

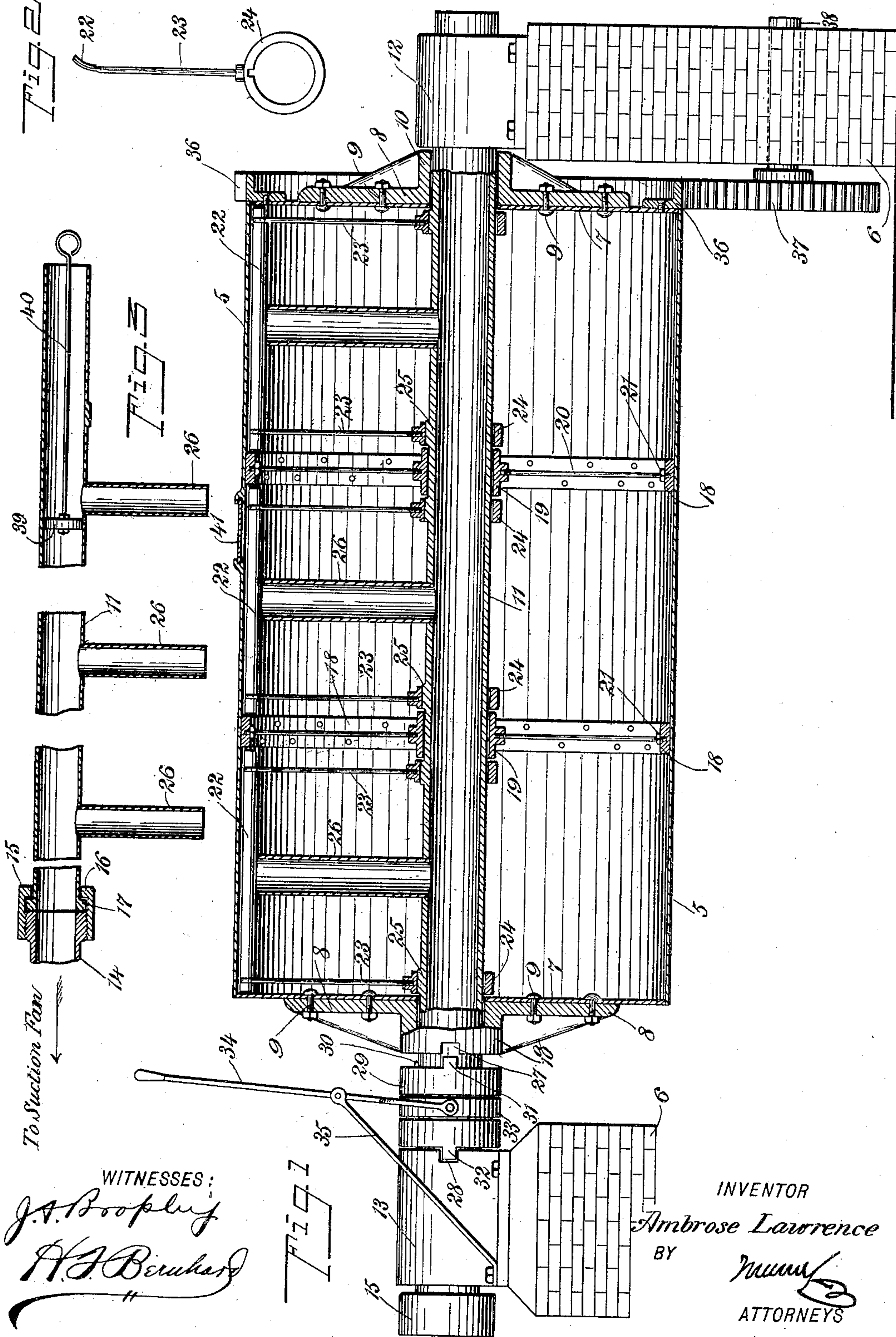
No. 706,965.

Patented Aug. 12, 1902.

A. LAWRENCE.
APPARATUS FOR CALCINING PLASTER.

(Application filed Mar. 12, 1902.)

(No Model.)



WITNESSES:

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APPARATUS FOR CALCINING PLASTER.

SPECIFICATION forming part of Letters Patent No. 706,965, dated August 12, 1902.

Application filed March 12, 1902. Serial No. 97,841. (No model.)

To all whom it may concern:

Be it known that I, AMBROSE LAWRENCE, a citizen of the United States, residing at Acme, in the county of Hardeman and State of Texas, have invented certain new and useful Improvements in Apparatus for Calcining Plaster, of which the following is a full, clear, and exact description.

My invention relates to an apparatus for calcining plaster of any kind; and the object that I have in view is to produce a simple and efficient apparatus in which provision is made for keeping clean the inner surface of a revoluble drum, for ventilating the drum during the calcining operation by carrying off the vapor arising from the plaster, and for easily removing the material after completion of the cooking operation. In my apparatus the several parts are arranged to secure strength and stability to the shell of the revoluble drum, and this drum is so mounted in a brick setting that it may be exposed to the action of heat, so as to secure the desired cooking of its contents. The scraping devices are not liable to become choked or clogged. The material to be cooked can easily be introduced into the drum, and the vapor-ventilating devices are also adapted to serve as the means through which the cooked material can be discharged from the drum.

With these ends in view the invention consists in the combination, construction, and arrangement of parts which will be hereinafter fully described, and the actual scope of the invention will be defined by the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal sectional elevation of a calcining apparatus embodying my invention. Fig. 2 is a detail view in edge elevation illustrating one of the scrapers and the supporting means therefor; and Fig. 3 is a fragmentary sectional elevation illustrating the hollow shaft and the parts associated therewith, said shaft and its parts being adjusted to the positions which they assume when unloading the revoluble tank.

In carrying my invention into practice I employ a horizontal drum or tank 5, which is mounted for rotation within a masonry or

brickwork setting similar to a boiler-setting and indicated partially at 6, whereby the lower portion of the revoluble drum or tank is exposed to the action of heat which may be generated on grates within the setting or which may be supplied in any suitable way to the setting 6 of the apparatus.

The drum or tank 5 consists of a metallic cylinder or shell, which may be constructed in two or more sections, and this shell is closed at its ends by means of the heads 7, to which are secured the ribbed cast-metal disks 8 by means of the bolts 9. These disks serve to materially strengthen and reinforce the heads, and the disks are provided with the short sleeves or the hubs 10 10^a. The heads 7 of the drum or tank are provided with openings, which register with the sleeves or hubs 10 10^a, and through the drum, its heads, and the sleeves or ribs is arranged to pass a horizontal tubular shaft 11, the end portions of which are supported in substantial bearings 12 13, that are erected on the brickwork setting 6, as clearly shown by Fig. 1. The end portions of the hollow shaft 11 are extended or carried through the bearings 12 13, so that one end of the shaft (preferably the right-hand end) is open for the free admission of air to the shaft during the operation of calcining the plaster which is contained within the drum, while the other or left-hand end of the shaft 11 is adapted for connection to a suction-pipe 14 through the medium of a swiveled coupling 15. This swiveled coupling may be of any suitable type; but as shown by Fig. 3 this coupling is flanged, as at 16, to loosely embrace a flange 17 on the left-hand extremity of the tubular shaft 11; and, furthermore, the coupling 15 has threaded connection with the end of the suction-pipe 14, that lies in alignment with said hollow shaft 11.

The revoluble drum or tank 5 is reinforced at points along its length by the employment of the annular bands 18, any suitable number of which may be secured to the inner surface of the drum, said bands serving particularly to reinforce the sections of the drum at the points where they are riveted or otherwise united together. The bands 18 are disposed in positions around the hubs 19, which are fitted loosely to the hollow shaft 11 at points along its length, and each band 18 is coupled

to one of the hubs 19 through the medium of a series of spokes or rods 20, the latter having their inner ends threaded into the hubs 19, while their outer ends are secured into the bands 18 and are locked in place by the employment of the jam-nuts 21.

The interior surface of the revoluble drum or tank 5 is kept in a clean condition and free from the adherence of plaster or other material under treatment by the employment of a scraper or scrapers. The presence of the bands 18 and the rods 20 within the drum or tank prohibits the use of a single scraper, which extends continuously throughout the length of the drum, and I therefore resort to the employment of a series of scrapers, which are indicated by the reference-numerals 22, said scrapers being disposed between the bands 18 and the heads of the drum. The scrapers are fastened to the arms or bars 23, that are fastened to the collars 24, which are splined or keyed at 25 on the shaft 11, a pair of arms 23 and the collars 24 being preferably employed to support each scraper 22.

The shaft 11 is provided with a series of hollow branches 26, said branches being in the form of tubes, which extend radially to the shaft and which open into or communicate with said shaft. These tubes 26 are all disposed in the same plane relative to the shaft, and said tubes preferably lie equidistant from the pairs of collars 24, which support the scrapers, the outer ends of the tubes terminating at points within said scrapers 22. The hollow arms or branches 26 of the shaft serve twofold purposes in my improved apparatus—first, they provide for the ventilation of the drum or cylinder during the operation of calcining the plaster by allowing the escape of the odors which arise from the cooking material during the rotation of the drum or tank 5, and, secondly, these arms or branches enable the cooked material to be drawn by suction through them and into the hollow shaft 11, from whence the cooked material may be carried by suction through the pipe 14 to a suitable place of discharge.

The hub or sleeve 10^a at the left end of the drum or tank is provided with a series of notches, one of which is indicated at 27. The bearing 13, which is disposed in opposing relation to the hub or sleeve 10^a, is provided with a single notch 28. Between the notched edge of the sleeve 10^a and the similar edge of the bearing 13 is arranged a shiftable clutch 29, the latter being keyed or feathered on the hollow shaft 11, as indicated at 30 in Fig. 1. The clutch 29 is provided at one edge with lugs 31, adapted to engage with the notches 27 on the sleeve or hub 10^a, and the other edge of said clutch is provided with a lug 32, adapted to have interlocking engagement with the single notch 28 of the fixed bearing 13. The clutch in one position is adapted to make the shaft 11 and the drum or cylinder fast one with the other, so that the two parts may rotate together; but in the other posi-

tion of the clutch it serves to lock the shaft 11 from rotation with the drum or tank. The adjustment of the clutch may be effected in any suitable way; but, as shown by Fig. 1, said clutch carries a loose collar 33, with which is engaged a shifting-lever 34, fulcrumed on a suitable support or brace 35, attached either to the setting or to the bearing 13.

From the foregoing description, taken in connection with the drawings, it will be seen that the hollow shaft 11 may be locked from rotation by the clutch being adjusted to engage with the bearing 13, and, furthermore, the hollow drum or tank is mounted loosely by its sleeves or hubs 10 10^a, fitted idly on the shaft 11 near its end portions. The drum is thus adapted to rotate on the shaft 11, which remains idly in place during the calcining operation, and as a suitable means for rotating said drum I have provided it with a toothed rim or gear 36 at the right-hand end thereof, said gear having intermeshing engagement with a driving-gear 37 on a shaft 38, which passes through the setting 6, said shaft adapted to be driven in any suitable way.

During the operation of unloading the drum or emptying the material therefrom I prefer to close the right-hand end of the shaft 11, and this may be effected by any suitable means—as, for example, by the employment of the fireproof plug 39, which is attached to a rod or spindle 40. This plug is adapted to be introduced by its rod or spindle through the open end of the shaft 11 at its right-hand end, and said plug is adapted to assume a position between the first and second of the arms or branches 26, whereby the first arm or branch is left open for communication with the shaft 11, so that air can enter the right-hand end of the shaft and pass through the first arm or branch 26 thereof.

The drum or tank 5 is provided with a door 41, through which the material to be cooked can easily be introduced.

In operation the clutch 29 is adjusted for its lug 32 to enter the notch 28 in the bearing 13, thus locking the shaft 11 against rotation. The plug 39 and the spindle 40 are removed from the shaft, so as to open the latter to the free ingress of air. The coupling 15 may be disengaged from the shaft 11, or the parts may remain idly coupled up, as desired. The door 41 is opened and the material to be operated upon is introduced through the door, after which the shaft 38 is set in motion in order to rotate the drum. The interlocking connection between the clutch and the bearing 13 serves to hold the shaft 11 in position wherein the tubular arms or branches 26 extend upwardly from the shaft 11 and the scrapers 22 are held in stationary positions and in operative relation to the upper inner surface of the revoluble drum 5. During the rotation of the drum the material, which has a tendency to adhere to the inner surface thereof, is scraped

from said drum by the action of the blades 22, and this material falls back upon the mass in the bottom portion of the drum. The vapors and foul gases which arise from the cooking material are free to pass through the hollow branches or arms 26 and to find their exit from the interior of the drum through the hollow shaft 11, thereby ventilating said drum. After the cooking of the material has been completed the clutch 29 is shifted to disengage it from the bearing 13 and to make its lugs 31 engage with the notches 27 of the sleeve 10^a at the left-hand end of the drum, thereby making the shaft 11 and the drum fast one with the other. The shaft, the drum, the hollow branches 26, and the scrapers are thus caused to turn in one direction, and at this period the suction-fan, which is connected to the suction-pipe 14, may be brought into service, and the plug 39 may be adjusted in the pipe 11 to the position indicated by Fig. 3. The operation of the fan creates a suction through the pipe 14, the right-hand end of the pipe 11, the first tube 26, the drum, and the remaining arms or branches 26, which communicate with said pipe 11, whereby the material contained within the revoluble drum 5 may be carried by suction through the arms 26 and the pipes 11 14 to the place of discharge. Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An apparatus for calcining plaster, comprising a ventilative shaft open for the admission of air, a revoluble drum mounted loosely on the shaft, means for locking the shaft against rotation and for making the shaft fast with the drum to rotate therewith, and means for interrupting the direct circulation of air through said shaft.

2. An apparatus for calcining plaster, comprising a ventilative shaft open at one end and provided with hollow branches, a revoluble drum loose on said shaft, means for making the shaft rotate with the drum and to allow the shaft to remain at rest, and a valve fitted to the shaft and adapted to interrupt the direct circulation of air through the same.

3. An apparatus for calcining plaster, comprising a shaft, a revoluble drum, a series of

scrapers carried by the shaft, and means for making the shaft fast to the drum and for locking the shaft in a non-revoluble condition to thereby sustain the scrapers in a stationary position within the drum.

4. An apparatus for calcining plaster, comprising a shaft having ventilative branches and scrapers, a revoluble drum having a clutch member, a stationary part having a clutch member, and a shiftable clutch member keyed to the shaft and arranged to engage with the clutch member either on the drum or the stationary part, as and for the purposes set forth.

5. An apparatus for calcining plaster, comprising a hollow shaft, a series of collars thereon, a drum, a series of internal bands fastened to the drum and united by arms to the collars, a series of longitudinal scrapers disposed in the spaces between the internal bands and in active relation to the inner surface of the drum, means connecting the scrapers to the shaft, hollow branches on the shaft, means for closing the shaft at a point intermediate of its length, and means for holding the shaft in a non-revoluble condition and for making said shaft fast with the drum.

6. An apparatus for calcining plaster, comprising a hollow shaft having hollow arms or branches in communication therewith, a drum mounted idly on said shaft, means for rotating said drum, means for locking the said shaft against rotation and for locking the shaft fast with the drum, and means for creating suction through said hollow shaft.

7. An apparatus for calcining plaster, comprising a tubular shaft having hollow arms, a drum mounted on the shaft, means for creating a suction through said shaft and its arms, and means for closing said shaft at a point between two of its arms.

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

AMBROSE LAWRENCE.

Witnesses:

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