B. W. DUNN AND K. MOODIE.

GAS MIXER.

APPLICATION FILED SEPT 10, 1920.

1,430,803. Patented Oct. 3, 1922.

Fig. 1.

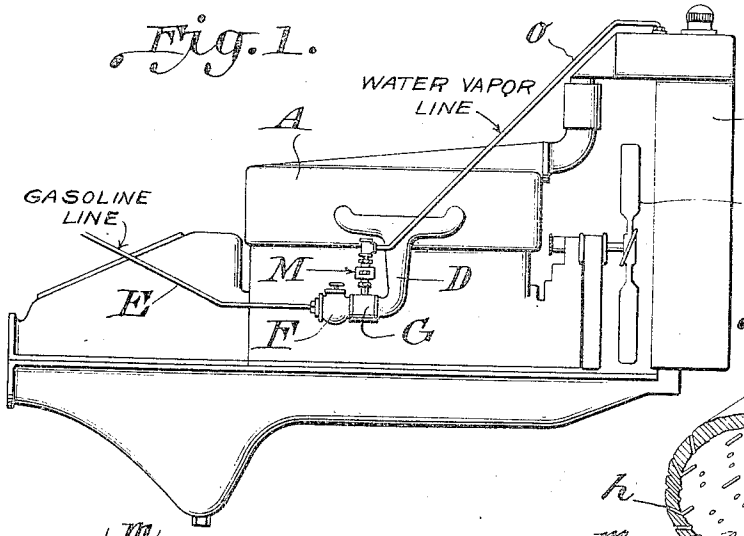


Fig. 4.

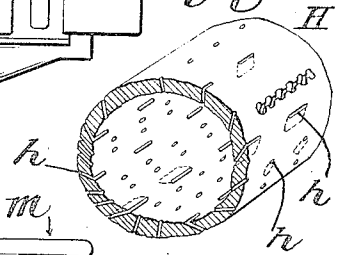


Fig. 2.

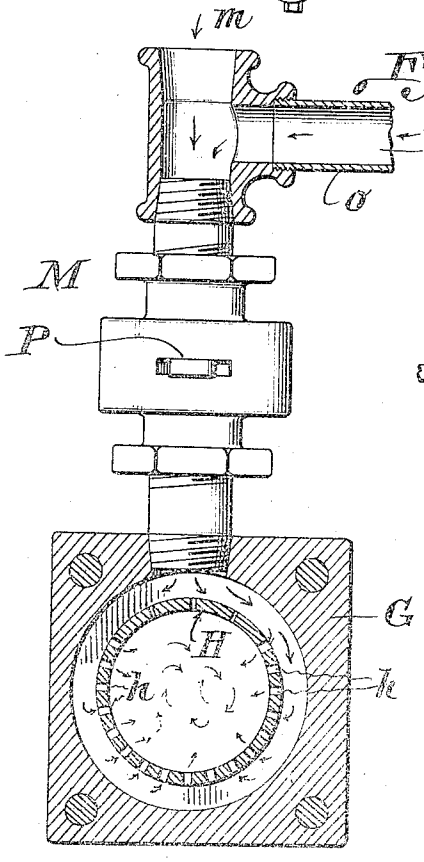
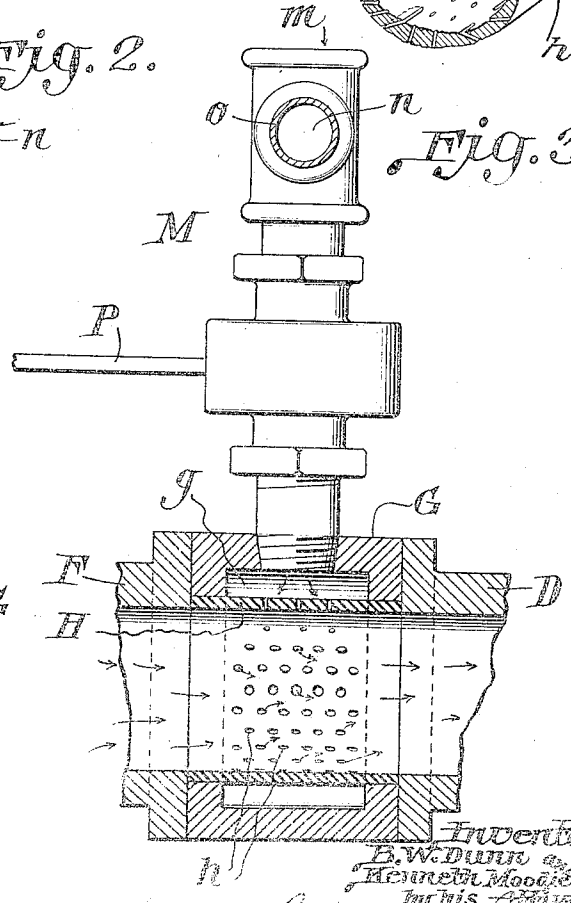


Fig. 3.



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UNITED STATES PATENT OFFICE.

BIRD W. DUNN AND KENNETH MOODIE, OF CALGARY, ALBERTA, CANADA.

GAS MIXER.

Application filed September 10, 1920. Serial No. 409,447.

To all whom it may concern:

Be it known that we, BIRD W. DUNN and KENNETH MOODIE, subjects of the King of England, residing in Calgary, in the Province of Alberta and Dominion of Canada, have invented certain new and useful Improvements in Gas Mixers, of which the following is a specification.

This invention relates to devices for increasing the efficiency of fuel supplied through a carburetter to an internal combustion engine or to a burner for gas or liquid or powdered fuel, and the object of the invention is to so improve devices of this kind that they may be of simple construction and may so completely mix the fuel with air and water vapor that less gas or hydrocarbon vapor is required to provide an efficient explosive mixture for the engine and to effect better combustion of the fuel.

In carrying out our invention we interpose between the carburetter and the burner or point of combustion a mixing device comprising a casing which is connected on one side to the carburetter and one the opposite side to the intake of the combustion chamber. Within the casing there is an annular chamber which surrounds a cylinder formed with numerous small perforations permitting communication between the annular chamber and the interior of the cylinder, which cylinder is connected at opposite ends to the carburetter and to the manifold. The annular chamber is connected to a valve chamber which controls the supply of air and water vapor to the mixer. The arrangement is such that air and water vapor are drawn past this valve into the mixer and introduced in a fine spray to the fuel as it passes through the mixer, the effect being to thoroughly mix the fuel with air and water vapor, which improves its quality.

In the accompanying drawings:—

Figure 1 is a side elevation of a portion of an automobile engine, illustrating how our improvements may be applied.

Figures 2, 3 and 4 are on an enlarged scale.

Figure 2 is a view partly in elevation and partly in section of our improved mixing device.

Figure 3 is a similar view, the section being taken at right angles to that of Figure 2.

Figure 4 shows a modified form of the perforated cylinder employed.

In Figure 1, A indicates an internal combustion engine, B the radiator, C the fan in rear of the radiator, D the intake manifold, and E the pipes supplying gasoline or other fuel to the engine. F indicates a carburetter and G, in Figure 1, indicates our improved mixing device.

The mixing device proper, shown most clearly in Figures 2 and 3, comprises a casing having an annular chamber g surrounding a cylinder H formed with numerous small perforations h by which communication is established between the annular chamber g and the interior of the cylinder H. The mixer is connected on one side with the carburetter F and on the opposite side with the manifold D. The gaseous fuel passes from the carburetter through the mixing device and into the manifold in the manner indicated by arrows in Figure 3.

Air and water vapor are supplied to the mixer through the valve mechanism M. Air enters at m and water vapor enters at n. The pipe o conducts water vapor from the top of the radiator B or other supply.

According to our invention we do not conduct water to the mixer, but water vapor from the radiator or other supply. A valve of any suitable construction is indicated at P and by this valve the amount of air and water vapor entering the mixer may be regulated. The valve may be actuated by any suitable mechanism.

When in operation, the air and water vapor enter at m and n, pass by the valve P, and enter the annular chamber g of the mixer. It will be observed by reference to Figure 2 that the perforations in the upper part of the cylinder H are very much smaller than the perforations in the lower part thereof. In Fig. 2 it will be observed that a part of the cylinder H opposite the admission port for air and vapor is imperforate, that is to say, Fig. 2 shows portions on opposite sides of the middle perforations which are imperforate, these parts being opposite the admission port and air and vapor cannot, of course, enter the cylinder through these parts of the cylinder but is caused to pass around the cylinder. In like manner the perforations disposed on opposite sides of

the middle part of the admission port are few and they are located some distance apart. If there were no perforations whatever in the top of the cylinder H opposite the admission port the apparatus would work well, the incoming air and vapor being caused to pass around the cylinder to the lower portion thereof but we find that it is advantageous to have some perforations in the upper part of the cylinder directly opposite the admission port. This is an important feature of the invention. If the perforations were large or numerous in that part of the cylinder adjacent the inlet the air and water vapor would be at once drawn into the mixing cylinder which would impair the efficiency of the device, but by providing an imperforate part of the cylinder opposite the entrance to the annular chamber, or by making the perforations smaller, or less numerous, the air and water vapor are largely divided into two currents which pass in opposite directions around the cylinder in the manner indicated most clearly in Figure 2, and as these currents of air and water vapor pass around the cylinder, they also pass through the perforations and have the effect of thoroughly mixing the fuel with air and water vapor, which experience has demonstrated materially increases the efficiency of the fuel.

The cylinder H as shown in Figure 3 is of parallel bore, but it may be made of various diameters to suit different conditions. The perforations shown in Figures 2 and 3 are straight or radial but they may approach a tangential or axial and tangential arrangement as indicated in Figure 4 to assist in producing a uniformly progressive whirling or helical movement of the mixture. The perforations may be in the form of narrow slots instead of round holes or a combination of slots and round holes may be employed as also indicated in Figure 4.

We have shown the best way now known to us of embodying our invention, but said invention may be embodied in other forms of apparatus without departing from the spirit of the invention or the scope of the claims.

We claim as our invention:—

1. An auxiliary mixing device to be interposed between a carburetor and a point of combustion comprising a casing having an annular chamber, means for conducting air and water vapor through an admission port into said chamber, a hollow cylinder within the chamber through which fuel passes axially from the source of supply to the point of combustion, a part of said cylinder adjacent said admision port being substantially imperforate, and a part of said cylinder on the opposite side having numerous perforations, whereby the greater part of the entering air and vapor is caused to flow in the chamber around the cylinder and enter the latter through said opposite side.

2. An auxiliary mixing device to be interposed between a carburetor and a point of combustion comprising a casing having an annular chamber, means for conducting air and water vapor through a single admission port into said chamber, a hollow cylinder within the chamber through which fuel passes axially from the source of supply to the point of combustion, a part of said cylinder adjacent said admission port having few perforations, and a part of said cylinder on the opposite side having numerous perforations, whereby the greater part of the entering air and vapor is caused to flow in the chamber around the cylinder and enter the latter through said opposite side.

3. An auxiliary mixing device to be interposed between a carburetor and a point of combustion comprising a casing having an annular chamber, means for conducting air and water vapor through a single admission port into said chamber, a hollow cylinder within the chamber through which fuel passes axially from the source of supply to the point of combustion, a part of said cylinder adjacent said admission port having few perforations, and a part of said cylinder on the opposite side having numerous tangentially arranged perforations, whereby the greater part of the entering air and vapor is caused to flow in the chamber around the cylinder and enter the latter through said opposite side.

In testimony whereof, we have hereunto subscribed our names.

BIRD W. DUNN.
KENNETH MOODIE.