July 28, 1931. W. MÖBUS 1,816,390

NEBULIZING AND ANTIBACKFIRING DEVICE FOR INTERNAL COMBUSTION ENGINES

Filed Dec. 6, 1927 2 Sheets-Sheet 1

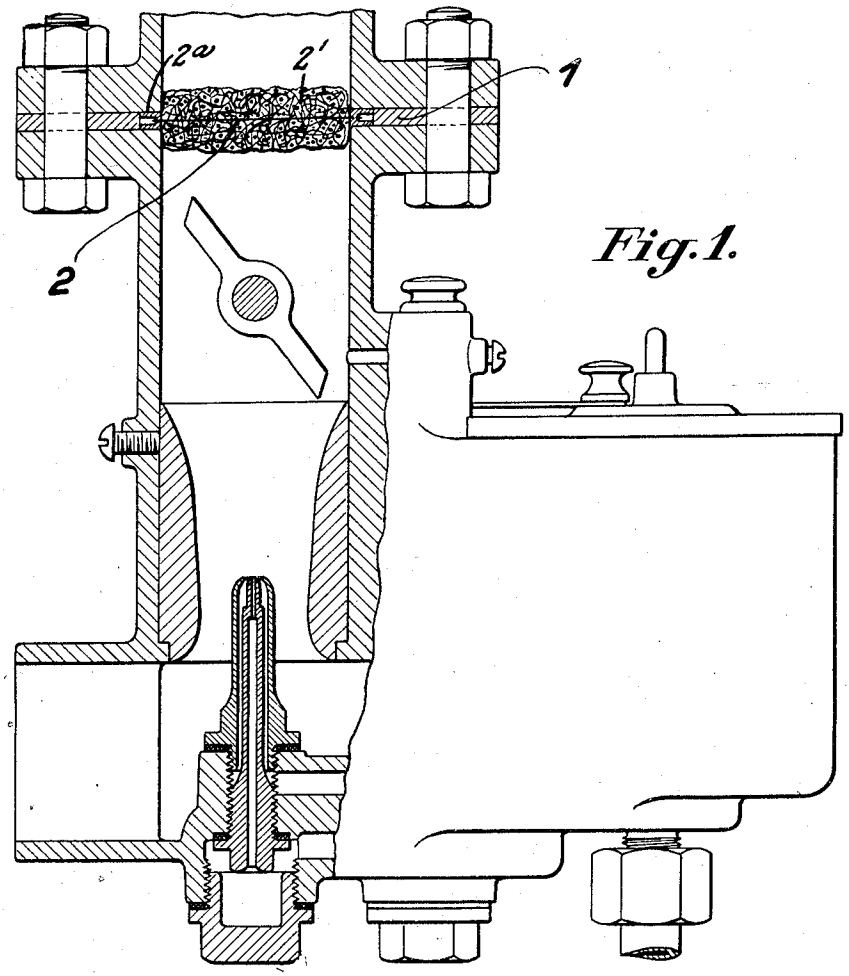



Fig. 1.

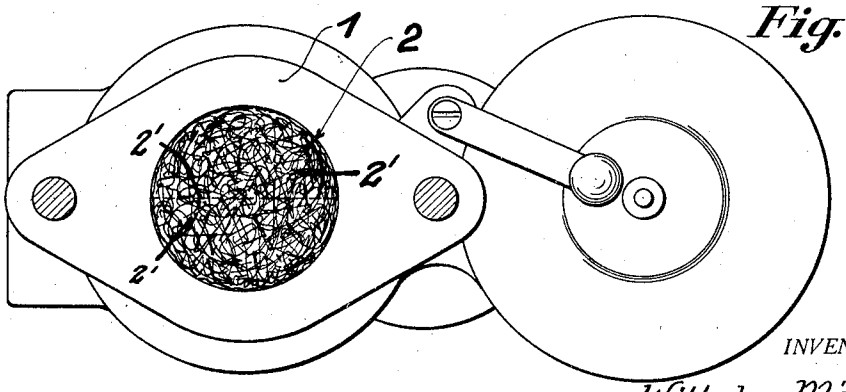



Fig. 2.

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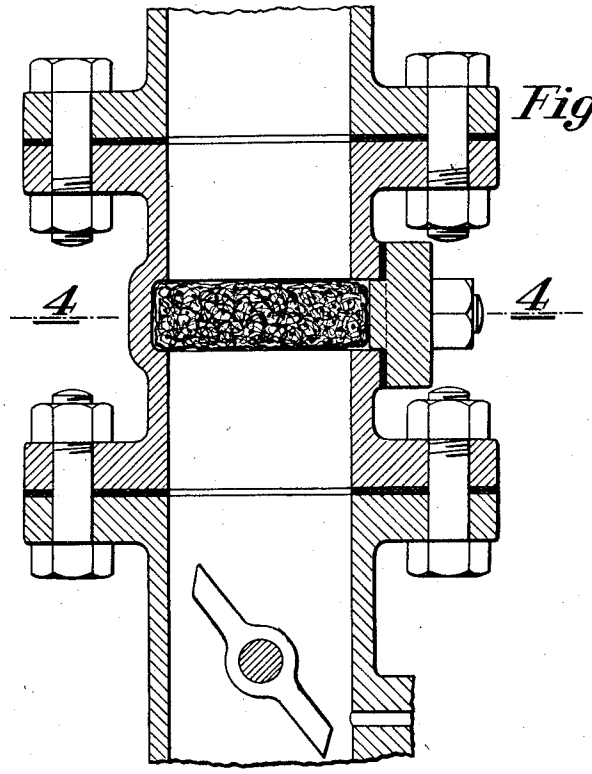



Fig. 3.

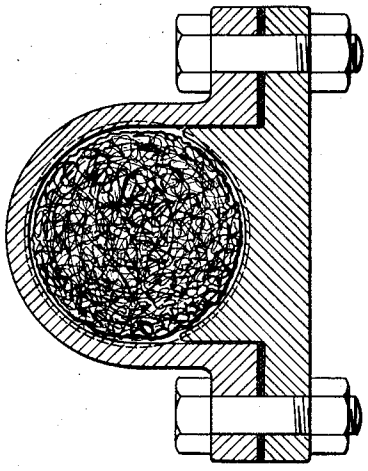


Fig. 4.

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# UNITED STATES PATENT OFFICE

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## NEBULIZING AND ANTIBACKFIRING DEVICE FOR INTERNAL COMBUSTION ENGINES

Application filed December 6, 1927, Serial No. 238,135, and in Germany December 7, 1926.

This invention refers broadly to means for the prevention of backfiring or flashing in connection with internal combustion engines, and it is intended to provide for a greater degree of safety and reliability than generally obtainable with the means heretofore suggested for this purpose, and in view thereof it is one of the important main objects of the invention to prevent the formation of not disintegrated drops of the condensed vapors of the combustion fluid and to counteract the undisturbed passage of the fuel through the interstices of the straining or screening instrumentality, generally employed for these purposes. In explosion and internal combustion engines, particularly those used in connection with automobiles incomplete and irregular ignition frequently causes jets of flame to be projected into the carbureter, thus becoming the cause of accidents and of the destruction of the engines and vehicles by fire. In accordance with the previous art it was proposed to use wire coils or screens or sieves of wire gauze sometimes combined with wads of asbestos, cotton or the like with a view of preventing the fuel gases or vapors from the ignition to reach the carbureter and the mains of the engine, without however absolutely avoiding the formation of drops and the passing through of larger particles of the fuel-and-air mixture by the prevailing draft.

Now in accordance with this invention an irregular accumulation of thin metal wires, a wad or ball of such irregularly mixed wires, and preferably of non-rusting metal is disposed in the conduit for the fuel mixture of the engine between the suction valves and the throttle valve or throttling-slide, so that the fuel mixture or the vapors thereof will be compelled to pass through a multitude of absolutely irregularly arranged broken or zig-zag-shaped or undular interstices, so as to be thoroughly exposed to the heat conducting and absorbing and disintegrating action of the metal wires, and by this means the breaking down and twisting of the device, occurring in the case of sieve-like screens with very fine meshes is likewise avoided.

In a preferred form of construction of the device according to this invention the wad or ball of metal wire is flattened transversely to the direction of flow and by this means the safety against backfiring and the flashing and the consequent occurrence of engine-fires is still further increased.

By means of this invention the additional object is accomplished that the fuel-and-air mixture is submitted to a thorough whirling and mixing action, and is thus rendered more homogeneous than it was possible to produce heretofore, so that, as has been shown by comparative tests, very important economies in fuel are obtained. The safety-attachment of this invention is preferably disposed in the vicinity of the carbureter where the fuel mixture after having passed through the throttling valve or the throttling slide has not yet become sufficiently nebulized or where the mixture has been partly broken up inasmuch as by the new arrangement a thorough disintegration, mixture and vaporization is obtained.

The invention is shown by way of example in connection with the throttling valve and the fuel admitting means of a carbureter in Figure 1 in longitudinal section, and in Figure 2 in top plan view, showing the device in the operative position. Figs. 3 and 4 are similar views showing a modification. In a plate or disc 1 adapted to conform to the shape of the flanges of the conduit the safety-body 2 referred to is mounted which comprises a uniformly thick mat-like mass of irregularly arranged or loosely and irregularly wound and preferably non-rusting metal wires. The ball or wad is preferably flattened and is crossed by other diametrically extending non-rusting tension wires 2′ and securing the mat to a holding ring $2^a$ and preventing any spring-like expansion of the body which comprises a multitude of layers of irregularly arranged and shaped portions of wire arranged in planes perpendicular to each other and latticed haphazardly in each plane to present passages or cells similar to the structure of a sponge through which the gas mixture is caused to pass and becomes very satisfactorily nebulized. The

holding ring 2ª is arranged in an opening in the plate or disk 1 and the wires 2′ pass through the meshes of the mat 2 and serve to hold the mat centered in the opening in the holding ring and to prevent its displacement. These tension wires may be comparatively thin and spaced apart so that they will not in any manner obstruct the flow of the fuel gases.

The device may also comprise a box-like attachment with lateral, tightly closable openings and adapted to be disposed between the connecting flanges, so that the anti-backfire safety body disposed in said box may be controlled and exchanged, whenever desired.

By means of the new instrumentalities described a very thorough nebulizing of the fuel-mixture and an absolutely reliable protection from backfiring will be produced.

It is to be understood that the broad features of the invention, as set forth and illustrated admit of various modifications and changes to better adapt the device to existing conditions, and without deviating from the scope of the invention, as expressed in the appended claim.

I claim:—

In a nebulizing and anti-back-firing device for internal combustion engines, a plate having an opening therein, a holding ring secured to said plate and disposed in said opening, a screen member filling the opening in the ring and projecting beyond both faces thereof, said screen member comprising a substantially flat, circular, uniformly thick mat-like mass of metal wire presenting irregularly shaped portions of wire arranged in planes perpendicular to each other and latticed haphazardly in each plane to provide passages meanderingly arranged in all directions throughout the mass, and tension wires extending diametrically across and secured to the ring and passing centrally through the meshes of the mat and holding said mat against displacement in the opening in the ring.

In testimony whereof I affix my signature.

WILHELM MÖBUS.