

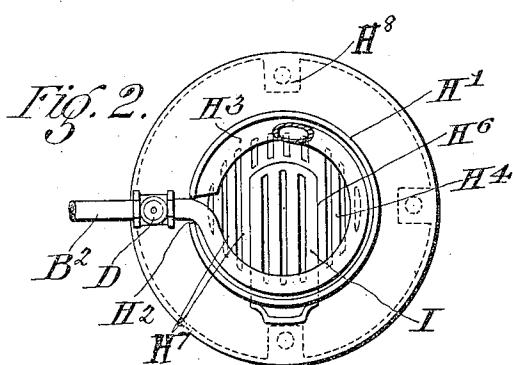
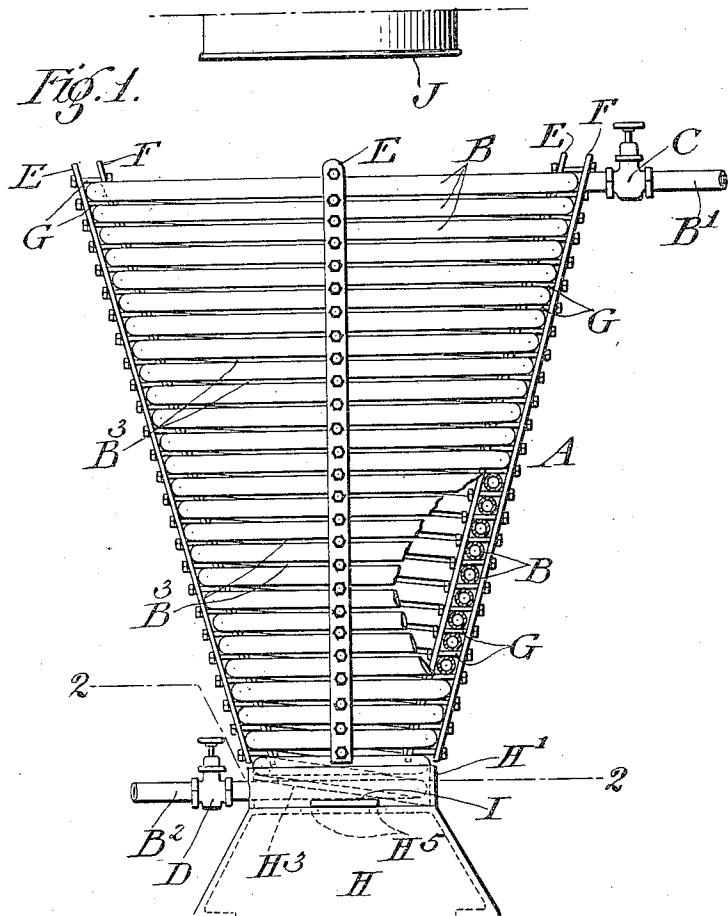
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SAND DRIER.

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WITNESSES:

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JAMES A. BEAMER, OF TYRONE, PENNSYLVANIA.

SAND-DRIER.

1,069,667.

Specification of Letters Patent. Patented Aug. 12, 1913.

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To all whom it may concern:

Be it known that I, JAMES A. BEAMER, a citizen of the United States of America, residing in Tyrone, in the county of Blair, 5 in the State of Pennsylvania, have invented a certain new and useful Improvement in Sand-Driers, of which the following is a true and exact description, reference being had to the accompanying drawings, which 10 form a part thereof.

My present invention relates to apparatus for drying sand and like material, and the object of the invention is to provide a simple and effective device for drying sand 15 which will effectively dry the sand passing through the device in a uniform manner and will not overheat any portion of the sand passing through the device.

In carrying out the invention I provide 20 a receptacle into which the sand to be dried is placed, and form the lateral wall, or a portion thereof, of this receptacle of portions of pipe through which a heating fluid may be passed, and I space the adjacent 25 pipe portions such a distance apart that dry sand may pass freely through the adjacent pipe portions while wet sand will be effectually prevented from so passing on account of its adhesive and cohesive properties.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. 35 For a better understanding of the invention however and the advantages possessed by it reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described the 40 best form now shown to me in which my invention may be embodied.

Of the drawings, Figure 1 is an elevation, partly broken away and in section, and Fig. 45 Fig. 1.

In the form of apparatus shown in the drawings, the body A of the receptacle in which the sand to be dried is placed is in the form of an inverted hollow cone the 50 curved wall of which is formed by the adjacent convolutions B of a steam pipe. The convolutions B are of progressively increasing diameters from the bottom to the top of the receptacle A. The upper end B', of the pipe is provided with a valve C, and the lower end, B², of the pipe is provided

with a similar valve D. By means of these valves the flow of the heating fluid, usually steam, through the convolutions of the pipe may be controlled. The body A is stiffened 60 and the spaces B³ between the adjacent convolutions are definitely fixed by means of a plurality of pairs of inner and outer strips E and F, which extend transversely to the convolutions of the pipe and are connected by bolts G which extend between each 65 adjacent pair of convolutions.

In the form shown, the body A is supported by a hollow base member H having a cylindrical flange H' which encircles the 70 lower end of the body A. The flange H' is notched at H² to permit the passage of the pipe end B². As shown, the member H is provided with an inclined shelf portion H³ on which the inclined portion of the 75 bottom pipe convolution B rests while the straight portion of the lower coil rests on the partition member H⁴ of the base member H. This partition H⁴ forms the bottom wall of the sand receiving receptacle and may be 80 slotted, as indicated at H⁵, to permit dried sand to pass through it. The partition H⁴ is also provided with an opening H⁶, normally closed by a slide I working on the guides H⁷ carried by the partition H⁴. The 85 slide I can be removed from time to time to permit removal from the interior of lumps or other large bodies which may accumulate in the receptacle. The base member H, in the form shown, is provided with apertured 90 ears H⁸, by means of which the base member may be secured on any suitable support not shown.

J represents the discharge spout from a suitable sand reservoir through which the 95 sand to be dried may be passed into the sand drying receptacle A.

In operation the pipe convolutions B are heated to the desired temperature by the passing of steam or other heating fluid 100 through the pipe. The wet sand coming in contact with the hot pipe sections is heated and its moisture is driven off. This moisture may escape freely into the surrounding atmosphere through the spaces B³ between 105 adjacent pipe convolutions. This avoids one of the great disadvantages with the sand drying devices having heating coils heretofore employed in which the arrangement of the heating coils has been such that the 110 moisture driven out of the sand in immediate contact with the steam pipes did not es-

cape from the body of the sand, but was merely driven into a portion of the sand more remote from the heating coils. The spaces B between adjacent convolutions are 5 of such width that the sand will flow by gravity freely through the spaces after it has been sufficiently dried, but before drying will be prevented by its cohesive and adhesive properties from passing through those 10 spaces.

While the inverted conical structure shown is a simple and effective one it will of course be understood that a sand drying receptacle may have a wall portion formed 15 of spaced apart pipes arranged in many different ways without any departure from the invention. In general I prefer, however, that the receptacle shall be hopper shaped, particularly as this facilitates the collection 20 and removal of large objects contained in the sand, which naturally accumulate at the bottom of the receptacle. I prefer also to have the piping forming the lateral wall horizontally disposed, as with this arrangement 25 of the piping, the tendency of the sand to bridge or arch between adjacent pipes and thereby restrict the discharge of dry sand, is reduced to a minimum. The size of the heating pipe to be used and the 30 distance which the adjacent pipes are spaced apart will vary somewhat with conditions, and will be readily determined in a particular case by any one skilled in the art. In one example of a structure of the form 35 shown which I have found to be highly satisfactory in operation, the external diameter of the steam pipe used was one and five eighths inches and the distance between the adjacent surfaces of each adjacent pair 40 of convolutions was three eighths of an inch.

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

45 1. A sand drying receptacle comprising a receptacle for the sand to be dried having an externally exposed wall portion formed of superimposed substantially horizontal pipe portions through which a heating fluid 50 may be passed, adjacent pipe portions being spaced such a distance apart that dry sand will and wet sand will not flow through the spaces between the pipe portions.

2. A sand drying device comprising a receptacle for the sand to be dried formed by the adjacent externally exposed convolutions of a vertically disposed coil of pipe 55 through which a heating fluid may be passed which has the adjacent convolutions spaced 60 such a distance apart that dry sand may

pass out from said receptacle between said convolutions, while wet sand is prevented from so passing from the receptacle.

3. A sand drying device comprising a pipe 65 through which a heating fluid may pass coiled in externally exposed convolutions of progressively varying diameters to form a vertically disposed hollow conical structure of inverted conical form, the adjacent convolutions of which are spaced at such a distance apart that dry sand may pass out from the receptacle, between said convolutions, while wet sand is prevented from so escaping 70 from said receptacle.

4. A sand drying device comprising a 75 pipe through which a heating fluid may be passed coiled into convolutions of progressively varying diameters to form an inverted hollow conical structure, one or more pairs of strips extending transversely of the 80 convolutions with one strip of each pair within and the other without said structure, and bolts connecting the two strips of each pair together, said bolts extending between adjacent pairs of convolutions and serving 85 to space them at such a distance apart that dry sand may pass but wet sand is prevented from passing between said convolutions.

5. A drying device comprising a pipe 90 through which a heating fluid may be passed coiled into convolutions about a vertical axis, with adjacent convolutions spaced at such a distance apart that dry sand may pass and wet sand is prevented from passing between 95 the convolutions, a base member on which said coil is mounted, said base member being provided with a floor closing the lower end of the space in the coil and formed with an opening through it, and a door for said opening which may be opened when desired to remove large material accumulating in said space.

6. A sand drying device comprising a receptacle for the sand to be dried, having an 105 externally exposed wall portion, which is slightly inclined outwardly from the bottom of the receptacle upward, and is formed by substantially horizontal pipe portions through which heating fluid may be passed, 110 said pipe portions being spaced such a distance apart that dry sand may pass from the receptacle through the spaces between said pipe portions, while wet sand is prevented from so escaping from the receptacle.

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