

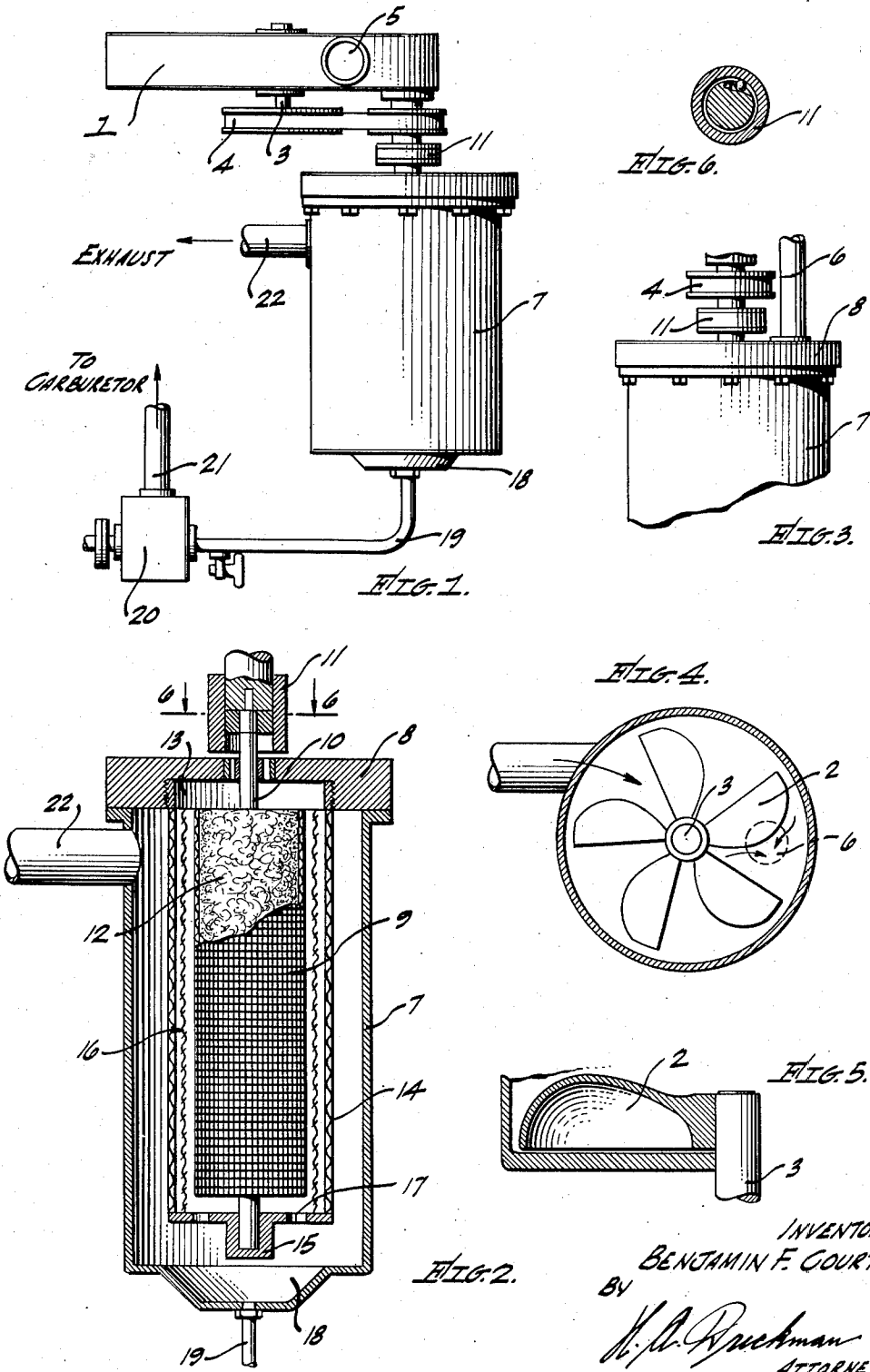
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MOTOR EXHAUST GAS CLARIFIER

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MOTOR EXHAUST GAS CLARIFIER

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2 Claims. (Cl. 183-63)

This invention relates to an exhaust gas clarifier, particularly for internal combustion engines. An object of my invention is to filter the gases coming from the engine and remove both solid and liquid particles from the gas, so that these particles may not be exhausted into and accumulate in the atmosphere.

Another object of my invention is to provide a novel gas clarifier of the character stated, which is caused to rotate by the velocity of the exhaust gases.

Still another object of my invention is to provide a novel gas clarifier in which the liquid particles (unburned gasoline) are accumulated and returned for use of the motor through the carburetor.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

Figure 1 is a side elevation of my exhaust gas clarifier.

Figure 2 is a longitudinal sectional view of the separating and filter element.

Figure 3 is a fragmentary side elevation of the separating and filter element.

Figure 4 is a transverse sectional view of the turbine.

Figure 5 is a fragmentary sectional view of the turbine.

Figure 6 is a sectional view taken on line 6-6 of Figure 2 and showing the clutch drive.

Referring more particularly to the drawing, a turbine 1 includes a bladed rotor 2 rotatably mounted therein. The rotor 2 is mounted on a shaft 3, which shaft extends into and drives the speed reduction drive 4. The turbine 1 includes an intake pipe 5 which is the exhaust pipe of the internal combustion engine (not shown). The exhaust gases move through the pipe 5 under high velocity and impinge upon the blades 2 to rotate the same. The blades 2 are so pitched that the gases are deflected into the outlet 6. A separating and filter element 7 consists of a cylindrical housing closed at the top by a cap or cover 8. The outlet 6 extends through the cover 8 and the exhaust gases are thus carried into the filter element 7. A drum 9 is rotatably mounted within the shell or housing 7 and this drum is mounted on a shaft 10, the upper end of which projects above the cap 8. A clutch drive 11, of the overrunning type, drives the shaft 10 and this type of clutch is usual and well known. The purpose of this type of drive is to permit the drum 9 to continue to spin even though its driving means 1 may stop its rotation. The clutch drive 11 is driven by the gear train 4 so that the turbine 1 will rotate the drum 9 whenever the engine is operating. The walls of the drum 9 are preferably formed of a wire or perforated material, and the drum is filled with a shredded metallic mass, like steel wool, indicated at 12. This mass of shredded steel particles or strands will collect the heavy particles in the exhaust gases as these gases pass downwardly through the fibrous mass 12, and then outwardly through the walls of the drum 9.

The exhaust gas outlet pipe 6 extends through the cap and into the space 13 within the cap 8 and above the drum 9 and the exhaust gases are thus directed down-

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wardly into the top of the drum 9. A secondary cylinder 14 is also mounted within the shell 7 and is suspended from the cap 8. The cylinder 14 preferably screws into the cap 8, thus enabling the cylinder to be removed when necessary. A bearing 15 on the bottom of the cylinder receives the lower end of the shaft 10, thus accurately journaling the drum 9 within the cylinder. A filter bag or pack 16 is positioned within the cylinder 14 and acts to filter out the liquid particles in the exhaust gases. The filter 16 is removable from the cylinder 14 and can be replaced, when necessary. A plurality of drain ports 17 in the bottom of the cylinder 14 permit the liquid particles to collect in the bottom of the shell 7. The walls of the cylinder 14 may also be perforated or formed of screen material so that the gases can pass readily therethrough.

The outer shell 7 may be provided with a sump 18 in the bottom thereof, and a pipe 19 extends from the sump to a pump 20, which picks up any of the accumulated liquids from the bottom of the shell 7 and returns these liquids to the carburetor through the pipe 21. The exhaust gases are expended through the pipe 22 which extends from the shell 7.

In operation the exhaust gases from the engine pass through the exhaust pipe 5 and thence through the turbine 1. These exhaust gases impinge upon the blades 2, causing the blades to rotate and, in turn, rotate the shaft 3. A gear train 4 extends from the shaft 3 to a clutch 11 of the overrunning type. A shaft 10, coupled to the clutch 11, is connected to the drum 9. Rotation of the shaft 10 will thus rotate the drum 9 as long as the engine is operating. The gases, which exhaust from the turbine 1, pass through the pipe 6 and thence into the top of the drum 9 where these gases pass through the steel wool 12 within the drum. The exhaust gases, now moving outwardly from the drum 9, pass through the filter 16. Any liquid particles, are thrown outwardly by rotation of the drum 9, and these particles pass downwardly in the cylinder 14, passing through the port 17 to collect in the sump 18. This sump is formed in the bottom of the outer shell 7 and the shell is spaced from the cylinder 14 so as to provide ample space through which the exhaust gases can move. The exhaust gas, free of solids and entrained liquids, passes outwardly through the pipe 22, while the liquids are withdrawn from the sump 18 by the pump 20 and returned to the carburetor.

Having described my invention, I claim:

1. An exhaust gas clarifier for internal combustion engines, comprising an outer cylindrical shell, a drum positioned within the shell and rotatable therein, means journaling said drum within the shell, the wall of said drum having openings therethrough, external drive means extending to the drum whereby the drum is continuously rotated, a gas exhaust pipe extending into said shell, a gas exhaust outlet pipe extending from said shell, a cylinder fixedly mounted within the shell and surrounding said drum in spaced relation to the drum, a cylindrical filter pad positioned within the cylinder and arranged between the cylinder and the drum, the wall of said cylinder having holes therein to permit gas and liquids to pass therethrough, a sump integrally formed in the shell and arranged in the bottom of the shell, and a pipe extending from said sump to remove materials from said sump.

2. An exhaust gas clarifier for internal combustion engines, comprising an outer cylindrical shell, said shell being open at one end thereof, a cover secured to the shell and enclosing the open end thereof, a drum positioned within the shell, a shaft on which said drum is mounted, means journaling the shaft in said cover, external drive means extending to said shaft whereby the shaft and drum are rotated, a gas exhaust pipe extending through the cover and into said shell, the wall of said drum being

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formed of a mesh material, said drum being filled with a fibrous metal, a cylinder fixedly mounted within the shell and spaced from the wall of the shell and also spaced from said drum, a filter pad positioned within the cylinder and arranged in the space between the cylinder and the drum, said cylinder being formed of a mesh material, an exhaust gas outlet pipe extending from the shell, the lower end of said shell being formed with a space therein defining a sump, the sump being arranged below said cylinder, and a pipe extending from the sump to remove accumulated material therefrom.

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