

# UNITED STATES PATENT OFFICE.

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## LUBRICANT.

No. 905,649.

Specification of Letters Patent.

Patented Dec. 1, 1908.

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*To all whom it may concern:*

Be it known that I, LEONARD CHAPMAN, a subject of the King of Great Britain, residing at London, England, have invented a certain new and useful Lubricant for the Inner Parts of Steam-Condensing Engines, of which the following is a specification.

It is known that the employment of fatty oils and heavy mineral oils, as also mixtures of the same with solid lubricants such as graphite etc. for lubricating the internal parts of steam engines, is coupled with serious disadvantages, particularly in engines, the condensation water of which is used for feeding boilers.

I have discovered that glycerin offers in its physical and chemical properties, peculiarities which render its use uncommonly advantageous for lubricating the internal parts of steam engines, particularly of steam engines the condensed water of which is used for feeding the boilers.

Glycerin is entirely indifferent as against metallic surfaces; it has a high boiling point; does not gum; is soluble in water, and dissolves certain alkalis and alkaline earths, as well as salts of the same. It hinders the precipitation of metallic oxides by alkalis; it dissolves neither heavy nor light hydro-carbons; it is easily miscible with boiler scale preventatives, and boiler cleansing substances, so far as these are not soluble in it, and when mixed with graphite and similar solid lubricants, it forms an emulsion, or a mixture which does not separate. From these properties result the very valuable advantages of glycerin for the purpose in question; it forms a lubricant which is absolutely indifferent against metal, and at the same time does not injuriously affect the interior of the boiler by causing the formation of scale thereon, but on the other hand tends to prevent the formation of such scale owing to its property of dissolving such scale preventatives as soda, borax, tannin, etc., it offers a very convenient means of introducing these materials into, and mixing them thoroughly with the feed water, while its property of forming stable mixtures with graphite etc. does away with the necessity of special appliances for agitation in the piping etc.

As suitable proportions may be mentioned:—

1. Glycerin 92½% by weight. 55  
Graphite 7½% “ “
2. Glycerin 85% by weight.  
Graphite 7½% “ “  
Borax 7½% “ “

The mixtures of glycerin with graphite may be prevented from separating in a very easy and practical manner by impregnating the graphite before mixing it with the glycerin, with a suitable quantity of hydro-carbon insoluble in glycerin, such as petroleum, kerosene, toluol, xylol, etc.

When suitable proportions are used, it is possible by this means to reduce the specific gravity of the graphite mixture to that of the glycerin, and thus cause the particles of graphite to remain in suspension.

It is best to work up the graphite with about two-thirds of its weight of light petroleum (kerosene); upon mixing this with about ten times its weight of glycerin, there results a perfectly stable and smooth emulsion. In this manner, the well-known boiler scale preventing properties of petroleum or kerosene may be utilized.

What I claim is:—

1. A lubricant for the cylinders of steam engines, consisting of a large percentage of glycerin with a comparatively small percentage of powdered graphite suspended therein, said lubricant being adapted to be acted upon by the steam in said cylinders, which will dissipate the glycerin and leave nothing behind except the finely divided graphite, substantially as described.

2. A lubricant for the cylinders of steam engines, consisting of a large percentage of glycerin mixed with a comparatively small percentage of a graphite mixture containing powdered graphite impregnated with a hydrocarbon insoluble in glycerin, said lubricant being adapted to be acted upon by steam, which will dissipate the glycerin, and leave behind the finely divided graphite, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LEONARD CHAPMAN.

Witnesses:

CLAUDE WINCKLEY,  
JOHN WALKER.