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R. O. DONNELLY

FUEL REGULATION DEVICE FOR INTERNAL COMBUSTION ENGINES

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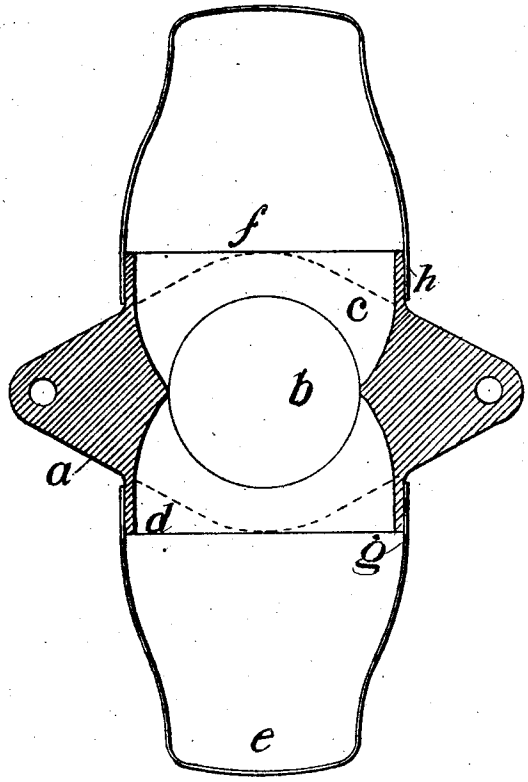


Fig. 1

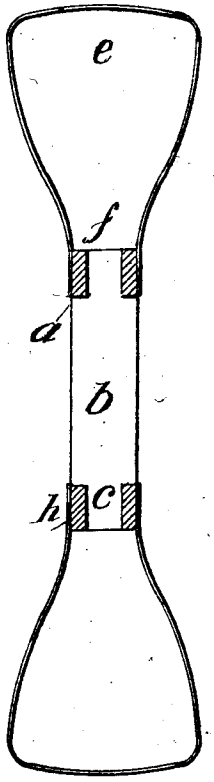


Fig. 2

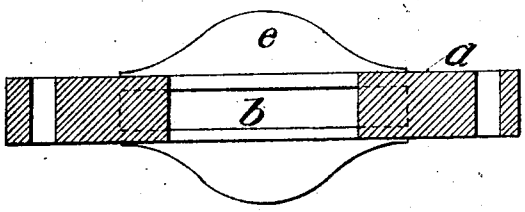


Fig. 3.

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UNITED STATES PATENT OFFICE.

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FUEL-REGULATION DEVICE FOR INTERNAL-COMBUSTION ENGINES.

Application filed June 22, 1922, Serial No. 570,266, and in Canada January 31, 1922.

This invention relates to internal combustion engines and has for its object the perfecting of the flow and distribution of the fuel gases between the carburettor and the cylinder or cylinders.

The devices hitherto known and used which regulate the flow and apportion the gaseous mixture to the various cylinders are admittedly defective for various and obvious reasons, amongst which the following are prominent:—viz. the necessarily varying distance of the several cylinders from the carburettor, the effects incident to which are complicated by the varying times during which the several valves are opened or closed, which action sets up pulsating effects in the stream line of the incoming gases, the effect of these periodic but irregular pulsations is such that one or more cylinders of a set receive much less than their adequate supply of fuel gas, with the obvious consequence that irregularity of the driving moment on the shaft occurs in varying degrees, thus it frequently happens (as shown by an average of indicator cards), that one cylinder may be exerting only sufficient power to overcome its own inertia, if not acting as an actual drag on the other cylinders.

By my invention the injurious pulsating effect above referred to is entirely eliminated or at least greatly reduced.

From a consideration of the foregoing premises, taking for simplicity the case of a single cylinder engine it will be seen that the gases in the induction pipe are suddenly exposed to a partial vacuum in the cylinder every time that the inductive valve on the cylinder is opened and in consequence a sudden flow or rush of gaseous mixture is set up in the pipe which is as suddenly arrested when the aforesaid valve is closed; this surging action of the fuel stream has a very direct effect on the gasoline consumption as well as on the smooth running and regularity of the engine performance as a whole.

The method I adopt in my device for neutralizing the action above referred to, is to insert at some convenient location between the carburettor and the cylinder, such as for instance betwen the carburettor flange and the flange of the manifold intake a lateral supplementary gas chamber which although in communication laterally with the stream line of the fuel gas is not in the direct line of the fuel flow, absorbing excess pressure and supplementing the gas flow at moments of greatest demand; it therefore smooths the variations of flow and thus promotes an equality of distribution between the various cylinders.

In the drawing Fig. 1, shows a cross sectional plan of one embodiment of my invention, and Figs. 2 and 3, sectional elevations of same.

Whilst these drawings show a usual and convenient embodiment of my invention it must of course be recognized that they exhibit but one of many methods of application that must readily occur to a resourceful engineer desiring to utilize the features of the device: in the present instance the application is shown at one of the most usual points, viz:—at the flange of the carburettor and interposed between that flange and the flange of the manifold intake to which the carburettor is usually attached: *a*, is the flange made to match that on the carburettor as above described, but otherwise of special form, the usual circular hole *b*, which coincides with the manifold connection opens out laterally into a shallow cavity *c* on the transverse horizontal center line of the flange, extending beyond the outline of the flange proper to form on each side of the flange a bell-mouthing of elongated elliptical shape *d*, which is thus especially shaped in order to receive—on each side a short metal pipe *e*, which is flattened at *f*, and expanded at *g*, to fit over the said elliptical bell-mouthing, to which it is soldered, brazed, or otherwise secured at *h*.

It will thus be seen that by the construction indicated, a pair of symmetrical lateral chambers are formed which in practise act as a lateral gas cushion, or compensator, which functions as a receiver or absorber during periods of maximum pressure and as a repellent or ejector during the corresponding opposite conditions: thus exerting an equalizing effect on the gas stream after the same

fashion as an air vessel on water pipe line, or a fly wheel on an engine shaft.

What I claim as my invention and desire to secure by Letters Patent, is:

In an internal combustion engine a fuel regulating device for insertion between the carburetter and the intake manifold comprising, a hollow-flange-member of metal having a central bore at right angles to the plane of its flange surfaces, said member having a lateral chamber on each side of the axis of its bore, each said chamber having a constricted outlet to said bore.

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