

(No Model.)

2 Sheets—Sheet 1.

G. H. CAMPBELL.
SAND DRIER.

No. 309,195.

Patented Dec. 16, 1884.

Fig. 1.

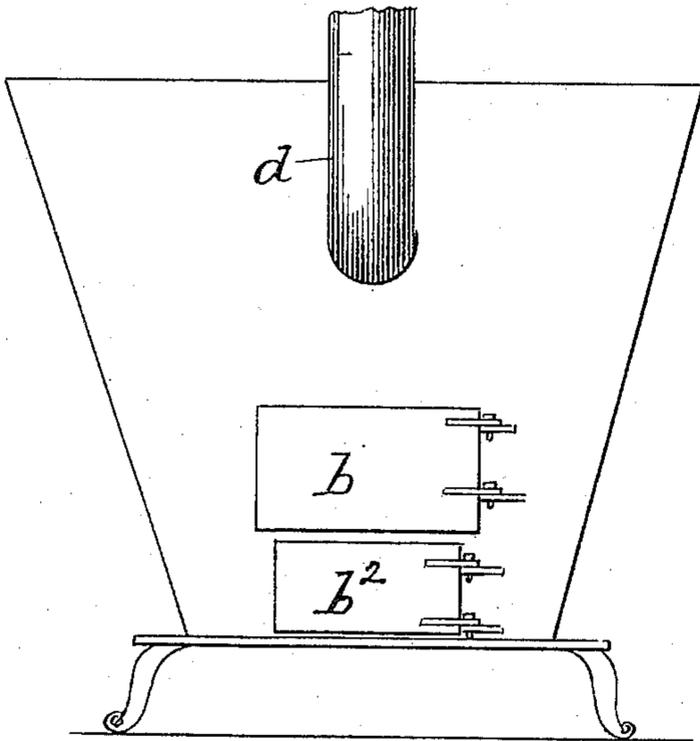


Fig. 2.

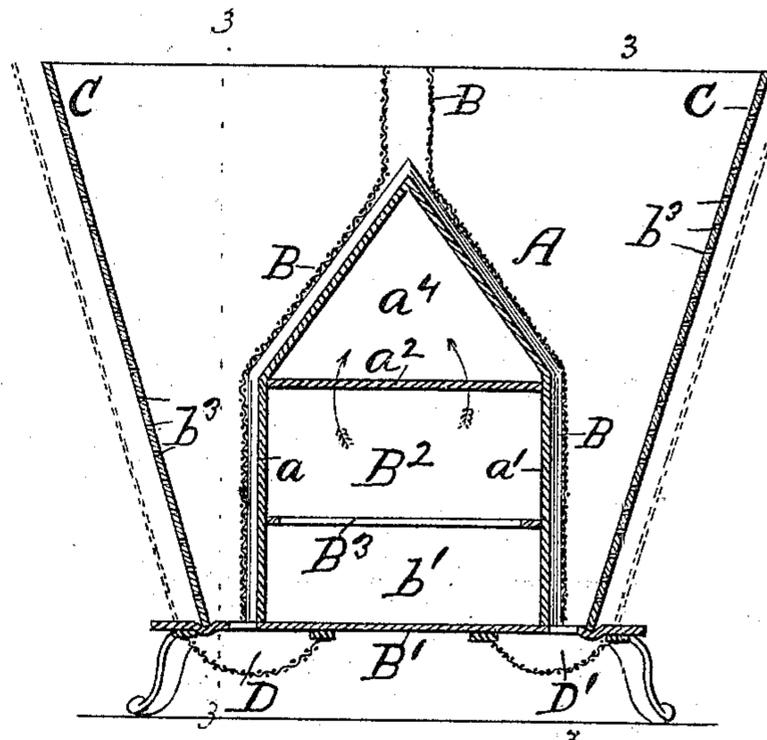
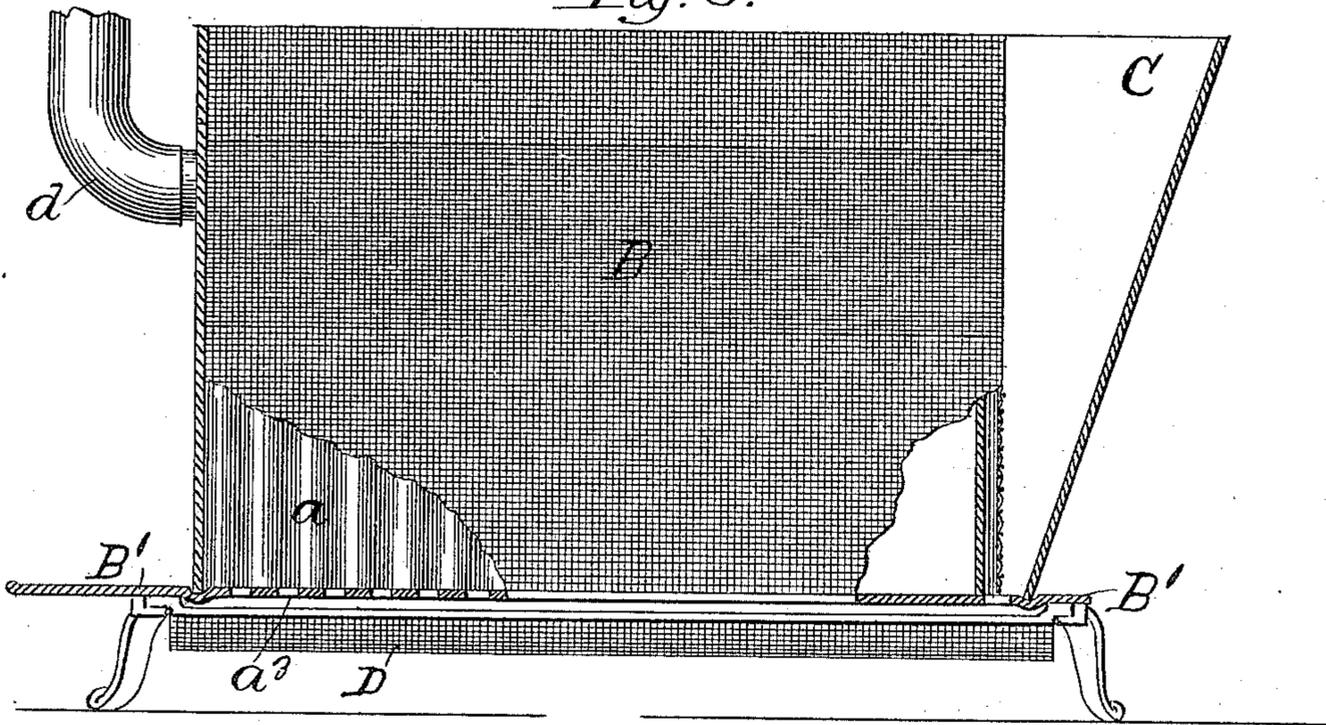


Fig. 3.



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Fig. 4.

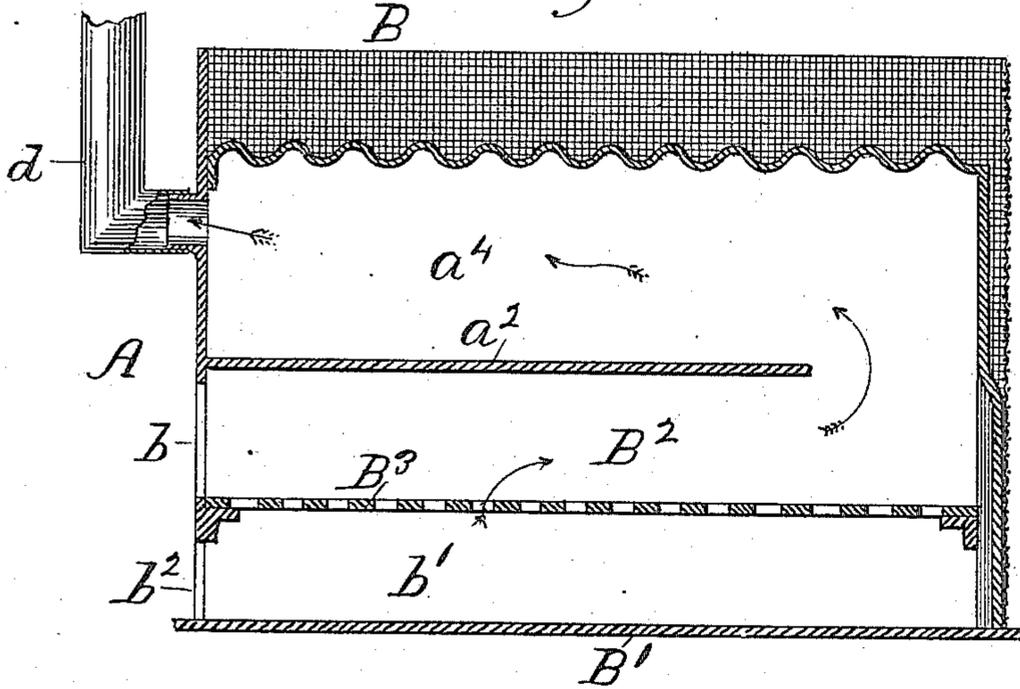
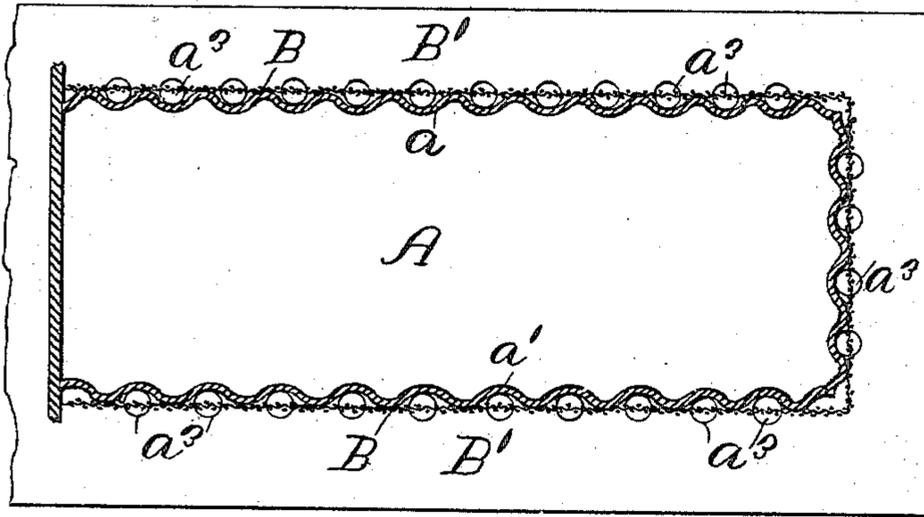


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE H. CAMPBELL, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
WILLIAM H. RHODES, OF SAME PLACE.

SAND-DRIER.

SPECIFICATION forming part of Letters Patent No. 309,195, dated December 16, 1884.

Application filed December 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. CAMPBELL, of Chicago, county of Cook, and State of Illinois, have invented certain new and useful
5 Improvements in a Sand-Drier, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this spec-
10 ification.

The object of this invention is to provide an improved apparatus for drying sand and gravel; and it consists of certain novel fea-
15 tures in the construction and arrangement of the several parts, whereby the heating and drying process is accomplished with facility.

Figure 1 is a front end elevation of a stove or heating and drying apparatus embodying my improved features; Fig. 2, a vertical trans-
20 verse section; Fig. 3, a vertical longitudinal section in the plane 3 3, Fig. 2, and showing part of the screen B, wall a , and bottom B' broken away; Fig. 4, a central longitudinal section, and Fig. 5 a horizontal section show-
25 ing the bottom in plan.

Referring to the drawings, A represents a stove or furnace of a rectangular shape, the inclosing side walls, $a a'$, being perpendicular as far as the diaphragm a^2 , and from that
30 point running inward and coming together at the top on a vertical line, as shown in Fig. 2 of the drawings, thus forming sloping sides to cause a free movement of the material being dried, and at the same time utilizing all the
35 heat. The side and rear walls, a, a' , and a^3 , are corrugated, as shown in Fig. 5. This arrangement increases the heat-radiating surface by reason of the convolutions, and also stiffens the wire screen B surrounding the corrugated
40 walls, as the outward corrugations are in contact with and form a support for the said screen, which prevents the sand from caking or baking in a mass. The wire screen B comes in contact with each alternate ridge of the corrugated
45 side and end walls, and forms separate channels or passages for the running of the sand or other material. The base or bottom B' of the stove is provided with the perforations a^3 , which extend around both sides and the back
50 end, as shown in Fig. 5 of the drawings. The

wire screen B is so placed that the lower edge, resting on the base B' , divides the holes in the center, so that the sand will run through on each side of the screen. Sheets of perforated metal may be substituted for the wire
55 screen, but the netting shown is preferably used.

B^2 represents the combustion-chamber; B^3 , the grate; b , the door affording communication with the combustion-chamber; b' , the ash-
60 box, and b^2 the door opening into the same. The diaphragm a^2 , placed in the combustion-chamber, extends clear across the same, and from the rear to a point near the front of the
65 furnace, thus forming the return-flue a^4 , and at the same time getting the full benefit of the fuel consumed by utilizing all the heat. The hopper C, which forms the receptacle for the
70 material to be operated upon, is quite wide at the top, but is gradually contracted toward the bottom, and its edges rest upon the projecting ledges of the base of the stove. The inclosing-walls of the hopper are provided with the numerous perforations b^3 , which provide for and facilitate the escape of the steam
75 from the heated sand, which would otherwise be forced through the body of the material and out at the top, and which of course add another important feature that greatly assists and facilitates the drying process. This hop-
80 per is in turn inclosed by the metallic jacket, (represented by the dotted lines in Fig. 2 of the drawings,) which provides a passage or flue for the escape of the steam driven through the perforated hopper. This jacket also pre-
85 vents the cold air from striking the exterior surface of the hopper, and thereby retarding the drying of the material. The wire screen or netting B extends clear to the top and on a line with the top of the hopper, as shown
90 in Fig. 2 of the drawings, which arrangement provides another passage for the convenient escape of the steam generated in the damp sand or gravel. The screen-boxes or recep-
95 tacles $D D'$, placed at each side of and underneath the base of the stove, receive the dry sand or other material, and serve to screen the same, and separate the coarse from the fine. These boxes extend around both sides and the back end, and are attachably connect-
100

ed to the apparatus, and may be readily removed at any time. One means of attaching these boxes is to provide a ledge on each end of the bottom upon which the flanges on the
 5 end of the boxes may rest, as shown in Fig. 3. The pipe *d*, connected to the front of and near the top of the apparatus, provides the usual escape for the smoke and unconsumed gases from the furnace.

10 The operation is as follows: The sand is placed in the hopper between the walls C and the screen B. More or less of the sand is forced through the meshes of the latter and passed down through channels formed by the
 15 corrugated surface above mentioned, and passes out through the openings *a*³. The bulk of the sand, however, is dried in the chamber, and passes out through openings *a*³, which are divided into two parts by the screen. The
 20 moisture expelled by the heat escapes through the perforated outer walls and the space between the corrugated wall and screen.

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

1. In a sand-drier, the combination of a hopper having openings in its bottom for the escape of sand, a stove having corrugated walls and a screen inclosing said corrugated walls, which, with the screen, form passages
 30 for the escape of steam and the sand forced through the meshes of said screen, substantially as described.

2. In a sand-drier, the combination of a hopper having openings in its bottom for the
 35 escape of sand, a stove having corrugated walls, and a screen inclosing said corrugated walls, and which divides the openings *a*³ into two parts, substantially as described.

3. In a sand-drier, the combination, with the
 40 stove A, of the wire screen or netting B, the perforated hopper C, and the screening-boxes D D', detachably secured underneath the base of said stove, substantially as and for the purpose set forth.

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Witnesses:

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