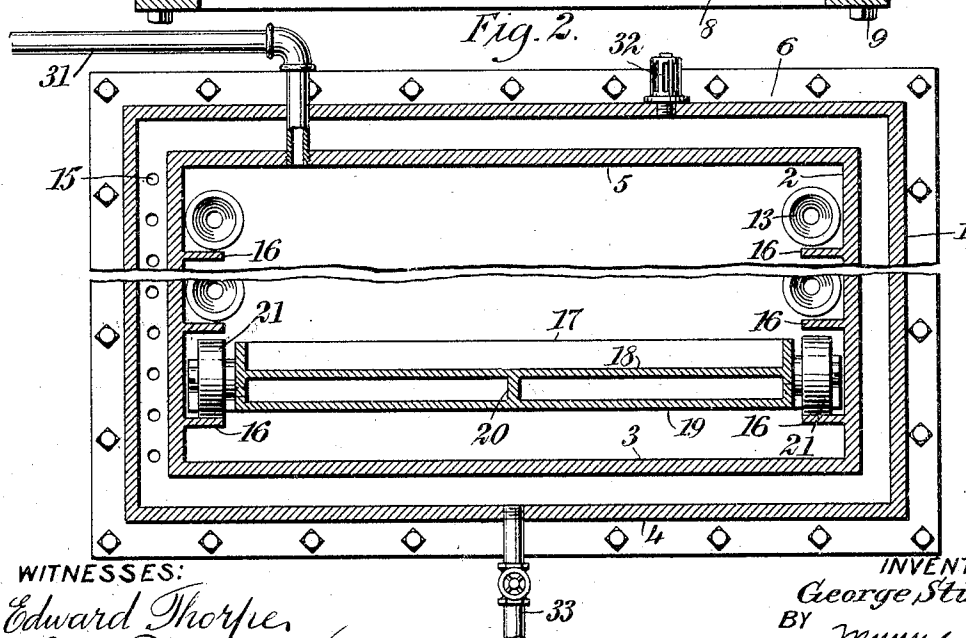
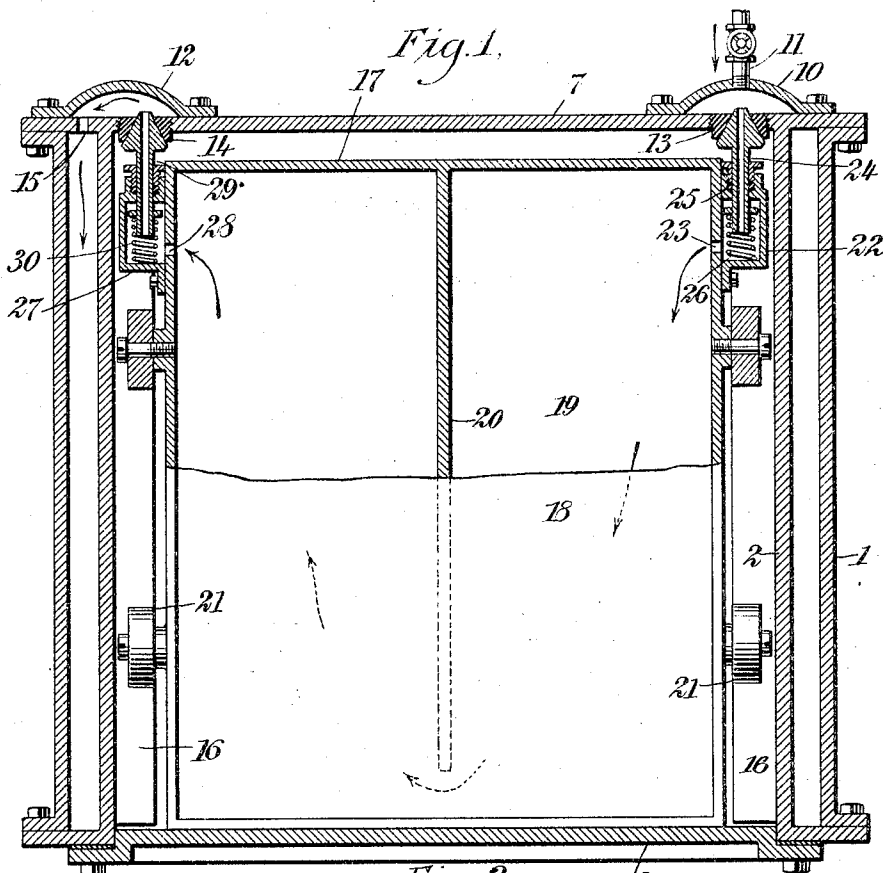


G. STIFF.
 DRYING APPARATUS.
 APPLICATION FILED SEPT. 24, 1904.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE STIFF, OF NORWICH, CONNECTICUT.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 794,564, dated July 11, 1905.

Application filed September 24, 1904. Serial No. 225,790.

To all whom it may concern:

Be it known that I, GEORGE STIFF, a citizen of the United States, and a resident of Norwich, in the county of New London and State of Connecticut, have invented a new and Improved Drying Apparatus, of which the following is a full, clear, and exact description.

This invention relates particularly to improvements in vacuum-driers, the object being to provide a drier of simple and novel construction in which material to be treated may be readily placed and removed therefrom.

I will describe a drying apparatus embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is a horizontal section of a drying apparatus embodying my invention, and Fig. 2 is a broken vertical section thereof.

The drier comprises a vacuum-chamber having spaced side walls 1 2, spaced bottom walls 3 4, spaced top walls 5 6, a rear wall 7, and a front door 8, which may be secured in place by any suitable means. I have here shown the door as secured in a closed position by means of bolts 9. The spaces between the side, top, and bottom walls form chambers for the circulation of a heating medium, such, for instance, as steam.

Attached to the rear wall of the vacuum-chamber is a steam-inlet casing 10, receiving steam through a valve-controlled pipe 11, and also attached to the rear wall is an exhaust-chamber 12. The wall 7 is provided with a plurality of ports 13 leading into the casing 10, and it is also provided with a plurality of ports 14, communicating with the chamber 12, and the exhaust-chamber also has port communications 15 with the space between the adjacent side, top, and bottom walls.

The inner wall of the vacuum-chamber is provided with tracks 16, on which the vacuum pans or trays 17 are movable. The vacuum-

pans 17 are each provided with a double bottom, consisting of the spaced walls 18 19, which form a chamber for a heating agent, such as steam, and this chamber at the center is provided with a longitudinal partition 20, which terminates inward of the outer end of the tray, as clearly indicated in Fig. 1. The tray is mounted on wheels 21, which engage with the tracks 16.

On the inner end of each tray at one side is a steam-box 22, communicating through a port 23 with the circulating or heating chamber, and connected with the steam-box is an inlet-tube 24, which has a cone-shaped end designed to engage in the correspondingly-shaped port 13. The tube 24 passes through a stuffing-box 25, and arranged within the box 22 and engaging with a collar on the tube is a spring 26. On the opposite side of the tray is an exhaust-box 27, communicating with the chamber in the lower portion of the tray through a port 28, and yieldingly mounted in this box 27 is an exhaust-tube 29, having a conical end for engaging in the exhaust-port 14 and similar to the tube 24. This tube 29 is held yieldingly by means of a spring 30. The springs 26 and 30 will insure a tight fit of the tube ends into the ports, or, in other words, compensate for wear or slight lateral disarrangement of the tray.

Any desired number of vacuum-pans may be arranged in the chamber.

Extended from the interior of the vacuum-chamber to a vacuum-pump is a pipe 31, and communicating with the steam-space around the chamber is a safety-valve 32, while a drip-pipe 33 leads from the bottom of said space.

In operation when the several trays containing the material to be treated are in the chamber the door 8 is closed, thereby forcing the trap into position and making steam-tight connections, and steam is admitted and passes through the several tubes 24 into the chambers of the trays, then passes around the ends of the partitions 20 and out through the tubes 29. This exhaust-steam then passes into the spaces around the vacuum-chamber, the

water of condensation from the steam flowing away through the pipe at the bottom of the chamber by its own gravity.

Having now described my invention, I claim
5 as new and desire to secure by Letters Patent—

1. A drier comprising a vacuum-chamber having spaced side, top and bottom walls, the spaces between said walls forming a circulating-chamber for a heating medium, vacuum-
10 pans movable into and out of said vacuum-chamber and having spaced bottom walls, means for directing the heating medium between the bottom walls of each pan, and means for directing the exhaust from the pans into
15 said circulating-chamber.

2. In a drying apparatus, a vacuum-chamber having spaced walls forming chambers for the circulation of a heating medium, an inlet-casing having port communication with
20 the interior of the chamber, an exhaust-casing having port communication with the interior of the chamber and also having port communication with the spaces surrounding the chamber, a series of trays movable into
25 and out of the vacuum-chamber and each having spaced bottom walls, an inlet-box secured to one side of each tray and having port communication with the space between the bottom walls, a spring-yielding tube carried
30 in said box for engaging in the inlet-ports, an exhaust-box on the opposite side of the tray and having port communication with the space between the bottom walls, and a spring-yielding tube extending into said box and adapted
35 for engagement with an outlet-port.

3. In a drying apparatus, a vacuum-chamber, a vacuum-pipe leading therefrom, a series of tracks attached to the side walls of the vacuum-chamber, vacuum-pans, wheels on
40 said pans for engaging on said tracks, each pan having spaced bottom walls, a partition extended through said space and terminating near one end, an inlet-chamber secured to the rear wall of the vacuum-chamber and having

port communication therewith, an exhaust-
45 chamber secured to the rear wall of the vacuum-chamber and having port communication therewith, the said ports having tapered walls, an inlet-tube carried by each vacuum-
50 pan and communicating with the space between the bottom walls, the said tube having a tapered end, and an exhaust-tube communicating with the exhaust-box and having a tapered end.

4. A drying apparatus comprising a vacuum-
55 chamber having a surrounding steam-space, a safety-valve communicating with said space, a vacuum-pipe leading from the interior of the vacuum-chamber, a series of trays movable into and out of the vacuum-chamber, a
60 steam-inlet chamber connected to the rear wall of the vacuum-chamber and having port communication therewith, an exhaust-chamber attached to the rear wall of the vacuum-chamber and having port communication
65 therewith, and also having port communication with the steam-space, inlet-tubes carried by the trays and adapted for connection with the inlet-ports, exhaust-tubes connected to the trays and adapted for connection with the ex-
70 haust-ports, and springs for holding said tubes yieldingly outward.

5. A drier comprising a vacuum-chamber, inlet-ports leading into the chamber, exhaust-
75 ports leading from the chamber, pans movable into and out of the chamber and having spaced bottom walls, and spring-pressed pipes carried by the pans and communicating with the space between the bottom walls and adapted
80 to engage in said ports.

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

GEORGE STIFF.

Witnesses:

WM. STIFF,

WM. F. MECUTCHEN.