F. W. ADLOF.

SAND DRYING FURNACE.

APPLICATION FILED JAN. 12, 1911.

1,018,951.

Patented Feb. 27, 1912.

2 SHEETS—SHEET 1.

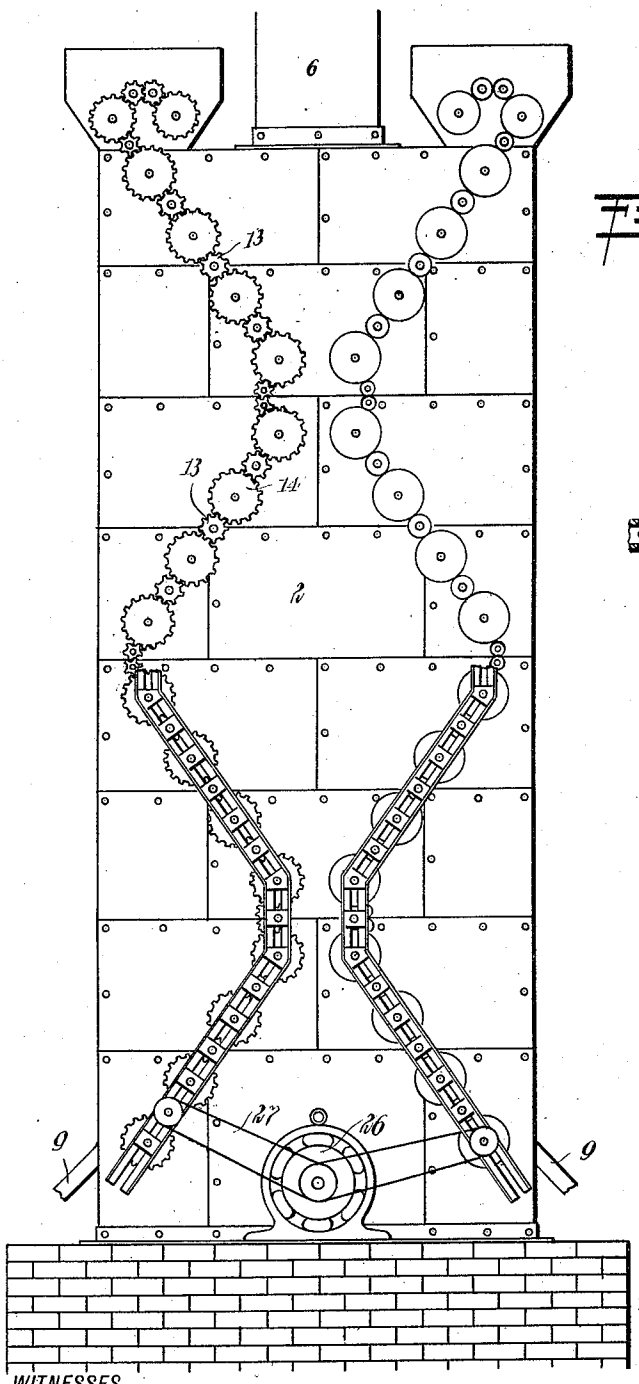


FIG. 1.

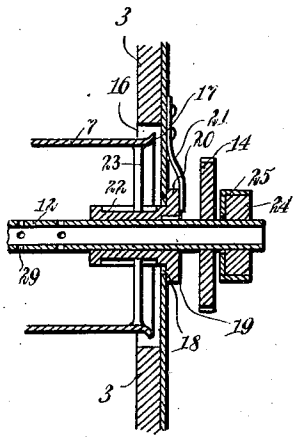
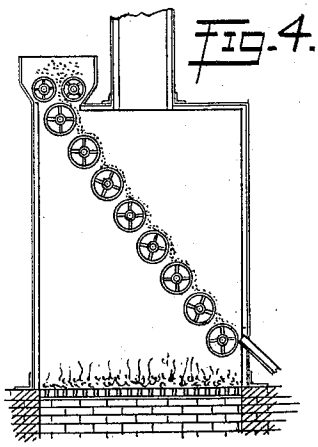


FIG. 3.

FIG. 4.



WITNESSES

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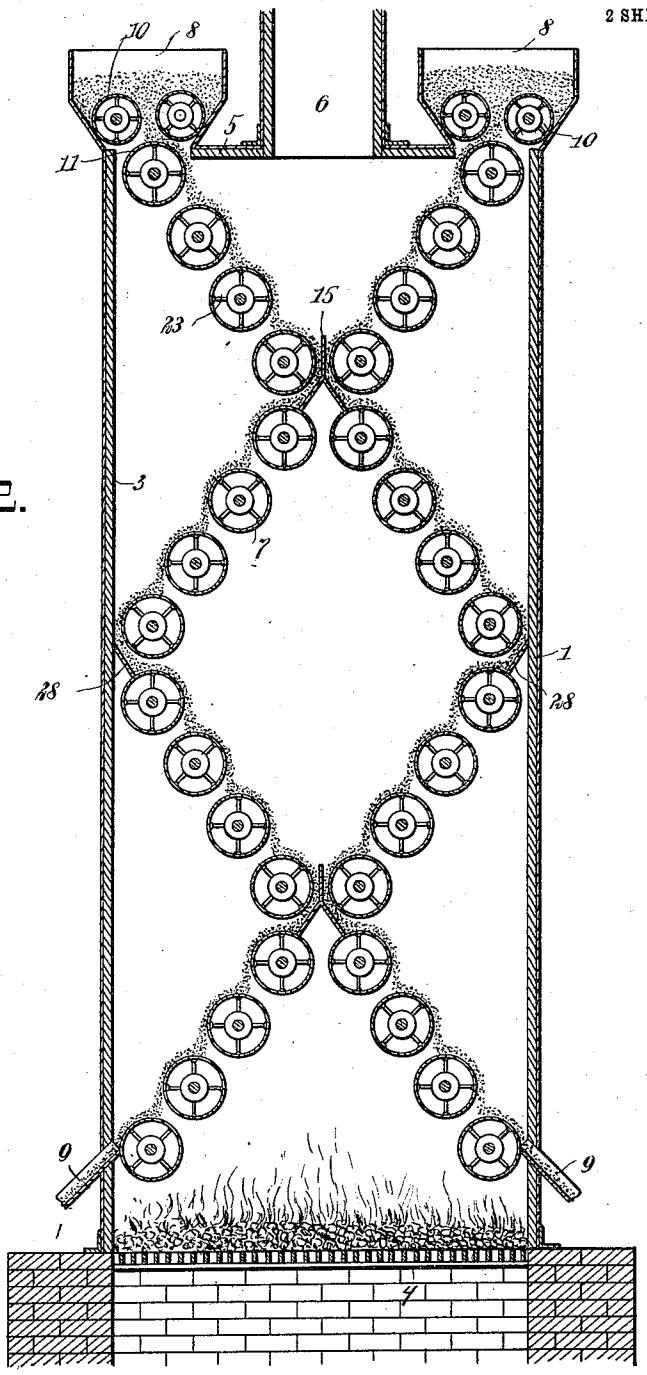
2 SHEETS—SHEET 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

FREDERICK W. ADLOF, OF NEW KENSINGTON, PENNSYLVANIA.

SAND-DRYING FURNACE.

1,018,951. Specification of Letters Patent. Patented Feb. 27, 1912.

Application filed January 12, 1911. Serial No. 602,148.

To all whom it may concern:

Be it known that I, FREDERICK W. ADLOF, a citizen of the United States, and a resident of New Kensington, in the county of Westmoreland and State of Pennsylvania, have invented a new and Improved Sand-Drying Furnace, of which the following is a full, clear, and exact description.

My invention relates to a new and improved form of sand-drying machine, and an object of my invention is to supply the wet or damp sand in thin streams through the furnace in such a manner that the separate particles will be exposed to the direct heat of the furnace. I attain this object by positioning a series of spaced-apart rollers within the furnace, so arranged that the sand is fed from one roller to another down a diagonally-inclined path to the outlet hoppers at the lower portion of the furnace.

A further object of my invention is to provide a device which admits of the expansion of the different parts due to the heating of the same, without in any way interfering with the working parts of the device.

With these and other objects in view, as will more fully hereinafter appear, the present invention consists in certain novel details of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out 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 all the figures, and in which—

Figure 1 is an end elevation of a preferred embodiment of my invention, parts being broken away for clearer illustration; Fig. 2 is a transverse vertical sectional view taken in a plane substantially parallel to the plane of the view shown in Fig. 1; Fig. 3 is a vertical detailed transverse sectional view showing the means for joining the cylinders to the casing of the furnace, and Fig. 4 is a vertical sectional view showing a modified form of the furnace.

In the drawings illustrating a preferred embodiment of my invention, I have shown a vertically constructed furnace comprising an outer casing 1, preferably made of a series of plates 2 fastened together in any preferred manner, and having an inner lining 3 of clay or any fire-brick material. Extending across the open bottom of the casing, is any preferred form of fire grate 4, and extending centrally from the upper portion of the closed top 5 is an exhaust flue 6. While any number of series of rollers may be placed in the furnace, I have shown a furnace comprising two sets of rollers or cylinders 7, arranged for the purpose of economy of space in a zigzag form leading from a hopper 8 at the upper end 5 of the casing to an exhaust chute 9 at the lower side of said casing.

The material from the hopper is fed to the first roller by means of a pair of feed rollers 10 positioned at the mouth 11 of the hopper. These rollers are mounted upon perforated shafts 12 extending transversely through the casing and having one end projecting to the outside of the same. These rollers or cylinders are so arranged that a vertical line passing through the axis of the sub-adjacent cylinder, will be tangent to or slightly offset from the downwardly-moving periphery of the cylinder next above. These cylinders, through the mechanism of the intermediate pinions 13, mesh with gear wheels 14 rigidly mounted upon the projecting portion of the shaft 12 on the outside of the casing. The pinions 13 and gears 14 are journaled in slidable journal blocks 24 mounted in a guideway 25 extending in a zigzag position on the outside of the casing. The gears 14 are connected to a motor 26 or other prime mover by means of a belted connection 27. It will be seen that by this arrangement, the cylinders of each set rotate in the same direction, so that as the sand or other material is fed through the hopper, it will fall down on the highest cylinder and then will fall off the face of this cylinder on to the face of the next cylinder, and so on diagonally down the length of the furnace as shown more particularly in Fig. 4. As these cylinders are spaced some material distance apart, it will be seen that the heat from the fire on the grate 4, will have free access to this stream of sand, thereby drying the same, and the moisture-laden air will pass out the exhaust 6.

While the series of cylinders may extend diagonally down the entire length of the furnace in one straight line, it has been

found that it affords a more economical arrangement to change the direction to a zigzag shape, and for this purpose there is interposed centrally in the body of the furnace, inverted Y-shaped buffer plates 15 and angularly-disposed plates 28 positioned on the sides of the furnace, both of which plates will change the direction of the flow of sand on to another series of cylinders having a rotating movement in the opposite direction from the rotation of the preceding series, and in this way, relatively long streams of material may be confined within the limits of the furnace.

The inner lining 3 is interrupted adjacent the axis 12, and into the recessed portion 16 formed by the interrupted lining extend outwardly-flaring ends 17 of the cylinders 7. Positioned within each of the apertures 18 in the casing and keyed to each of the shafts 12, is a collar 19 having a flanged head 20 closing the apertures and held in position by means of a leaf spring 21, having one end riveted to the casing 2 and having its free end pressing against the head 20, to hold said collar removably in contact with the casing. This collar has a series of longitudinal slots 22 about its periphery and within the casing, and in these slots are movably positioned a series of radially-disposed axles 23. It will be seen that by this arrangement, there is permitted a relative expansion between the several parts, the cylinders in this case being free to move transversely along the collar 19. The perforations 29 in the shaft 12 allow the air to freely circulate therethrough, to keep the bearings cool.

Many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof.

It is intended that all matters contained herein in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is merely intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween, and that materials, sizes and relativities of parts are non-essential, except as called for in the claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a sand-drying furnace, a casing having an aperture therein, a collar mounted in said aperture and having a series of longitudinally-extending slots therein, a cylinder shaft journaled in said collar and extending within said casing, a cylinder concentric with and surrounding said shaft, and radially disposed members supporting said cylinder in position, said members having their inner ends in sliding engagement with said slot, whereby expansion may take place between the several parts.

2. In a sand-drying furnace, a casing, two sets of rollers mounted in said casing, said rollers arranged in a zigzag form, whereby a relatively large number of rollers may be inserted within the casing, and a pair of feed rollers positioned above the topmost roller of each set.

3. In a sand-drying furnace, a casing, a series of cylinders arranged in sets and mounted in said casing, gears rigidly mounted upon said cylinders, and pinions mounted upon said casing and meshing with the adjacent gears of each set, whereby the cylinders of each set are rotated in the same direction.

4. In a sand-drying furnace, a casing having a series of cylinders therein, shafts carrying said cylinders and projecting through said casing, a guideway mounted upon the outside of said casing, and sliding journal boxes mounted in said guideway and carrying said shafts.

5. In a sand-drying furnace, a series of parallel rollers mounted in a vertical zigzag position within said casing, and buffer plates disposed at the point of each change of direction of said rollers, whereby material in its course down the different rollers will be deflected from said buffer plates on to the next series of rollers.

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

FREDERICK W. ADLOF.

Witnesses:
CARROLL C. WAREHEIM,
HARRY C. WALLEY.