W. L. BELL.

FUEL SAVING DEVICE FOR EXPLOSION ENGINES.

APPLICATION FILED MAY 5, 1917.

1,244,689.

Patented Oct. 30, 1917.

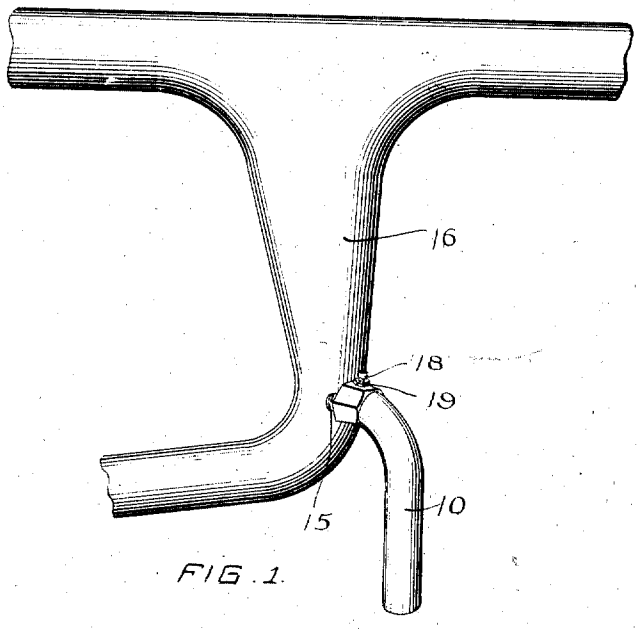


FIG. 1.

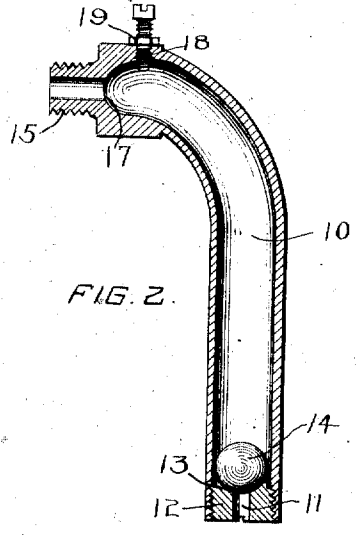


FIG. 2.

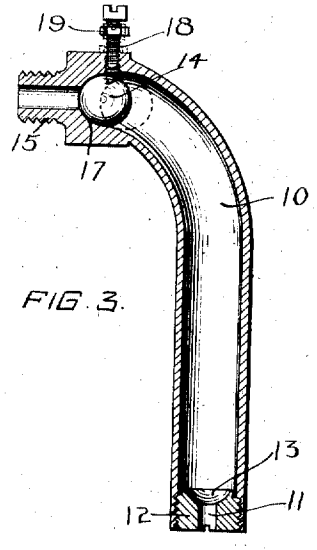


FIG. 3.

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FUEL-SAVING DEVICE FOR EXPLOSION-ENGINES.

1,244,689. Specification of Letters Patent. Patented Oct. 30, 1917.

Continuation of application Serial No. 93,000, filed April 22, 1916. This application filed May 5, 1917. Serial No. 166,610.

To all whom it may concern:

Be it known that I, WALLACE L. BELL, a citizen of the United States of America, residing at Athens, in the county of Clarke, State of Georgia, have invented certain Improvements in Fuel-Saving Devices for Explosion-Engines, of which the following is a description, reference being had to the accompanying drawings, forming a part thereof.

The object of the invention is to provide a simple, inexpensive and efficient attachment for explosive engines designed to economize the use of fuel by providing for the supply to the intake manifold a maximum amount of air when the engine is running under a light load, and a minimum amount when the engine is running under a heavy load, the control of the amount of air admitted to the mixture being automatic and dependent upon the stroke of the engine and the stress or tension of the suction produced thereby.

Further objects and advantages of the invention will appear in the following description of a preferred embodiment, it being understood that changes in the form, proportion and minor details may be resorted to within the scope of the appended claims without departing from the spirit of the invention.

In the drawing,

Figure 1 is a general perspective view showing an attachment embodying the essential principles of the invention applied in the operative position to an intake manifold.

Fig. 2 is a longitudinal sectional view of the attachment with the valve shown in its normal position as when not subjected to cylinder suction.

Fig. 3 is a view similar to Fig. 2 wherein, in full lines, the valve is shown in its fully seated position at the discharge end of the attachment, and in dotted lines in a restrained position due to the arrangement of an adjustable stop or limiting means.

In the illustrated embodiment of the invention, there is provided a preferably tubular run-way 10 having an inlet 11, formed for example in a removable plug 12 and fitted with a valve seat 13 designed to receive a ball valve 14. At its outlet or discharge end the run-way is provided with a threaded nipple 15 or other means for attachment to a manifold 16 and also with a seat 17 for the aforesaid valve, whereby, unless otherwise prevented, a sufficiently strong suction in the intake manifold of the engine will result in drawing the ball valve from the position illustrated in Fig. 2 to that illustrated in full lines in Fig. 3.

In the ordinary adjustment of carbureters for use in connection with gasolene and other liquid fuel motors, it is usual to arrange the air intake so as to secure the maximum efficiency or the most satisfactory admixture under normal running conditions, and as a consequence when the engine is running under a light load or practically without load, the mixture is richer in gas than necessary, whereas when the engine is running under a heavy or excessive load, the mixture is relatively poor in fuel.

With the apparatus herein described and involving the use of the attachment in connection with the intake manifold of the engine, it is possible when the engine is running under a light load to permit the influx of a relatively large percentage of air through the attachment due to the unseating of the valve from the inlet end of the run-way to reduce the richness of the mixture by preventing the full suction of the cylinders to operate through the carbureter. On the other hand, when the engine is traveling under a heavy stress or load, the valve is adapted to be drawn to the discharge end of the run-way so as to reduce or cut off the supply of air through that source and cause the cylinders through their suction to act directly or more directly through the carbureter.

Under these conditions the carbureter may be adjusted to give the maximum efficiency or, in other words, the richest desirable mixture under the maximum estimated load or stress, the economizer being depended upon to cut down the richness of the mixture under a light load by reducing the effect of the suction stroke of the cylinders upon the carbureter.

However, it has also been found desirable in practice and more especially in adapting the attachment to different engines and where different conditions of operation are encountered, to provide for a graduation of the air inlet to the manifold, or discharge into the manifold from the run-way under the maximum or most severe stress or tension due to the stroke of the engine, and to this end, a limiting device is provided for the

valve 14 in the path of its approach to the discharge seat 17 thus affording means to break the suction when the valve is seated at the outlet end of the run-way to insure the dropping away of the valve on the reduction of the stress of suction or the lessening of the subatmospheric pressure. In the construction illustrated, this limiting device consists of a screw 18 inserted in the wall of the run-way adjacent to the valve seat and adapted to be inserted or withdrawn to a greater or less extent according to the conditions of operation and as experience may demonstrate, a lock nut 19 being used to secure the stop in its adjusted position. As indicated in dotted lines in Fig. 3, the valve may be checked at such a distance from the seat as to provide a relatively limited influx of air under the suction stress of the engine, to modify or dilute the mixture, and this control may be varied to a greater or less extent as the requirements of the particular service may indicate.

The only preparation of the ordinary gas engine for the use in connection therewith of the above described economizer consists in drilling and tapping an opening in the intake manifold thereof, and the resistance of the valve to the suction stroke of the engine may be modified and regulated by disposing the run-way in different positions with reference to the vertical, it being obvious that when vertically disposed, the maximum resistance to the seating of the valve at the discharge end of the run-way is afforded, whereas by inclining the run-way to a greater or less extent, such resistance may be reduced.

What I claim is:—

1. A fuel economizing attachment for use in connection with the intake manifold of an explosion engine, the same consisting of a tubular air-intake provided at its discharge end with a valve seat, and a floating valve arranged in the intake, said intake having a valve run-way depressed toward its inlet end and variable in inclination to modify the resistance to the seating action of the valve.

2. A fuel economizing attachment for use in connection with the intake manifold of an explosion engine, the same consisting of a tube having angularly disposed arms forming a continuous valve run-way, depressed toward its inlet end, valve seats at the inlet and outlet ends of said run-way, and a gravity actuated valve mounted in the run-way.

3. A fuel economizing attachment for use in connection with the intake manifold of an explosion engine, the same consisting of a tube having angularly disposed arms forming a continuous valve run-way, depressed toward its inlet end, a gravity actuated valve mounted in the run-way, and an adjustable stop for limiting the approach of the valve toward an outlet seat.

4. An auxiliary air supply device for direct exposure to the suction of an explosive engine, having a tube downwardly directed on a curved line from its outlet end, and a valve operating in the bore thereof, said tube being provided near its discharge end with an outlet seat for the reception of the valve.

5. An auxiliary air supply device for direct exposure to the suction of an explosive engine, having a tube downwardly directed on a curved line from its outlet toward its inlet end, and a valve operating in the bore thereof, said tube being provided near its outlet or discharge end with a seat from which the bore of the tube extends at a slight downward inclination, gradually increasing in pitch as it recedes from the outlet end of the same, means being provided to break the suction when the valve is seated at the outlet end.

This specification signed and witnessed this 2nd day of May A. D., 1917.

WALLACE L. BELL.

Witnesses:
F. G. Bell,
J. S. Dicken.