W. I. SHORT.

FUEL MIXING SAFETY THROTTLE VALVE.

APPLICATION FILED FEB. 19, 1917.

1,244,379. Patented Oct. 23, 1917.

Fig. 1.

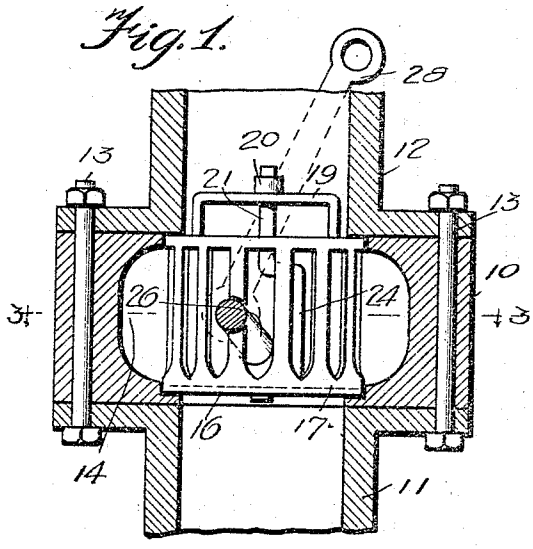
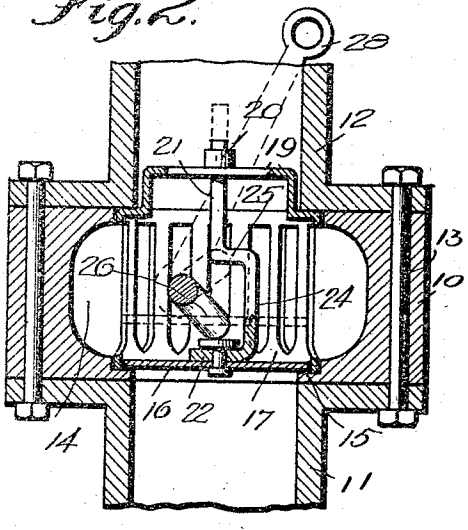


Fig. 2.



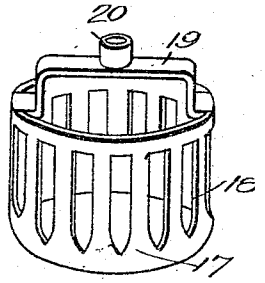


Fig. 4.

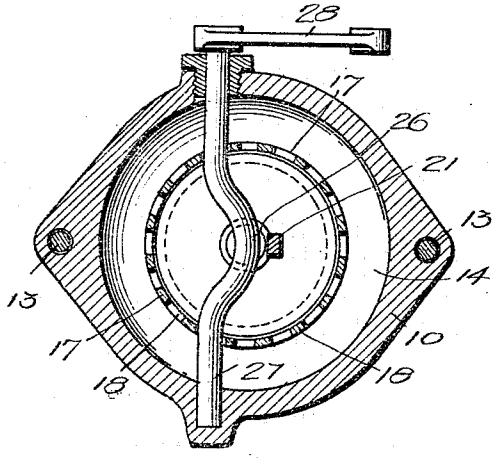


Fig. 3.

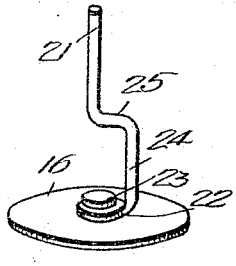


Fig. 5.

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FUEL-MIXING SAFETY THROTTLE-VALVE.

1,244,379. Specification of Letters Patent. Patented Oct. 23, 1917.

Application filed February 19, 1917. Serial No. 149,560.

To all whom it may concern:

Be it known that I, WILLIAM I. SHORT, a citizen of the United States, and a resident of Neosho, in the county of Newton and State of Missouri, have invented a certain new and useful Improvement in Fuel-Mixing Safety Throttle-Valves, of which the following is a specification.

My present invention relates generally to throttle valves, and more particularly to throttle valves for internal combustion engines, my object, among others, being to provide a valve of this type by which the fuel, including gas and air, may be intimately mixed, irrespective of the degree to which the valve is permitted to open.

A further object is to provide a valve of the above type, embodying a construction whereby the operator may be enabled to shift or force the valve open in case it sticks, by means which in proper position provide for sufficient play in case of back fire from the working cylinder while the engine is running, so that the force thereof will close the valve automatically without attention on part of the operator.

In carrying out my invention generally, I provide an enlarged mixing chamber within the fuel intake pipe, coaxial with the passage of the fuel therethrough, and in which the safety valve works centrally of the fuel passage way, to close in a direction away from the engine cylinder, my present construction providing for an effective control of the valve at all times without affecting its closing movement automatically in case of back fire.

In the accompanying drawings illustrating my improvements:

Figures 1 and 2 are longitudinal sections taken centrally through the valve casing and adjacent parts, with my present improvements respectively in elevation and section;

Fig. 3 is a horizontal section taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a detail perspective view of the valve guide tube, and

Fig. 5 is a similar view of the valve disk and its stem.

Referring now to these figures, I provide a casing 10, inserted within an intake pipe intermediate the ends of the latter, for instance, between the flanged ends of the pipes 11 and 12 leading respectively from a carbureter, and to the working cylinder of an engine, the latter for instance the intake manifold of the engine. The casing 10 is preferably secured by bolts 13 passing therethrough and through the flanged ends of the pipes 11 and 12, and is provided with an enlarged mixing chamber 14, communicating through openings with the pipes 11 and 12, adjacent one of which openings the casing 10 is cut away to provide an internal annular seat 15, forming a seat for the valve disk 16 as well as one end of the valve guide tube 17, which latter is initially inserted in the position best shown in Figs. 1 and 2, through the opposite opening of the casing 10 communicating with the pipe 12.

The guide tube 17 as seen in detail in Fig. 4, is provided with an annular series of elongated slots 18, although it is to be understood that the tube may be perforated in various ways, in order to bring about the desired result to be hereinafter stated, the seat 15 and consequently the tube 17 as well as the valve disk 16 movable in the tube, being concentric or coaxial with the fuel passageway through the pipes 11 and 12 and the casing 10. At one end which in operative position of the parts lies nearest the pipe 12, the tube 17 is provided with a diametrical bracket 19, the intermediate portion of which is offset to extend into the pipe 12, as seen in Figs. 1 and 2, and is provided with a centrally disposed bearing 20 for the adjacent end of the valve stem 21, the opposite end of the latter of which is bent angularly as at 22, secured to the valve disk 16 at a point centrally of the latter by a rivet or like fastening member 23, it being noted that the valve stem 21 has an intermediate offset portion 24, forming a shoulder 25 opposing and spaced from its angular end 22, whereby to provide for engagement of the intermediate offset portions 26 of the controlling shaft 27 therewith, whenever it becomes necessary to force the valve open due to its sticking, it being understood that the adjustment of the shaft to position its portion 26 in adjustably spaced relation to the valve disk 27 normally controls the extent of opening movement of the valve disk under the effect of the suction of the working cylinder through the parts. It is further to be understood that the intermediate offset portion 26 of the controlling shaft 27 is movable similarly against the inner angular end 22 of the stem, centrally of the disk 16, to force the latter to the closed position shown in Fig. 2.

The controlling shaft 27 which is journaled suitably in bearings laterally of the casing 10, is operated in practice through suitable connections to its exterior crank arm 28, and the valve disk 16 which interfits and is slidable in the guide tube 17, opens under control of the shaft 27, it being obvious that when away from its seat 15 in open position, the valve disk 16 which is imperforate, forces the passage of the gas and air from pipe 11 outwardly through the apertures of the tube 17 at the near side of the disk, and the intimate and thorough intermixing of such gas and air in their passage and circulation within the chamber 14 and their reëntry into the tube 17 upon the far side of the valve disk 16 prior to their passage into the intake pipe 12.

Thus the tube 17 supports and guides the valve in use, and the stem of the latter gives the operator the advantage of being able to shift the controlling shaft far enough to force the valve open in case it should stick, leaving sufficient play, however, so that in case of backfire from the cylinder while the engine is running, the force will close the valve automatically without requiring movement of the controlling shaft by the operator.

As before stated, the tube 17 is initially introduced within the opening of the casing 10 nearest the intake pipe 12, and from its opposite end it seats upon the seat 15, which latter is extended inwardly a sufficient distance to form the seat of the valve disk 16 as well.

I claim:

1. The combination with a fuel intake pipe having a fuel passage, of a valve casing interposed therein having an enlarged chamber coaxial with, and forming a part of the fuel passage, and provided with an internal annular valve seat adjacent said chamber, a perforate guide tube coaxial with the fuel passage, extending through said chamber and, at one end, against said seat, a valve disk movable in said tube and against said seat, and controlling means for moving said valve disk toward and away from said seat.

2. The combination with a fuel intake pipe having a fuel passage, of a valve casing interposed therein having an enlarged chamber coaxial with, and forming a part of, the fuel passage, and provided with an internal annular valve seat adjacent said chamber, a perforate guide tube coaxial with the fuel passage, extending through said chamber, and at one end, against said seat, a valve disk movable in said tube and against said seat, and controlling means for moving said valve disk toward and away from said seat, arranged to permit of automatic movement of the valve to seated position, for the purpose described.

3. The combination with a fuel intake pipe having a fuel passage, of a valve casing interposed therein having an enlarged chamber coaxial with, and forming a part of, the fuel passage, and provided with an internal annular valve seat adjacent said chamber, a perforate guide tube coaxial with the fuel passage, extending through said chamber, and at one end against said seat, a valve disk movable in said tube and against said seat, a stem secured at one end to the valve disk and provided with an offset portion forming a shoulder opposing and spaced from the valve disk, and controlling means including a transverse controlling shaft having an intermediate offset portion projecting into the space between the valve disk and the said shoulder of the stem.

4. The combination with a fuel intake pipe having a fuel passage, of a valve casing interposed therein and having an enlarged chamber coaxial with, and forming a part of, the fuel passage, and provided with an internal annular valve seat adjacent said chamber, a perforate guide tube coaxial with the fuel passage, extending through said chamber and, at one end, against said seat, a valve disk movable in said tube and against said seat, a stem secured to the valve disk and projecting through the said tube, and a cross piece carried by one end of the tube and having a bearing for the free end of the valve stem.

5. The combination with a fuel intake pipe having a fuel passage, of a valve casing interposed therein, having an enlarged chamber coaxial with, and forming a part of, the fuel passage, and provided with an annular valve seat around the fuel passage adjacent said chamber, a perforated tube disposed axially within said casing and open at its opposite ends, a valve disk interfitting and slidable within the said perforated tube toward and away from the said seat and controlling means for said valve engageable with and disengageable from the same in operation.

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