No. 804,607. PATENTED NOV. 14, 1905.

W. KING.

SAND DRIER.

APPLICATION FILED MAY 3, 1905.

2 SHEETS—SHEET 1.

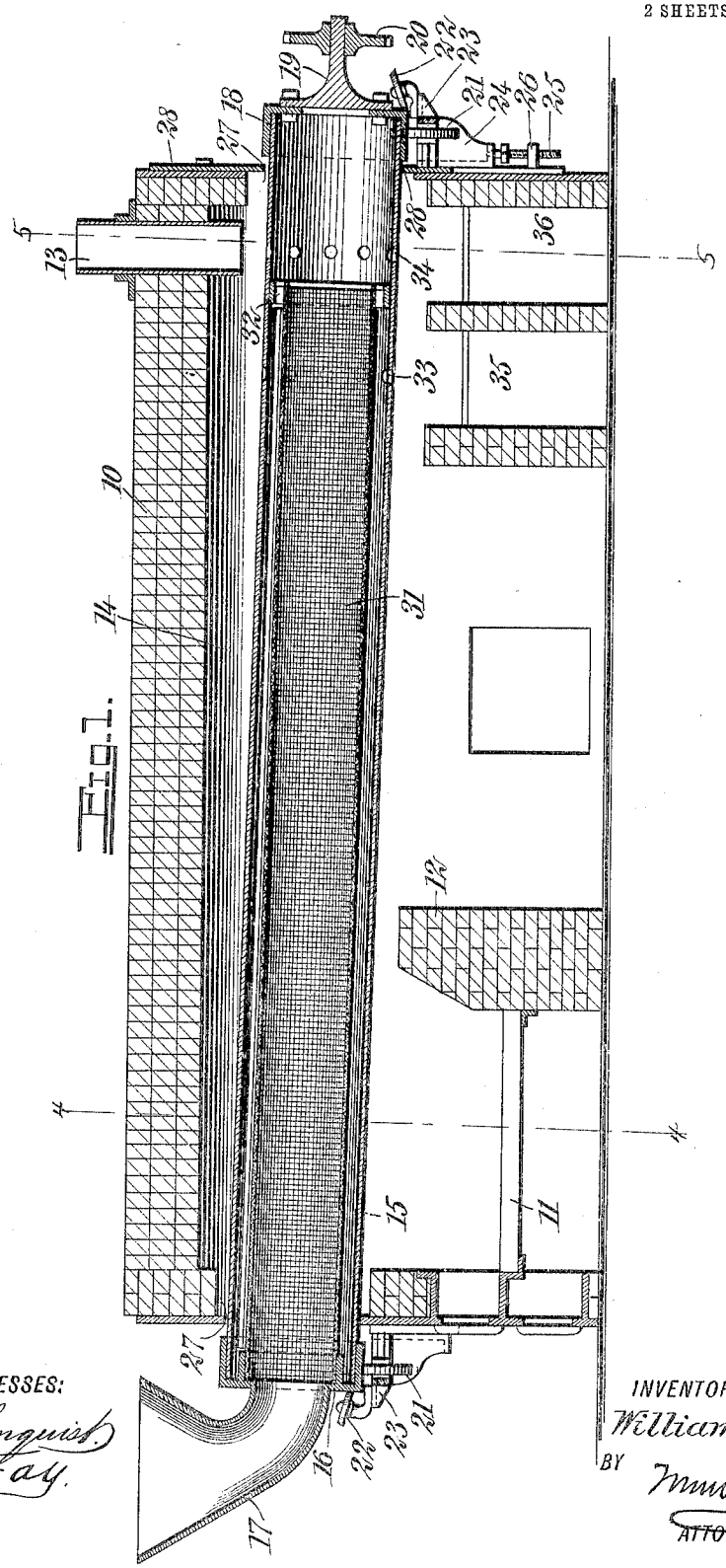


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

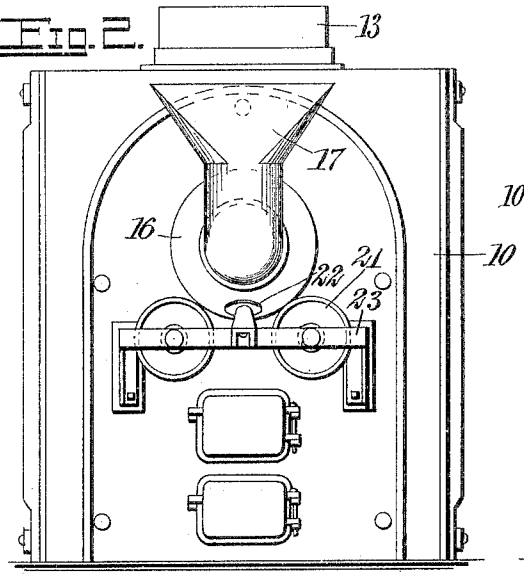


Fig. 3.

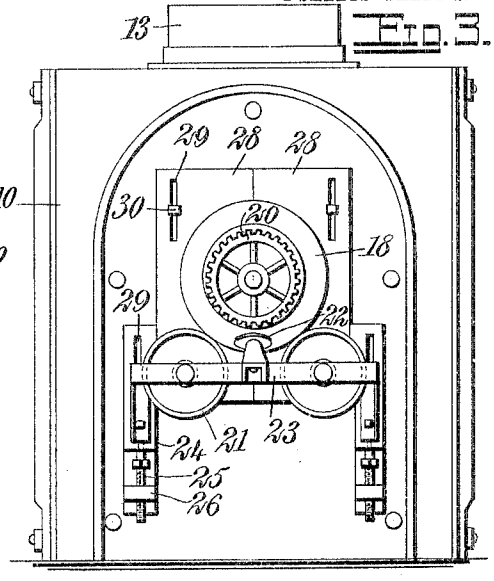


Fig. 4.

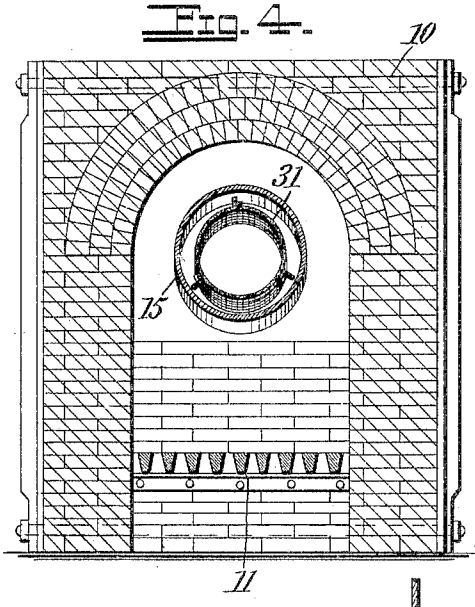
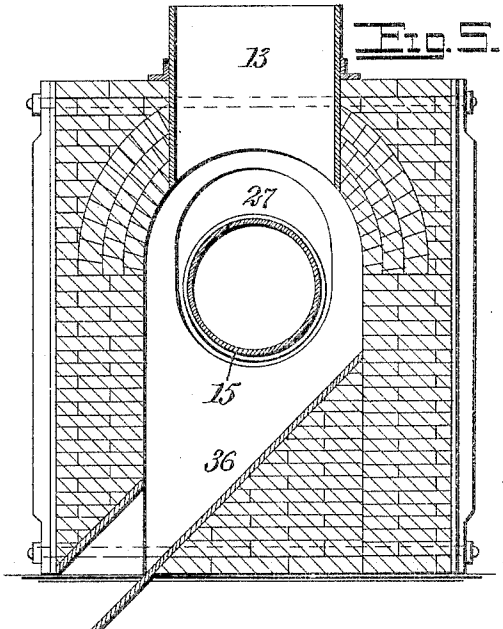
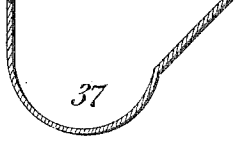


Fig. 5.





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UNITED STATES PATENT OFFICE.

WILLIAM KING, OF CEDAR RAPIDS, IOWA.

SAND-DRIER.

No. 804,607. Specification of Letters Patent. Patented Nov. 14, 1905.

Application filed May 3, 1905. Serial No. 258,588.

To all whom it may concern:

Be it known that I, WILLIAM KING, a citizen of the United States, and a resident of Cedar Rapids, in the county of Linn and State of Iowa, have invented a new and Improved Sand-Drier, of which the following is a full, clear, and exact description.

My invention relates to the drying of sand and other similar materials.

The principal objects of the invention are to provide means for the effective separation of sand from coarser materials mingled therewith, for drying both the fine and coarse materials, and for separating the former from the latter.

Further objects are to provide means for permitting steam or any volatile matters to escape from the material operated upon, for slowly feeding the material over a drying-surface, and for effectively supporting the apparatus and applying heat in an economical and efficient manner.

Further objects of the invention will appear in the course of the subjoined description.

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.

Figure 1 is a longitudinal central sectional view of an apparatus embodying the principle of my invention. Fig. 2 is a front elevation thereof. Fig. 3 is a rear elevation; and Figs 4 and 5 are sectional views on the lines 4 4 and 5 5, respectively, of Fig. 1.

In the form illustrated in the drawings my invention includes the following parts:

A furnace structure 10 is provided, as usual, with a grate 11, bridge 12, stack 13, and any other features which may be necessary or desirable for the proper combustion of fuel and distribution of the heat therefrom. The construction of the furnace in general is not a part of my invention, and any desired kind of furnace may be employed; but I prefer one in which a horizontal passage 14 is provided for the reception of a rotary cylinder or other receptacle 15. This receptacle is provided with a front cap 16, secured to its end in any desired manner and having a hopper 17 for the introduction of material to it. It is also provided with a rear cap 18, having an extension 19 and a wheel 20 or other element by which rotation may be imparted to the receptacle. Two sets of bearing-rollers 21 and 22 are provided, preferably at the ends of the receptacle, so as to bear upon the end caps. These rollers are mounted in bearings upon brackets 23. One of the brackets is preferably connected with a stationary part of the machine, while the other one is mounted upon a reciprocal frame 24, adapted to be adjusted vertically by means of a screw 25, engaging in a stationary nut 26, mounted upon the frame of the furnace. These bearing devices are preferably located outside of the furnace, the latter being provided with perforations 27 to permit the casing to pass through it. The opening through which the adjustable end of the casing extends is preferably provided with sliding plates 28, which can be adjusted with the frame 24. These plates are provided with elongated slots 29 for the reception of studs 30 for guiding them with respect to the outside of the furnace.

The cylinder or casing is provided with a cylindrical screen 31, preferably located concentric with the casing and extending from the hopper to a point near the rear end, where it is supported by a spider 32. The casing is provided with two series of perforations 33 and 34 upon opposite sides of the spider and of the end of the screen. The perforations 23 are provided for permitting the fine material which passes through the screen to pass out of the casing, while the perforations 34 are provided for discharging the coarse material that is carried to the end of the screen and deposited in the casing beyond the spider. Another function of the perforations 34 is to permit any steam or volatile matter from the sand to pass upwardly through the stack 13. The materials discharged from the openings 33 and 34 are deposited, respectively, on chutes 35 and 36, from which they can be discharged into any desired receptacle—as, for example, a trough 37. (Shown in Fig. 5.)

In operation the sand or other material deposited in the hopper 17 will be discharged into the screen 31. As the casing and screen are inclined from the front to the rear end and are constantly rotated by the wheel 20, the material will gradually work down to the rear end of the screen, the final part of it passing through the screen and being deposited upon the surface of the casing. During all this time the heat from the fire will serve to assist in drying the materials, and as they are constantly being separated and assuming different positions with respect to each other the heat applied to the casing will be most efficiently used for effecting the desired result. As the fine material or sand moves toward the

spider it will be discharged through the openings 33, which may be in any desired numbers and located as near together as may be found advantageous. Sand will therefore be discharged in an obvious manner. The coarser material will pass to the openings 34 and be discharged in the same way. Any gases or volatile matters from the material will be allowed to pass upwardly through the openings 34 and the stack 13 and from there discharged from the furnace.

It is to be understood that while I have illustrated one form of my invention the latter is not limited to this form, but can be carried out in many other ways coming within the scope of the appended claims. It will also be readily understood that the apparatus can be used for drying many other materials than that mentioned and that it is not limitedto any particular character of materials upon which to operate.

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

1. In a drying apparatus, the combination of a furnace with a rotatable casing, said furnace being provided with roller-bearings for the casing, the bearings at one end of the casing being vertically adjustable, and the furnace being provided with an opening having adjustable plates for partially closing it.

2. In a drying apparatus, the combination of a horizontal furnace having a grate at one end and a discharge-outlet at the other, and openings in its opposite ends, with a rotatable casing extending through the furnace from end to end in an inclined position and projecting through said openings; said casing being provided with means for rotating it upon one end, and said furnace being provided with roller-bearings for the ends of the casing, the bearings at one end of the casing being vertically adjustable, and one of the openings in the furnace being provided with plates for partially closing it, and having a passage for the cylinder, said plates being adjustable.

3. A drying apparatus, comprising a rotatable cylinder, means for introducing material into said cylinder, and a screen located in the cylinder, the cylinder being provided with perforations located on opposite sides of one end of the screen.

4. A drying apparatus for sand, comprising a rotatable cylinder, means for introducing material into one end of said cylinder, a screen located in the cylinder and extending from the receiving end thereof to a position adjacent to the discharge end, said cylinder being provided with perforations located beyond the end of the screen and with perforations located adjacent to the screen, and discharge-chutes located beneath said openings.

5. A drying apparatus comprising a rotatable cylinder having an open end and a closed end, means for introducing material into the open end, and a screen located in the cylinder and extending from the open end to a position adjacent to the closed end, said cylinder being provided with perforations located on opposite sides of the rear end of said screen.

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

WILLIAM KING.

Witnesses:
JOHN BURIANEK, Jr.,
FRANK H. RENO.