UNITED STATES PATENT OFFICE.

IRA G. BETTS, OF DETROIT, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO GEORGE B. PETERS, OF MARSHALL, MICHIGAN.

IMPROVEMENT IN LUBRICATING COMPOUNDS.

Specification forming part of Letters Patent No. **161,468**, dated March 30, 1875; application filed February 18, 1875.

CASE A.

To all whom it may concern:

Be it known that I, IRA G. BETTS, of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Lubricating Compound adapted for Packing; and I do hereby declare that the following is a full and exact description of the same.

The object I have in view in this application is a lubricating compound, especially adapted for journal-boxes for machinery, which shall possess the qualities of cheapness, durability, and convenience in use, and portability in transportation; and my invention therein consists in the process of manufacture and in the lubricating compound, as hereinafter particularly described.

To make my compound I first prepare a base in the following manner: I dissolve one pound of potash in three gallons of soft water. I take forty pounds of lard and melt it in any proper vessel, preferably of copper or brass. Into this melted lard before spoken of I pour the three gallons of water in which the potash has been dissolved. I then boil the mixture from half an hour to one hour, frequently stirring it. If the mixture has been sufficiently boiled, it will form on the side of the stirring paddle or stick, held horizontally, in a thin film-like glue. This mixture is then allowed to become perfectly cool, and when cool resembles flour-paste in appearance and texture, but is of about the same density as tallow. In making this base as described, the result will be very nearly the same if alkalies other than potash, and animal fats other than lard, are used; but I prefer the ingredients which I have named. The quantities named may be somewhat changed, but I prefer the quantities already given. It will be also observed that in the process I have described I have not made a soap, which would have required more than three times the quantity of water and more than twice the quantity of potash, and a boiling of at least five hours. To this mass, when cold, I add five gallons of cold lard-oil, and incorporate the same intimately with such mass, preferably by grinding the same together in a proper machine, which may conveniently be done in a paint-mill. When this part of the process is completed there remains a mass of the appearance and density of lard at a temperature of about 60° Fahrenheit.

If, in the first part of the process described, I had made a soap, the oil of which I added afterward would have become saponified, and would have united chemically with the soap, and become incapable of separation by pressure, whereas the oil I add to my mixture does not become chemically a part of the mass, but is held mechanically by it, and by pressure may be forced out of it.

It follows from the above that lubricating compounds made from a base which is soap soon dry up, and become hard and useless, by reason of the evaporation of the water contained in them, and by the presence upon the surface of the potash, which is freed by the evaporation of the water. My compound, on the other hand, having little or no water in it, and having the oil held mechanically, preserves its density unchanged at all times, and under pressure gives out continually a small quantity of oil upon the surface under pressure.

I prefer lard-oil, as above named, for the purposes described; but I am aware that other animal oils, or even the heavy mineral oils, may be used in the same way with good results. This mass forms the base of the lubricating compound, and of itself is a good lubricating compound, but is lacking in durability or capacity for wear, in its ability to resist the effect of ordinary summer temperature and in its density or body.

To supply the deficiencies above named to this compound, I employ asbestus, of which I use about forty-eight ounces, which I mix with the five gallons of lard-oil previously mentioned, and grind both together in any suitable mill, it being essential to have the asbestus reduced to separate fiber, and then grind this mass thus produced with the mass first named, produced from the alkali, water, and lard, until both are intimately mixed. The result is a lubricating compound wherein the asbestus

acts as a vehicle to hold the greasy or oily portions of the compound, and serves as a body which separates the journal from its bearings, protects the compound largely from the effects of a warm temperature of the air, and gives it great durability in wear. In this way there is made a lubricating compound very suitable for packing in boxes for the journals for heavy machinery.

If it is desirable to have a compound better adapted to light machinery, for packing in boxes, or for journals, I take, instead of the asbestus before named, an equal weight of paper-pulp—viz., forty-eight ounces—which is first dried, and then employed in just the same way as that previously described in regard to the asbestus. The result is a compound with less power of resistance under heavy pressure than the asbestus compound, and with less durability of wear, but one which offers less friction to the journals than the asbestus compound. I prefer, however, to combine the advantages belonging to the asbestus and the paper-pulp compounds, and employ twenty-four ounces of each, and combine them with the oil; and the mass thus produced with the first-described mixture resulting from the alkalies, water, and fat, in the manner before described. There results from this last-named combination a compound which can be conveniently used with heavy or light machinery, which is not affected by heat, which is exceedingly durable, which can be applied wherever tallow may be used, and which can be packed and transported conveniently. In addition to this, it will not case-harden the journal which runs upon it, which is apt to take place in lubricators.

I am aware that to the base which I have described there may be added many equivalents to the asbestus and the paper-pulp, which I preferably employ—as, for instance, any vegetable pulp, or sponge or leather—without departing from the spirit of my invention.

Having thus described my process and compound, what I claim as new therein and my invention is—

1. The process of making a base for lubricating compounds by partially saponifying alkalies, water, and fats, and combining with the same, when cold, a quantity of cold oil, substantially as described.

2. A lubricating compound composed of a base made by partially saponified alkalies, water, and fats, combined, when cold, with cold oil, and asbestus, paper-pulp, or other suitable material, to hold said base mechanically, substantially as described.

This specification signed and witnessed this 18th day of February, 1875.

IRA G. BETTS.

Witnesses:

CHARLES THURMAN,

GEORGE L. DYER.