Aug. 2, 1932. E. E. SMITH 1,869,718

VISCOSITY INDICATING DEVICE

Filed Jan. 31, 1931

Fig. 1

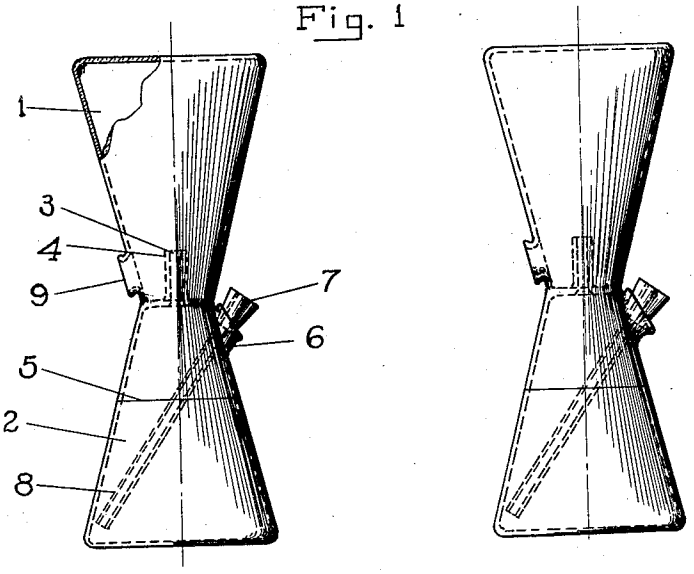
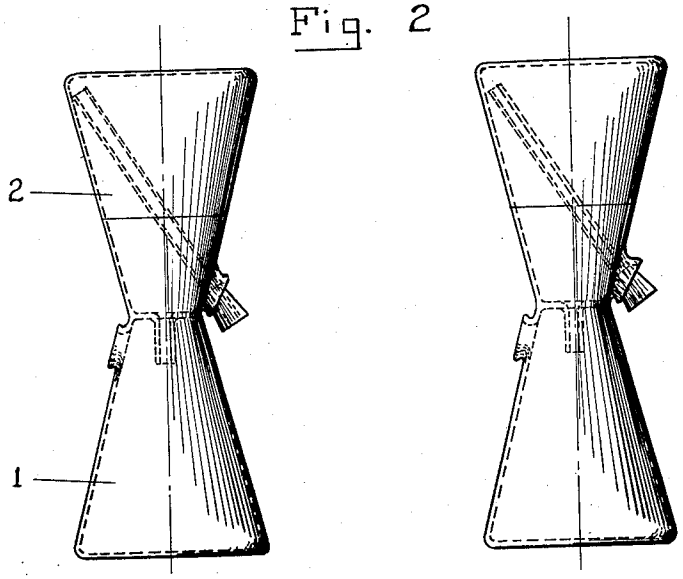


Fig. 2



INVENTOR
EMORY E. SMITH
BY
Crosby R. Gauthier
ATTORNEY

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UNITED STATES PATENT OFFICE

EMORY E. SMITH, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO LEON LIVINGSTON, OF SAN FRANCISCO, CALIFORNIA

VISCOSITY INDICATING DEVICE

Application filed January 31, 1931. Serial No. 512,586.

This invention relates to devices for indicating the viscosity of lubricating oil and has to do more specifically with the matter of determining the relative viscosity of used oil—as compared with unused oil of the same kind.

Heretofore there has not been readily available to motorists any dependable means of determining the condition of their motor lubricant, and, in consequence, the best they have been able to do has been to follow rather blindly the more or less arbitrary recommendations of automobile and oil manufacturers, namely, to drain and refill crank cases every five hundred or thousand miles, as the case might be—and, in addition maintain the proper oil level.

While such recommendations may, perhaps, be reasonably sound with respect to the majority of cars, they are certainly not well founded in many specific cases.

In a particular motor the oil level may be well maintained without periodic additions for more than the prescribed mileage, but this may be due to gasoline dilution offsetting oil losses. In another case oil leakage may necessitate frequent additions in order to maintain the desired level.

It is manifest that in the latter instance the condition of the oil after a given mileage should be better than in the first case. But even though the motorist may have been aware of the aforementioned determinant factors, he has been able to do no more than guess as to the mileage he could safely make before draining and refilling.

This invention has for its object to facilitate the making of relatively accurate viscosity tests whereby the condition of used oil can be quickly determined—thereby eliminating the former guesswork and enabling individual motorists to know to a reasonable certainty when and how often their crankcases should be drained and refilled.

The aforesaid object is accomplished by means of comparative flow tests—the relative viscosities of used and unused oils of the same kind being visibly demonstrated so that the motorist can see for himself to what extent the viscosity of his used oil may have become impaired.

The device to be described as representing the preferred embodiment of this invention is in the nature of a viscosimeter—but not being intended for making viscosity measurements of a laboratory precision, it is thought that to call it a viscosimeter is not entirely appropriate. It will be referred to simply as a viscosity indicating device.

The device of this invention is somewhat similar in outward appearance and related in function to that described in U. S. patent to Larson No. 1,635,281; but as will be pointed out hereinafter, it is distinguished from that of Larson in several important respects.

Referring to the drawing which accompanies this specification:

Fig. 1 depicts a pair of viscosity indicating devices—identical in every respect.

Fig. 2 shows the same pair of devices inverted.

Referring first to Fig. 1, each of the two identical devices is shown in position to receive oil preparatory to the making of comparative tests.

Each device is a unitary element made preferably of glass, and, in general, of the form of an hour glass. There are two similar compartments designated 1 and 2 respectively and these are connected through an orifice 3 extending through a nozzle-like tube 4 projecting into the compartment 1.

Compartment 2 is provided with a gauge line 5 for indicating the level to which it should be filled with oil. There is an aperture at 6 for filling purposes—this being closed with a stopper 7 through which a glass vent tube 8 extends from the outside to a point near the bottom of compartment 2 as illustrated in Fig. 1.

Compartment 1 has an opening 9 to admit air and which also facilitates cleaning.

In operation one of the devices is filled through aperture 6 to the gauge line 5 with new oil while the other device is similarly filled with used oil taken from the crankcase. The stoppers 7 are then put in place. The two devices hold identical quantities of oil when filled to the gauge lines 5.

If the used oil is warm, as is likely to be the case, both devices are stood in a pan of

cold water and allowed to cool until it may be certain that the temperatures of their contents have become equalized. This is essential because the viscosity of lubricating oil varies with temperature.

The two devices are then inverted simultaneously as illustrated in Fig. 2, and the oil in both immediately starts flowing through the orifices 3. These orifices are of precisely the same diameter and length, and consequently if the oils are of the same viscosity they will flow from the upper to the lower compartments in exactly the same time. If the viscosity of the used oil is materially impaired that fact will be visibly apparent from the more rapid flow thereof.

The motorist may thus judge from his own observations whether he should drain and refill the crankcase; or, alternatively, he may follow recommendations predicated upon relative flowing time.

The function of the vent tube 8 is to permit ingress of air to compartment 2 when the device is in the position shown in Fig. 2. This permits the oil to flow freely while avoiding the necessity of providing stoppers at the lower ends (Fig. 1) which would have to be pulled out simultaneously when the devices are inverted.

By virtue of the nozzle-like tube 4 (see Fig. 2) projecting into compartment 1, the oil flows in a stream to the bottom of compartment 1 and consequently does not adhere to the glass sidewall and obscure the view.

The advantages inherent in the device described over what is disclosed in the prior art may be appreciated by comparing it with that of the aforementioned Larson Patent No. 1,635,281.

In using the Larson device the oils are poured simultaneously through orifices 4 (instead of being put first into the lower compartment as in the present invention), and they run down the inner surfaces of the lower compartments obscuring the visibility of the oil level. This deficiency, as well as the necessity of the operator pouring oil from two receptacles at the same time, is obviated by the present invention.

It will be apparent that the vent tube 8 does not of necessity extend through the stopper 7, but may, if desired, extend through some other part of the receptacle wall and be sealed therein. The construction shown, however, is preferred, since it facilitates cleaning the vent tube in case of stoppage. The point of exit of the vent tube should, manifestly, be above the gauge line 5 (Fig. 1), since otherwise the oil would be likely to escape therethrough.

It will be noted that through the use of the vent tube as illustrated there is avoided the alternative of providing a stopper in the bottom of compartment 2 which would have to be withdrawn immediately upon the device being inverted. This would not only be inconvenient but otherwise undesirable, because it would somewhat complicate the design in that the stopper could not be allowed to project below the base line.

The term "invert" and its derivatives as used in this specification and the appended claims is to be construed as meaning:—to turn upside down. It is not to be given its broader dictionary definition.

What is claimed is:

1. A device for indicating viscosity comprising two connected receptacles having an orifice which provides communication therebetween, said device being designed to stand alternately on two opposite ends whereby said receptacles are disposable one above the other alternately, one of said receptacles, when in its lower position, being adapted to receive a charge of oil, the viscosity of which is to be observed, and a vent tube extending from within the lower part of said last mentioned receptacle to an exterior point above the level of the oil charge.

2. A device for indicating viscosity comprising two connected receptacles having an orifice which provides communication therebetween, said device being designed to stand alternately on two opposite ends whereby said receptacles are disposable one above the other alternately, one of said receptacles having a filling aperture and being adapted, when in its lower position, to receive through said filling aperture a charge of oil, the viscosity of which is to be observed, a stopper closing said filling aperture, and a vent tube extending from within the lower part of said last mentioned receptacle and through said stopper to an exterior point above the level of the oil charge, said vent tube being removable with said stopper.

3. A device for indicating viscosity comprising two connected receptacles, said device being designed to stand alternately on two opposite ends whereby said receptacles are disposable one above the other alternately, an orificed nozzle interconnecting said receptacles and providing communication therebetween, one of said receptacles having a filling aperture and being adapted, when in its lower position, to receive through said filling aperture a charge of oil, the viscosity of which is to be observed, a stopper closing said filling aperture, and a vent tube extending from within the lower part of said last mentioned receptacle and through said stopper to an exterior point above the level of the oil charge, said vent tube being removable with said stopper, said nozzle projecting into the upper of said receptacles when said device is standing in position to be filled.

In testimony whereof, I have hereunto set my hand.

EMORY E. SMITH.