W. YEO.

SAND DRIER.

APPLICATION FILED APR. 27, 1910.

980,387.

Patented Jan. 3, 1911.

Fig. 1.

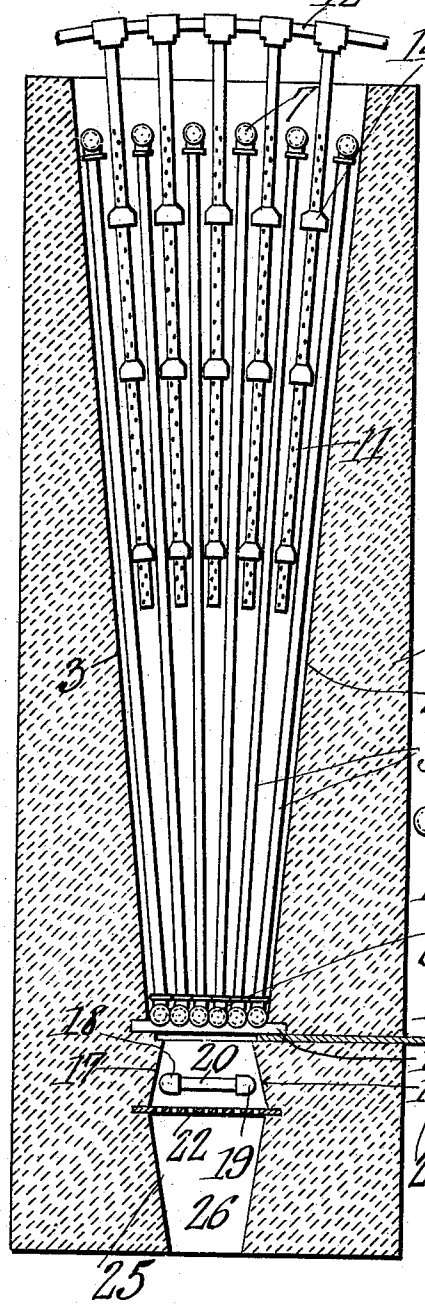


Fig. 2.

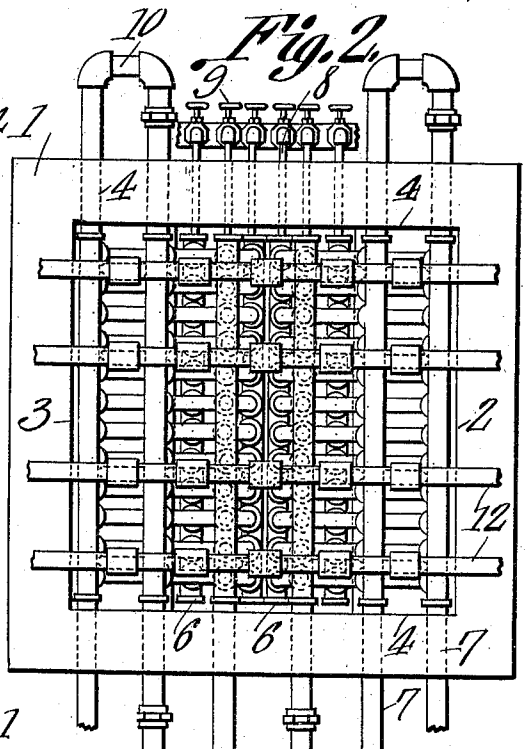
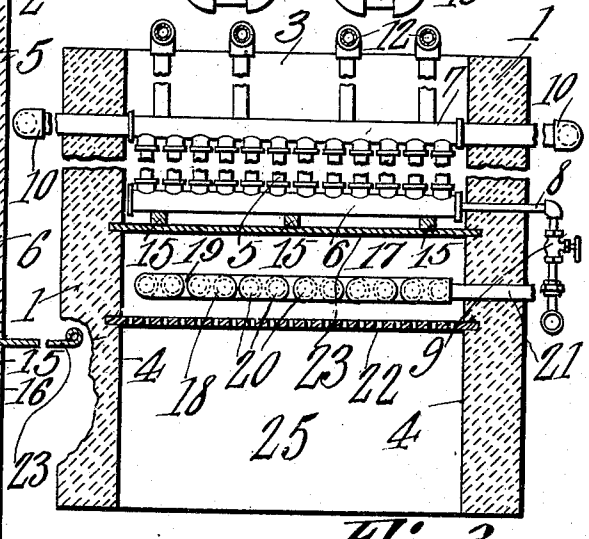


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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SAND-DRIER.

980,387. Specification of Letters Patent. Patented Jan. 3, 1911.

Application filed April 27, 1910. Serial No. 557,930.

To all whom it may concern:

Be it known that I, WILLIAM YEO, a citizen of the United States, residing at Dunbar, in the county of Fayette and State of Pennsylvania, have invented a new and useful Sand-Drier, of which the following is a specification.

This invention relates to sand driers.

The object of the invention is to provide a sand drier in which the action of the steam pipes will be more effective in drying the sand than is the case in sand driers as usually constructed.

A further object of the invention is to cause the weight of the wet sand to pack the same thoroughly around the steam pipes so as to produce a rapid drying thereof.

Another object of the invention is to arrange the steam pipes in such manner as to facilitate the movement of the sand through the drier.

A further object of the invention is to provide improved means for permitting the escape of vapor or steam generated during the drying of the sand.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of the claims without departing from the spirit of the invention.

In the accompanying drawings forming part of this specification:—Figure 1 is a vertical section through a sand drier constructed in accordance with the invention. Fig. 2 is a plan view thereof. Fig. 3 is a vertical section, at a right angle to Fig. 1, the intermediate portion of the sand drier being broken away in order to decrease the length of the figure.

Like reference numerals indicate corresponding parts in the different figures of the drawing.

The sand drier of the present invention is constructed with a casing 1 which may be formed of masonry, metal, wood or any other suitable material. The casing 1 is formed interiorly with downwardly converging front and rear walls 2 and 3 shown in Fig. 1 and the straight or parallel side walls 4 shown in Fig. 2. The converging walls 2 and 3 serve to pack the body of damp sand around the steam pipes 5 which are arranged in upright manner, instead of in horizontal position as usual, and preferably, although not essentially, are arranged in a slightly fan shape design with their inner ends closer together than their upper ends. The steam pipes 5, as shown best in Fig. 3, are arranged in banks or rows, all of the pipes of each bank or row being connected with each other in any suitable manner such as by means of the manifolds or other devices 6 and 7 arranged at the lower and upper ends of the pipes 5 as shown. Water is drained from the lower manifolds 6 through the pipe 8 having a valve 9 therein. The ends of the upper manifolds 7 of the steam pipes 5 extend outward through the casing 1 and are connected with each other by means such as the connections 10, whereby a continuous supply of steam to all of the pipes 5 is effected.

It is to be understood that the upright steam pipes 5 can be arranged in any desired manner and that steam may be supplied thereto in any suitable way.

The means for permitting the escape of the vapor which is generated by the drying of the sand, preferably consists of the upright vent pipes 11 which are preferably arranged between the upper ends of the steam pipes 5 and are provided with suitable perforations as indicated in Fig. 1. The vent pipes 11 at their upper ends are connected with the manifolds 12 which also serve to support said vent pipes. If desired, the vent pipes 11 may be provided at suitable intervals thereon with bell shaped baffle members 14 which serve to facilitate the withdrawal of the vapor from the sand.

It is to be understood that the lower manifolds 6 of the steam pipe are separated from each other sufficiently to permit the dry sand to flow therebetween. The said manifolds preferably are supported upon the cross pieces 15 which are carried by the casing 1. The casing 1 below the manifolds 6 preferably is formed with downwardly and outwardly diverging walls 16 and 17 and in the chamber formed by said walls, is disposed a pair of manifolds 18 and 19 which are connected with each other by short horizontally extending steam pipes 20 having a supply pipe 21 as shown in Fig. 3.

Disposed below the horizontal steam pipe

20 is a foraminous partition or sieve 22 some distance above the surface of which is mounted a slide or damper 23 by means of which the flow of sand through the drier may be regulated or entirely cut off as desired.

Below the grating 22, the casing 1 may be formed with downwardly and inwardly converging walls 24 and 25 which produce an outlet through which the dry sand flows. After the sand leaves the opening 26 at the lower end of the drier, it may be removed in any suitable manner (not shown).

In operation, sand is supplied to the casing 1 at the upper end thereof in any suitable manner. The sand settles downwardly between the vertically extending steam and vent pipes 5 and 11. The moisture which is generated escapes through the vent pipes. The weight of the damp sand at the top of the device forces the sand below it downward between the contracted walls 2 and 3 and holds the sand constantly in engagement with the steam pipes 5 so as to effect thorough drying thereof. Moreover the upright arrangement of the pipes 5 serves not only to produce thorough drying of the sand, but said pipes also are prevented from greatly retarding the movement of the sand through the device as is the case with horizontally arranged pipes. The short horizontally arranged pipes 20 serve to produce heat in the intermediate chamber above the grating 22. As only a single line of these pipes is usually employed, they will not interfere with the movement of the dry sand.

By reason of the fact that the weight of the material pressing downward will keep the lower layers thereof in contact with the entire surface of the hot pipes, the device of the present invention is more effective with a given number of pipes than would be the case if the pipes were differently arranged.

While the device of the present invention has been described as a sand drier, it is to be understood that it can be used for drying any other suitable material.

The improved drier is strong, simple, durable and inexpensive in construction as well as thoroughly practical and efficient in operation.

What is claimed as new is:—

1. A drier for sand and similar material having upright downwardly converging drying and vent means.

2. A drier for sand and similar material having a casing formed with downwardly converging walls, parallel manifolds mounted adjacent the lower ends of said walls, and serving to support the body of sand therein until dried, and upright steam pipes connected with said manifolds at their lower ends.

3. A drier for sand and similar material having a casing formed with an upper chamber having downwardly converging walls, an intermediate chamber having downwardly diverging walls, and a lower chamber having downwardly converging walls, drying means located in said upper chamber and foraminous means located between said intermediate chamber and said lower chamber.

4. A drier for sand and similar material having a casing formed with downwardly converging walls, downwardly converging steam pipes located within said casing, and downwardly converging vent pipes disposed between said steam pipes.

5. A drier for sand and similar material having an upper drying chamber, upright steam pipes in said upper chamber, horizontal steam pipes located at the lower end of said upper chamber, an intermediate chamber having downwardly diverging walls, horizontal steam pipes in said intermediate chamber, a foraminous partition at the lower end of said intermediate chamber, a damper slidable within said intermediate chamber, and a lower chamber having downwardly converging walls.

6. A drier for sand and similar material comprising a casing formed into an upper, an intermediate, and a lower chamber, said upper chamber having two straight side walls and two downwardly converging side walls, a plurality of manifolds extending across the lower end of said upper chamber, a plurality of upright steam pipes connected with said manifolds and being arranged so as to converge toward their lower ends, a plurality of manifolds connecting the upper ends of said steam pipes in a plurality of banks, a plurality of downwardly converging vent pipes projecting into the upper end of said upper chamber, manifolds connecting the upper ends of said vent pipes, bell shaped baffle members mounted on said vent pipes, a foraminous partition mounted at the lower end of said intermediate chamber, a sliding damper mounted in said intermediate chamber, a plurality of horizontally disposed steam pipes mounted above said foraminous partition in said intermediate chamber, and means for supplying steam to all of said steam pipes.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM YEO.

Witnesses:
M. D. WILLIAMS,
W. W. BRANT.