UNITED STATES PATENT OFFICE.

SAMUEL GIBBONS, OF FREEDOM, PENNSYLVANIA, ASSIGNOR TO THE EXCELSIOR OIL MANUFACTURING COMPANY OF PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF LUBRICATING-OILS FROM PETROLEUM.

Specification forming part of Letters Patent No. 87,485, dated March 2, 1869.

To all whom it may concern:

Be it known that I, SAMUEL GIBBONS, of Freedom, in the county of Beaver, and in the State of Pennsylvania, have invented certain new and useful Improvements in Lubricating-Oils; and do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention consists in treating crude petroleum to the direct action of steam or superheated steam, either in bulk or fractional quantities, in such a way as to reduce the oil to the proper gravity for a lubricator, and not tar or decompose the oil, but allow it to retain its natural lubricating properties, and, at the same time, remove the more volatile portions of the oil and the earthy acids from the crude petroleum.

After careful observation and repeated experiments I have found that petroleum-oil treated by steam possesses qualities as a lubricator for machinery over and above other oils heretofore known.

The usual lubricating-oils possess more or less grit and other earthy matter, which will wear the machinery or become cloggy, so that, instead of assisting to overcome friction, they will retard the same or produce more friction.

Petroleum not treated by steam can be numbered with other defective oils, but when treated with steam obviates all previous difficulties.

In treating petroleum to the direct action of steam or superheated steam at a certain temperature an affinity takes place between the minute particles of steam and the globules of oil, and when the steam is condensed water is held in suspension or combination with larger particles of oil, so that the addition of water to the petroleum is about two per cent., more or less. This combination will continue as long as the oil is not exposed to extreme high or low temperature, and while the affinity continues the oil is a still better lubricator for summer uses than after the affinity is destroyed; but for winter use it is much better to remove the water, as the oil stands a better cold test. Otherwise, the water freezing at 32°, the oil will become lumpy in the barrel or can. Also the acting upon or treating the oil to the direct action of steam will precipitate all the grit, sediment, or other foreign substances, of whatever nature or kind, which are detrimental to machinery in most treated oils, and will, at the same time, remove the more volatile portions of the oil, and not tar or color or decompose or in any way injure it.

In preparing my oil for lubricating purposes it can be done in bulk or fractional quantities. The process is very simple and plain. If in bulk, the oil is placed in a tank or still, and dependent chambers or pipes placed. (It can be done without, but not so well.)

The steam is admitted directly into the body of oil, and, by means of numerous jet-pipes, all parts of the oil are treated alike and reduced evenly. Jet-pipes are not absolutely necessary, but are better. As the oil becomes heated the lighter or more volatile oils are carried off, and all the grit, sediment, or foreign substances are precipitated and drop into the dependent chambers, and are carried off by means of siphon-pipes attached. It neutralizes all the earthy acids in the oil, which are injurious to machinery. When the oil becomes sufficiently hot a union or affinity takes place between the particles of oil and water, which makes the oil a much better lubricator while this union continues. The action of the steam upon the oil is continued until it is of sufficient body for the purpose designed, which I have found to be from thirty degrees to thirty-six degrees, according to the kind of machinery on which it is to be used. For railroad purposes, rolling-mills, heavy marine engines, and heavy machinery generally, about thirty-two degrees' gravity is found to be best. For lighter machinery oils of lighter gravity are found more adaptable. Petroleum being more easily affected by heat and cold for summer uses, an oil reduced to a lower gravity is adapted.

I find we can reduce oil, by steam direct, even as low as twenty-six to twenty-eight degrees' gravity without tarring or coloring the same. If I wished to reduce my oil in semi-bulk or fractional quantities, I would admit my steam directly, as before, into the oil while it was passing through or over the bottom of a retort or still. To get a heavy oil, I would run it much slower or at a greater distance, either of which would subject the oil to a longer action of the steam and produce the desired result. At the bottom of my still I

would have chambers dependent, as in the case of reducing the oil in bulk. The action of the steam is the same, either in bulk or fractional quantities. Superheated steam is best, if reducing by fractional or continuous distillation, as the action is much more rapid, enabling the production of larger quantities of oil. This can be done in various ways, one of which is seen by reference to the Letters Patent for an improved process for the distillation of oil granted to me January 12, 1869.

Any suitable device, apparatus, or machine may be used to treat the oil, and when so treated becomes a cheap, efficient, and practical article for the use claimed.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The within-described process of preparing petroleum or hydrocarbon oils for lubricating purposes, as specified.

2. The preparing of petroleum or hydrocarbon oils for lubricating purposes, by reducing the gravity of the same by the direct action of steam or superheated steam upon the crude petroleum while in a still, tank, or retort, substantially as set forth.

3. The reducing of petroleum in a still or retort, with or without dependent chambers, and with one or more jet-pipes, by the direct action of steam or superheated steam, substantially as and for the purposes specified.

4. The reducing of crude petroleum for lubricating purposes, either in bulk or fractional quantites, by the direct action of steam or superheated steam, substantially as set forth.

5. As a new manufacture, an oil product, as above described, when produced from crude petroleum by evaporation of the lighter oils and removing of all earthy acids, grit, and sediment by the direct action of steam, substantially as set forth.

6. The improved lubricating-oil for machinery, as herein described, prepared from petroleum by the direct application of steam or superheated steam to the crude petroleum, as set forth.

7. Petroleum for lubricating purposes, when the same has been prepared or reduced to the proper gravity, in the manner set forth.

8. The employment of steam or superheated steam-treated petroleum, holding water in suspension, for summer lubricating purposes, as described.

9. The employment of steam or superheated steam-treated petroleum, after the water has been removed, for winter lubricating purposes, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of January, 1869.

SAML. GIBBONS.

Witnesses:
G. E. WALMER,
J. R. LOCKHART.