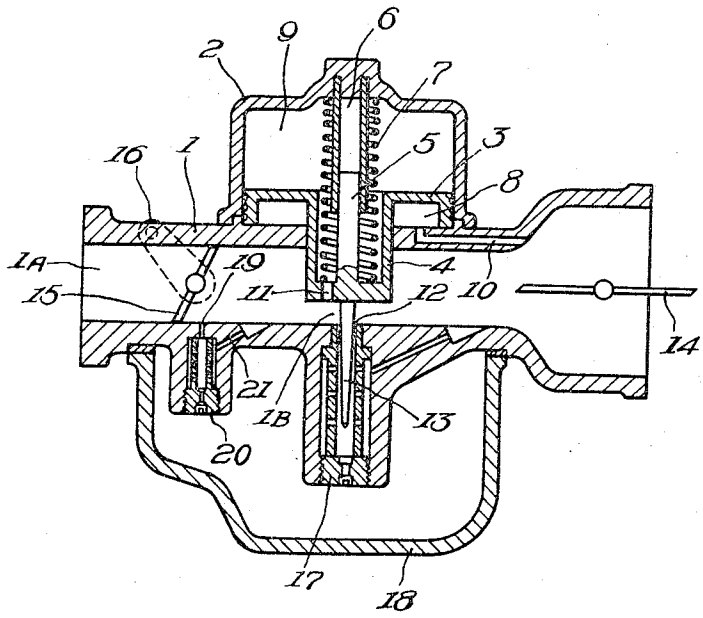
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CARBURETOR

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CARBURETOR

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This invention relates to carburetors for internal-combustion engines and more particularly to those of the SU type, which includes a slide valve extending into the intake air passage and operable under the boost pressure of the engine.

In this type of carburetor, the slide valve is connected with a piston member accommodated in the valve cylinder or casing, which is secured to the outside of the intake duct. The valve cylinder includes two spaces separated from each other by the piston member and one of the two spaces which is adjacent to the intake duct is in communication with the atmosphere, the other space being fed with the boost pressure of the engine. Further, a balancing spring is arranged between the piston member and the opposite wall of the valve cylinder with a tapered jet needle secured to the slide valve.

As is well known, with the SU type carburetor the slide valve automatically operates together with the jet needle to adjust the air passage area adjacent to the main delivery orifice and the orifice area in response to the boost pressure, that is, negative pressure brought within the intake duct by the suction of the engine so that the main delivery orifice can have a satisfactory fuel spraying or atomizing effect to produce a mixture at all times with an optimum fuel-air ratio.

However, where the SU type carburetor is adapted for use with engines having only a limited cylinder volume, the balancing spring employed naturally has a very limited spring force and in some cases even such weak balancing spring is eliminated. Thus, the slide valve of such carburetor undergoes, when fully closed, only an extremely limited balancing force, and, during slow-speed engine operation, when the slide valve is in its fully closed position or very slightly open, it may possibly be oscillated under any unstable boost pressure to adversely affect the fuel spraying or atomization from the main delivery orifice of the carburetor.

Accordingly, the present invention has for its object to provide a novel carburetor of the type described in which any such undesirable oscillation of the slide valve is effectively prevented. Other objects will be apparent from the following specification.

The carburetor of this invention will now be described with reference to the accompanying drawing, which forms a part of this specification and illustrates one practical embodiment of the invention.

Referring to the drawing, the intake duct **1** has a valve cylinder **2** secured to its outside and a piston **3** slidably accommodated in the cylinder **2** is formed integrally with a slide valve **4**, which extends into the intake air passage **1A**. Upstanding from the valve bottom is a guide rod **5**, which is slidably fitted in a tubular guide **6** affixed to the top wall of the valve cylinder **2**. A balancing spring **7** is arranged between the cylinder wall and the slide valve **4**, encircling the tubular guide **6** and guide rod **5**. The interior of the valve cylinder **2** is divided into two spaces **8** and **9** by the piston **3**. One of the two spaces **8** which is adjacent to the intake duct **1** communicates with the atmosphere by way of an air passageway **10** formed in the wall of the intake duct **1** while the other space **9** in the valve cylinder is in communication with an air passage **1B**, which is really a space defined between the bottom of

the slide valve **4** and the opposite inner wall of the intake duct, through an aperture **11** formed in the valve bottom adjacent to the main delivery orifice **12** of the carburetor. A tapered jet needle **13** extends from the bottom of the slide valve **4** into the main delivery orifice **12** for the purpose of controlling the orifice area. Reference numeral **14** indicates a choke valve; **15** a throttle valve connected with a lever **16**; **17** a main nozzle; and **18** a float chamber. These and previously described components of the carburetor structure are similar in arrangement as well as in function to those of the conventional SU type carburetor except that the slide valve **4** of the carburetor according to the present invention has a limited length compared to that of the conventional SU type carburetor.

Because of the limited length of the slide valve **4**, there remains a more or less significant air passage **1B** between the main delivery orifice **12** of the inventive carburetor and the slide valve **4** even when the latter is fully extended into the intake duct **1** opposite to the main delivery orifice **12**, as shown. Also, according to the present invention, an idle or slow-speed delivery orifice **19** is arranged in the intake duct **1** on the downstream side of the slide valve **4** or in the vicinity of the throttle valve **15**. Reference numeral **20** indicates a slow-speed nozzle associated with the slow-speed orifice **19**; and **21** indicates an air bleed passage for the slow-speed delivery.

According to the present invention, as pointed out hereinbefore, a more or less substantial air passage **1B** remains between the slide valve **4** and the adjacent main delivery orifice **12** even when the slide valve **4** is in its fully extended position because of the limited length of the slide valve and, since the speed of air flow through such air passage **1B** is relatively slow, any instability of the boost pressure acting upon the slide valve **4** through the aperture **11** formed in its bottom is effectively reduced. Because of this, it will be appreciated that the slide valve **4** is kept from being oscillated under the boost pressure even during slow-speed engine operation. On this occasion, though no substantial fuel delivery is effected through the main delivery orifice **12** because of the limited speed of the air flow through the passage **1B**, a satisfactory fuel delivery is effected through the slow-speed orifice **19**.

While but one embodiment of the present invention has been shown and described, it will be understood that many changes and modifications may be made therein without departing from the scope or spirit of the invention as defined in the appended claims.

What is claimed is:

1. An SU type carburetor, including
an air intake duct,
float chamber means secured to said duct, said float chamber means having a main delivery orifice and a slow-speed delivery orifice,
slide valve means extending into said intake duct opposite to the main delivery orifice, said slide valve being of such length and positioning that it cannot seat on said main delivery orifice whereby a substantial air passage remains between the main delivery orifice and the slide valve when the slide valve is in its fully extended position, said slide valve means including,
a cylinder,
a piston slidably received by said cylinder,
needle means secured to and extending from said piston means, and
compression spring means acting to force said piston downwardly in said cylinder wherein said needle means carried by said piston blocks the flow of fuel through the main delivery orifice.

2. An SU type carburetor according to claim 1 wherein the speed of air flow through said air passage during slow-speed operating conditions overcomes negative pressure

brought within the intake duct by the suction of the associated internal combustion engine whereby the compression spring means holds said piston downwardly so that no fuel delivery is effected through said main delivery orifice.

3. A carburetor of the type including

an air intake duct having a main fuel delivery orifice therein,

a slide valve extending into the air intake duct opposite said main delivery orifice and means to enable it to be operated under the negative pressure brought within the intake duct by the suction of the associated internal combustion engine, the improvement comprising said slide valve being limited in length whereby a substantial air passage remains between the main delivery orifice and the slide valve when said slide valve is in its fully extended position, the speed of air flow through said air passage during slow speed engine operation effectively reducing the negative pressure acting upon said slide valve to maintain the slide valve in its fully extended position, and

a slow speed delivery orifice positioned in the intake duct on the downstream side of the slide valve.

4. The combination according to claim 3 and including

a jet needle secured to and extending from said slide valve into said main delivery orifice whereby when the slide valve is maintained in its fully extended position during slow speed operation of the engine no fuel delivery is effected through said main delivery orifice.

5. The combination according to claim 3 and including

a valve cylinder secured to the outside of the intake duct,

a piston member connected to said slide valve and slidable in said cylinder, said piston member dividing said cylinder into two spaces, one of the two spaces being adjacent to the intake duct and being in communication with the atmosphere, the other of the spaces being in communication with the negative pressure developed by the engine by connecting to the air passage between the main delivery orifice and the slide valve,

a balancing spring positioned between said piston member and the opposite wall of the valve cylinder to force said piston member downwardly in said cylinder, and

a tapered jet needle secured to said slide valve and extending into the main delivery orifice.

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