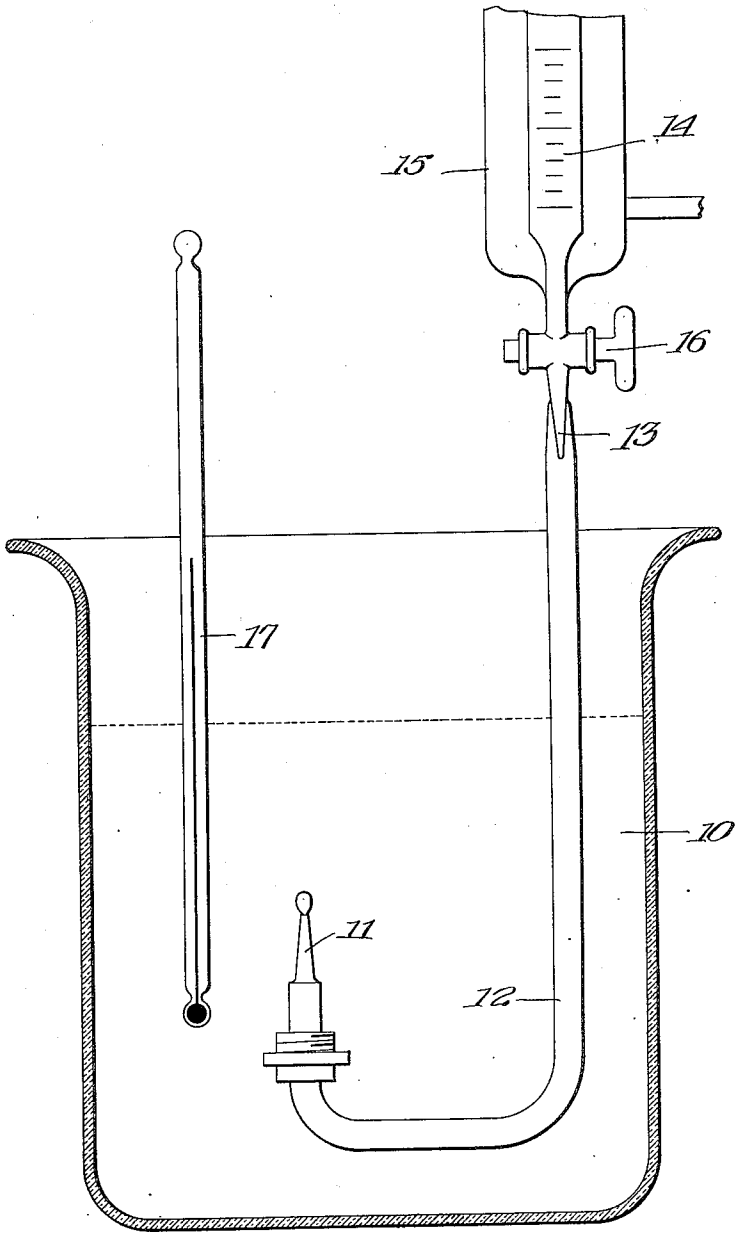
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LUBRICATING OIL

Filed April 23, 1928



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UNITED STATES PATENT OFFICE

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LUBRICATING OIL

Application filed April 23, 1928. Serial No. 272,321.

This invention relates to improvements in lubricating oils and particularly to such oils as are used in connection with hydrostatic lubricators.

It has been found that various oils of similar lubricating properties give drops of considerably varying sizes under the same conditions. The drop size is apparently dependent upon the origin of the oils and the refining treatment to which they have been subjected. This variation of drop size necessitates frequent adjustments of the lubricator if excessive waste of the oil is to be avoided and satisfactory lubrication insured.

I have now found that the drop size may be controlled within wide limits and substantial uniformity may be attained with oils of various origins, by adding thereto relatively small quantities, generally less than 1%, of sperm oil.

The invention will be illustrated in detail with reference to oils intended for the lubrication of valves at high temperatures, but it will be understood that it is not limited to such oils, since other lubricating oils may be similarly modified. Such lubricating oils usually contain a substantial quantity of a fatty oil such as lard oil.

Before proceeding with the description of the invention, it is necessary to describe a suitable method and apparatus for determining drop size of such oils under conditions approximating those under which the oil is used. Such an apparatus is diagrammatically illustrated in the accompanying drawing.

Referring to the drawing, 10 is a beaker for containing water in which a Nathan lubricator tip 11 of 0.046 inches internal diameter is immersed and directed upwardly. The tip 11 is connected by a tube 12 to the discharge point 13 of a burette 14, which is surrounded by a steam jacket 15 so that its contents may be maintained at standard temperature. The burette 14 comprises a valve 16 for the purpose of controlling the rate of flow from the burette. 17 represents a thermometer, the bulb of which is immersed in the water in the beaker 10. Suitable means, not shown, are provided for maintaining the beaker 10 at a desired temperature.

In using the apparatus described, the water in the beaker 10 is maintained at a standard temperature, for example, 180.5° F.± 0.5° and steam at 205° F. is passed through the jacket 15. The valve 16 is regulated so that a certain number of drops are formed per minute at the discharge point of the tip 11. The point of the tip 11 is kept free from grease so that only the internal diameter is effective. From the number of drops and the amount of oil passing from the burette in a certain time, the volume of each drop can be readily calculated. It is found that the volume of the drops increases with the rapidity with which they are formed. Therefore, it is necessary to control carefully the rate at which the drops are formed, in order to compare various oils and the effect of various additions.

The invention will be described by referring to the improvements of certain specific lubricating oils, with reference to a standard lubricating oil of satisfactory properties and drop size. For example, a satisfactory super heat valve oil suitable for use on locomotives and steam engines is constituted by adding to Pennsylvania cylinder stock about 5% of prime lard oil. Lubricating oil derived from cylinder stock from Mid-Continent crude and containing about 5% of prime lard oil has equally satisfactory lubricating properties but, under the same conditions has a drop which is 20 to 30% larger. It is found that the size of such drop may be reduced to, or below that of the standard oil, by adding thereto suitable quantities, generally less than 1% of sperm oil.

In the following table are given results

obtained with the oils with the apparatus and under the conditions described above:

Lubricating oil	Volume of drops in CCs.		
	7 drops per min.	11 drops per min.	15 drops per min.
Pennsylvania cylinder stock, 5% lard oil	0.111	0.113	0.114
M. C. cylinder stock, 5% prime lard oil	0.132	0.136	0.142
M. C. cylinder stock, 5% lard oil and sperm oil 0.25% (by volume)	0.113	0.118	0.124
M. C. cylinder stock, 5% lard oil and sperm oil 0.50% (by volume)	0.104	0.110	0.114

From the foregoing it is readily understood that the drop size can be controlled as desired within wide limits, by the addition of suitable small quantities of sperm oil thereto.

Although the present invention has been described in connection with the details of specific examples, it must be understood that the invention is not intended to be limited to said details except in so far as included in the accompanying claims.

I claim:

1. The method of controlling the drop size of petroleum lubricating oils which consists in adding thereto not more than about 1% of sperm oil.

2. A lubricating oil comprising a petroleum lubricating oil and not more than about 1% of a sperm oil.

3. The method of controlling the drop size of petroleum cylinder stocks which consists in adding thereto less than 1% of sperm oil.

4. A lubricating oil comprising a petroleum cylinder stock and less than 1% of sperm oil.

5. A lubricating oil comprising a petroleum lubricating oil, a fatty oil and not more than 1% of sperm oil.

6. A lubricating oil comprising about 95% of petroleum cylinder stock, about 5% of lard oil and less than 1% of sperm oil.

7. A lubricating oil comprising a petroleum cylinder stock, and not more than .50% of sperm oil.

8. A lubricating oil comprising a petroleum cylinder stock, a fatty oil, and not more than .50% of sperm oil.

In testimony whereof I have hereunto set my hand this 12th day of April, 1928.

EDWARD N. ROBERTS.