

UNITED STATES PATENT OFFICE

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HIGH TEMPERATURE LUBRICANT

No Drawing.

Application filed July 13, 1929. Serial No. 378,181.

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

5 Many petroleum base lubricants have been prepared and tested for use under conditions of high temperature, particularly for the lubrication of internal combustion engines, steam cylinders, valve stems, piston rod
10 packing, and the like uses in connection with the generation of power. When steam having a temperature approximating 600° F., or above, is used, available liquid lubricants are either volatile or suffer decomposition 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
20 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
25 more common in the use of steam for power generation and the like. In the case of internal combustion engines, cylinder lubrication has been accompanied by carbonization and its attendant troubles.

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

35 I have discovered that diphenylene oxide, which has a boiling point of 287° to 288° C. at one atmosphere pressure and is fluid above 80° to 81° C., has admirable lubricating properties at all fluid temperatures. It is extraordinarily free from decomposition and carbonizing complications at temperatures as high as 1000° F. making it admirably suited for use in whole or in part as a lubricant for surfaces at high temperatures.

45 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 several approved combinations of in-

gredients embodying my invention, such disclosed means constituting, however, but several of the various ways in which the principle of the invention may be used.

My invention consists, then, in the substitution of diphenylene oxide for all or a part of the cylinder or motor oil or other high temperature lubricating oil customarily used, or in its use in place of such cylinder, motor or lubricating oil where the latter may not be employed. I have found that the addition of even a minor proportion of diphenylene oxide to such oils reduces markedly the consumption thereof in reciprocating engines, and the like, operating under high temperature conditions such as are encountered when superheated steam is employed, particularly when such temperature exceeds 600° F., at and above which temperature lubricating oils are not fully satisfactory.

Diphenylene oxide, being unacted upon at the temperature of decomposition of available 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, furthermore, soluble or miscible in all proportions with petroleum base motor oils, lubricating oils, or so called cylinder oils.

The addition of as much as one pint of diphenylene oxide to the gallon of cylinder oil used in a reciprocating engine taking steam at 600° F. and above, will reduce consumption of such oil 50 per cent or more; larger additions will reduce such consumption still more, and complete substitution will provide a non-decomposable lubricant of high merit.

Diphenylene oxide affords a piston lubricant of great merit for internal combustion engines in which it may be used in a variety of ways. It may be used alone as crank case oil, or in admixture with the lubricant, such as petroleum base oil. It may be injected into the cylinder directly or along with other lubricant. Again it may be added in very minor proportions uniformly or occasionally to the fuel, and be carried by it to the surfaces to be lubricated.

Diphenylene oxide is insoluble in water and may be recovered from the steam conden-

sate or it may be returned to the boiler with the condensate. No deleterious action has been observed in the engine or in the boiler.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the materials employed, provided the ingredients stated by any of the following claims or the equivalent of such stated ingredients be employed.

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

1. A lubricant consisting of diphenylene oxide.

15 2. A lubricant comprising diphenylene oxide.

3. A lubricant containing diphenylene oxide and a petroleum base oil as constituents.

Signed by me this 10th day of July, 1929.

20 HERBERT H. DOW.

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