

No. 612,181.

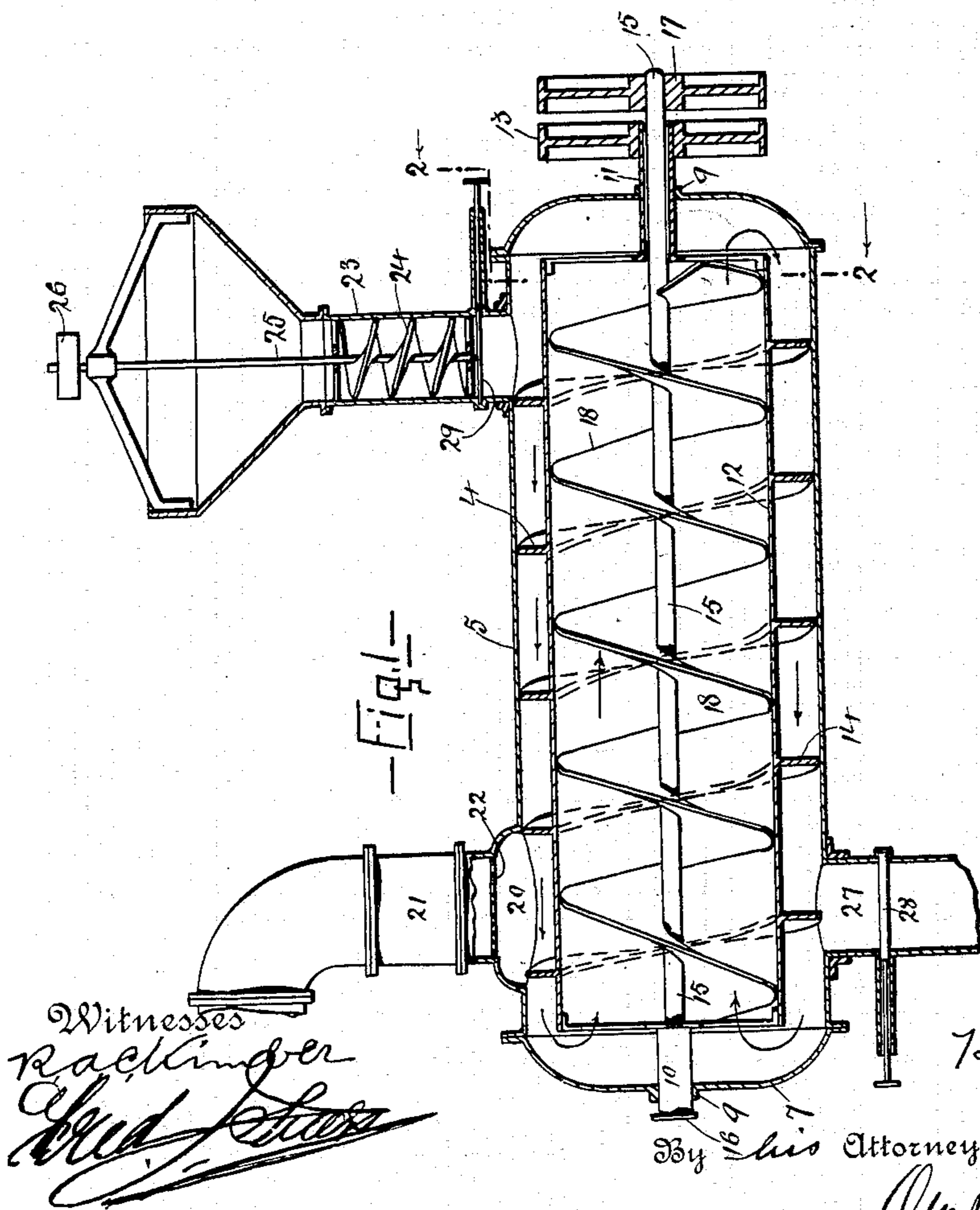
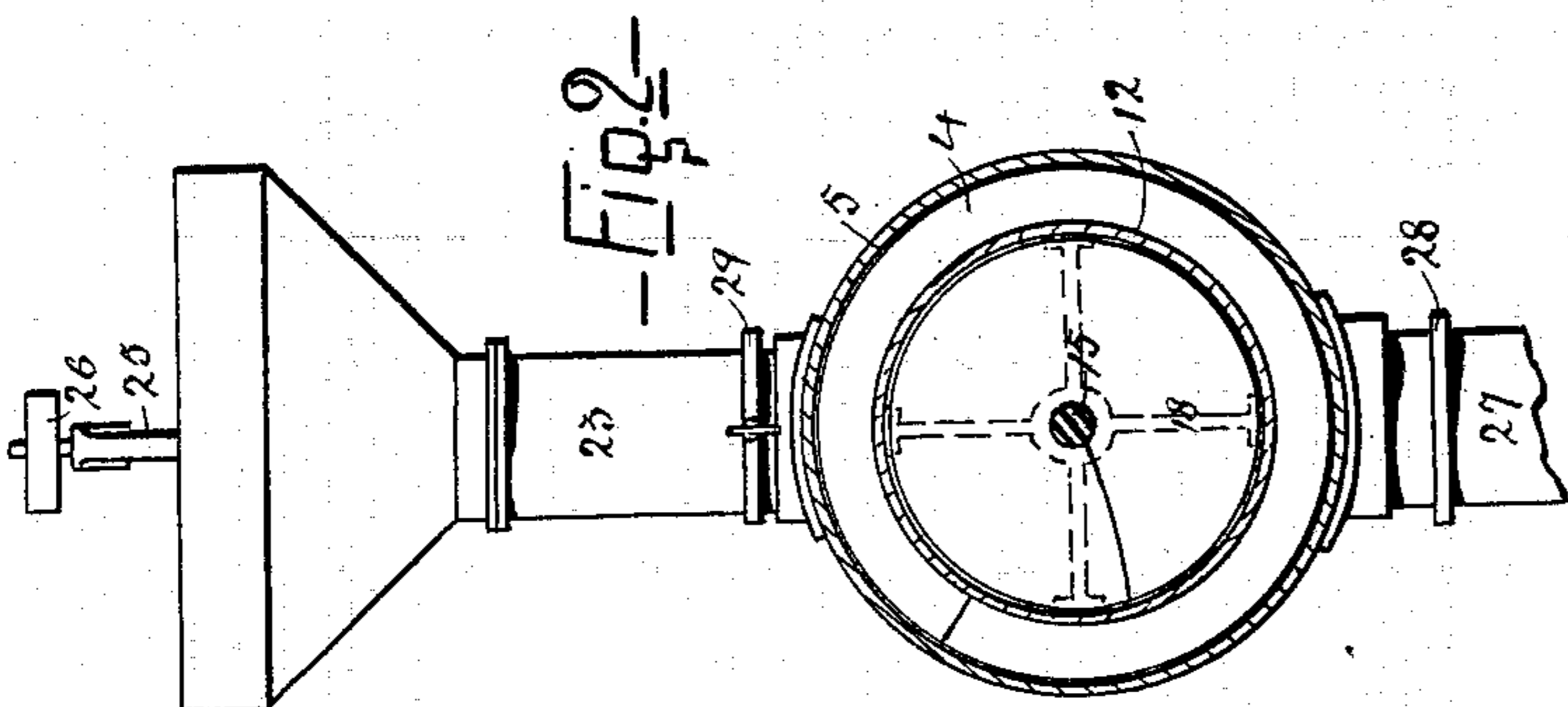
Patented Oct. 11, 1898.

H. SPURRIER.

RETORT.

(Application filed Mar. 4, 1898.)

(No Model.)



# UNITED STATES PATENT OFFICE.

HARRY SPURRIER, OF MONTREAL, CANADA, ASSIGNOR OF ONE-HALF TO  
CHARLES WAUDBY PEARSON, OF WESTMOUNT, CANADA.

## RETORT.

SPECIFICATION forming part of Letters Patent No. 612,181, dated October 11, 1898.

Application filed March 4, 1898. Serial No. 672,540. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY SPURRIER, of the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Retorts; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates particularly to retorts for use in the destructive distillation of sawdust; and it has for its object to provide means whereby the sawdust during the process of distillation will be kept in a constant state of agitation and each particle thereof be brought at intervals into the area of the greatest heat, at the same time providing for the most effective collection of the by-products and the uniform feeding to the retort of the sawdust.

To these ends the invention may be said, briefly, to consist of a pair of cylinders located one within the other, and one, preferably the inner, of said cylinders being rotary, a pair of helices being mounted one intermediate of said cylinders and the other inside of the inner cylinder, said helices being adapted to feed the sawdust in different directions, a gas-discharge, preferably having a transverse perforated diaphragm, being provided at the highest point of the cylinders, and a gate-controlled discharge for the residue provided at the lowest point thereof, while an expansion-chamber is preferably located intermediate of the cylinder and the said discharge-passage, and the pipe through which the sawdust is supplied to the cylinders having a helix located therein.

For full comprehension, however, of the invention reference must be had to the accompanying drawings, forming a part of this specification, in which like symbols indicate corresponding parts, and wherein—

Figure 1 is a longitudinal vertical sectional view of my improved retort; and Fig. 2, a transverse vertical sectional view thereof, taken on line 2 2, Fig. 1.

The stationary cylinder may be mounted upon any suitable superstructure (not shown) and consists, preferably, of a tubular section 5, having hemispherical ends 6 and 7, secured thereto, preferably by bolts, rivets, or the like. These ends are formed with bearings 9,

in which rest the tubular trunnions 10 and 11 of the open-ended inner rotary cylinder 12, the capacity whereof is equal to the capacity of the space between same and the outer cylinder, a pulley 13 being rigidly mounted upon the tubular trunnion 11, while a helix 14 is rigidly mounted upon the exterior of the inner cylinder, and the vanes thereof are of sufficient width to have their radially outer edges rotating in close proximity to the inner surface of the outer cylinder.

A shaft 15 extends through the tubular trunnions and is held against displacement at one end by a disk 16, secured thereon, and the other end thereof has a pulley 17 mounted rigidly thereon, while a helix 18 is carried rigidly by said shaft and extends from end to end of said inner cylinder, the interior of which it closely fits.

The surface of the outer cylinder is formed adjacent to one end thereof to present a dome-like extension 20, to the upper end of which is connected a pipe 21 for the discharge of the gases and communicating with any suitable receptacle, (not shown,) this pipe having a perforated diaphragm 22 secured transversely thereof.

A supply-pipe 23, having a helix 24 mounted therein, driven from any suitable source by a shaft 25 and pulley 26 is connected adjacent to the other end of said outer cylinder and preferably communicates at its upper end with any suitable form of hopper adapted to carry the supply of sawdust to be distilled, while the lower side of the outer cylinder has connected thereto a discharge-pipe 27, leading to any suitable receptacle (not shown) and provided with a gate 28, the supply-pipe 23 being also provided with a gate 29.

The operation of my improved retort is as follows: The gate 29 is opened and the helix 24 started, which will break up any lumps that might occur in the sawdust and feed same uniformly into the space between the cylinders. The outer helix then acts upon the sawdust and causes same to travel from right to left (see Fig. 1) along the interior of the outer cylinder, and owing to the upward curve of the left-hand end will be precipitated into the adjacent end of the inner cyl-

inder, along which it will be caused to travel in a right-hand direction by the inner helix 18. When the retort is filled, the feeding-helix 24 is stopped and the gate 29 closed, after which the entire mass is kept continually in motion, one half moving in one direction and the other half moving in an opposite direction until complete destructive distillation has taken place, the dome 20 serving as an expansion-chamber for the gases and the perforated diaphragm 22 preventing the escape of any particles with the gases through the pipe 21, while upon the gate 28 being opened the residue will be discharged therethrough, owing to the action of the outer helix in moving same in that direction.

It is obvious that, although I have illustrated and described my device as principally applicable for use as a retort for the destructive distillation of sawdust, it may be used with advantageous results in the distillation of other material or as a means to thoroughly mix any granular or liquid substance, in which latter case the gas-discharge pipe may be dispensed with, without departing from the spirit of my invention.

What I claim is as follows:

1. In a retort or the like, the combination of a pair of cylinders located one within the other, a pair of helices adapted to impart motion in opposite directions, one of said helices being located between said cylinders, and the other within the inner cylinder, the inner cylinder having its ends open and the outer cylinder being of greater length than the inner cylinder and having its ends closed, means for guiding substance from one of said cylinders to the other, a feed-pipe leading to and a discharge-pipe leading from said cylinders and means for actuating said helices, for the purpose set forth.

2. In a retort or the like, the combination of a rotary and a stationary cylinder located one within the other, a pair of helices adapted to impart motion in opposite directions, one of said helices being located between said cylinders, and the other within the inner cylinder, the inner cylinder having its ends open and the outer cylinder being of greater length than the inner cylinder and having its ends closed, means for guiding substance from one of said cylinders to the other, a feed-pipe leading to and a discharge-pipe leading from said cylinders, means for rotating said rotary cylinder, and means for actuating said helices, for the purpose set forth.

3. In a retort or the like, the combination of a rotary and a stationary cylinder located

one within the other, a pair of helices adapted to impart motion in opposite directions, one of said helices being located between said cylinders and the other within the inner cylinder, the inner cylinder having its ends open and the outer cylinder being of greater length than the inner cylinder and having its ends closed and of hemispherical form, a feed-pipe leading to and a discharge-pipe leading from said cylinders, means for rotating said rotary cylinder, and means for actuating said helices for the purpose set forth.

4. A retort for the destructive distillation of sawdust, comprising a stationary cylinder, a rotary cylinder located within said stationary cylinder, a helix carried upon the exterior of and movable with said rotary cylinder, a helix mounted within said rotary cylinder, means for rotating said inner helix and rotary cylinder in opposite directions, a sawdust-supply pipe, a gas-discharge pipe and a residue-discharge pipe connected to said outer cylinder, and the ends of said outer cylinder being closed and hemispherical in form, for the purpose set forth.

5. In a retort for the destructive distillation of sawdust, a horizontally-arranged stationary cylinder having its ends closed and of hemispherical form, a rotary cylinder located within said stationary cylinder and mounted upon tubular trunnions extending through the ends thereof, a helix mounted rigidly upon the exterior of said rotary cylinder, a shaft extending through said tubular trunnion and having a helix mounted rigidly thereon and extending within said rotary cylinder, a pair of driving-pulleys mounted rigidly one upon said shaft and the other upon one of said trunnions, a feed-pipe communicating with the upper side of said stationary cylinder, a gate for controlling the passage through said pipe, a helix mounted within said pipe, means for rotating said helix, a gas-discharge pipe also at the upper end of said stationary cylinder and having a transverse perforated diaphragm located therein, a dome or expansion-chamber located intermediate of said gas-discharge pipe and cylinder, and a residue-discharge pipe communicating with the lower side of said cylinder, a gate for controlling said latter pipe, substantially as and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

HARRY SPURRIER.

Witnesses:

WILL P. McFEAT,  
FRED. J. SEARS.