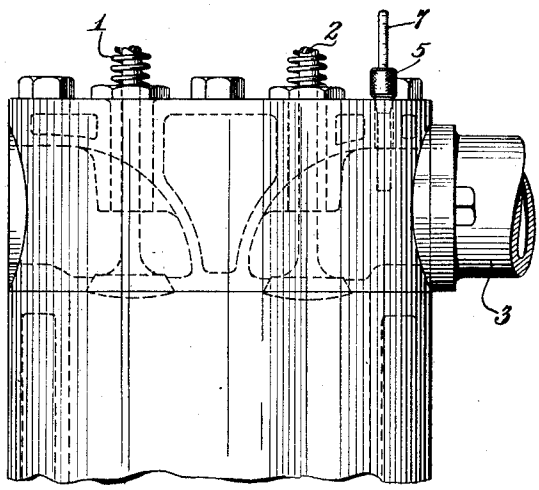
Dec. 20, 1927. 1,653,213

E. J. KATES

ENGINE EXHAUST TESTER

Filed Aug. 22. 1924

Fig. 1.



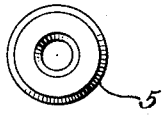
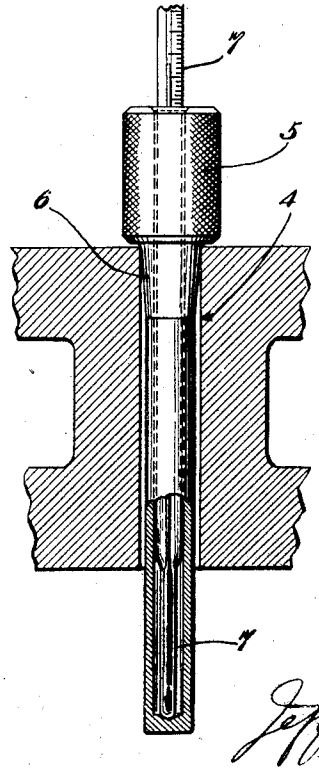


Fig. 2.

Fig. 3.



Edgar J. Kates INVENTOR

BY Jeffery, Kimball & Eggleston

ATTORNEYS

Patented Dec. 20, 1927. 1,653,213

UNITED STATES PATENT OFFICE.

EDGAR J. KATES, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO DE LA VERGNE MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ENGINE-EXHAUST TESTER.

Application filed August 22, 1924. Serial No. 733,483.

This invention provides a simple and inexpensive means for testing the condition of the exhaust gas of internal combustion engines and consists in an attachment to the engine, as below described, which is capable of application to internal combustion engines of various designs, and by means of which the condition of the internal combustion can be readily determined, being especially useful in multi-cylinder engines wherein it greatly facilitates the adjustment of the injection or fuel supply to produce equalization of load among the various cylinders, as will be understood by those skilled in this art.

The accompanying drawing illustrates the preferred form of the invention, Fig. 1 representing the head portion of an engine cylinder and Figs. 2 and 3 larger scale views, plan and elevation respectively, of the attachment.

In the engine conventionally illustrated, the inlet valve is marked 1, the exhaust valve 2 and the exhaust pipe 3. The usual water-cooled cylinder head is provided with a hole 4 leading through the jacketed space into the exhaust gas passage, as close as possible to the exhaust valve itself. This hole is normally closed by a tubular plug having a knurled head 5 and a closed inner end which projects through the hole into the path of the exhaust gas. For a distance just below the knurled head, the plug shank is tapered, as indicated at 6, to make a gas-tight fit in the outer end of the hole, closing it completely. The hollow plug forms a well subject to the temperature of the exhaust gas and is intended and adapted to receive the bulb end of a thermometer, such as indicated at 7. With the thermometer so placed the temperature of the exhaust can be easily observed. By removing the plug the exhaust gas will issue from the hole so as to be observable as to color, sound and smell, thereby also giving an index, useful to those skilled in the art, as to the character of the combustion occurring in the engine cylinder. The diameter of the plug inward of its tapered part, is considerably smaller than the hole through the engine wall, thereby forming an annular gas space which insulates the plug from the surrounding metal and thereby minimizes escape of heat from the inner end of the well, correspondingly enhancing the accuracy of the temperature indication.

The exact point of location of the hole 4 is of course accommodated to the engine design and may be located at any convenient point adequate for producing the indicia referred to, in the head, or exhaust piping, as desired. In multicylinder engines one such plug is used for each cylinder, the single thermometer serving for all of them. When placed in a vertical position as indicated, the weight of the plug alone is sufficient to keep it in place against the internal gas pressure and it is accordingly very quickly removed when it is desired to allow the exhaust to escape.

I claim:

1. An engine testing device comprising the combination with an engine having an exhaust passage the wall of which has a gas test aperture, of a tubular closure plug having a quickly detachable connection with the wall of the aperture and adapted to contain a thermometer, a head on the plug upstanding away from the wall of the aperture and forming a hand grip by which the plug may be detached from the engine without the use of tools whereby the quality and temperature of the exhaust gas can be simultaneously ascertained.

2. An engine testing device as claimed in claim 1, in which the weight of said plug exceeds the exhaust pressure thereagainst, whereby the plug is held in contact with the wall of the aperture by gravity only.

3. An engine testing device as claimed in claim 1, in which the plug is provided with an aperture-closing seat adapted to engage the wall of the aperture adjacent the outer end thereof only, the plug otherwise being spaced from the wall of the aperture.

In testimony whereof, I have signed this specification.

EDGAR J. KATES.