

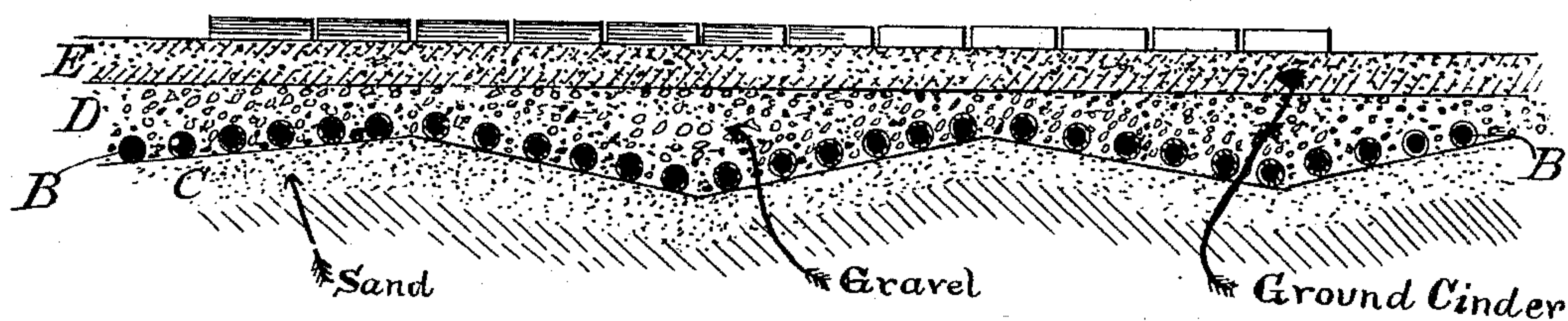
(No Model.)

L. C. TURLEY & W. G. BEYERLY.  
BRICK DRYING APPARATUS.

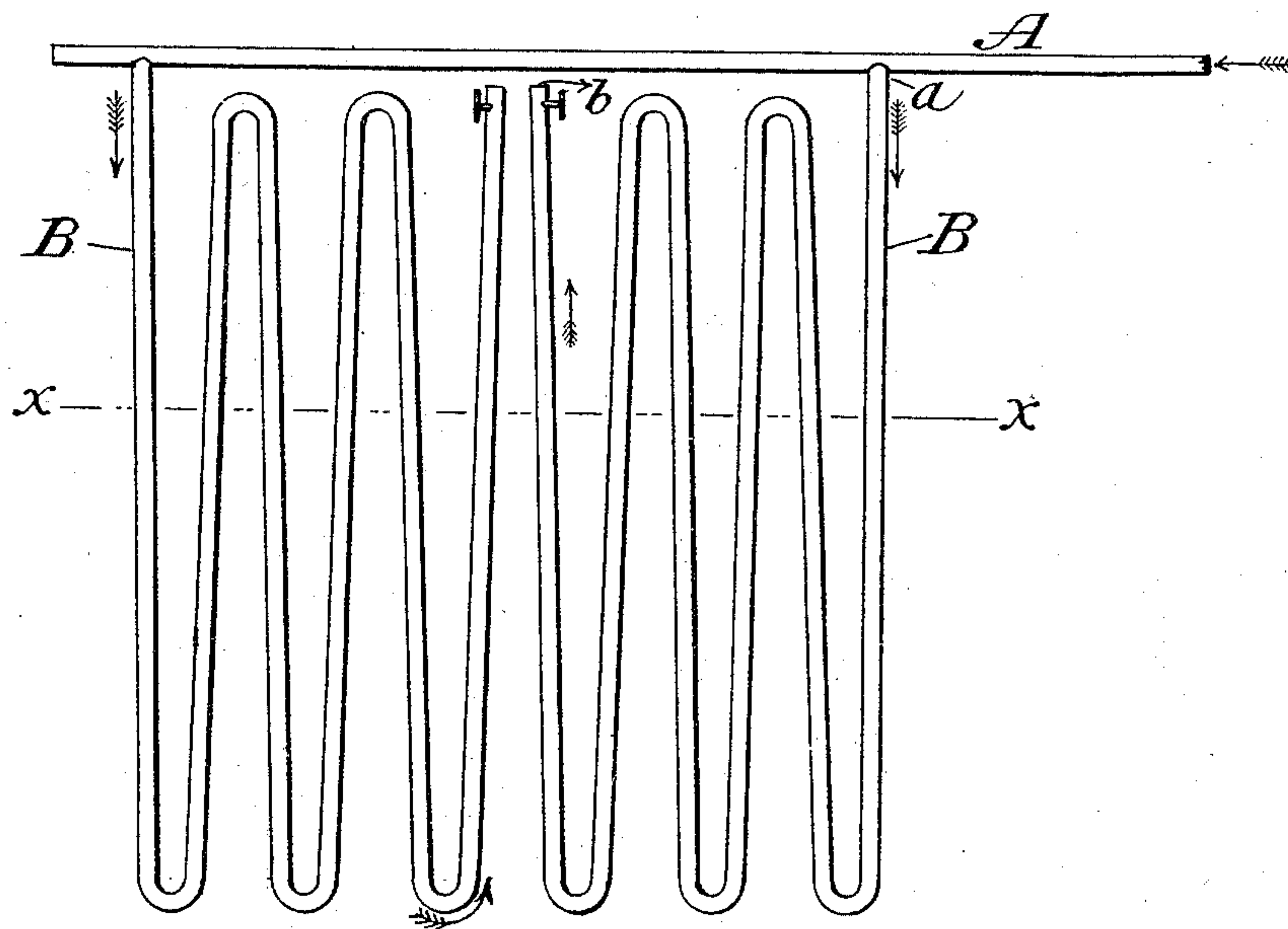
No. 462,179.

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*Fig. 1*



*Fig. 2*



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## BRICK-DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 462,179, dated October 27, 1891.

Application filed April 3, 1891. Serial No. 387,554. (No model.)

*To all whom it may concern:*

Be it known that we, LESLIE C. TURLEY and WILLIAM G. BEYERLY, citizens of the United States, residing at Portsmouth, in the county of Scioto and State of Ohio, have invented certain new and useful Improvements in Brick-Drying Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in drying apparatus in which is employed a system of circulating-pipes for steam, hot water, or other suitable heating medium arranged below a drying-surface upon which the material to be dried is placed. The invention is particularly designed to be used in drying bricks and malt, but of course may be used for drying purposes generally, according to requirements.

In brick-making it has heretofore been proposed to provide a system of circulating-pipes embedded in sand placed upon a board foundation and having the drying surface or floor proper composed of tempered clay, upon which the bricks to be dried are placed. In such systems the circulating-pipes are subject to the dangers of unequal expansion and contraction, by which the screw-threaded connections between the various sections of metallic pipes are liable to become loose and cause leakage, while a floor of tempered clay is liable to crack and have hot and cold streaks through the same, which cause an unequal distribution of the heat in contact with the bricks upon the floor, resulting in the production of bricks of inferior quality and correspondingly diminishing the receipts derived from the plant. Furthermore, in previous systems the method of constructing and arranging the pipes and the drying-floor is expensive on account of the number of pipes necessary to be used and the manner of connecting the same together.

The object of our invention is to overcome these several difficulties and at the same time to provide a simple, economical, and efficient heat-circulating system and drying-bed constructed so as to materially reduce the number of circulating-pipes and yet thoroughly

and evenly distribute the heat over the entire bed or floor.

To this end our invention consists in the improvements hereinafter described, and particularly pointed out in the claims at the end of this specification.

In the accompanying drawings, in which like letters refer to like parts of the apparatus, Figure 1 is a transverse sectional view of a drying-bed embodying our invention, illustrating the arrangement of the heat-circulating pipes, which are shown in cross-section, as indicated at the line X X of Fig. 2. Fig. 2 is a plan illustrating our system of fluid-circulating pipes, showing two independent sections connected to a common supply-pipe.

A designates the supply-pipe by which the heating medium may be conveyed to the circulating-pipes and which may be connected with the exhaust of a steam-engine or with any suitable source of supply of hot water or other fluid.

B designates the circulating-pipes, which may consist of sets or groups of pipes springing from the main supply-pipe A, each independent section being bent in zigzag form out from and back again toward the pipe to which it is attached, extending across the width of the drying-bed, as shown, so as to cause the heating-fluid to circulate back and forth across the bed or floor in a serpentine course from the inlet end of the pipe at *a*, at which point it is attached to the pipe A, to the outlet or free end thereof at *b*, the latter end being provided with a suitable stop cock or valve, by which the escape of water of condensation or the heating-fluid may be regulated. The drying-bed consists of a layer or layers C of any suitable material, such as sand or other non-conductor of heat placed upon a foundation of natural earth or other non-decaying material, and above the sand is placed a bed D of coarse gravel or broken rock, on which rests the floor proper E, composed of a suitable layer or layers of ground cinder, preferably ground-blast-furnace cinder.

In forming the drying-bed the foundation of earth is first prepared by making a suitable excavation, and then the layer of sand



or the like is placed thereon. The pipes B B are then placed on the bed of sand with their inlet ends *a* slightly elevated above their exit ends *b*, and coarse gravel or broken rock is placed upon the sand and around the pipes until a layer of suitable thickness is built above the same, and on this layer of gravel is placed a layer or layers of ground cinder, which forms the floor proper, upon which the bricks or material to be dried are placed.

The pipes B, as shown in Figs. 1 and 2, are arranged so that each independent section inclines downwardly from its point of attachment *a* to the free end thereof at *b*, so as to insure perfect drainage, and the arrangement is preferably such that two adjacent sections will incline toward each other, so that their exit ends will be adapted to empty into a common receiver for returning the product of condensation or other heating medium back into the boiler or source of supply; but of course the pipe-sections may be arranged so that each independent section may lead to a separate receiver provided therefor and still retain the advantages of our system of circulation and drainage.

Some of the advantages of our improved system over present methods may be enumerated as follows:

First. The coarse gravel or rock above and around the pipes affords such perfect distribution of heat as it ascends to the under surface of the floor proper that with one-third the number of pipes ordinarily employed it is not possible to locate a pipe from above by the amount of heat thrown off from the upper surface of the floor proper at any point or line, and hot and cold streaks in the floor are avoided, whereas with previous methods it has been necessary to arrange the pipes only a few inches apart to avoid such streaks.

Second. Our system of pipes is of simple construction, and insures perfect circulation and perfect drainage, and may be constructed and put in at small cost, without the tedious and costly connections used in previous systems.

Third. With our system of independent sections of heat circulating and distributing pipes, connected to a common supply-pipe, perfect circulation of the heating medium and perfect drainage are afforded, and at the same time the dangers of unequal expansion and contraction are avoided. The steam or other heating medium which enters each section or coil of pipe at its point of attachment to the supply-pipe will circulate freely through the same to the exit end thereof without endangering intermediate or screw-threaded end connections of the pipe-sections by the heating of such connections at a later period than the inlets of the pipes, which results in expanding such parts later, such expansion tending to pull off threads at the

ends of the pipes. The series of independent coils or sections being also inclined from the point of attachment to the supply-pipe to their free ends will cause the hot water or other fluid to circulate freely through the apparatus, so as to thoroughly drain the same, and thereby avoid all danger of injury to the pipes by freezing in cold weather.

It will of course be understood that various modifications may be made in the general arrangement of the pipes and the drying-floor without departing from the spirit of our invention, and hence we do not desire to be limited to the exact construction shown and described.

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

1. In a drier, a drying bed or floor comprising a suitable foundation, a layer of sand or similar non-heat-conducting material thereon, a heating device or apparatus placed upon the sand, a layer of coarse gravel or similar coarse heat-distributing material placed above the sand about and around the heating apparatus, and a drying surface or floor proper composed of ground cinder or like material, substantially as described.

2. In a drier, the combination of the drying-floor comprising a suitable foundation, a layer of sand above the same, a layer of coarse gravel above the sand, and a layer of ground cinder upon the gravel, forming the floor proper, together with a heating apparatus comprising a suitable supply-pipe, and fluid-circulating pipes formed in independent sections, each of which is attached at one end to said supply-pipe and has its free end arranged in close proximity to the free end of the adjacent section, said sections of pipe being bent across the drying-floor in zigzag form and inclining downwardly from their point of attachment to said supply-pipe to their meeting points, substantially as described.

3. A drier comprising a heating apparatus embedded in a heat-distributing layer of coarse gravel or similar material placed upon a bed of sand; and a layer of ground cinder or similar material above the gravel, composing the drying surface or floor proper, said heating apparatus being composed of independent sections of pipe coiled or bent in zigzag form across the drying-bed, and each section thereof being connected at one end to a common supply-pipe and inclined therefrom downwardly to the free end of the section, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

LESLIE C. TURLEY.

WILLIAM G. BEYERLY.

Witnesses:

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