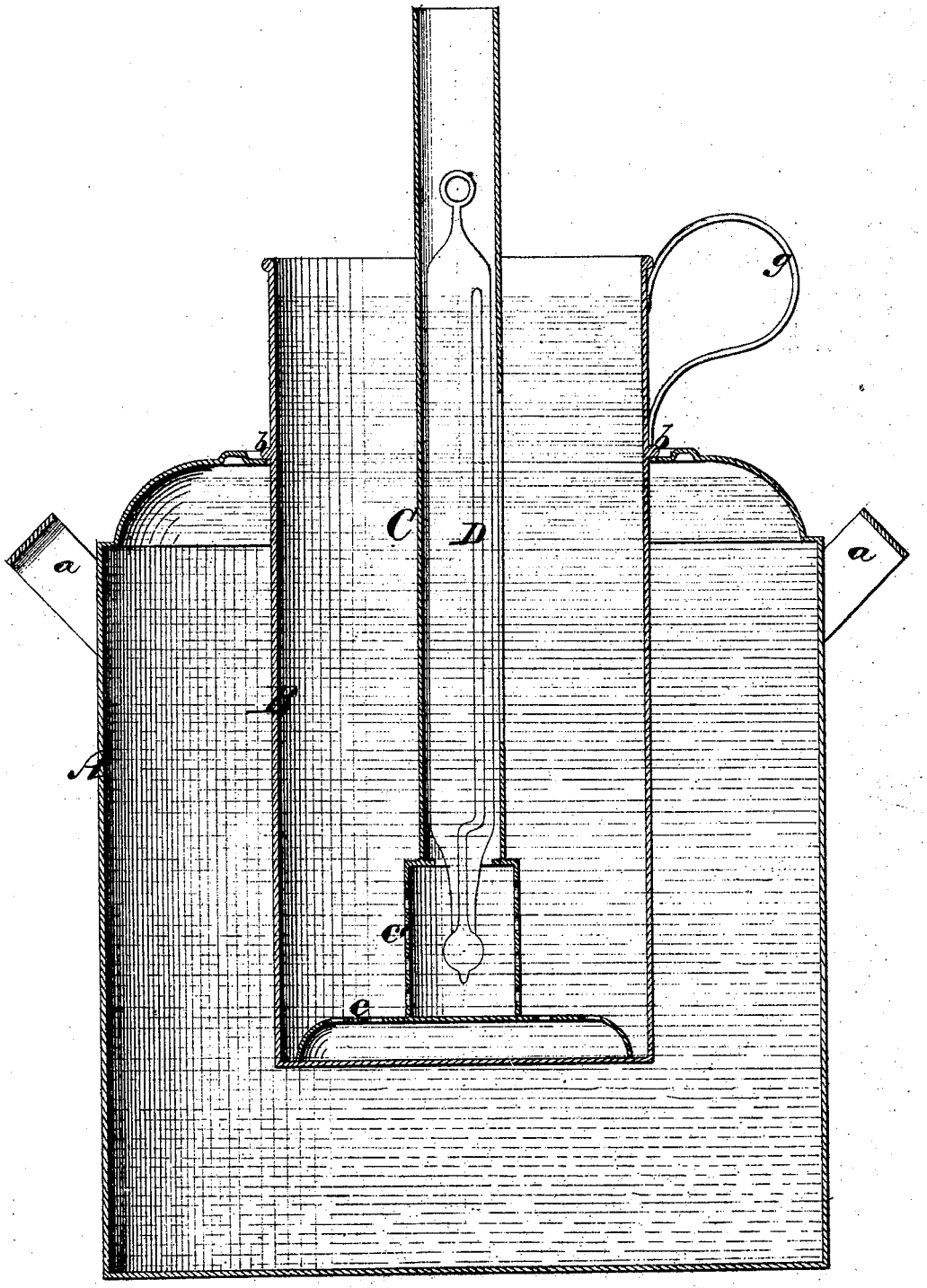
B. Crawford,

Refining Oil.

No. 113,023. Patented Mar. 28. 1871.



Witnesses.
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Inventor
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by
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BENJAMIN CRAWFORD, OF ALLEGHENY, PENNSYLVANIA.

Letters Patent No. 113,023, dated March 28, 1871.

IMPROVEMENT IN APPARATUS FOR PURIFYING COAL-OIL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, BENJAMIN CRAWFORD, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented an Apparatus for the Better Purification of Kerosene or Coal-Oil; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a section taken vertically through the center of the apparatus.

The object of this invention is to furnish persons who use any of the light hydrocarbon illuminating oils with a simple apparatus by means of which such oils can be readily tested, and when found dangerous, from containing too much of the light and volatile fluids and gases originally combined with them, a safe and convenient means is afforded to extract the dangerous fluids which generate explosive gas at low temperatures.

To ascertain the degree of safety to which such oils have been reduced in the process of distillation, it is usual to subject them to the trial known as the fire-test. For this purpose pyrometers of various kinds are used, by which the degree of heat at which the oil flashes is noted.

With my apparatus I furnish a small dipper, in which the oil can be taken from the apparatus and safely tested from time to time, by which means the quality of the oil can be ascertained. After treatment in the apparatus it can be again tested during the process of cooling, which will show whether it has been reduced to the desired point of safety.

The test is made by drawing a lighted match slowly across, and within about half an inch of the surface of the heated oil, and as soon as the gas rises it will flash like gunpowder, when the degree of heat is immediately noted.

To be perfectly safe from generating gas, oil ought not to flash at a temperature less than 105 degrees of Fahrenheit, as the heat of a lamp when burning is from 95 to 100 degrees. Other modes than the fire-test may be used to ascertain the quality of the oil, or if no test is made at all the oil can be safely used after treatment in my apparatus.

The following is a description of my invention.

In the accompanying drawing I have represented a portable purifyer which is adapted for domestic use, but it will be obvious from the following description that the apparatus may be made on a larger scale.

The vessel A, which may be made of any suitable capacity, is intended for containing hot water of a temperature ranging from 212° Fahrenheit down.

This vessel A is provided with handles *a a*, and it has a circular opening through its top to receive and afford support to an oil-trunk, B. This oil-trunk is intended for receiving the oil which it is desired to purify, and it should sit well down into the vessel A, so that the oil in it will be subjected to the heat of the water put into this vessel A.

A bead or flange, *b*, which surrounds the vessel B, affords a support for this upon the top of the outer vessel A, as shown in the drawing.

The vessel B is provided with a handle, *g*, for lifting it, and this vessel contains a stirrer, which consist of a perforated plate, *c*, a perforated cylindrical portion, *c'*, and a long tubular handle, C. The handle C rises above the upper end of the oil-vessel B, and can be grasped in the hand when it is desired to agitate the oil in said vessel.

An opening through the side of the tubular handle C is made for the purpose of exposing to view a thermometer, D, which may be employed for indicating the temperature of the oil under experiment.

In addition to a thermometer, a specific-gravity tube alcoholometer, may be employed for giving the specific gravity of the oil, and indicating when the process should cease. If desirable, a glass plate may be inserted into the handle C or into the vessel B, and graduated in such manner as will indicate, by the varying height of the oil during the evaporating process, the specific gravity of the oil.

The essential parts of the apparatus are the two vessels A and B, the former adapted for hot water and the latter for the fluid which it is designed to purify. I prefer, however, to employ in combination therewith the stirrer or agitator and its tubular handle, adapted to receive and expose to view a thermometer or a specific-gravity indicator.

The oil to be purified and rendered safe for illumination is put into the vessel B, and boiling water is put into the vessel A. When the vessel B is put into the boiling water the heat thereof will be transmitted to the oil, which will drive off the highly volatile and explosive elements in the oil in the form of vapor or gas, and leave behind the heavier fluid, which may be burned with safety. The time occupied in conducting the process of vaporization will vary according to the amount of explosive fluid contained in the fluid submitted to the process; and by means of a device which will indicate the specific gravity of fluids, accompanied with proper directions for using it, any person can readily determine when the fluid would be safe for illumination. The object of using hot water instead of the heat of a flame is to avoid the possibility of an accident during the process.

By means of an apparatus, substantially as I have above described, any person using the light explosive hydrocarbon oils for illumination, such as are sold in the market under various names, can, in a short

time, separate all of the lighter and explosive principles from the oils.

Having described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for evaporating benzine and other light volatile fluids, which produce explosive gases at low temperature, from illuminating oils, constructed substantially as described.

2. The combination with the oil-receiver of the apparatus of an agitator for facilitating the escape of the most volatile fluids from the fluid under treatment, substantially as described.

3. The tubular handle C of the agitator, adapted to receive a thermometer, D, substantially as described.

4. The treatment of explosive burning fluids to a hot-water bath, by means substantially as described.

BENJ. CRAWFORD.

Witnesses:

R. T. CAMPBELL,

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