No. 687,061. Patented Nov. 19, 1901.

F. I. POST, H. BRIDGE, H. A. CUMFER & H. E. BROWN.

DRIER.

(Application filed Feb. 11, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 2

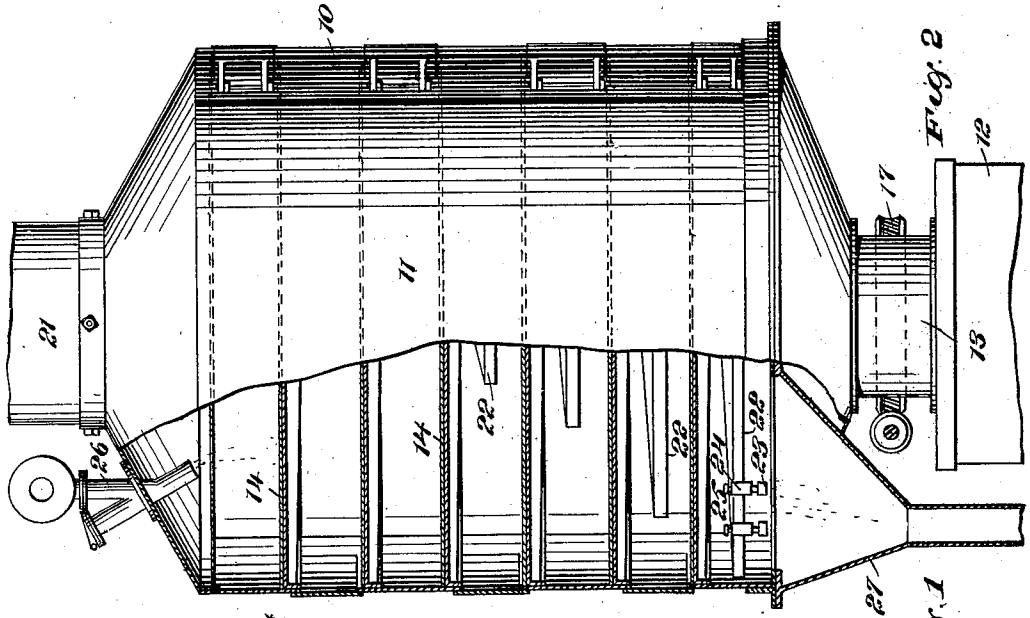
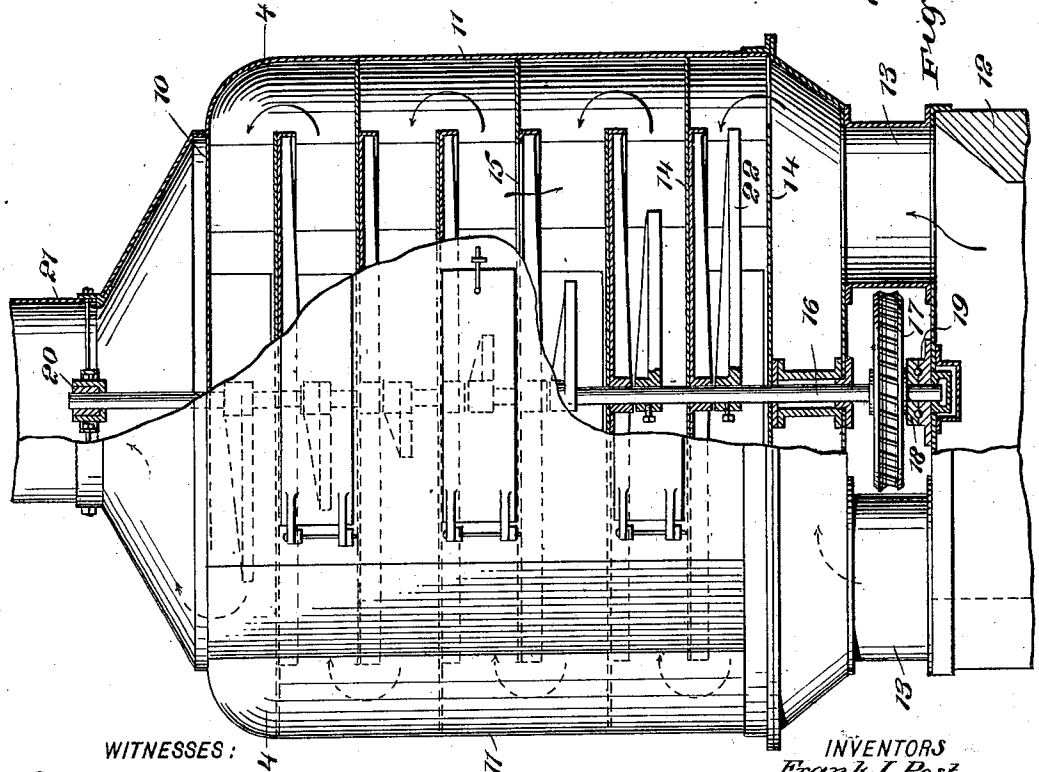


Fig. 1



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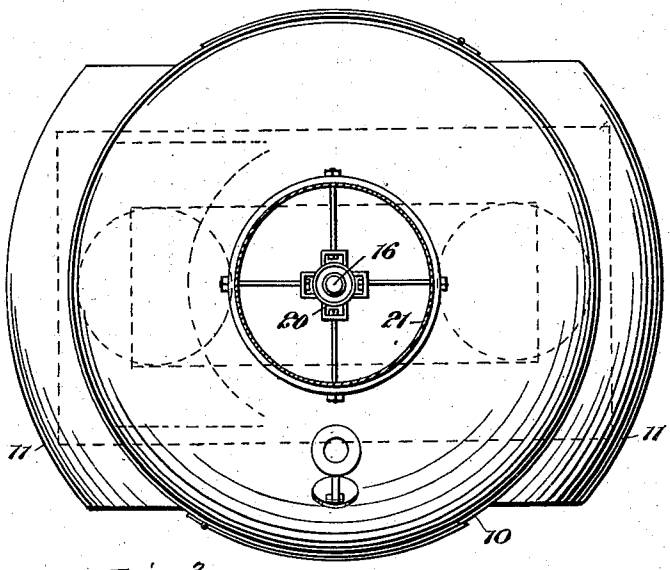


Fig. 3

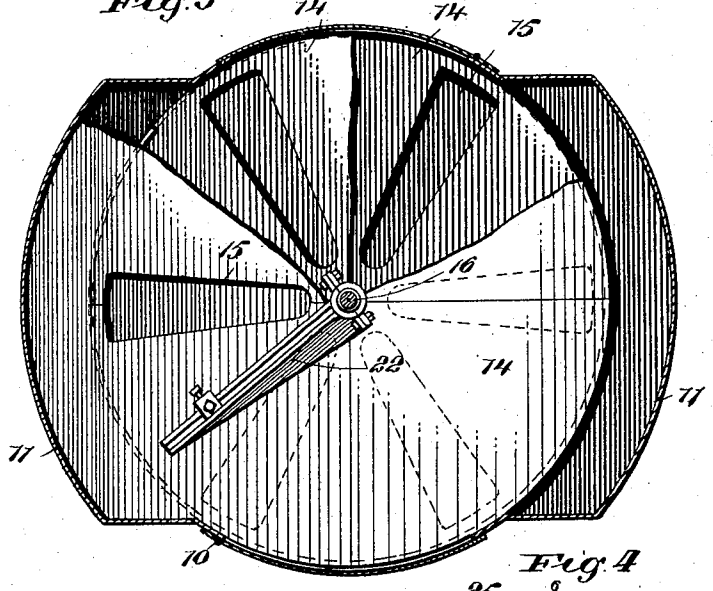


Fig. 4

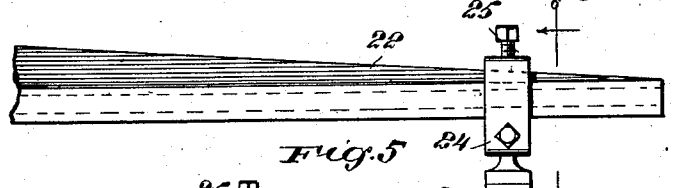


Fig. 5

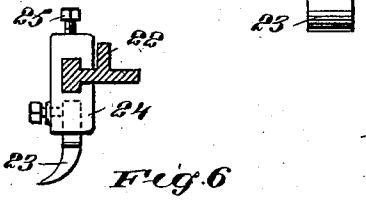


Fig. 6

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UNITED STATES PATENT OFFICE.

FRANK I. POST, HENRY BRIDGE, HARRY A. CUMFER, AND HERMAN E. BROWN, OF COLDWATER, MICHIGAN.

DRIER.

SPECIFICATION forming part of Letters Patent No. 687,061, dated November 19, 1901.

Application filed February 11, 1901. Serial No. 46,800. (No model.)

To all whom it may concern:

Be it known that we, FRANK I. POST, HENRY BRIDGE, HARRY A. CUMFER, and HERMAN E. BROWN, citizens of the United States, and residents of Coldwater, in the county of Branch and State of Michigan, have invented a new and Improved Drier, of which the following is a full, clear, and exact description.

This invention relates to improvements in driers for slurry cement, clay, or other material designed to be calcined in a kiln; and the object is to provide a drier of simple construction and arranged to use the excess or escape heat of a kiln as a drying medium.

We will describe a drier embodying our invention and then point out the novel features in the appended claims.

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 partial section and partial elevation of a drier embodying our invention. Fig. 2 is a partial section and and partial elevation at right angles to Fig. 1. Fig. 3 is a top plan view. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is a detail showing a scraper-carrying arm employed, and Fig. 6 is a section on the line 6 6 of Fig. 5.

The drier comprises a cylinder 10, at opposite sides of which are extensions or flues 11, and the device is placed upon the outlet or chimney 12 of a kiln and communicates therewith through pipes 13. Arranged within the cylinder are a number of drying-platforms 14, each provided with an opening 15, through which material may discharge from one platform to another. These platforms extend alternately from opposite sides of the cylinder and have openings alternately at opposite sides for the passage of heat, as clearly indicated in the drawings. Extended upward through the several platforms is a shaft 16, on the lower end of which is a gear-wheel 17, designed to be engaged by any suitable device to impart a rotary movement to the shaft. The shaft 16 at its lower end has connection with a collar 18, which is mounted to rotate on a block 19, and ball or roller bearings are placed between said collar and block. The upper end of the shaft has a bearing in a boxing 20, attached to rods extending across the chimney or outlet 21 of the cylinder.

Mounted on the shaft above each platform 14 is a scraper-carrying arm 22. These several arms are variously arranged as to their outward projection from the shaft, and it may be here stated that the openings 15 in the several platforms are arranged out of line one with another. Mounted on the arms 22 are scraper-blades 23. These scraper-blades are curved in the direction of their movement, and as here shown they are removably connected to blocks 24, adjustable longitudinally on the arms and are held as adjusted by set-screws 25. While we have shown scrapers as applied to the lower arm in Fig. 2, it is to be understood that they are designed to be connected to all of the arms and as many scrapers as desired may be placed upon each arm.

In operation the material to be dried is fed through the pipe 26, leading through the top of the cylinder, and falls upon the uppermost platform 14. The scrapers rotating over this uppermost platform will keep the material in motion, and as the material reaches the opening 15 in said uppermost platform it will pass downward upon the next of the series, and this will be continued until it reaches the lowermost platform, from which it passes through a chute 27 into the kiln. During this operation the heat will pass upward through one flue 11 over the platform, thence through the opposite flue 11 over the next platform, and thus continue until it finally escapes through the chimney 21.

For the purpose of adjusting the parts or for cleaning the platforms when necessary the cylinder is provided with door-closed openings between the platforms.

It will be noted that the arms 22 are adjustably connected to the shaft 16 and may be held as adjusted vertically thereon by means of set-screws.

A device embodying our invention may be economically operated, because it uses waste gases or heat from the kiln, and as the material will be in comparatively thin layers it will be thoroughly dried before finally discharging through the chute 27 into the kiln.

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

1. A drier adapted for connection with the heat-escape flue of a kiln, and comprising a cylinder having vertically-arranged extensions forming flues at opposite sides, a series of platforms arranged in the cylinder and extending alternately from opposite sides thereof at the extensions, and terminating alternately at opposite sides at the flues forming openings for the passage of heat, each of said platforms having an opening for the discharge of material, a shaft extended upward through the partitions, an arm on the shaft above each platform, and scraper-blades carried by the arms, substantially as specified.

2. In a drier, a platform having an outlet, a shaft extended through the platform, an arm adjustable at one end on the shaft and having a T-shaped portion, a block adjustable longitudinally on the T-shaped portion of the arm, and a curved scraper removably connected to the block, substantially as specified.

3. A drier adapted for connection with the heat-escape outlet or chimney of a kiln, and comprising a cylinder having an outlet at its top and pipes at its lower end arranged to communicate with the said outlet of the kiln, the said cylinder being provided with vertically-arranged offsets or extensions at opposite sides forming flues, a series of platforms arranged in the cylinder and extending alternately from the walls of the flues at opposite sides and terminating alternately at the said flues forming openings for the passage of heat, the said platforms being each provided with an opening for the discharge of material, a shaft mounted at its lower end between the pipes at the bottom of the cylinder, and extended upward through the partitions, scrapers carried by said shaft over the platforms, an inlet for the material at the top of the cylinder and an outlet for the material at the bottom of the cylinder, substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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Witnesses:
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