W. B. FLOYD.

AUTOMATIC VAPORIZING PLUG.

APPLICATION FILED DEC. 16, 1916.

1,271,304. Patented July 2, 1918.

Fig. 1.

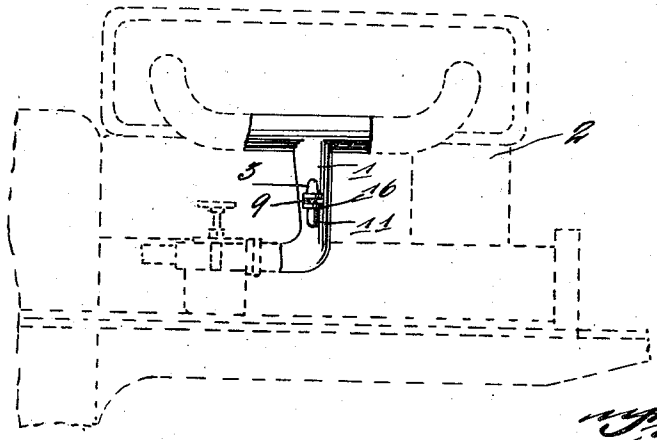


Fig. 2.

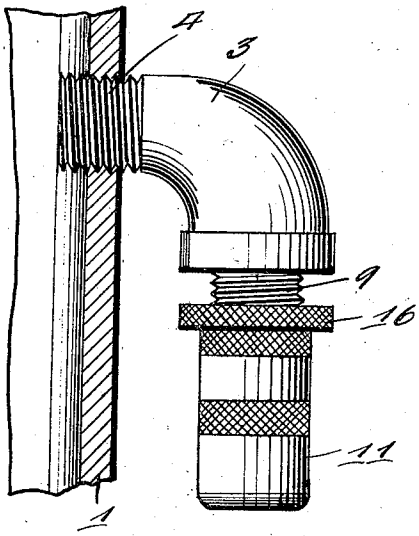


Fig. 3.

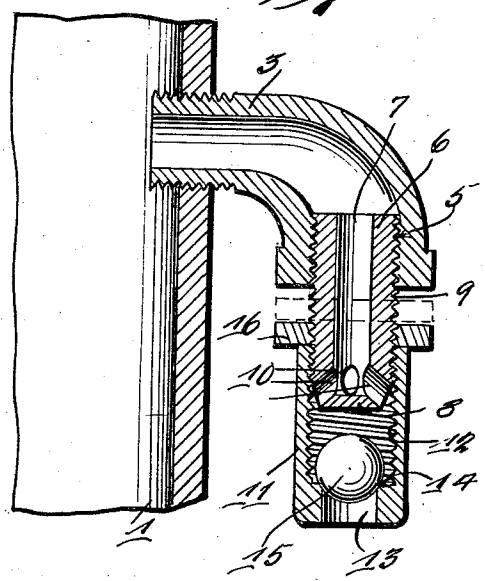


Fig. 5.

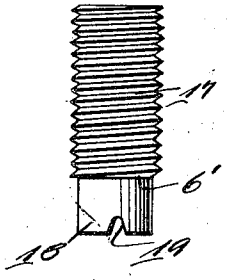


Fig. 4.

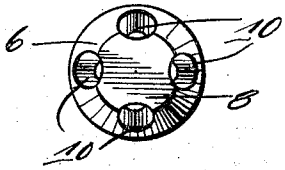
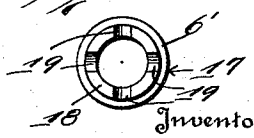


Fig. 6.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC VAPORIZING-PLUG.

1,271,304. Specification of Letters Patent. Patented July 2, 1918.

Application filed December 16, 1916. Serial No. 137,336.

To all whom it may concern:

Be it known that I, WILLIAM B. FLOYD, a citizen of the United States of America, residing at Fort Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Automatic Vaporizing-Plugs, of which the following is a specification.

This invention relates to an automatic vaporizing plug and has for its principal object the production of a device which is adapted to be carried upon a manifold of an internal combustion engine such an engine as is used in automobiles, so that upon each stroke of the piston, or pistons, air will be drawn into the intake manifold wherein it will be mixed with gas passing therethrough, thus forming a charge which will have more power when exploded and which will prevent the formation of carbon deposits within the cylinders and which will also reduce the cost of operation of the engine.

Another object of this invention is the production of an automatic vaporizing plug which is constructed so as to be easily applied to the intake manifold of an engine in such a manner as to cause the suction within the intake manifold to suck air through the plug, although the air will be prevented from escaping back through the plug because of a ball valve used in connection therewith.

A still further object of this invention is the production of an automatic vaporizing plug wherein the thimble screwed into the joint of the invention is provided with a plurality of branch apertures leading from the bore so as to permit air to pass through the thimble without interference from the ball valve as the air is passing into the intake manifold.

With these and other objects in view this invention consists of certain novel combinations, constructions, and arrangements of parts as will be hereinafter fully described and claimed.

In the accompanying drawing:—

Figure 1 is an elevation of the automatic vaporizing plug, illustrating the manner in which the same is carried upon the intake manifold, the intake manifold of an engine being shown in dotted lines.

Fig. 2 is a side elevation of the automatic vaporizing plug.

Fig. 3 is a vertical section through the plug, shown in an assembled condition.

Fig. 4 is an end elevation of one end of the thimble.

Fig. 5 is a side elevation of the slightly modified form of the thimble.

Fig. 6 is a plan view of one end of the modified thimble of Fig. 5.

Referring to the accompanying drawings by numerals it will be seen that the automatic vaporizing plug is adapted to be used in connection with the intake manifold 1 of an engine, as shown in dotted lines at 2.

The plug comprises the joint 3 which is formed of an elbow, as shown in Figs. 2 and 3, having an externally threaded end 4. This externally threaded end 4 is adapted to be threaded into the intake manifold 1 so as to communicate with the interior thereof. This joint 3 is connected adjacent its outer end and is internally threaded, as shown at 5.

The thimble 6 is provided with a central bore 7 extending therethrough, although one end of the bore 7 is closed, as shown at 8. This thimble 6 is externally threaded, as shown at 9, so as to thread into the interior of the joint 3 to be threaded into the threaded portion 5 of this joint. It will be seen by referring particularly to Fig. 3 that this thimble 6 projects for a considerable distance beyond the outer end of the joint 3 for purposes to be hereinafter set forth. This thimble 6 is provided with a plurality of diagonally extending branch apertures 10 formed adjacent the closed end 8 of the thimble and communicating with the interior of the bore 7.

The cap 11 is internally threaded, as shown at 12, and is threaded onto the projecting end of the thimble 6. The cap 11 is provided with an enlarged opening 13, formed in its outer end although this opening is smaller than the diameter of the threads 12 so as to form a valve seat 14 upon which the ball valve 15 is adapted to normally rest. Thus, it will be seen that the ball valve 15 will be carried in alinement with the closed end 8 of the thimble 6. In order to hold this cap 11 against accidental displacement the jam nut 16 is carried upon the thimble 6 and is adapted to be rotated so as to pass along the thimble until it comes into binding engagement with the inner end of the cap 11. This action,

of course, will bind the cap against accidental displacement for the jam nut will be bearing upon the threads as will the cap 11, which elements bear upon opposite sides of the threads, thus holding the cap against accidental displacement.

When this automatic vaporizing plug is in use the joint is threaded into engagement with the intake manifold, as hereinbefore set forth. The thimble 6 is then threaded into the joint and after this action takes place the jam nut is positioned upon the thimble until it assumes the position indicated in dotted lines in Fig. 3. The cap is then threaded upon the projecting end of the thimble to a position desired and after this action takes place the jam nut is threaded into engagement with the inner end of the cap, thus holding the cap against accidental displacement. At this time it will be seen that the branch apertures 10 will be communicating with the interior of the cap 11, as shown clearly in Fig. 3, although the bore will be resting at a distance below the lower end of the thimble. As the engine begins to run it is obvious that suction will be created within the intake manifold 1 due to the suction caused by the strokes of the pistons of the engine. This action will not only cause gas to be drawn through the intake manifold but will also cause air to be sucked through the automatic vaporizing plug since the suction within the plug will cause the ball 15 to be directed over the valve seat 14 and thus cause the air to pass through the opening 13, the cap 11, through the apertures 10 and bore 7 to the joint 3, and into the intake manifold. Thus, it will be seen that as the air mixes with the gas passing through the manifold it will cause the air to be thoroughly mixed with the gas, thus forming a charge which will have a high power when exploded within the cylinders of the engine and which will prevent the formation of carbon deposits within the cylinder. Furthermore, it will be seen that by the mixing of the air and gas the expense of fuel will be greatly reduced since the air will only make it necessary for a limited amount of gas to be used. It will be seen that as the ball 15 is lifted from the valve seat sufficient space is provided for the passage of air into the thimble and that if the ball is lifted very high it will come into engagement with the closed end 8 of the thimble and will not interfere with the passage of air through the apertures formed in the thimble. It is, of course, obvious that because of the length of the thimble the cap may be adjusted to different positions so as to permit only a limited amount of air to pass into the thimble or a maximum amount, owing to the position the cap assumes when the device is in operation.

From the foregoing description it will be seen that a very simple and efficient automatic vaporizing plug has been produced which is comprised of a minimum number of parts and because of the structure of these parts the life of the structure will be very long, while it will permit the amount of air passing through the plug into the manifold to be regulated as desired.

By referring to Figs. 5 and 6, it will be seen that a slightly modified form of the thimble is provided wherein the thimble 6′ is internally threaded as shown at 17. The thimble 6′ has an unthreaded neck 18 in which there are formed a plurality of notches 19. The outer end of this neck 18 is open as shown clearly in Fig. 6 so as to permit air to pass freely through this thimble when the same is in use. This thimble 6′ is used similarly to the thimble shown in Fig. 3 for under such conditions, it will be seen that the thimble 6′ is to be carried by the joint 3 and support the cap 11. It is obvious that the ball may be sucked by air pressure into engagement with the lower end of the neck 18 and the notches 19 will permit air to pass through the notches into the thimble and thus permit the thimble to operate in the usual manner.

It will be noted that the internally threaded portion 5 of the elbow 3 extends to a point adjacent the bend in the elbow. As a consequence when the thimble is screwed into the elbow the movement of the thimble will be limited by the passing of the inner end of the thimble to a point adjacent the bend of the elbow. Owing to the bend of the elbow, it is obvious that the thimble will be held against accidental displacement. It will further be noted that the thimble is screwed adjacent its outer end so as to form an annularly reduced portion slightly spaced from the threads of the cap, when the cap is positioned on the thimble. As a consequence since the passages 10 extend from points adjacent the bore and terminate at the reduced portion of the thimble as shown in Figs. 3 and 4, air will be permitted to freely pass through the passages into the thimble without interference from the cap, after the air has been admitted into the cap.

What is claimed is:—

As a new article of manufacture, an automatic vaporizing plug comprising an elbow having the usual bend intermediate its straight end portions, one end portion of said elbow being internally threaded to a point adjacent the bend in the elbow, the other end of said elbow being externally threaded, whereby said elbow may be screwed into a set position upon the manifold of an engine, an externally threaded thimble having a longitudinally extending bore projecting partially therethrough, whereby one end of said thimble is closed, said thimble being screwed into said elbow to a point adjacent

the bend in the elbow, whereby said thimble will be wedged in said elbow so as to be held against accidental displacement, said thimble being reduced adjacent its outer end, said thimble having radiating passages formed therethrough, said passages communicating at their inner ends with said bore and at their outer ends with the reduced outer end portion of said thimble an internally threaded cap having an opening formed in its outer end, a ball positioned within said cap for intermittently closing the opening formed in said cap, said cap being adjustably screwed onto the thimble, whereby when a vacuum is formed in said plug the movement of said ball may be regulated, a jam nut carried by said thimble and bearing upon said cap for holding said cap in an adjusted set position, and the reduced end portion of said thimble permitting air to pass freely into said passages from said cap.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM B. FLOYD.

Witnesses:
BESSIE DANCE,
S. M. CAPPS.