UNITED STATES PATENT OFFICE.

CLARK JOHNSTON, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN LUBRICATING COMPOUNDS.

Specification forming part of Letters Patent No. **199,913**, dated February 5, 1878; application filed January 15, 1878.

To all whom it may concern:

Be it known that I, CLARK JOHNSTON, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Lubricating-Oils, of which the following is a specification:

This invention relates to an improvement in that class of lubricating compounds in which graphite or plumbago is held in suspension for the purpose of increasing the lubricating qualities of the said compound.

The well-known qualities of the mineral substance variously known as "plumbago," "graphite," or "black lead" have induced the invention of various means of applying said substance to mechanical bearings for the purpose of reducing friction, the most efficient method of application so far known being the combination of the powdered mineral with an oil or liquid compound, which is poured into oil-cups or upon the bearings in the ordinary manner.

A great difficulty, however, in the way of the successful use of this method has been the impossibility hitherto of holding the powdered graphite in proper suspension in the fluent vehicle of its application, no oil having been discovered or compound invented, so far as I am aware, in which the graphite will remain in perfect suspension, even under the ordinary variations of atmospheric temperature.

It is the object of my invention to overcome the obstacles heretofore existing to the application of graphite as a mechanical lubricant; and to this end it consists in a lubricator consisting of petroleum, African-palm wax, or its equivalent, pulverized graphite, the mineral extract of petroleum, (or paraffine-wax,) and an alkali, combined in varying proportions, to form either a solid or liquid lubricating medium, which, while holding its graphite in perfect suspension, will be efficient in use and cheap in production.

In the preparation of my compound I first heat the oil in a suitable vessel to about 80° Fahrenheit, and then add bicarbonate of soda or other suitable alkali, the action of which is to "cut" the oil, or convert the globules thereof into thin flat tissues well adapted for retaining in suspension the graphite. I then melt together the African-palm wax and mineral extract of petroleum, and add them to the oil. The combination of these waxes forms a very adhesive unctuous substance, which adheres closely to the tissues into which the oil has been converted, preparing it for holding in suspension the produced graphite, which is subsequently added. When the ingredients have all been added, but a few moments' simmering and agitation are necessary to form a thorough combination of the same, which may be allowed to cool either slowly or rapidly, the resultant product being either solid or liquid, according to the relative proportions of its constituents.

For a liquid lubricating compound holding its graphite in perfect suspension, I use the following formula, viz: Petroleum, one gallon; African-palm (*Avoira elais*) wax, two ounces; graphite, powdered, five ounces; mineral extract of petroleum, one ounce; bicarbonate of soda or other alkali, one ounce.

This lubricator has been tested for twelve consecutive days on a steam-chest under a heat of from 120° to 180° Fahrenheit without the least precipitation of the graphite. It will also resist congelation at a temperature 30° lower than is required to congeal No. 1 winter-strained sperm-oil, and 40° lower than the effect upon No. 1 lard-oil. It is, in fact, the only lubricating compound known in which graphite is held in absolute suspension and solution in all climates for any length of time. Each and every substance used is, besides, itself a lubricant, so that no lubricating qualities are sacrificed to buoyancy, and the combined cost of all is comparatively so small that the product may be given to the public at a lower price than any other known compound for the same purpose.

In order to produce a solid compound for application, as tallow is ordinarily used, or by first melting and then pouring it around a journal, I use the following proportions: Petroleum, one gallon; graphite, eight ounces; African-palm (*Avoira elais*) wax, eight ounces; mineral extract of petroleum, two ounces; bicarbonate of soda, or equivalent alkali, one ounce.

The solid compound resulting from this for-

mula, when melted, holds its graphite in perfect suspension, and its efficiency is not impaired by a heat of 350°.

I am aware that each of the ingredients hereinbefore recited has been long known and used separately in lubricating compounds, and, therefore, the employment of either alone or in various combinations is not claimed; but

What I claim is—

A lubricating compound consisting of petroleum, African-palm wax, graphite, mineral extract of petroleum, and a suitable alkali, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

CLARK JOHNSTON.

Witnesses:

JAMES L. NORRIS,

ALBERT H. NORRIS.