyond the throttle valve so that the free end of the flexible tube will be subjected, particularly when the throttle is nearly closed, to the whole of the vacuum produced by the suction of the engine.

According to a further feature of the invention a regulating screw is so mounted as to cooperate with the outlet end of the flexible tube in the position occupied by the latter when the throttle is closed, so that the output of the flexible tube in the closed or nearly closed positions of the throttle may be regulated at will, by thus regulating the degree of suction permitted to act upon the free end of this tube.

The invention is applicable to carburetors having a main nozzle in addition to a starting or slow speed nozzle irrespectively of the feeding arrangements of these devices, and may among others be applied to a carburetor of the kind described for instance in the specification of my prior U. S. patent application filed December 11, 1924, under Serial No. 755.296.

The accompanying drawing illustrates an embodiment of the invention as applied to a multiple fuel nozzle carburetor having a central slow-speed nozzle and a normal speed diffusing nozzle the outlet of which is situated on that side of the throttle furthest from the engine.

Fig. 1 is a partly sectional view of the said carburetor through the centre line of the fuel nozzles, the throttle being shown in its open position;

Fig. 2 is a similar view showing the throttle in its closed position;

Fig. 2[b] is a partial view showing a modification of Fig. 2.

Fig. 3 is a view of a portion showing the throttle in an intermediate position;

Fig. 4 is a front view of the throttle disc;

Fig. 5 being a sectional view on the line V—V of Fig. 4.

Fig. 6 is a view similar to Fig. 2 showing a modification with a carburetor provided with a cock.

Referring to the drawing, 1 is the float chamber which is supplied with fuel from the inlet conduit 2 through the medium of a hollow cover 3. The said chamber has the usual float chamber mechanism for controlling the flow of the fuel. The conduit 4 connects the float chamber with the nozzle, which comprises a main diffusing nozzle 5 having a primary mixture outlet 6, and a slow-speed nozzle comprising a flexible extension tube 8 secured to the upper end of the main nozzle, said tube being formed of suitable wire. The throttle is a butterfly valve 9 mounted on a rotatable spindle 10.

As illustrated in Figure 4, the throttle disc 9 is provided at one side and close to the periphery with a notch 11 connected with a diametrical groove 12. This notch co-operates in the closed position of the throttle device with the flexible tube 8 in such manner that the end of the latter extends beyond the throttle and opens more or less completely into the throttled portion of the suction conduit of the engine or at a point situated on the side of this portion nearest to the engine (Figures 2 and 4). It will be observed that none of the parts of the throttle device will be interposed between the portion of the suction conduit 13 situated on the engine side of the throttle and the outlet of the slow speed nozzle, so that the suction of the engine will have the desired degree of influence upon the slow speed nozzle, this being the case more particularly when the throttle is nearly closed. At the same time, the outlet of the slow speed nozzle will be situated in the rapid current

of air flowing through the region 16 which is left open between the throttle and the walls of the suction conduit 13, this being a region in which the rapid air current expands and forms eddies, in such manner as to further the energetic mixing of the product issuing from the tube 8.

In order to regulate at will the output of the tube 8 when in the extreme slow speed position, i. e. when the throttle is closed, a screw 14 is provided extending towards the outlet of the tube 8 when the latter occupies its extreme slow speed position, or adjacent positions. This screw enables the outlet of the tube when in the slow speed position to be closed wholly or partially as required, and may be made hollow, whereby an additional air inlet is provided or the tube 8 may be perforated at 8^a (Figure 2^b) in order to provide an additional air inlet when required.

When the throttle disc 9 is gradually opened the end portion of the flexible tube 8 will by reason of its elastic nature, tend naturally to resume the straight position, as shown in Figure 1, and will thus automatically follow the motion of the throttle proceeding from the notch 11 to the groove 12 wherein it will be partially disposed, in a straight line, in the open position of the throttle, Figure 1. The groove 12 will thus serve when the throttle 9 is in its open position to contain part of the tube 8, and to guide the latter when in its intermediate positions, as shown in Figure 3. It will be noted that this arrangement is of a very simple character and ensures that the flexible nozzle is efficiently guided in all its movements, while affording a minimum resistance to the outflow of the mixture when the throttle is fully open. The main nozzle 5 which supplies the mixture through the outlets 6 operates in a known manner according to the mean and the full opening of the throttle device, and in co-operation with a Venturi tube fitting 15.

It will be observed that in all positions of the throttle and especially when the throttle is nearly closed the outlet of the flexible tube 8 is situated more or less on the engine side of the throttle disc 9.

As illustrated in Figure 6 the invention is also applicable to a throttle constituted by a plug cock 17, for example by forming a suitable notch 18 in the wall of the passage through the barrel of the cock to accommodate the free end of the flexible tube, a second notch 19 diametrically opposite to the first notch being provided in the wall of the passage, so that, when the plug cock is in its closed position, the flexible tube is in communication through the first notch, the passage in the barrel of the plug cock and the second notch with the engine side of the throttle.

Obviously, the invention is not limited to the devices and details of construction herein described but various modifications may be made therein without exceeding the scope of the invention.

I claim:

1. In a carburetor comprising a main nozzle arranged in a casing with a throttling valve arranged beyond the main nozzle and a slow speed nozzle comprising a flexible tube having one end rigidly mounted on the main nozzle, an indentation in the edge of the throttling valve engaging the free end of said flexible nozzle and permitting said flexible nozzle and permitting said flexible tube to project beyond the free end when the throttling valve is closed.

2. In a carburetor comprising a main nozzle arranged in a casing with a throttling valve arranged beyond the main nozzle and a slow speed nozzle comprising a flexible tube having one end rigidly mounted on the main nozzle, an indentation in the edge of the throttling valve engaging the free end of said flexible nozzle and permitting said flexible tube to project beyond the said free end when the throttling valve is closed, said indentation guiding the flexible tube by elastic contact without interposition of any mechanical means.

3. In a carburetor comprising a main nozzle arranged in a casing with a butterfly throttling valve arranged beyond the main nozzle and a slow speed nozzle comprising a flexible tube having one end rigidly mounted on the main nozzle, an indentation in the edge of the throttling valve engaging the free end of said flexible nozzle and permitting said flexible tube to project beyond the said free end when the throttling valve is closed, said indentation guiding the flexible tube by elastic contact without interposition of any mechanical means, and a diametrical groove in the wall of said butterfly valve extending within said indentation.

In testimony whereof, I have hereunto set my hand.

CHARLES HENRI CLAUDEL.