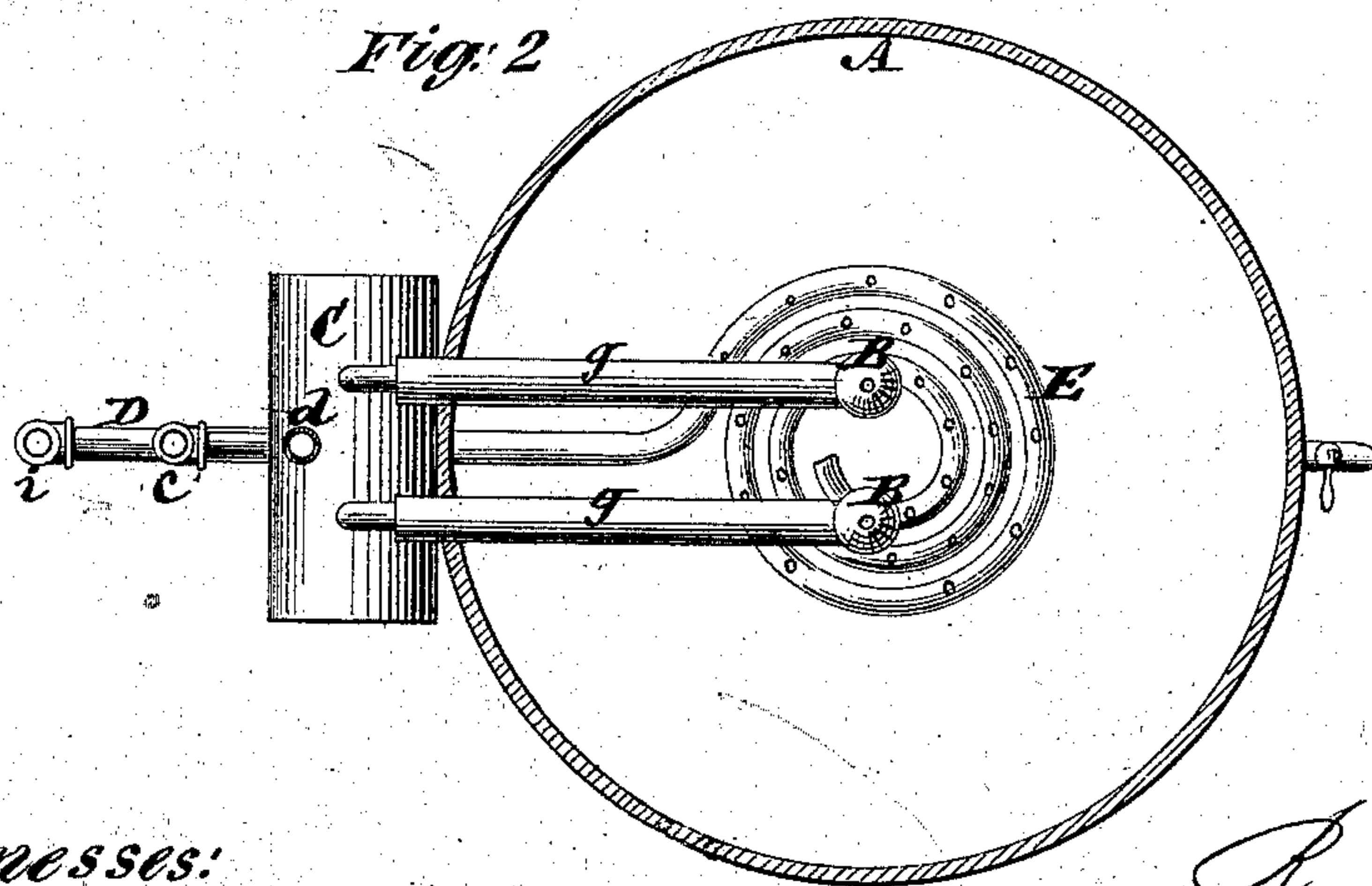
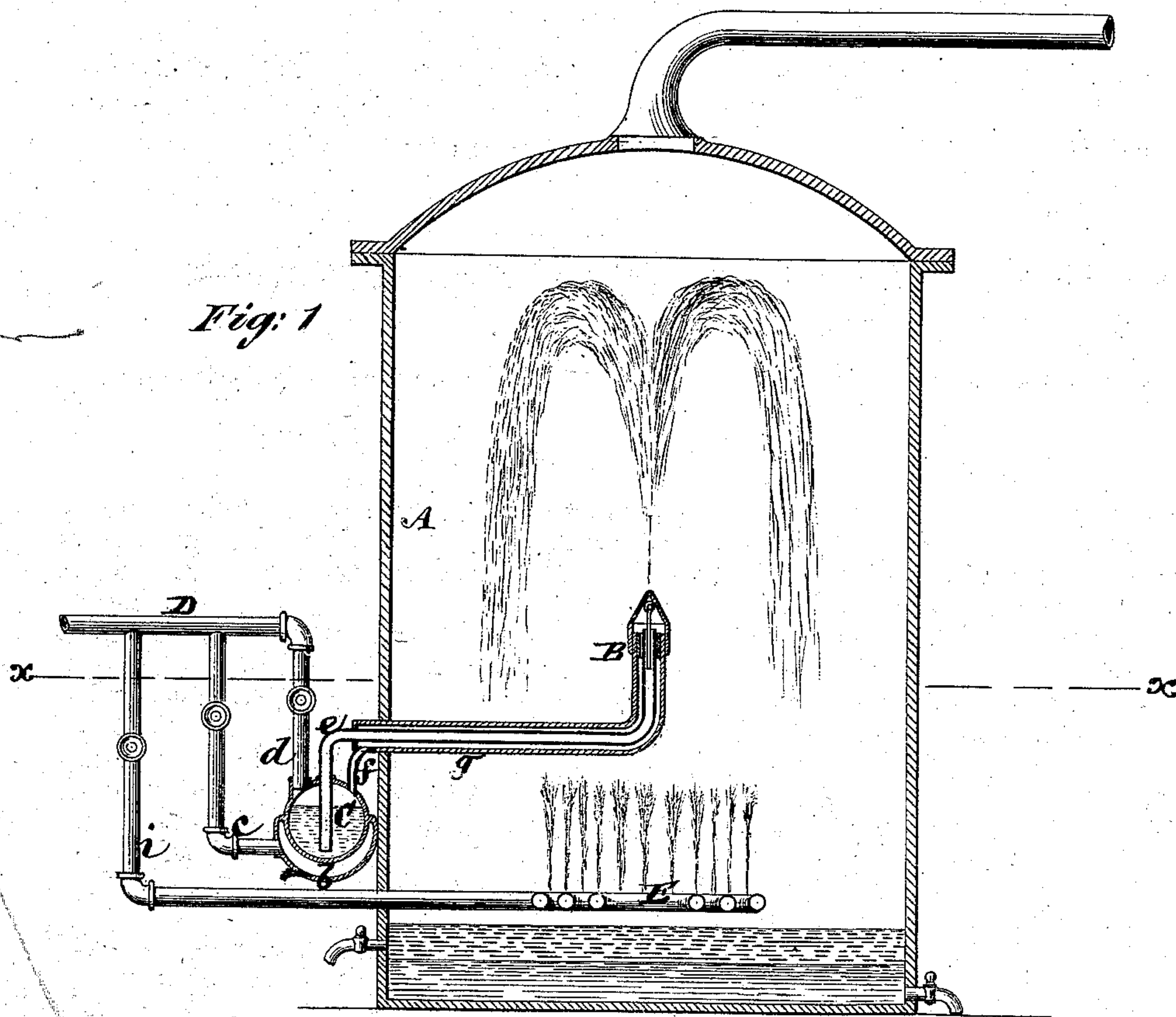


R. D. TURNER.

Apparatus for Refining Petroleum.

No. 154,430.

Patented Aug. 25, 1874.



Witnesses:  
Michael Ryan  
Fred. H. Humes

R. D. Turner  
by his Attorney  
Brown & Allen



# UNITED STATES PATENT OFFICE.

REUBEN D. TURNER, OF NEW YORK, N. Y., ASSIGNOR OF FIVE-EIGHTHS HIS RIGHT TO WILLIAM BUSHELL, EDGAR W. WHITNEY, AND HENRY J. TROWBRIDGE, OF SAME PLACE, AND THEODORE W. ARMS, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN APPARATUS FOR REFINING PETROLEUM.

Specification forming part of Letters Patent No. 154,430, dated August 25, 1874; application filed January 23, 1874.

*To all whom it may concern:*

Be it known that I, REUBEN D. TURNER, of the city, county, and State of New York, have invented an Improved Apparatus for the Treatment of Petroleum, of which the following is a specification:

This invention relates to the treatment of petroleum oils for the purpose of depriving them of their odorous and explosive properties by atomizing the oil through the agency of steam. The invention consists in the combination of a perforated steam-coil with steam and oil atomizers arranged within a refining-chamber, and connected with an outside oil-heating vessel or tube, substantially as hereinafter described, whereby all the obnoxious odors and explosive or "flashing" principles of the oil are absorbed and the oil generally improved for illuminating and other purposes.

Figure 1 is a vertical section of an apparatus constructed in accordance with my invention, and Fig. 2 a horizontal section thereof on the line *x x*.

Similar letters of reference indicate corresponding parts.

A is the refining chamber or vessel, into which the petroleum is sprayed, and, while thus cut up or divided, is mingled with steam, that forms such an intimate relation or union with the oil, when the latter is in the condition of a fine spray, as to readily absorb the odorous and flashing principles of the oil, and to generally improve and refine it. The oil is introduced, together with a small supply of steam, through one or more spraying devices or atomizers, B, similar to those employed by me in other apparatus for treating spirits and other purposes.

The oil to be treated is first introduced into a close vessel or tube, C, arranged on the outside of or around the vessel A, and heated by a jacket, *b*, into which steam is introduced by a pipe, *c*, through a main steam-pipe, D, from

a boiler, another branch, *d*, serving to convey steam onto the top of the heated oil in the vessel B for the purpose of forcing or expelling it through the pipes *e* of the atomizers, and to supply a certain portion of steam, by branches *f*, to the outside pipes of the atomizers, through which latter said steam escapes, along with the sprayed oil, into the vessel A. As, however, this supply of steam would not be sufficient to effect the necessary absorption from the oil, an additional supply of steam is introduced within the vessel A by a perforated coil, E, connected, by a branch, *i*, with the pipe D.

The pipes or branches *c*, *d*, and *i* should each be provided with a cock to regulate the supply of steam through it; and the pipes *e* may be similarly provided to regulate the discharge of oil.

After the sprayed oil has been treated as described, it collects, together with any water of condensation, in the bottom of the vessel A, and may be readily drawn off by a cock or otherwise, while the water of condensation is run off, from time to time, by another and lower cock. The more volatile particles of the oil may pass off with escaping steam, either to the atmosphere by pipe from the upper portion of the vessel A, or be conducted to and through a condenser, or through a succession of condensers, to prevent waste of any valuable principles.

I claim—

The combination of the perforated steam-coil E with the steam and oil atomizers B, the refining-chamber A, and the oil-heating vessel or tube C, substantially as shown and described.

REUBEN D. TURNER.

Witnesses:

MICHAEL RYAN,  
FRED. HAYNES.