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HERBERT H. DOW, OF MIDLAND, MICHIGAN, ASSIGNOR TO THE DOW CHEMICAL COMPANY, OF MIDLAND, MICHIGAN, A CORPORATION OF MICHIGAN

LUBRICANT

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The present invention relates to the art of lubrication and has particular reference to lubricants for use under conditions of high temperature.

Many petroleum base lubricants have been compounded and tested for use under conditions of high temperature, particularly for the lubrication of steam cylinders, valve stems, piston rod packing, and the like, used in connection with the generation of power from high pressure steam. When steam having a temperature approximating 600° F., or above, is used, available liquid lubricants are either volatile or are decomposed causing the lubricated surfaces to become sticky or to foul up with carbonized material. Such action is frequently followed by injury to the bearing surfaces and interferes with the smooth action which it is the office of the lubricant to insure. Cylinder oils, in general, exhibit deficiencies of lubricating power when employed under temperature conditions of the order above indicated, which temperatures are becoming more and more common in the use of steam for power generation and the like.

It is the object of my invention to provide a superior form of lubricant suited for use in connection with high temperature steam, particularly at temperatures above 600° F. where lubricating difficulties are met.

I have discovered that diphenyl oxide, which has a boiling point approximating 500° F. at 1 atmosphere pressure and is a fluid above approximately 80° F., has lubricating properties at all fluid temperatures and is free from decomposition and carbonizing complications at temperatures as high as 700° F. and is even so free from such troubles above that temperature that its use as a lubricant is indicated for still higher ranges of temperature. Even at 850° F. the rate of decomposition is very slow and such decomposition as occurs interferes very little with its lubricating power.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail but several approved combinations of ingredients embodying my invention, such disclosed means constituting, however, but several of various forms in which the principle of the invention may be used.

My invention consists then in the substitution of diphenyl oxide for all or a part of the cylinder oil customarily used, or its use in place of cylinder oil, where the latter may not be employed. I have found further that when even so small a proportion as 1 pint of diphenyl oxide is added to a gallon of cylinder oil the consumption of the oil in an engine operating at around 600° F. steam temperature may be cut to a quantity approximating 50% of that necessary when no diphenyl oxide is used and that the lubrication is smooth and satisfactory.

If a larger proportion of diphenyl oxide be employed, than above stated, the consumption of oil may be still further reduced and the diphenyl oxide may be completely substituted for the oil if desired.

Diphenyl oxide, being unacted upon at the temperature of decomposition of customarily used lubricating oils, acts when admixed therewith, to dissolve the tarry or viscous products of decomposition and to maintain fluidity and lubricating character of the mixture. It is further soluble or miscible in all proportions with petroleum base lubricating or so called cylinder oils.

Diphenyl oxide is insoluble in water and may be recovered from the condensate or it may be returned to the boiler with the condensate. No deleterious action has been observed in the engine or in the boiler.

Instead of diphenyl oxide I may use diphenyl, naphthalene, pyrene, picene, phenanthrene or the like suitable high boiling organic compound immiscible with water. I may further employ any of the above as such or in combination with petroleum or other lubricating oil or I may employ mixtures of one or more thereof with or without petroleum or other lubricating oil.

Other modes of applying the principle of my invention may be employed instead of those explained, change being made as regards the materials employed, provided the ingre-

dients stated by any of the following claims or the equivalent of such stated ingredients be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A lubricant comprising cylinder oil with which has been admixed diphenyl oxide.

2. A lubricant adapted for high temperature usage, which comprises an oil and diphenyl oxide.

3. A lubricant adapted for high temperature usage, which comprises a petroleum lubricating oil and diphenyl oxide.

4. A lubricant comprising cylinder oil and diphenyl oxide in proportion of at least 1 pint of the latter to a gallon of the cylinder oil.

5. A composition of matter which comprises an oil, diphenyl oxide, and diphenyl.

6. A composition of matter which comprises an oil and diphenyl oxide to which has been added at least one of the compounds diphenyl, naphthalene, pyrene, picene, phenanthrene.

HERBERT H. DOW.