

No. 652,369.

Patented June 26, 1900.

E. L. MERRIMAN & J. W. VOUGHT.

SAND DRIER.

(Application filed Apr. 6, 1900.)

(No Model.)

Fig. 1.

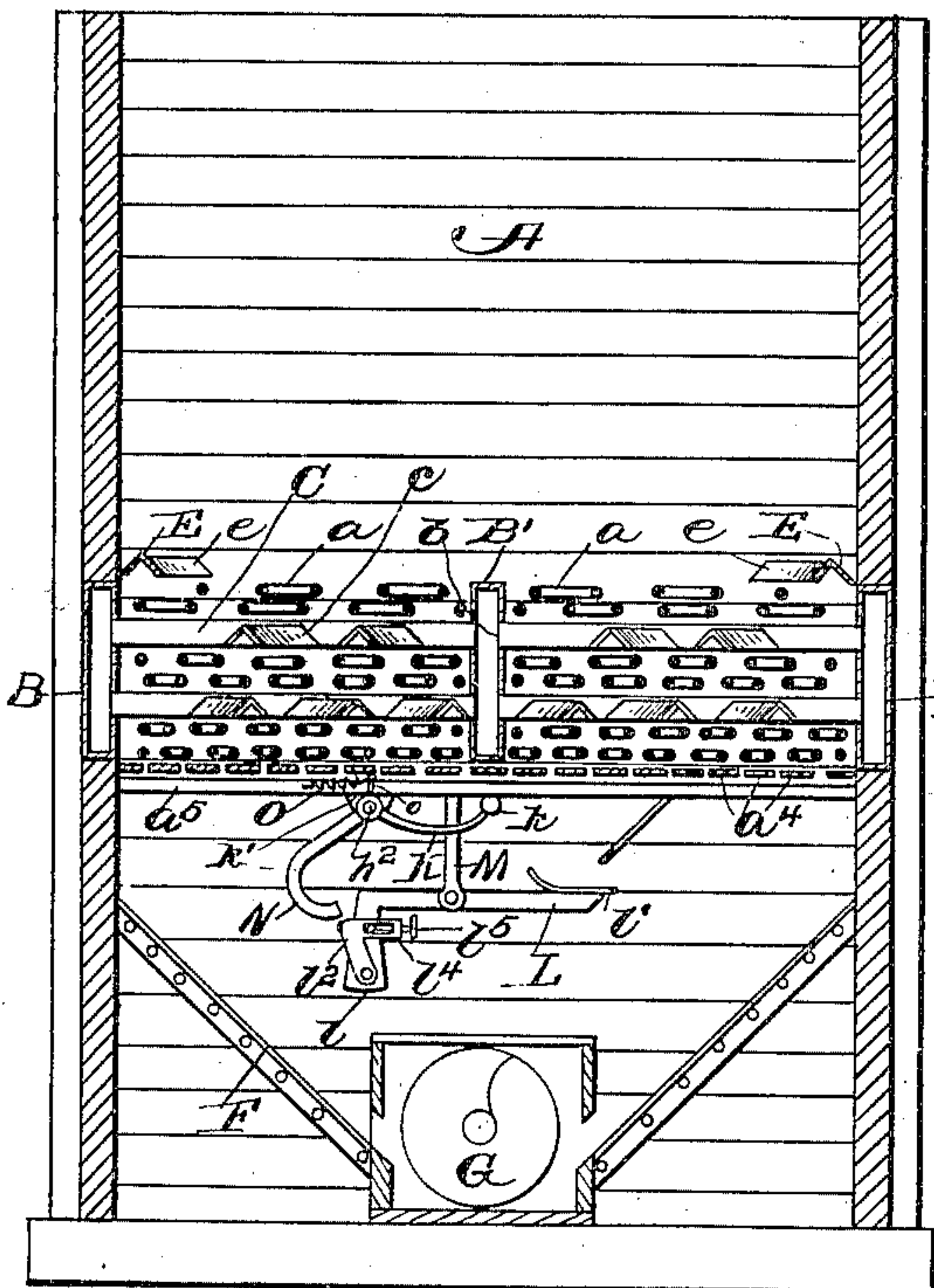
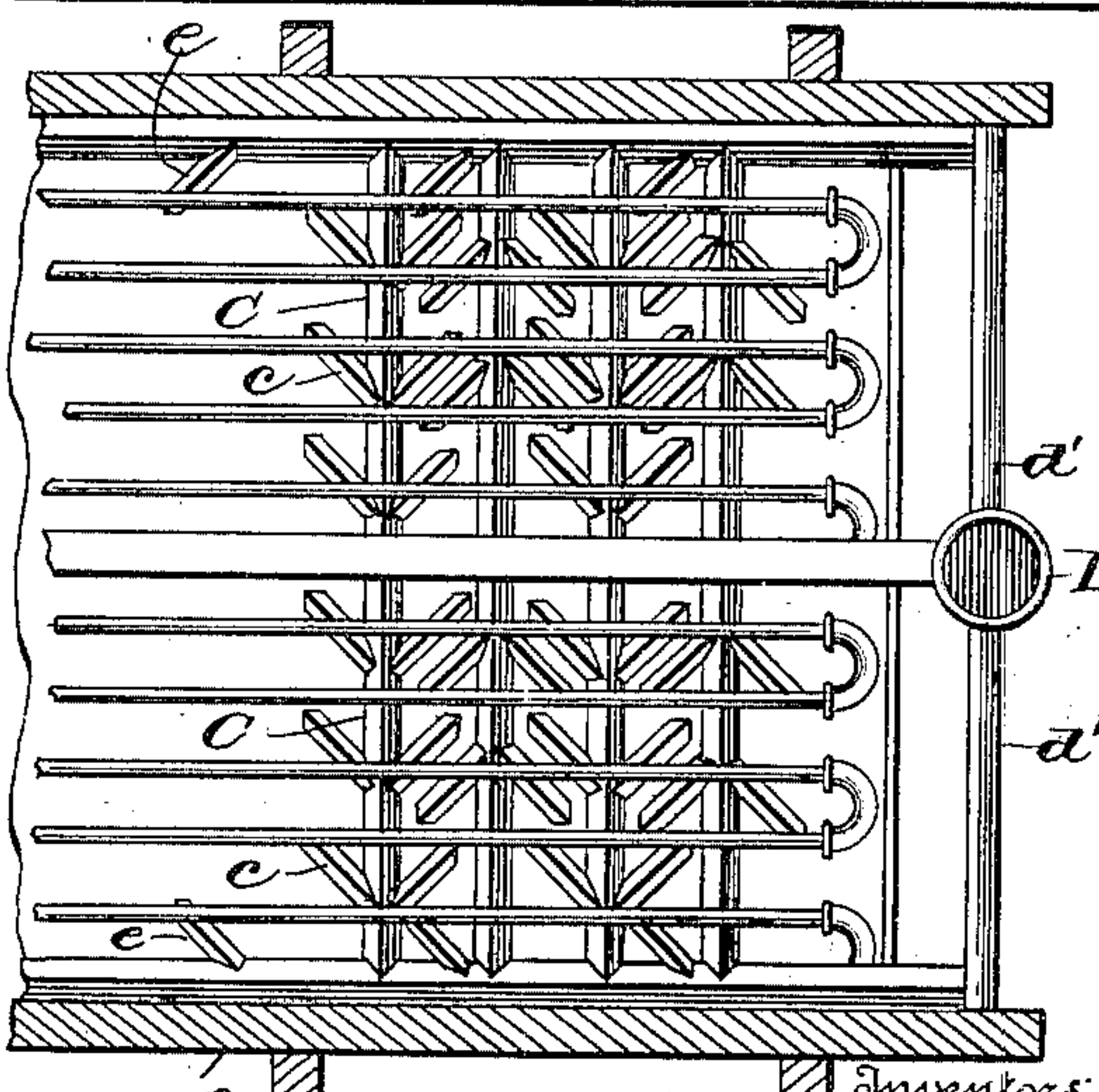
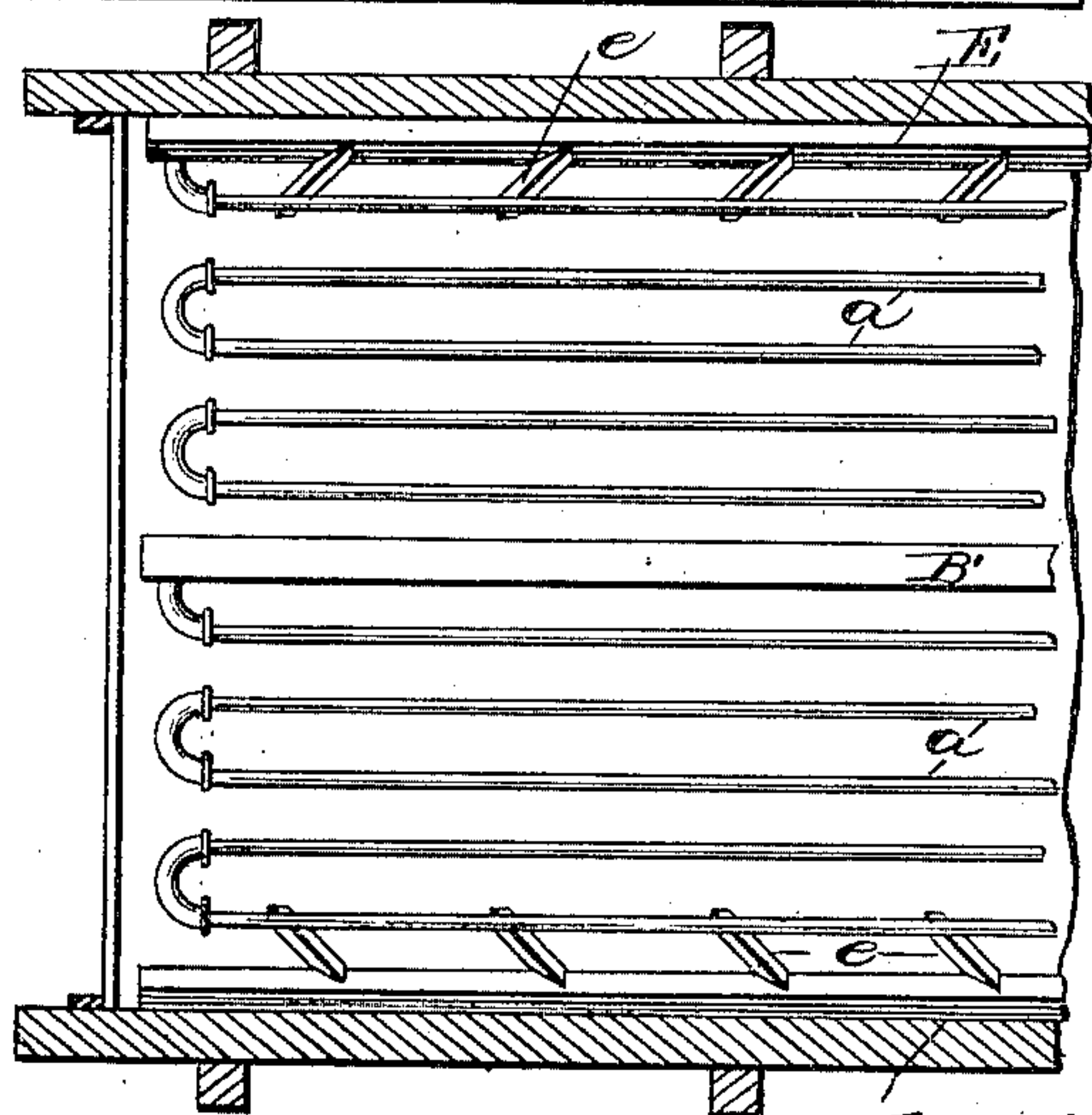
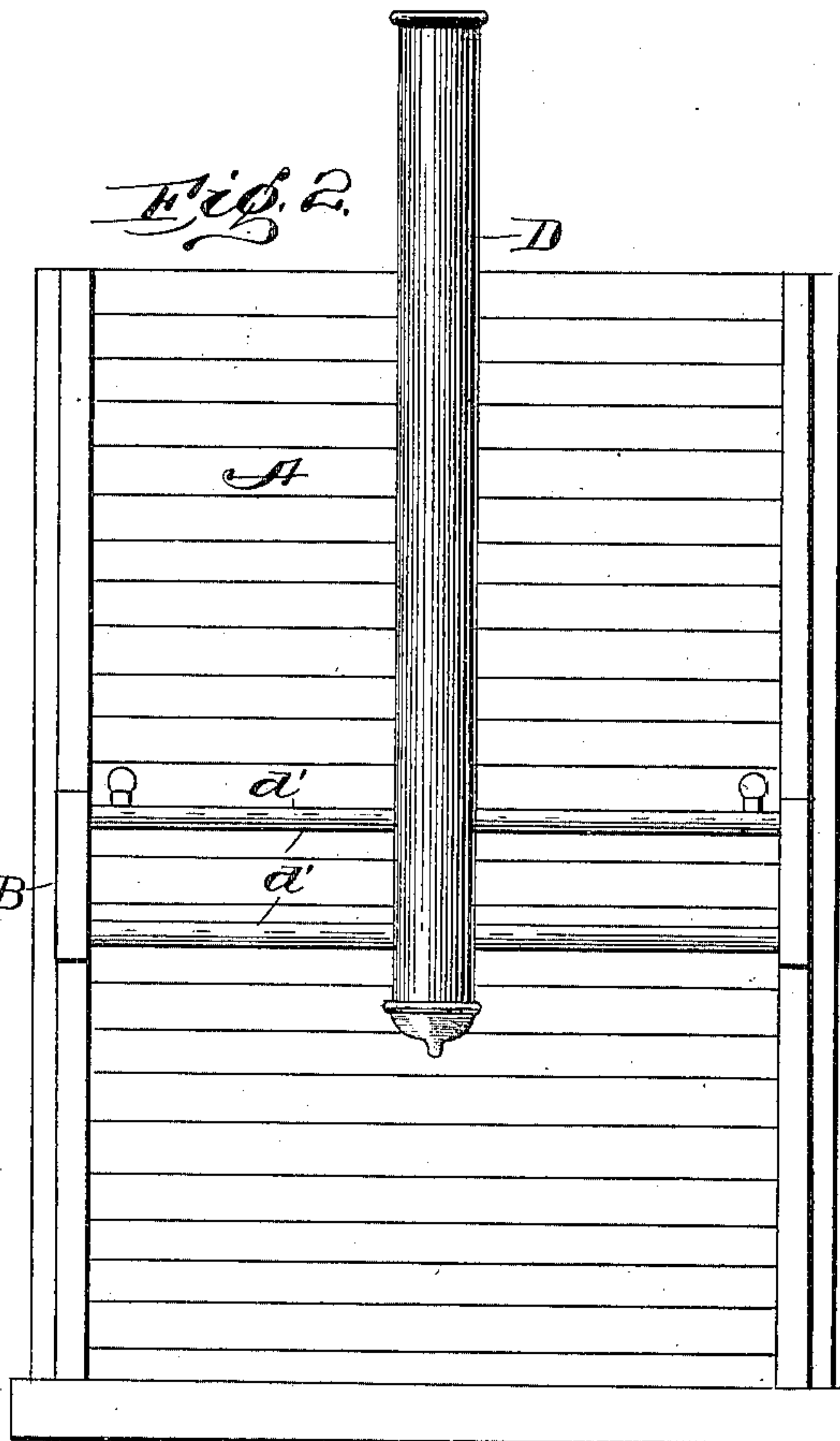


Fig. 2.



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Fig. 3

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UNITED STATES PATENT OFFICE.

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SAND-DRIER.

SPECIFICATION forming part of Letters Patent No. 652,369, dated June 26, 1900.

Application filed April 6, 1900. Serial No. 11,872. (No model.)

To all whom it may concern:

Be it known that we, EURIE L. MERRIMAN and JOSIAH W. VOUGHT, citizens of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Sand-Driers; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in driers for sand, &c., the object being to provide an apparatus in which the moisture in the sand will be removed by a continuous process and the sand thoroughly and effectually dried, rendering it capable of immediate use.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and the particular features of novelty pointed out in the claims.

In the drawings, Figure 1 is a section through a drier embodying our present invention. Fig. 2 is an end elevation. Fig. 3 is a longitudinal horizontal section.

Like letters of reference in the several figures indicate the same parts.

The letter A represents a casing, preferably of rectangular shape and open at the top, into which the sand to be dried is dumped in bulk, such casing containing the drying mechanism through which the sand travels. This drying mechanism consists of a system of heating or steam pipes *a*, extending longitudinally of the casing, the pipes near the top being somewhat farther apart than those lower down, so that while the sand may be thoroughly heated and dried by contact with the pipes there will be no clogging of the sand while very damp, because the pipes are widely spaced at the top, all as more specifically shown and described in our prior patent, No. 591,413, dated October 12, 1897. Extending along each side of the casing A are flues or ventilating-chambers B, preferably of a height equal to the distance from the top to the bottom of the system of pipes *a*. Extend-

ing centrally along the interior of the casing is another flue or ventilating-chamber B', similar to the chambers B. These chambers are of metal and are formed with openings *b*, in which fit the ends of the sand separators or breaks C, preferably each provided with branches *c* and hollowed out beneath to form passages or channels for the escape of the moist air or steam, their upper surfaces being preferably inclined to shed the sand. Two systems of breaks or separators are employed, one above the other, those of the lower system being arranged between those of the upper.

The steam-chambers or ventilators B communicate with a stack or uptake D at the end of the casing through pipes *d'*, and the central longitudinal chamber B' communicates directly with the uptake D for carrying off the moist air or steam. The side chambers B, being heated by the vaporized steam, also assist in drying the sand, and to carry off the steam and moisture created by the heat of these chambers we arrange within the casing, on each side thereof, a separator E, having branches *e*, similar in construction and shape to the separators C, these separators E communicating at their ends with the pipes *d'*, leading into the uptake D. Arranged below the lower row of heating-pipes *a* are grates or dampers consisting of a frame having pivoted therein a series of slats *a'* and a transverse slat *a''* for operating the slats, as described in our before-mentioned patent.

The bottom of the sand receptacle or casing A is preferably formed with inclined sides F, by which the sand may be directed to a screw conveyer G for removing the sand, although it is to be understood that any suitable means may be provided for this purpose.

To insure against any possible clogging of the sand, we provide a system of knockers adapted to strike the under side of the grate, and thereby dislodge the sand. These knockers consist of the arms K, having the weighted end or head *k*, and mounted on a longitudinal shaft *k'*, journaled in brackets *k''*. The knockers are adapted when said shaft is oscillated to strike the under side of the grate. Any suitable mechanism may be employed

for oscillating the shaft; but we prefer to automatically operate them by the sand passing through the apparatus. To accomplish this, the following mechanism is employed:

5 An arm L is pivotally mounted on the end of a bar M below the grate, through which the sand feeds, said arm L carrying weight l at one end and at the other a pan or receptacle l' . At the weighted end and preferably on
10 the weight l is pivotally mounted a trip-arm l^2 , adapted to rest normally beneath the curved end of an arm N, mounted on the shaft k^2 . As the sand feeds down through the grate the pan or receptacle l' will be
15 gradually filled until the weight of the sand overbalances the weight l , when that end of the arm or lever L will drop and the opposite end move up, lifting the arm N, and thereby depressing the arm K until the trip
20 slips past the curved end of the arm N. At this point a spring O, secured at one end to arm o , carried by the shaft k^2 , will cause the knocker to be returned to normal position and strike the grate a blow, loosening the
25 sand, as will be readily understood. As the end of the arm L, carrying the pan or receptacle, is depressed, the sand will be dumped out, and the weight l will restore the parts to first position.

30 In order to regulate the force of the blow of the knocker, the trip l^2 is provided with an extension l^4 at the side, in the end of which works a set-screw l^5 , by means of which the position of the trip may be adjusted to vary
35 the distance it may project under the end of the arm N, thereby causing the arm N to be raised a greater or less distance, the knocker to be proportionately depressed, and the spring for returning the knocker put under
40 more or less tension, as will be readily understood.

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

45 1. In a sand-drier the combination with the receptacle for receiving the sand having entrance and discharge openings at top and bottom, a system of heating-pipes within the receptacle the flues or chambers located within
50 and forming part of the sides of the receptacle, the central longitudinal flue or chamber, the series of transverse ventilators communicating with said flues or chambers, and the

uptake with which said flues or chambers communicate; substantially as described. 55

2. In a sand-drier, the combination with the receptacle, a system of heating-pipes therein, the grate below said pipes, and the knocker, adapted to strike the grate to loosen the sand operated by the falling sand; substantially 60 as described.

3. In a sand-drier, the combination with the receptacle, for receiving the sand, a system of heating-pipes therein, the grate below said pipes through which the sand falls, the oscillating shaft, the knocker carried by said shaft, mechanism operated by the falling sand to oscillate the shaft and depress the knocker, and the spring for returning the knocker to cause it to strike the grate; substantially 70 as described.

4. In a sand-drier, the combination with the sand-receptacle, the heating-pipes the grate below the pipes, the oscillating shaft below the grate, the knocker carried thereby, the operating-arm on said shaft, the tilting lever one end of which normally rests below the end of said operating-arm, the pan or receptacle on the opposite end of the tilting lever, adapted to be filled by the falling sand, whereby the lever will be tilted, and the weight carried by the lever for returning it to normal position; substantially as described. 75

5. In a sand-drier, the combination with the sand-receptacle, the grate, the oscillating shaft, the knocker and operating-arm carried thereby, the tilting lever operated by the falling sand, the trip carried by the lever cooperating with the arm on the shaft, to depress the knocker, the spring for returning 85 the knocker; substantially as described.

6. In a sand-drier, the combination with the sand-receptacle, the grate therein, the oscillating shaft, the knocker and operating-arm carried thereby, the tilting lever operated by the falling sand, and the adjustable trip carried by said tilting lever, cooperating with the arm on the shaft to depress the knocker, and the spring for returning the knocker; substantially as described. 95

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