No. 692,791.

Patented Feb. 4, 1902.

C. LINDSTRÖM.

SAND DRIER.

(Application filed June 4, 1901.)

(No Model.)

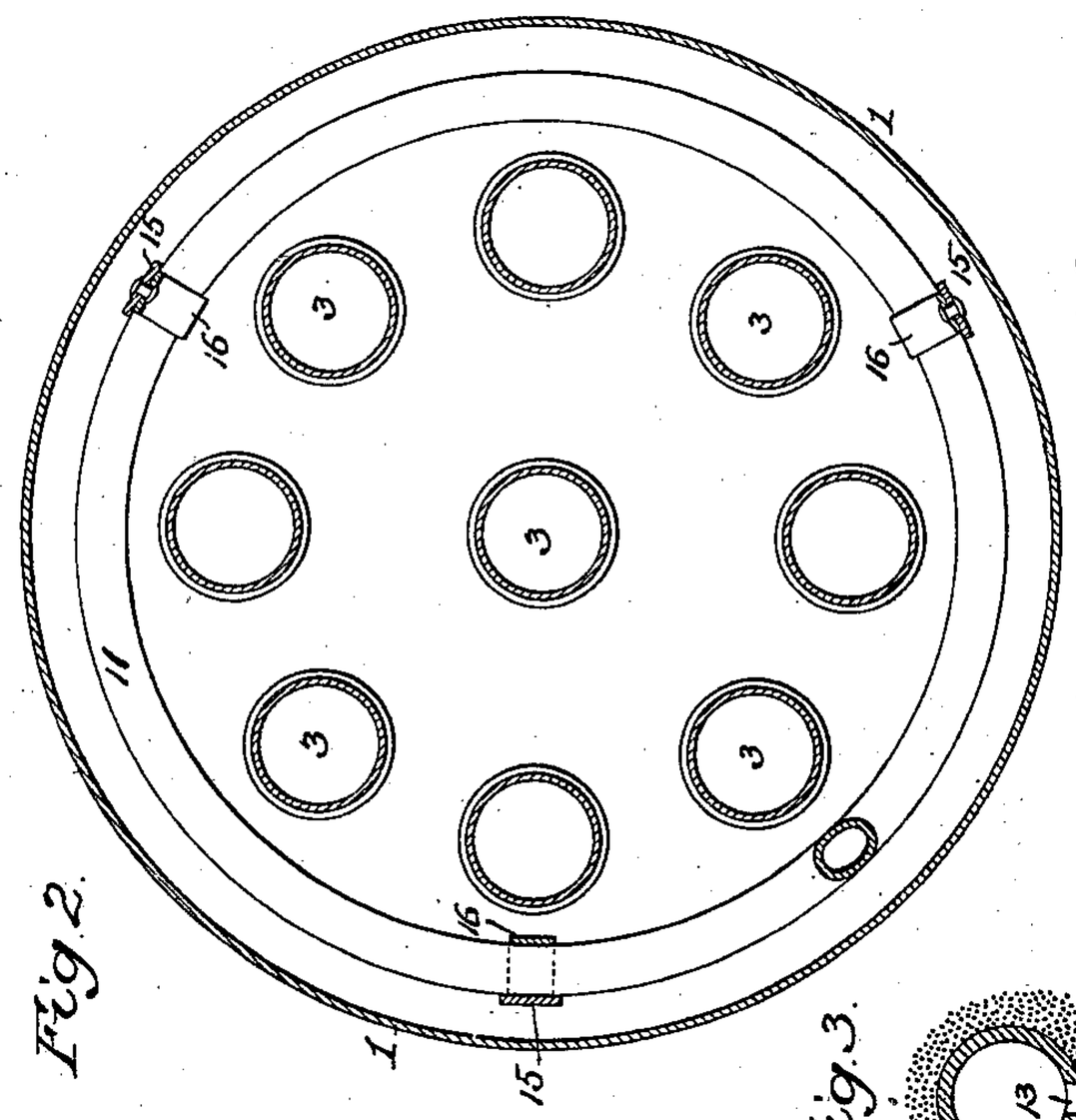

Fig. 2.

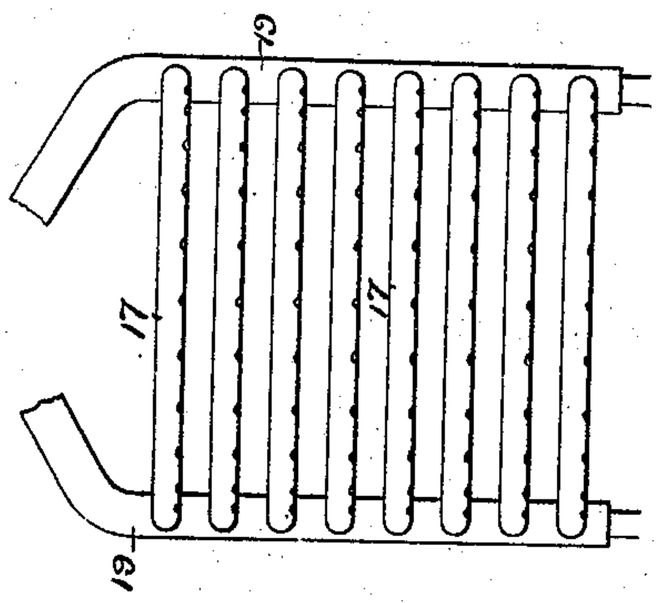

Fig. 4.

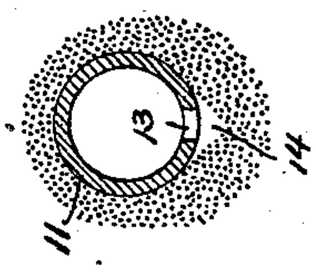

Fig. 3.

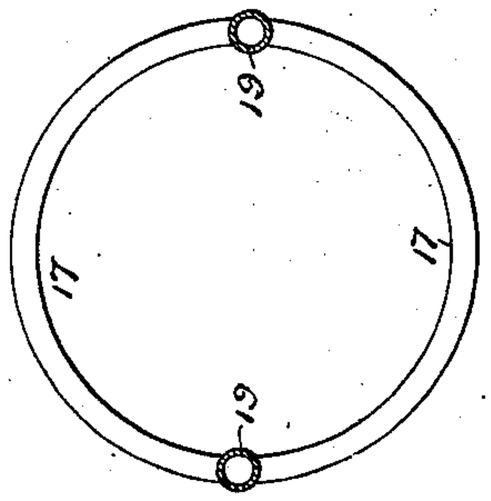

Fig. 5.

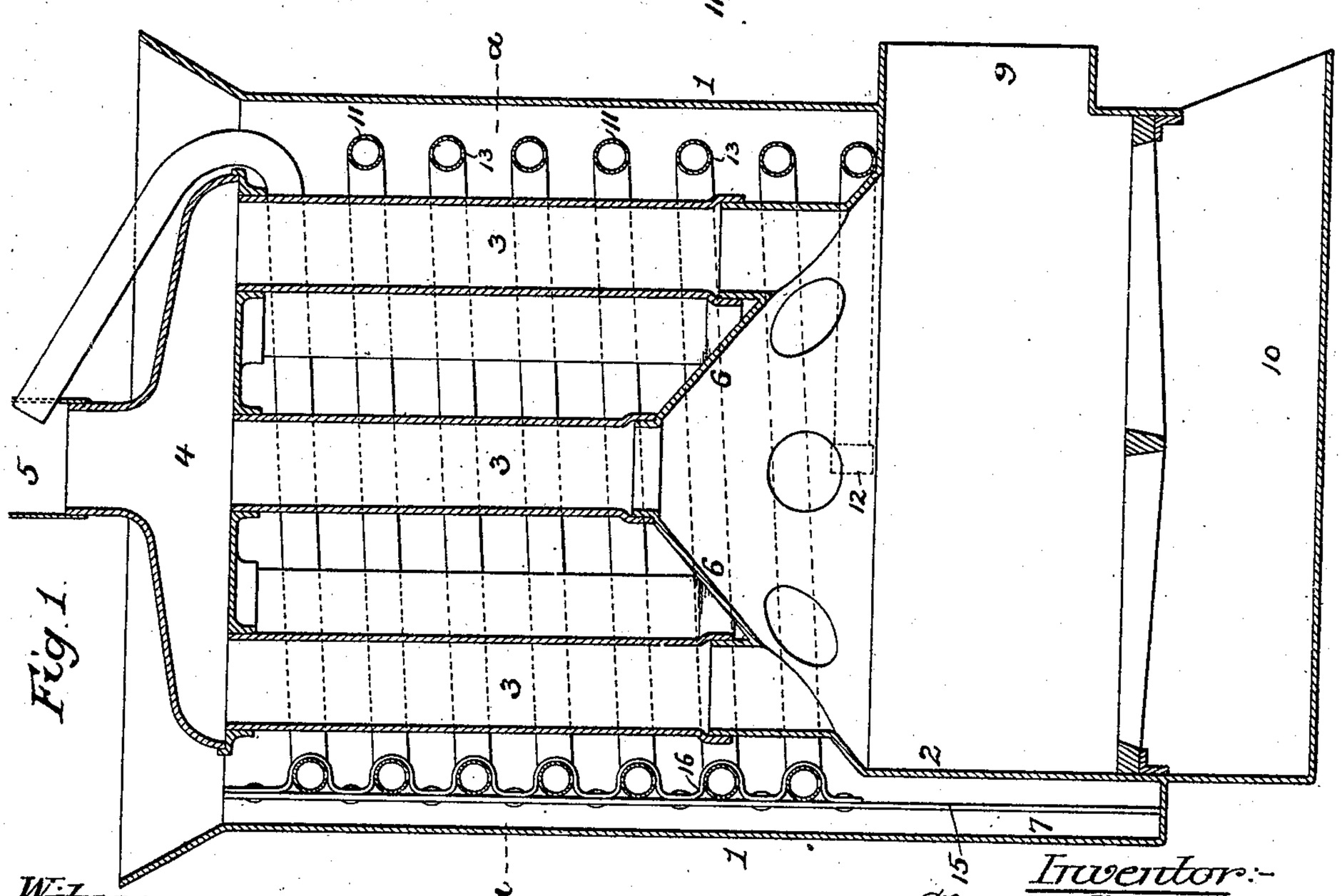

Fig. 1.

Witnesses:-
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UNITED STATES PATENT OFFICE.

CHARLES LINDSTROM, OF BLOOMINGTON, ILLINOIS, ASSIGNOR OF ONE-HALF TO CLARENCE M. MENDENHALL, OF BLOOMINGTON, ILLINOIS.

SAND-DRIER.

SPECIFICATION forming part of Letters Patent No. 692,791, dated February 4, 1902.

Application filed June 4, 1901. Serial No. 63,101. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LINDSTROM, a citizen of the United States, and a resident of Bloomington, Illinois, have invented certain Improvements in Sand-Driers, of which the following is a specification.

The object of my invention is to so construct a sand-drier as to provide for the free escape from the sand of the vapor developed by the action of heat upon the moisture in the mass. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a sand-drier constructed in accordance with my invention. Fig. 2 is a sectional plan view of the same on the line *a a*, Fig. 1. Fig. 3 is an enlarged view of part of the drier. Fig. 4 is a side view illustrating another embodiment of my invention, and Fig. 5 is a sectional plan view of the same.

Sand for use in sand-boxes of locomotives requires to be thoroughly dried to prevent the clogging of the delivery-pipes, which is likely to result if the sand is in a moist or adherent condition, and many forms of sand-driers have been devised, none of which, however, so far as I am aware, have been provided with efficient means for the escape of the vapors developed by the action of the heat upon the moisture in the mass of sand during the drying operation. Hence it frequently happens that this vapor accumulates in the mass until it is under such pressure as to dislodge the sand and eject it forcibly from the heater or cause bursting of the latter, in any event interfering with the operation of the heater and reducing the capacity of the same. My invention has therefore been designed with the view of overcoming these objections and providing for the ready escape of the vapor from all portions of the mass of sand under treatment.

In the drawings, 1 represents the casing of the drier, which may be of any suitable size and shape, but which is preferably cylindrical, and 2 is a fire-pot contained within said casing and communicating through a series of vertical flues 3 with an upper smoke-chamber 4, which has a suitable stack 5, the top 6 of the fire-pot being conical, so as to direct the dry sand into a well 7, intervening between the sides of the fire-pot and the lower portion of the casing 1, from which well the dry sand can be withdrawn in any suitable manner. The fire-pot has the usual feed-opening 9 and ash-pit 10. Within the sand-chamber of the drier and surrounding the series of flues 3 is a coiled pipe 11 of circular or other form in cross-section and of a diameter or size sufficient to freely carry off all of the vapors generated by the heating of the moisture in the sand, the lower end of this pipe being closed by the cap 12 or other suitable means and its upper end discharging either into the stack 5, as shown by full lines in Fig. 1, or into the air, as shown by dotted lines in said figure. In the under side of the pipe, at suitable intervals throughout the length of the same, are openings 13, and the vapor generated in the mass of sand by reason of the heating of the moisture contained in said mass has a constant tendency to seek the nearest of these openings, the pipe 11 providing the line of least resistance for the escape of the moisture from the mass. When the upper end of the pipe communicates with the stack 5, this tendency is aided by the fact that the draft in the stack tends to form a partial vacuum in the pipe, and thus induce flow into the latter through the perforations 13, the lower end of the pipe being closed, so that no air can enter the same at that point.

There is no tendency for the openings 13 in the under side of the pipe 11 to become clogged by the sand, for the latter in flowing in beneath the pipe seeks the natural angle of repose, as shown in Fig. 3, and thereby forms below each convolution of the pipe a chamber 14 in line with the row of perforations in the under side of the pipe. Hence free access to the perforations 13 of air or vapor driven off from the mass of sand by the heat is always insured. While, therefore, I prefer in all cases to form perforations in the under side of the pipe, my invention in its broader embodiment is not limited to this location of the perforations, since the latter may in some cases be formed in the sides of the pipe or even in the top of the pipe when the draft through the latter is sufficiently strong.

The pipe 11 is suitably supported in the

sand-chamber of the drier by means of a series of vertical legs or posts 15, three of which are shown in the present instance, the convolutions of the coil being secured to these legs or posts by suitable clips, which in the present instance are formed by bending a strip of sheet metal 16 and securing it to the legs or posts at points between the convolutions of the coil by means of bolts, rivets, screws, or other suitable fastenings.

More than one of the pipes 11 may be used, if desired, and the lower end of the pipe may be open or provided with a detachable cap, so as to permit of the discharge of any sand that may enter the pipe.

Although I prefer in all cases to use a vapor-escape pipe in the form of a continuous coil, it is not absolutely essential to the proper carrying out of my invention, as a series of independent pipes—such, for instance, as shown at 17 in Fig. 4—may be employed, these pipes communicating with one or more uptake-pipes—such, for instance, as shown at 19 in said figure—and said independent pipes may either be inclined or horizontally disposed.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. A sand-drier consisting of a casing having a fire-pot, flues for said fire-pot extending upwardly through the casing and a vapor-escape pipe having a series of convolutions disposed one above another in the space between the flues and the casing, said convolutions being provided with openings for carrying off vapor, substantially as described.

2. A sand-drier consisting of a casing having a fire-pot, flues from said fire-pot extending upwardly through the casing and a vapor-escape pipe having a series of convolutions disposed one above another in the space between the flues and the casing, said convolutions being provided with openings in their under sides for carrying off vapor, substantially as described.

3. In a sand-drier the combination of a casing, a fire-pot having flues extending upwardly through the casing, a smoke-chamber into which said flues discharge, and a vapor-escape pipe having convolutions disposed one above another in the annular space between the casing and said flues, said escape-pipe communicating with the smoke-chamber and said convolutions having openings for the escape of vapor from the sand, substantially as described.

4. In a sand-drier the combination of a casing, a fire-pot having flues extending upwardly through the casing, and a continuous coil of pipe presenting convolutions one above another within the annular space between the casing and said flues, said convolutions having openings through which vapor from the mass of sand can enter the same, substantially as described.

5. In a sand-drier the combination of a casing, a fire-pot having flues extending upwardly through the casing, a smoke-chamber into which said flues discharge and a continuous coil of pipe disposed in the annular space between the casing and said flues and presenting convolutions one above another which are provided with a number of openings, said pipe communicating with the smoke-chamber, substantially as described.

6. In a sand-drier the combination of a casing, a fire-pot having flues extending upwardly through the same, a smoke-chamber into which said flues discharge, a continuous coil of pipe in the annular space between the casing and said flues, the same presenting convolutions one above another, which convolutions have a number of openings in their under sides, said pipe communicating with the smoke-chamber, substantially as described.

7. The combination in a sand-drier of a casing, a fire-pot and a smoke-chamber having flues extending between them, and a continuous coil of pipe within the annular space between the casing and the said flues, the convolutions of said coil extending substantially from the bottom to the top of said annular space and having openings for the escape of vapor from the sand, substantially as described.

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

CHARLES LINDSTROM.

Witnesses:
JNO. F. JOHNSON,
HARRY J. MAGANN.