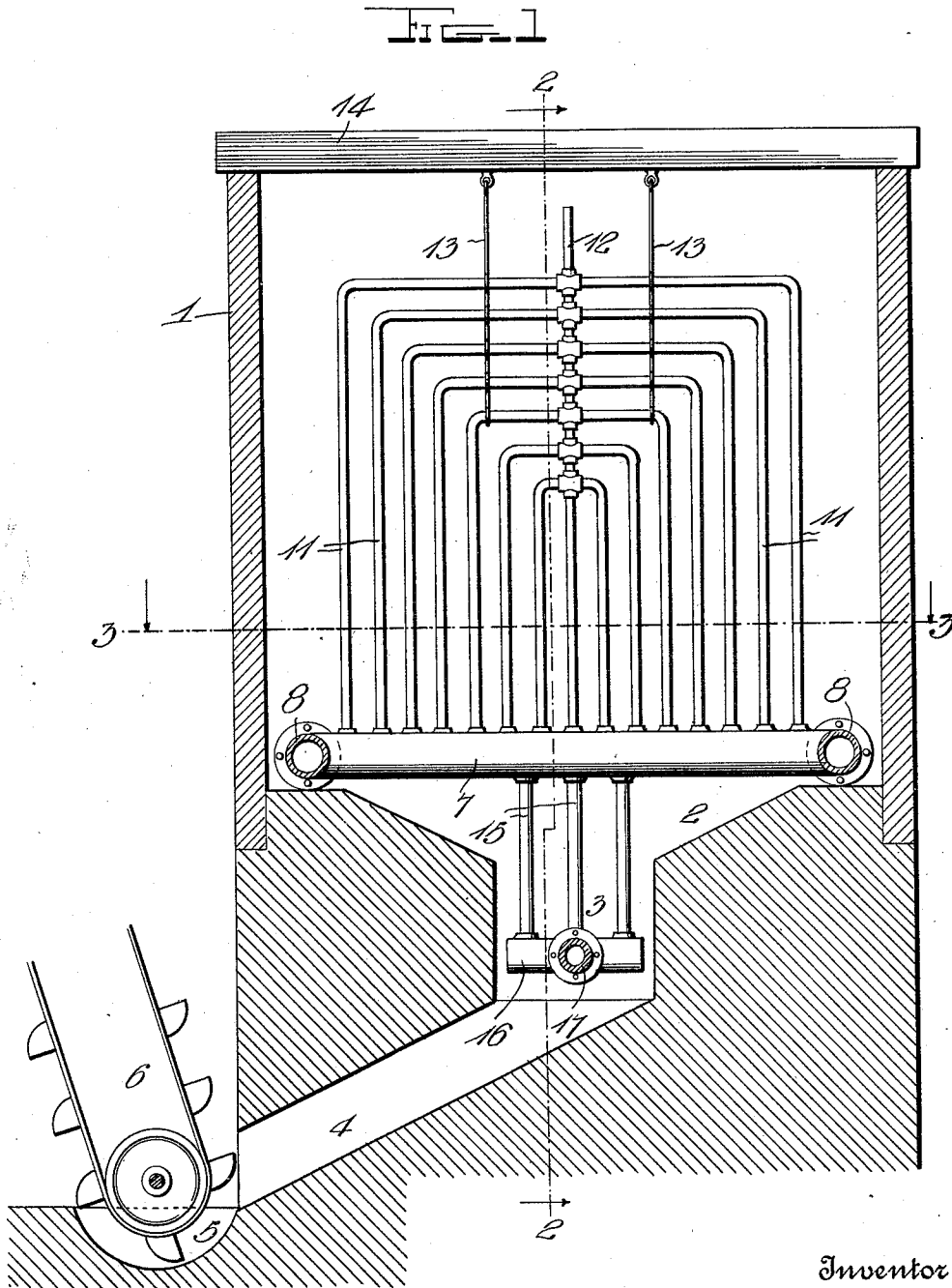


J. W. EAST.
 DRY BIN AND ROASTER.
 APPLICATION FILED APR. 13, 1911.

1,005,945.

Patented Oct. 17, 1911.

3 SHEETS-SHEET 1.



Witnesses

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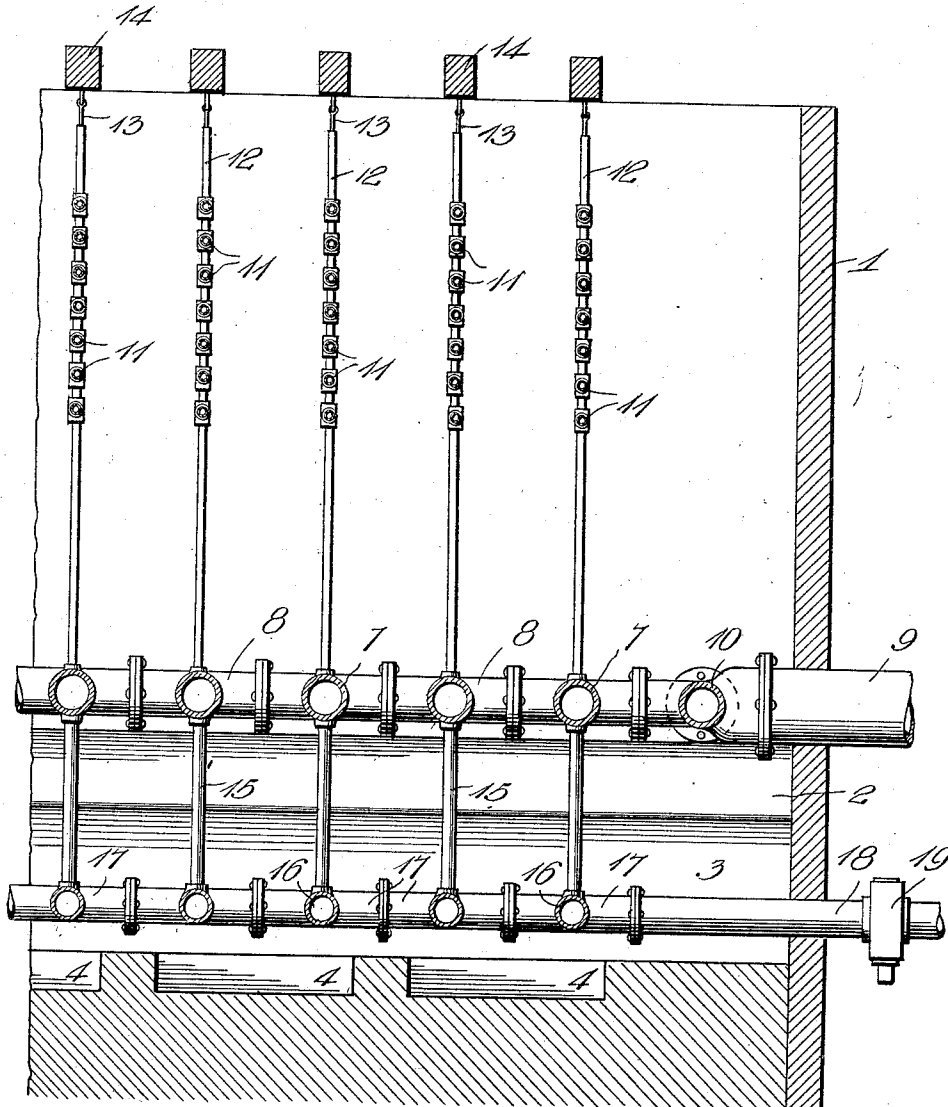
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3 SHEETS-SHEET 2.

FIG. 2



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3 SHEETS-SHEET 3.

Fig. 3

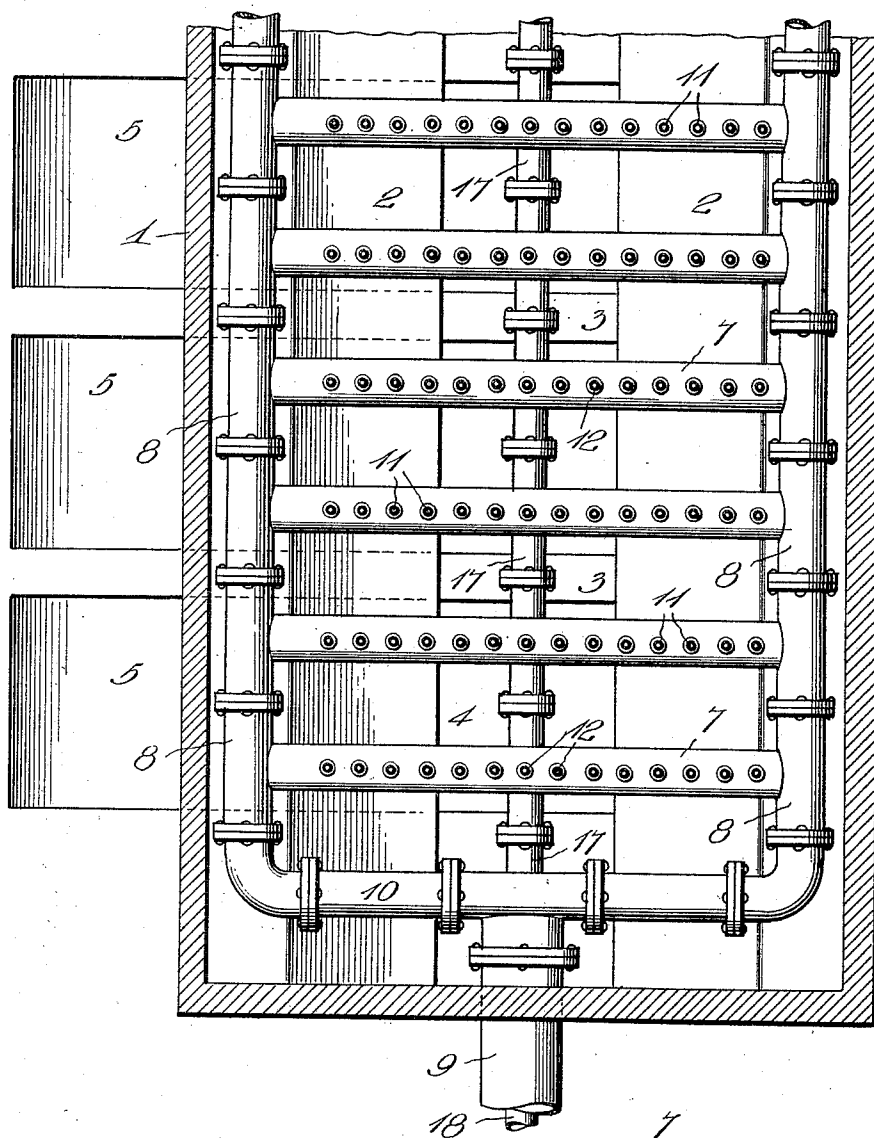
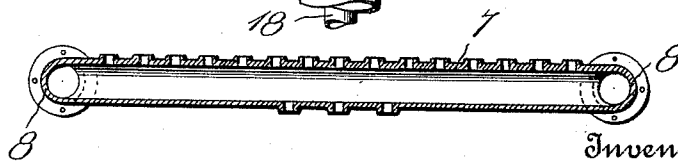


Fig. 4



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UNITED STATES PATENT OFFICE.

JAMES W. EAST, OF MULBERRY, FLORIDA.

DRY BIN AND ROASTER.

1,005,945.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed April 13, 1911. Serial No. 620,944.

To all whom it may concern:

Be it known that I, JAMES W. EAST, a citizen of the United States, residing at Mulberry, in the county of Polk and State of Florida, have invented certain new and useful Improvements in Dry Bins and Roasters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in drying bins and roasters for phosphate rock.

One object of the invention is to provide a drying bin of this character having an improved construction and arrangement of heating coils between and around which the rock is placed and whereby the same is thoroughly dried and roasted.

Another object is to provide a drying bin of this character having an improved means for removing the dry rock from the bin.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claim.

In the accompanying drawings: Figure 1 is a vertical cross sectional view of a drying bin or roaster constructed in accordance with my invention; Fig. 2 is a vertical longitudinal sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1; Fig. 4 is a detail longitudinal sectional view through one of the headers for the heating coils.

Referring more particularly to the drawings, 1 denotes my improved bin which is open at the top and provided with a bottom having formed therein a series of hoppers 2 adapted to receive the dried or roasted rock. Through the center of the bottom and connecting the hoppers 2 is a longitudinal pit 3 with which is connected a series of discharge chutes 4 through which the roasted rock is discharged into conveyor troughs 5 arranged along one side of the bin as shown. In the troughs 5 are arranged the lower ends of suitable elevators 6, said elevators being here shown and are preferably

of the endless chain bucket type, said elevators being adapted to elevate and convey the dried or roasted rock to the desired place of deposit.

Arranged transversely across the lower portion of the bin and spaced apart at suitable intervals are a series of steam coil header pipes 7 having on their ends T-coupling members 8 which are adapted to engage and rest on the bottom of the bin along the upper or outer edges of the hoppers as shown. The T-coupling members 8 of the successive headers are suitably connected together to form steam tight joints thus forming a continuous steam conducting pipe whereby the headers are supplied with steam from a main steam supply pipe 9 which is connected to one end of the coupling members 8 of the headers by branch pipes 10 as clearly shown in Fig. 3 of the drawings.

To each of the headers 7 are connected the ends of a series of steam coils 11. The coils 11 project upwardly from the headers 7 and are arranged in a vertical position one within the other, said coils decreasing in size from the outer toward the inner coil as shown. Connected with the center of each of the headers 7 and with the center of each of the coils is a vent pipe 12 the upper end of which projects a slight distance above the upper portion of the outer coil as shown. The coils of each of the headers are fastened together and supported in position by means of supporting rods 13 which are connected to the coils in any suitable manner and have their upper ends connected to cross bars or beams 14 arranged across the upper portion of the bin as shown.

Connected with the center of each of the headers 7 are a series of return tubes 15 the lower ends of which are connected with hollow cross heads 16 arranged in the lower portion of the pit 3 and engaged with suitable supporting walls arranged therein. The cross heads 16 have formed on their opposite sides couplings 17. The couplings of the successive heads 16 when connected together form a continuous return pipe whereby the condensed steam from the coils is collected and carried back to the boiler by a return pipe 18 which is connected to one end of the series of couplings as shown. At a suitable

location in the return pipe 18 is arranged a steam trap 19 whereby steam from the boiler is prevented from entering the return pipes. The steam supply pipe 9 may be connected directly to the steam dome of a boiler while the return pipe 12 is connected to the lower portion of the boiler thus providing for the circulation of steam from the boiler through the heating coils and back to the boiler.

In using the bin the phosphate rock is placed in the bin through its upper open end and said rock is filled in closely around the coil 7. The heat from the coils radiates through the rock thus thoroughly drying and roasting the latter. After the rock has thus been sufficiently dried and roasted the elevators are set in motion and the dried rock thus removed from the bins.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claim.

Having thus described my invention, what I claim is:

A drying bin and roaster of the character described having arranged therein a series of headers, said headers having on their opposite ends T-couplings, said couplings being connected together to form steam conducting pipes, a main steam supply pipe connected with said conducting pipes, a series of vertically disposed heating coils arranged one within the other and connected with said headers, a vent tube connected to said headers and coils, means to hold said coils in operative position, a series of return tubes connected with said headers, a series of cross heads connected to the lower ends of said tubes, coupling members formed on said cross heads and adapted to be connected together to form a return pipe whereby the condensed steam from the coils is collected and conveyed from the coils.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES W. EAST.

Witnesses:

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HENRY SAPP.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."