

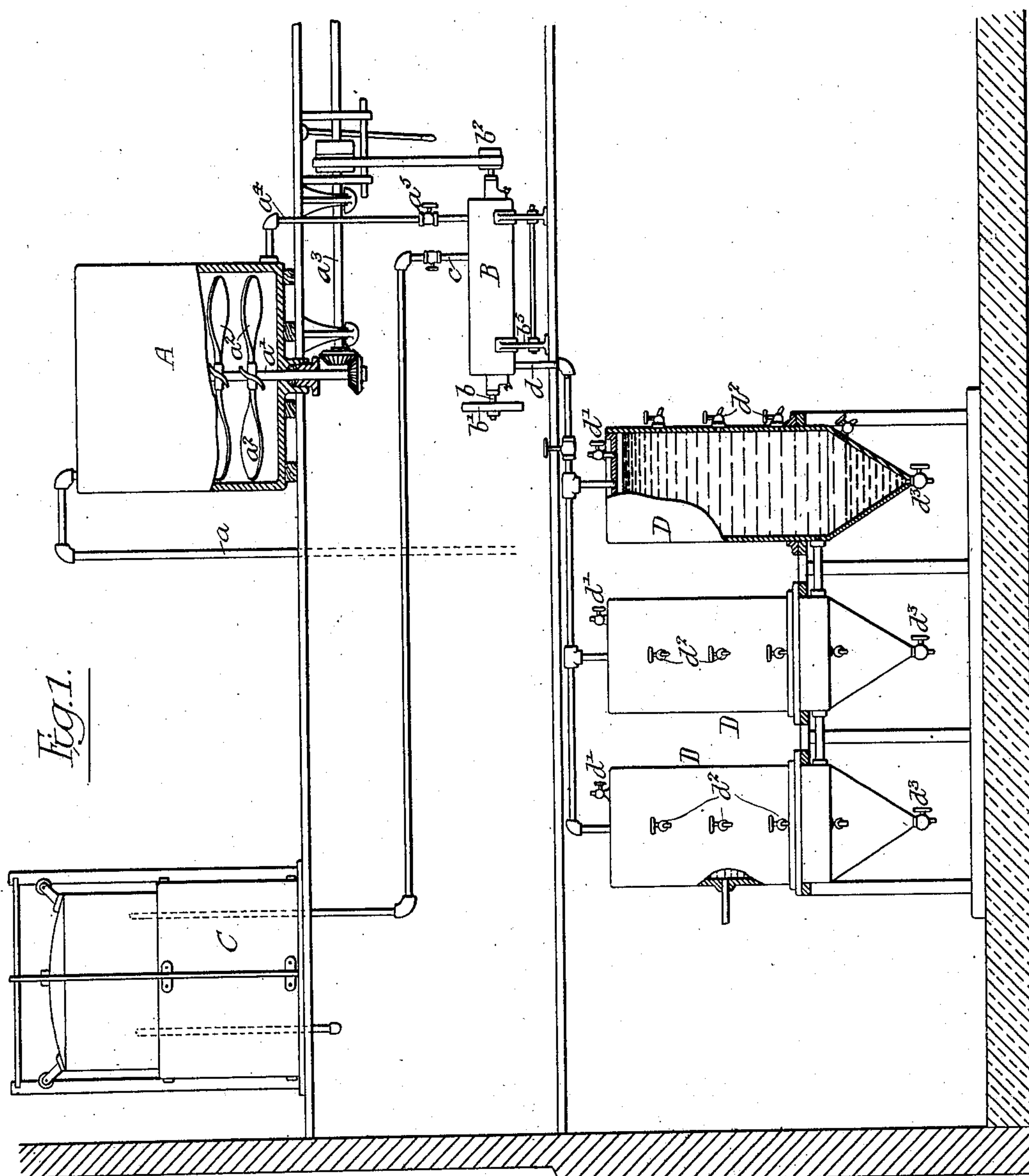
No. 749,925.

PATENTED JAN. 19, 1904.

J. C. FLEMING.
PROCESS OF REFINING OIL.
APPLICATION FILED MAY 28, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:-

A. B. Coppers

Herman E. Metrus.

Inventor:-

John C. Fleming.

by his Attorneys:

Harmon & Harmon

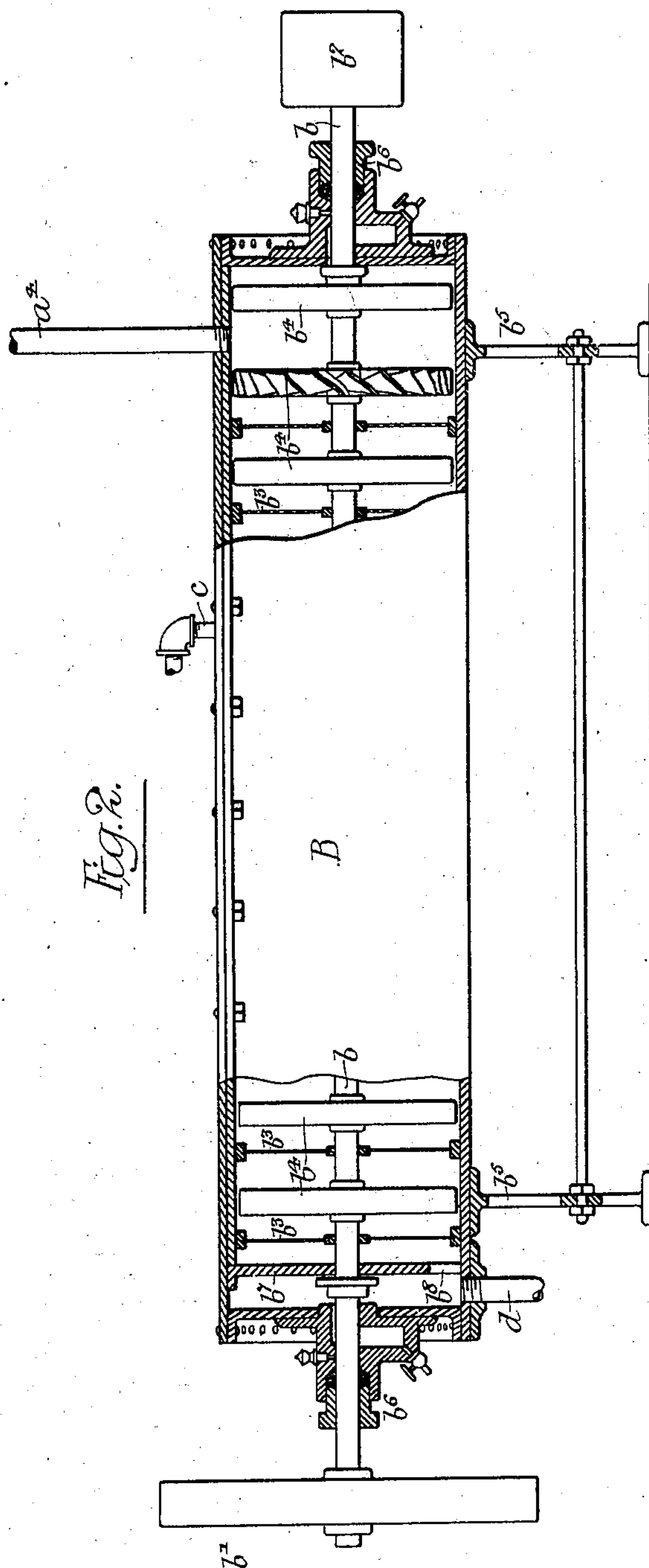
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UNITED STATES PATENT OFFICE.

JOHN C. FLEMING, OF NEW YORK, N. Y.

PROCESS OF REFINING OIL.

SPECIFICATION forming part of Letters Patent No. 749,925, dated January 19, 1904.

Application filed May 28, 1902. Serial No. 109,375. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN C. FLEMING, a citizen of the United States, and a resident of New York city, New York State, have invented certain Improvements in Processes of Refining and Clarifying Oil, of which the following is a specification.

My invention relates to an improved process for refining and clarifying oil, and more particularly to a process especially applicable to the refining of cotton-seed oil. It has for its object the economical removal of rosin and objectionable nitrogenous substances from the oil in such a manner that not only will the marketable quality of the oil be improved, but at the same time the extracted mass obtained therefrom as a by-product may be utilized for various industrial purposes.

While in the following description I dwell particularly upon the application of my process of the treatment of cotton-seed oil, it will be understood that said process is not limited to this oil, since not only may other vegetable oils be refined and clarified by my process, but mineral oil as well may be subjected to the same with the herein-noted beneficial results.

In carrying out my invention I mix with the oil, which if of vegetable origin is more or less contaminated with gum, albuminoid substances, &c., an aqueous solution of borax, preferably in the proportion of about six ounces to one hundred pounds of oil. The borax I preferably dissolve in about five pounds of water, mixing the resultant solution with the oil by rapid agitation. Immediately thereafter I subject the oil to an atomizing operation in the presence of and in conjunction with carbon dioxide. During this operation the gas mixes thoroughly with the mixture of borax solution and oil, after which the whole is drawn off into settling-tanks, where the coloring-matter and the objectionable substances which have combined with the borax are allowed to settle or precipitate.

In the accompanying drawings I have illustrated one form of apparatus in which my improved process may be carried out, and in these drawings Figure 1 is an elevation of a refining apparatus, a portion of the oil-tank and one of the settling-tanks being broken away, so that

their interior construction may be seen; and Fig. 2 is an enlarged sectional elevation of the atomizer illustrated in Fig. 1.

In the above drawings, A is a tank for the reception of oil to be refined, having a pipe *a* for the delivery of the oil thereto and carrying within it a vertical shaft *a'*, provided with laterally-projecting arms *a''*. This shaft passes through the bottom of the tank, as shown, and is suitably geared to a power-shaft *a'''*, whereby it may be revolved. A pipe *a''''*, extending from the bottom of this tank to an atomizer, is provided with a valve *a'''''* and enters said atomizer a short distance from one end, as indicated in detail in Fig. 2. A pipe *c*, connected to a gasometer C, also enters the atomizer at a point some distance beyond the pipe *a''''*.

The atomizer consists of a horizontally-placed cylinder, through which extends a shaft *b*, having a fly-wheel *b'* at one end and a pulley *b''* at the other, this latter being belted to fast and loose pulleys suitably supported on the power-shaft *a'''*.

The interior of the cylinder is divided into a number of compartments by means of gauze or screen partitions *b'''*, between each pair of which is a fan-like structure *b''''*, supported by and revolvable with the shaft *b*. The cylinder is preferably carried on supports *b'''''* and is provided with stuffing-boxes *b''''''* at each end where the shaft *b* passes through, the end of the cylinder farthest from that at which the pipe *a''''* enters being provided with a false end *b'''''''*, which prevents the possibility of the oil being driven along the shaft *b* during its treatment, and thereby becoming contaminated with the lubricant used in the bearings at the ends of the cylinder for carrying said shaft. I preferably cause the pipe *c* from the gasometer to enter the atomizer at such a point that the gas therefrom does not strike the material under treatment until this has been reduced to a finely-divided condition by the action of a certain number of the fan structures and has been thoroughly incorporated with the solution.

An outlet-pipe *d* communicates with the space between the false head *b'''''''* and the end of the cylinder, there being an opening *b''''''''*

through the lower portion of this false head for the passage of oil to said pipe.

A number of settling-tanks D are connected to the pipe d by suitable brackets, these
5 tanks being provided at the top with valves d' for the escape of air or gas and having valves d'' at different levels of their sides, whereby different grades of oil may be drawn from one tank. A drainage-valve d''' is provided at the lowest point of each tank, through
10 which the precipitated material in the oil, as well as water or any other foreign substances, may be removed.

In carrying out my process I introduce into
15 the tank A a mixture, preferably consisting of one hundred parts of oil and an aqueous solution five parts of water and about one-half part of borax. The shaft a^3 being in operation, these compounds are violently agitated
20 and thoroughly mixed in said tank and after being so treated are drawn off through the pipe a^4 into the atomizer B, the shaft b , with its fan-like structures b^4 , being made to rapidly rotate previous to the introduction of the
25 liquid. Carbon dioxid is simultaneously admitted through the pipe c , so that it meets the finely-divided liquid after it has been subjected to the action of a number of the fans. The resulting mixture is driven forcibly through
30 the screen or gauze, partitions b^3 being passed from fan to fan, so that there is the most intimate contact between the various compounds. The cream-like liquid resulting from

this treatment finally flows off through the pipe d and is led into the settling-tanks D, 35 whereby the nitrogenous substances which have combined chemically with the borax and the carbonates formed by the action of the carbon dioxid upon any compounds contained in the oil settle with the water to the bottom 40 of the tanks, leaving the clarified and refined oil in the upper portion thereof.

I claim as my invention—

1. The process of refining and clarifying oil, the same consisting in mixing a solution 45 of borax with the oil, mingling carbon dioxid with said mass, subjecting the mixture to an atomizing action and finally permitting it to settle, thereby separating the objectionable elements, substantially as described. 50

2. The process of refining and clarifying oil, the same consisting in mixing a solution of borax and carbon dioxid with the oil, subjecting the mass to a sucking and forcing action whereby it is atomized and thoroughly 55 commingled with the carbon dioxid and finally allowing the whole to settle whereby the objectionable ingredients are separated, substantially as described.

In testimony whereof I have signed my 60 name to this specification in the presence of two subscribing witnesses.

JOHN C. FLEMING.

Witnesses:

WILLIAM E. BRADLEY,
JOS. H. KLEIN.