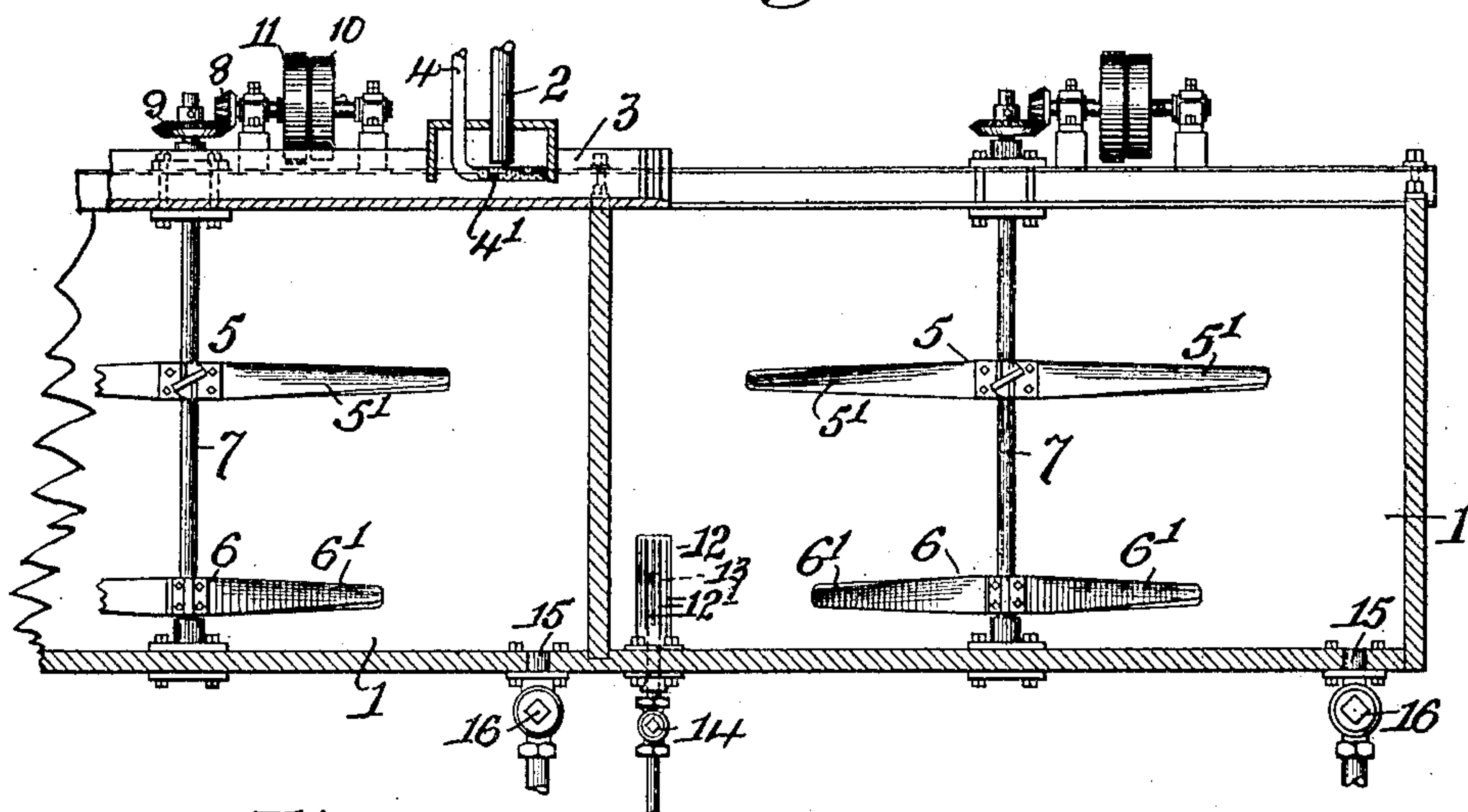


No. 872,049.

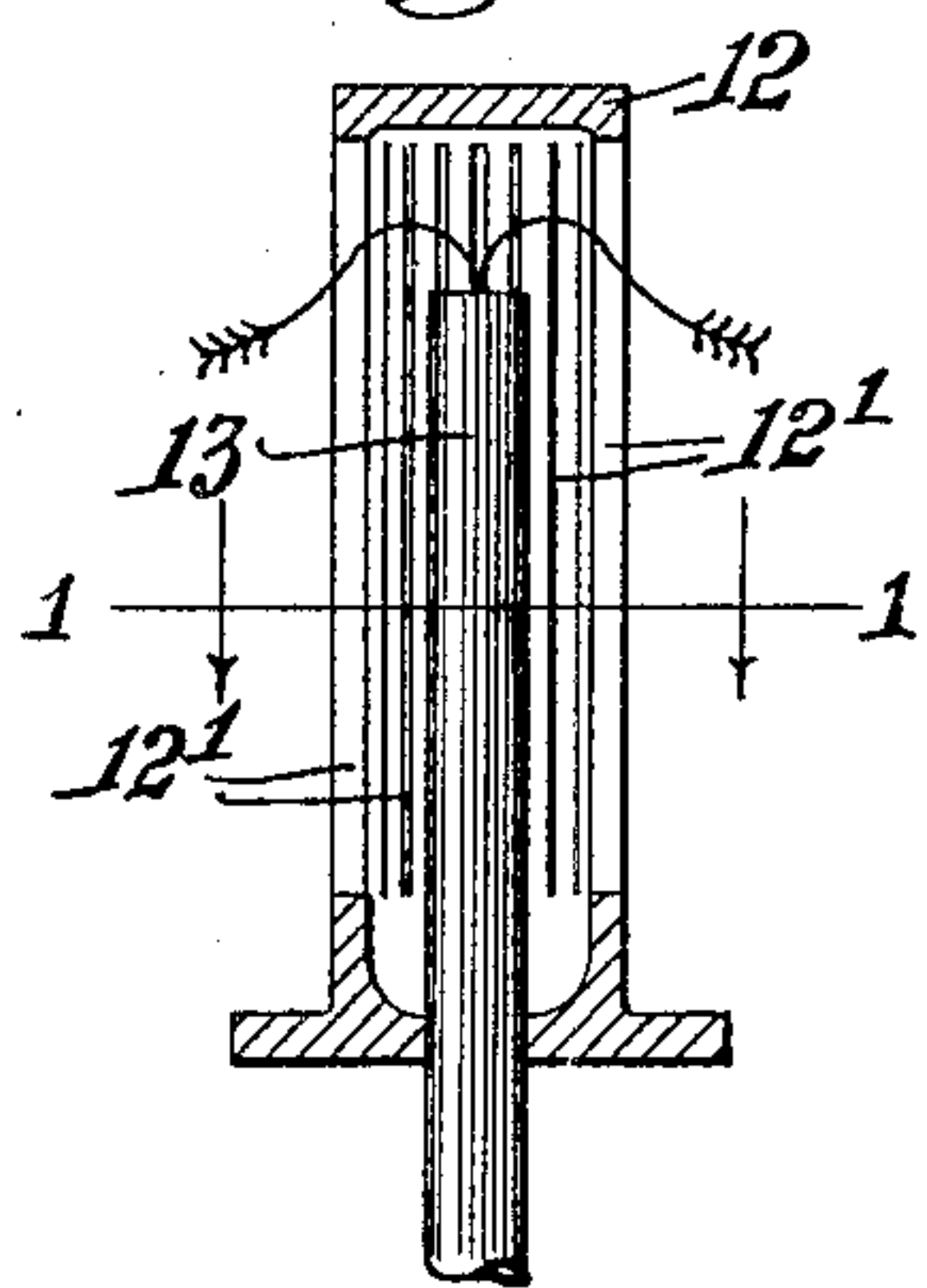
PATENTED NOV. 26, 1907.

B. & A. BROADBENT.  
APPARATUS FOR TREATING TRADE EFFLUENTS.  
APPLICATION FILED FEB. 2, 1907.

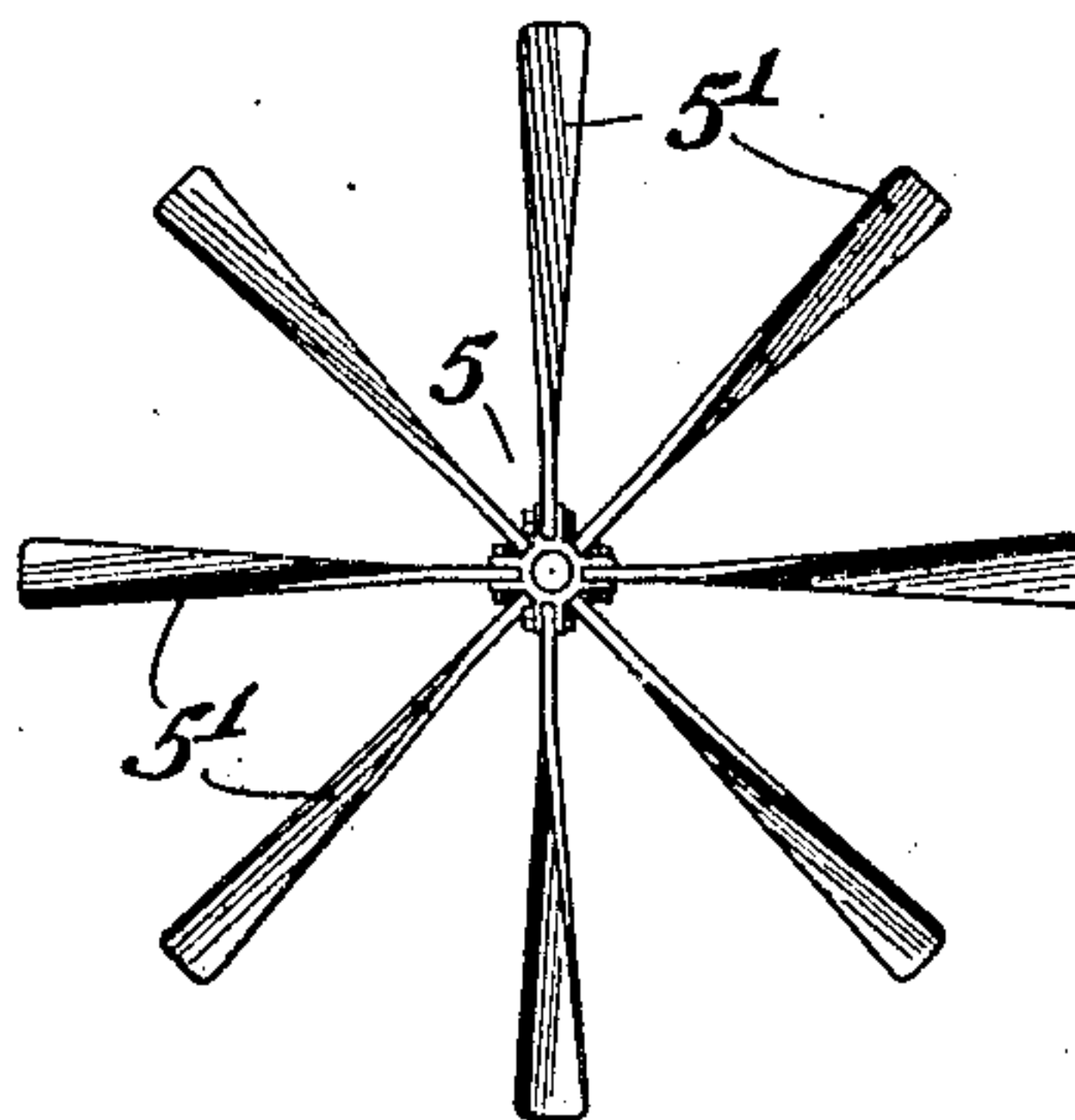
*Fig.1.*



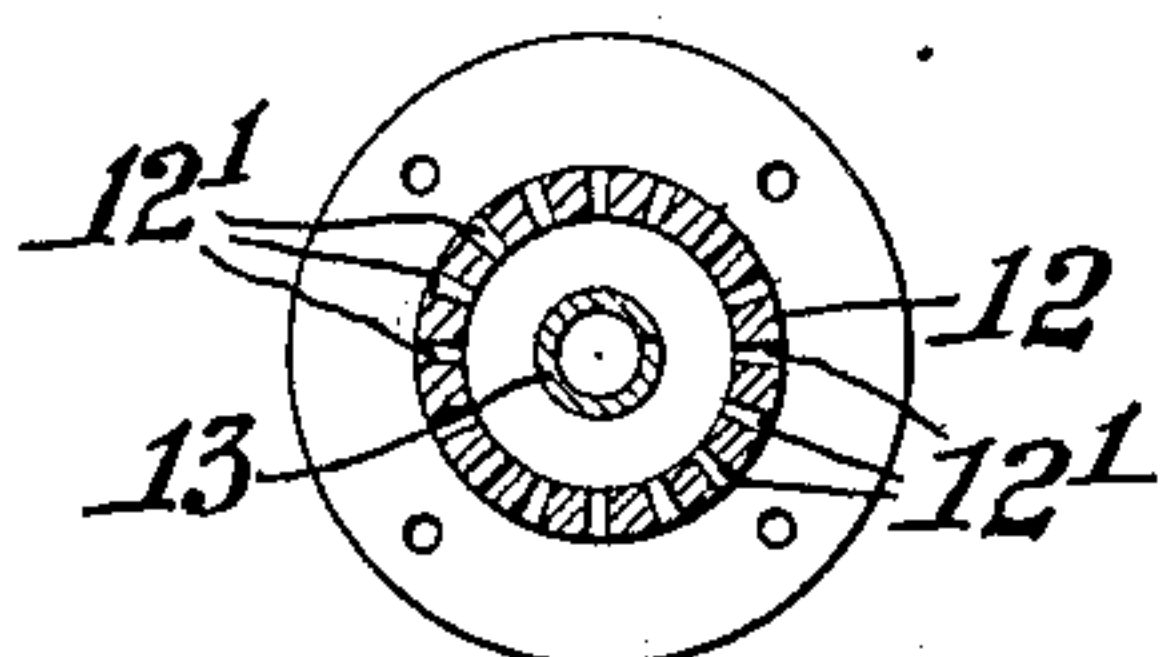
*Fig.3.*



*Fig.2.*



*Fig.4.*



Witnesses.  
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# UNITED STATES PATENT OFFICE.

BENJAMIN BROADBENT AND ARTHUR BROADBENT, OF LONGWOOD, NEAR  
HUDDERSFIELD, ENGLAND.

## APPARATUS FOR TREATING TRADE EFFLUENTS.

No. 872,049.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed February 2, 1907. Serial No. 355,469.

*To all whom it may concern:*

Be it known that we, BENJAMIN BROADBENT and ARTHUR BROADBENT, subjects of King Edward VII of Great Britain, and residents of Longwood, near Huddersfield, in the county of York, England, have invented certain new and useful Improvements in Apparatus for Treating Trade Effluents, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to the treatment of trade effluents or refuse soap suds for recovering or extracting the grease or oil therefrom.

Our improvements consist in combining, in a single sud tank, an acid sprayer or discharge pipe for spraying or discharging into the suds as they flow to the tank, the required portion of the acid used to crack the sud, an agitator of suitable construction, and a grease trap having an outlet pipe for running off the water separated from the denser or solid bodies, the object of our invention in employing the said combination being to extract or recover from the refuse soap suds or trade effluent, all the grease or oil contained therein and improve and expedite the process.

The novel features of construction, arrangement and combination will be fully described in the subjoined specification and particularly pointed out in the following claims.

Referring to the drawings:—Figure 1 is a vertical section of a sud tank having our improvements applied thereto, a portion of an adjoining tank being also shown at the left hand of the figure; Fig. 2 is a plan view of the agitator, showing the disposal of the blades; Fig. 3 is a vertical section, on an enlarged scale, of the grease trap; and Fig. 4 is a cross section of the trap taken as on the line 1, 1, of Fig. 3, looking in the direction of the arrows thereon.

In the accompanying drawings, 1 represents a sud tank to which trade effluents or refuse soap suds are supplied by pipe 2 and trough 3. Preferably we arrange, say, three or four tanks side by side and work them in series, the trough 3 extending over all the tanks so that the effluent can be directed and discharged into any one tank of the series.

The sulfuric or other acid employed to

crack the sud is supplied, preferably from an overhead tank not shown, through the pipe 4, the end 4' of which is suitably perforated to cause the acid to be sprayed on to the refuse sud and as it enters the trough so as to mingle intimately therewith. The quantity of acid allowed to mix with the sud is regulated by the operator according to the density or composition of the sud.

When the mixture of sud and acid has been fed into the tank, the agitators are set in motion. These agitators, of which, in this instance, there are two, as 5 and 6, comprise a series of blades 5', 6', secured to a vertical shaft 7 mounted centrally of the tank, one of such agitators being placed near the bottom of the tank, and the other at a convenient distance therefrom. The blades 5', 6' of the said agitators are bent, curved or otherwise shaped to cause the sud, as they revolve in it, to be carried around and also to be forced in a downward direction towards the bottom of the tank, so that the sud is subjected to a thorough agitation to facilitate or hasten the cracking process.

The shaft 7 upon which the agitators 5 and 6 are mounted is rotated by any convenient means. In the arrangement shown, rotation is effected by the bevel gears 8, 9, and fast and loose pulleys 10, 11, motion being communicated to the said loose pulleys by belt from a line shaft or other source. When the tank has become full of sud and the operator judges by experience or observation, that the sud is thoroughly cracked, the rotation of the agitators is stopped, and the sud allowed to settle. The grease thereupon rises to the top and the heavy impurities sink to the bottom, leaving an intervening layer of comparatively clear water. This latter is drawn off through a grease trap 12 which comprise a hollow cylindrical chamber extending upwards from the bottom of the tank and having a series of vertical V-shaped slots or openings 12' therethrough.

Rising up to a given distance centrally of the trap is a pipe 13 controlled by a valve 14 and having an open upper end into which, when permitted by the said valve 14, the separated water passes, and flows through the said pipe to a filter, or away to a drain. The openings 12' allow only water to pass into the pipe, the V-shape slots or gradually narrowing openings 12' preventing the passage of grease to the interior of the trap.



When the water has been separated from the grease and impurities and removed from the tank and it is necessary to transfer the grease to a filter, the agitators are again rotated, the lower one tending to keep the grease and deposited impurities in a sufficiently loose and fluid state to permit of their gravitating freely through the discharge pipe 15 which is controlled by valve 16.

10 By our improved arrangement and combination of parts we are enabled to treat trade effluents, refuse soap suds, and the like, much more efficiently and quickly than hitherto, and further we are enabled to per-  
15 form the whole process in one tank which is a very great advantage.

Having fully described our said invention, what we claim as new and desire to secure by Letters Patent is:—

20 1. The combination, with a tank, of an outlet valve at the bottom of the said tank for letting out the grease and impurities, means for mixing acid with the sud, an agi-  
25 sud so that it separates into layers of grease,

water and impurities, and a valved pipe provided with a trap for preventing the passage of grease into it and projecting into the said tank above the level of the said outlet valve to tap off the middle layer of water. 30

2. The combination, with a tank, of an outlet valve at the bottom of the said tank for letting out the grease and impurities, means for mixing acid with the sud, an agi- 35  
tator arranged in the tank for treating the sud so that it separates into layers of grease, water and impurities, a pipe projecting through the bottom of the tank and having its upper end arranged above the level of the said outlet valve, and a strainer having 40  
V-shaped openings secured around the upper part of the said pipe.

In testimony whereof we affix our signatures in the presence of two witnesses.

BENJAMIN BROADBENT.  
ARTHUR BROADBENT.

Witnesses:

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THOMAS H. BARRON.