

UNITED STATES PATENT OFFICE.

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VISCOSIMETER.

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To all whom it may concern:

Be it known that I, LOUIS L. TIFFANY, a citizen of the United States, residing at Ashmont, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Viscosimeters, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in devices for measuring the viscosity of fluids, such as lubricating oils and the like, and it is an object of the invention to provide a device of this general character having novel and improved means whereby the viscosity of a lubricating oil or other fluid may be accurately determined in seconds.

Another object of the invention is to provide a novel and improved device of this general character comprising two receptacles, one of which is adapted to contain a master fluid and the second receptacle to contain the fluid to be tested, together with a scale or other indicating means common to both of the receptacles whereby may be readily determined the differences, if any, in similar members passing downwardly through the master fluid and the fluid to be tested, thereby determining the viscosity of the fluid to be tested.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved viscosimeter whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in elevation illustrating a device for testing the viscosity of fluids constructed in accordance with an embodiment of my invention;

Figure 2 is a view in top plan of the device as disclosed in Figure 1;

Figure 3 is a fragmentary sectional view taken through one of the testing receptacles

and the heavy cylindrical member arranged therein; and

Figure 4 is a view in top plan of the structure illustrated in Figure 3.

As disclosed in the accompanying drawings, B denotes a body of wood or other suitable material and which is herein disclosed as flat in form. One end portion of the body B at its transverse center is provided with the handle H whereby the same may be readily held or manipulated as desired.

The body B is provided with a plurality of open ended slots 1, herein disclosed as four in number, with the open ends thereof remote from the handle H. Snugly fitting in the side or end slots 1 are the tubes 2 of brass or other suitable material, said tubes being of a length to extend beyond the open ends of the slots. The outer ends of the tubes 2 are closed by the removable stoppers 3.

One of the tubes 2 is adapted to hold a hydrometer and the second of said tubes 2 to hold a swob, both of which being of particular advantage in connection with an operation for testing the viscosity of fluids such as oil and the like but which in themselves form no part of my present invention.

Snugly engaged within the intermediate slots 1 are the tubes 4, the walls of which are of transparent material, preferably glass. These tubes 4 are in duplicate, that is to say, of the same length and of the same diameter inside and out. The inner end of each of the tubes 4 is preferably closed or sealed by a cork disc 5 or the like. Associated with the tubes 4 are the plugs or members 6 of duplicate construction and of the same weight each of said members being heavier than the liquid to be measured.

When it is desired to test the viscosity of a lubricating oil or other fluid, a master oil or fluid, that is, a fluid of which is positively known the correct viscosity in seconds, is placed in one of the tubes 4, while in the second tube 4 is placed the oil or fluid to be tested. The oil or fluid in both of the tubes is of the same amount and temperature. A plug or member 6 is then placed in each of the tubes 4 and the difference in time required by the plugs in passing downwardly through the fluid for a given distance is the

means whereby may be determined the viscosity of the oil or other fluid being tested.

Each of the plugs or members 6 has drilled therethrough at its axial center a bore or opening 7, the extremities of which are flared, as at 8, to facilitate the flow of fluid therethrough. This weighted member or plug snugly fits within the coating tube and is provided in its periphery with a series of circumferentially spaced grooves or channels 9 extending entirely along the plug or member 6 and open at their opposite ends. These grooves or channels 9 are to facilitate the passage of the oil or fluid as the plug or member 6 moves downwardly.

Carried by the body B and positioned between the tubes 4 is an indicator 10, herein disclosed as a scale of linear measure and indicating a distance of three inches.

The plugs 6 before being employed in connection with my device are first thoroughly tested in alcohol or gas to see if each of said plugs moves exactly the same distance in the same time.

In the use of my improved device, with a master oil of a viscosity of 400 seconds it requires four minutes for the plug 6 to travel two inches. If the plug in the tube containing the oil to be tested travels three inches in four minutes time, this clearly indicates that this plug travels fifty per cent faster than the plug associated with the master oil so that the viscosity in seconds will be 500 seconds or showing a fluid friction of 100 seconds greater than the master oil.

Associated with each of the tubes 4 is a thermometer 11 to indicate the temperature of the oil within the tube and which is of particular advantage as the oils in both tubes, during a test, must be of the same temperature as otherwise there will be a dif-

ference in the fluidity of the oils. Each of the thermometers 11 is cemented or otherwise fixed to a stopper or cork 12 which fits tightly within a tube 4 to prevent leakage.

The tubes 2 and 4 may be held in applied position relative to the body B in any desired manner but as herein disclosed I employ a band 14 secured to each side face of the body B and straddling or bridging the containers or tubes 2 and 4 whereby the same are effectively held in working position.

From the foregoing description it is thought to be obvious that a viscosimeter constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:

A device of the class described comprising a body, a pair of tubes carried thereby, said tubes having their walls transparent and said tubes also being of the same dimensions, and heavy cylindrical members snugly fitting within each of the tubes, said members being of duplicate construction and of the same weight, each of said members having grooves produced in their peripheries, the ends of the grooves being open.

In testimony whereof I hereunto affix my signature.

LOUIS L. TIFFANY.