

No. 758,327.

PATENTED APR. 26, 1904.

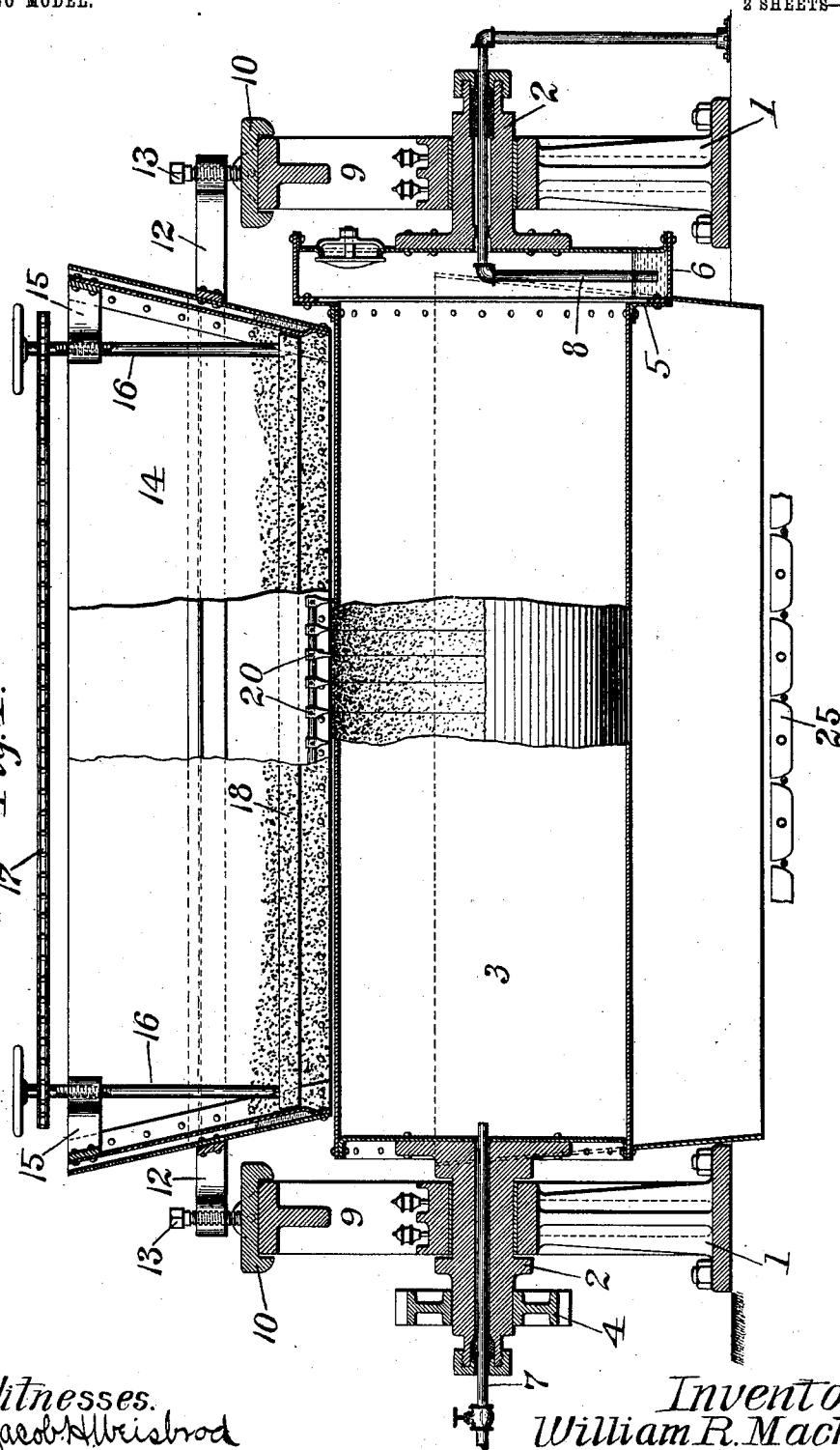
W. R. MACKLIND.
DRIER.

APPLICATION FILED SEPT. 26, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses.
Jacob H. Weisbrod
G. A. Pennington

Inventor:
William R. Macklind,
by Bakerwell & Cornwall
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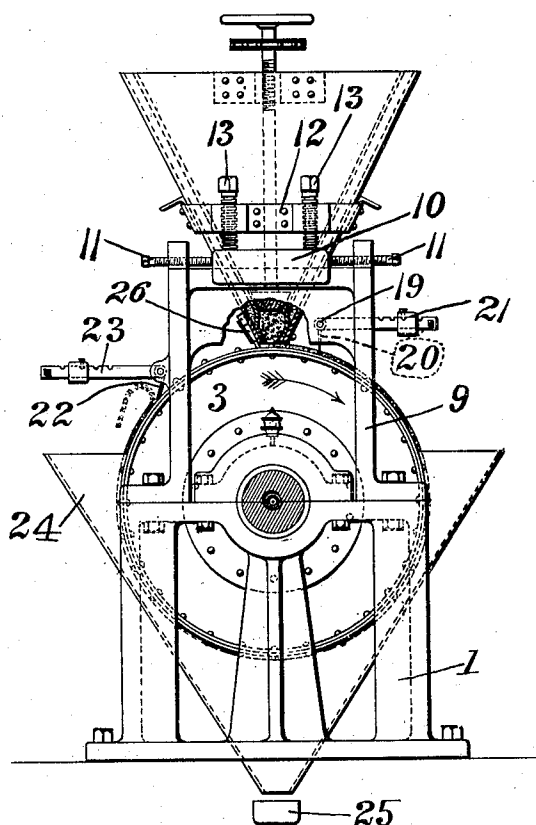
W. R. MACKLIND.
DRIER.

APPLICATION FILED SEPT. 26, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.



Witnesses.

Jacob H. Weisbrod
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UNITED STATES PATENT OFFICE.

WILLIAM R. MACKLIND, OF ST. LOUIS, MISSOURI.

DRIER.

SPECIFICATION forming part of Letters Patent No. 758,327, dated April 26, 1904.

Application filed September 26, 1903. Serial No. 174,783. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. MACKLIND, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Driers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal sectional view through my improved drier; and Fig. 2 is an end elevational view, partly in section.

This invention relates to a new and useful improvement in driers of that class wherein the sludge in a plastic state is spread over a revolving heated cylinder, the contained heat thereof driving off moisture, after which the dried material is removed from the surface of the cylinder.

My invention consists in the construction, arrangement, and combination of the several parts, all as will be hereinafter described and afterward pointed out in the claims.

In the drawings, 1 indicates an end casting which, together with a cap-piece, forms an appropriate bearing for the trunnions 2 of a cylinder 3. One of these trunnions is provided with a driving gear or pulley 4, by which motion is imparted to the cylinder. The cylinder 3 consists of heads, to which the cylindrical shell is riveted in a well-known manner. The shell terminates short of one of the cylinder-heads and has riveted thereto a flange 5, which, with the flanged shell 6 and the enlarged cylinder-head, forms a pocket for the collection of water of condensation. A hand-hole may be employed in this enlarged cylinder-head for well-understood purposes. In the cylinder shown in the drawings steam is to be used as the heating medium and is introduced through a pipe 7, passing through a packed joint in one of the trunnions, the water of condensation therefrom collecting in the enlarged annular chamber at the opposite end of the cylinder, whence the water is conducted off through a pipe 8, passing through a packed joint in an opening in the trunnion in a well-known manner. Instead of steam hot air or gases may be em-

ployed to generate heat in the cylinder, in which event the openings through the trunnions of course will be made of proper size.

The end frames or castings 1 support standards 9, upon the cross-pieces of which are arranged saddles 10. These saddles are adjustable along the cross-pieces by means of the set-screws 11.

12 indicates a frame supported upon the saddles by set-screws 13. This frame carries a hopper 14, which is preferably water-jacketed for the purpose of keeping the sludge contents cool. Inside the hopper are brackets 15, in which are threaded rods 16, said rods preferably having chain-sprockets, over which passes a chain 17, whereby the rods may be adjusted in unison. The lower ends of these rods carry a tapered bar 18, which acts practically as a plug-valve to regulate the supply of sludge to the discharge-opening of the hopper.

In operation the sludge is fed to the hopper 14 and supplied to the discharge-opening in proper quantities by the adjustment of the bar 18, whose position is regulated according to the consistency of the sludge. Assuming that the cylinder is being rotated in the direction of the arrow in Fig. 2, it follows that the sludge will be deposited in a thin sheet upon the periphery of the cylinder, and the heat inside the cylinder will quickly evaporate the moisture from the sludge and leave the same caked on the cylinder in a dried state. In order to avoid the flaking off of the particles of dried material, due to its contraction upon the evaporation of moisture, I prefer to divide the sheet of sludge as it is deposited on the cylinder into separate strips. To accomplish this, I pivot a bar 19 in the webs of standards 9, from which bar depend needles 20, their points bearing on the cylinder 3. This bar is provided with a counterbalancing-weight 21, whereby pressure is exerted to hold the points of the needles against the cylinder. In this manner when the sludge is deposited on the cylinder the needles subdivide the sludge while in a plastic state into strips, which are circumferentially disposed. To remove the dried material from the cylinder, I pivot a blade 22 to the standards 9 and provide the same with a weighted lever-arm 23, which forces the

blade into contact with the cylinder. This blade scrapes the dried particles from the cylinder into a hopper 24, under whose discharge-opening are a series of traveling conveyer-buckets 25. This hopper preferably extends on both sides of the cylinder, so that should the material flake off on account of the heat it will be received in the hopper.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

To prevent the sludge from flowing in the wrong direction, I arrange a plate 26 on the rear wall of the hopper, which plate acts as a dam. Should the sludge flow too freely or should the cylinder 3 not move rapidly enough to carry off the sludge, this dam will prevent the sludge from flowing backwardly.

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

1. In a drier, the combination with a heated rotating cylinder, of a hopper for supplying sludge to the same, and an adjustable bar for regulating the supply of sludge to the discharge-opening of the hopper; substantially as described.

2. In a drier, the combination with a heated rotating cylinder, of a hopper for supplying sludge to the same, an adjustable bar for regulating the supply of sludge to the discharge-opening of the hopper, and means for adjusting said bar in the hopper; substantially as described.

3. In a drier, the combination with a heated rotating cylinder, of a hopper for supplying sludge to the same, an adjustable bar for regulating the supply of sludge to the discharge-opening of the hopper, threaded rods by which said bar is supported, and a connection between said rods whereby they may be rotated in unison to adjust the bar in the hopper; substantially as described.

4. In a drier, the combination with a heated rotating cylinder, of a hopper for depositing sludge thereon, a frame in which said hopper is mounted, means for vertically adjusting the said frame which carries the hopper, and means for adjusting said hopper laterally; substantially as described.

5. In a drier, the combination with a heated rotating cylinder, of end castings in which the same is mounted, a hopper for depositing sludge on said cylinder, a frame in which said hopper is supported, saddles slidingly mounted on the end castings, set-screws for supporting the frame from said saddles, and means for adjusting said saddles horizontally; substantially as described.

6. In a drier, the combination with a hopper containing sludge to be dried, of a rotating cylinder arranged beneath the hopper for receiving

said sludge, said cylinder having an enlarged head at one end forming a continuous circumferential drainage-pocket, and a vertical siphon leading from the bottom of said pocket and thence through the journal of the cylinder for draining said pocket; substantially as described.

7. In a drier, the combination with a heated rotating cylinder, of a hopper for depositing sludge thereon, and means for dividing said sludge into strips; substantially as described.

8. In a drier, the combination with a heated rotating cylinder, of a hopper for depositing sludge thereon, and a weighted needle-bar arranged adjacent the hopper, the ends of the needles engaging the cylinder to divide the sludge into strips; substantially as described.

9. In a drier, the combination with a heated rotating cylinder, of a hopper for depositing sludge thereon, means for dividing the sludge into strips before it is dried, a collecting-hopper for receiving the dried particles, and a scraping-blade for removing the dried particles from the cylinder; substantially as described.

10. In a drier, the combination with a heated rotating cylinder, of a hopper for distributing sludge thereon, means for dividing the sludge into strips before it is dried, a weighted scraping-blade for scraping the dried particles from the cylinder, and a collecting-hopper into which the dried particles are received; substantially as described.

11. In a drier, the combination with a heated rotating cylinder, of a water-jacketed hopper arranged thereabove, a device for controlling the supply of sludge to the discharge-opening through said hopper, and a plate secured to the rear wall of the hopper and cooperating with the cylinder to act as a dam to prevent the sludge from flowing in the wrong direction; substantially as described.

12. In a drier, the combination with a heated rotating cylinder, of a hopper for depositing sludge thereon, a plate mounted on the rear wall of the hopper and engaging the cylinder to act as a dam to prevent the sludge from flowing backwardly on the cylinder, and a scraping-blade cooperating with the surface of the cylinder for removing the dried material therefrom; substantially as described.

13. In a drier, the combination with a heated rotating cylinder, of a hopper for depositing plastic material on the cylinder, and means for vertically adjusting said hopper for regulating the thickness of plastic material deposited on said cylinder; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 24th day of September, 1903.

WILLIAM R. MACKLIND.

Witnesses:

LENORE WILSON,
GEORGE BAKEWELL.