(No Model.) 2 Sheets—Sheet 1.

H. DICKSON.

DRYING BRICK.

No. 346,362. Patented July 27, 1886.

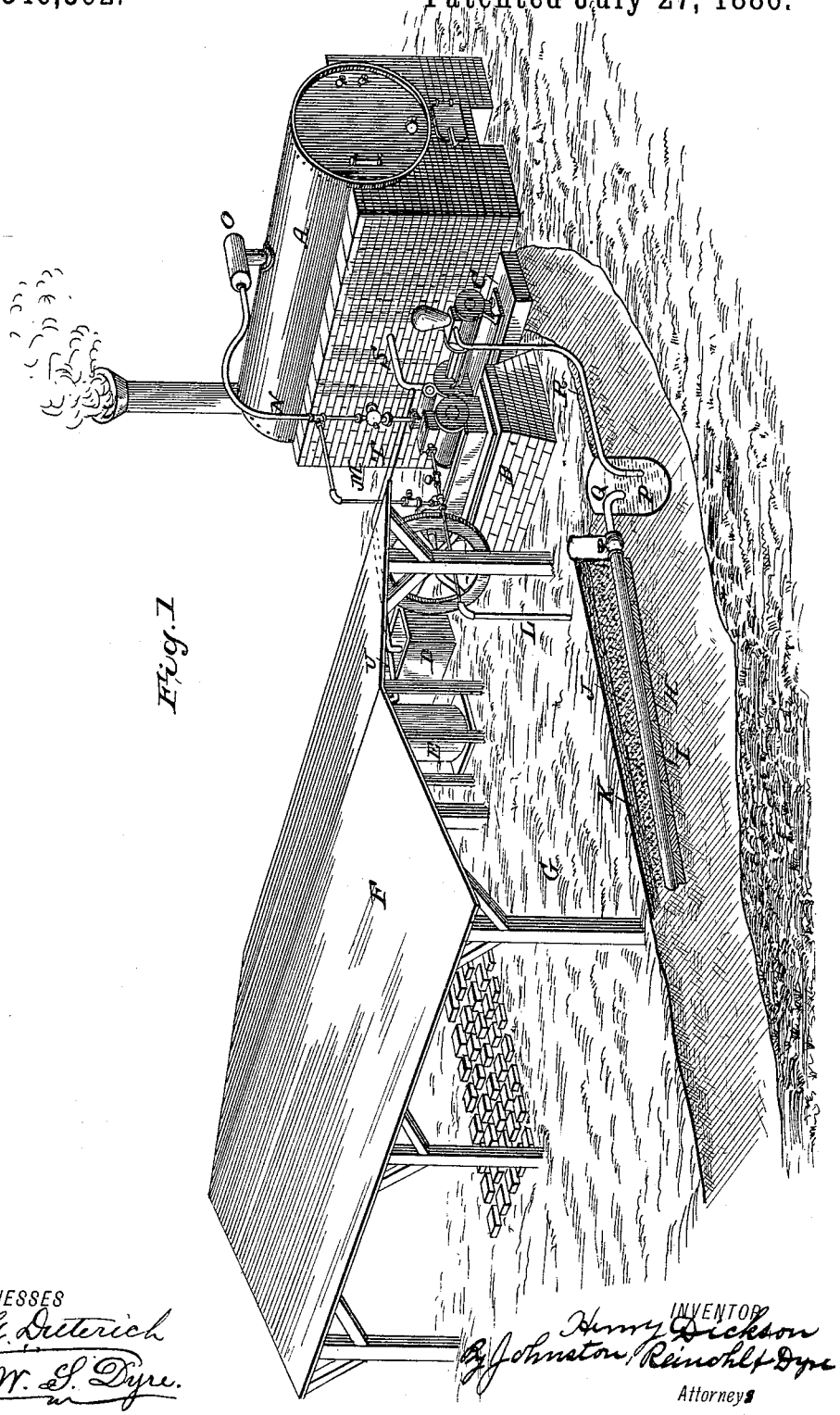

Fig. 1.

WITNESSES

Fred. G. Dieterich

Wm. W. S. Dyre.

INVENTOR

Henry Dickson

By Johnston, Reinohl & Dyre

Attorneys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2

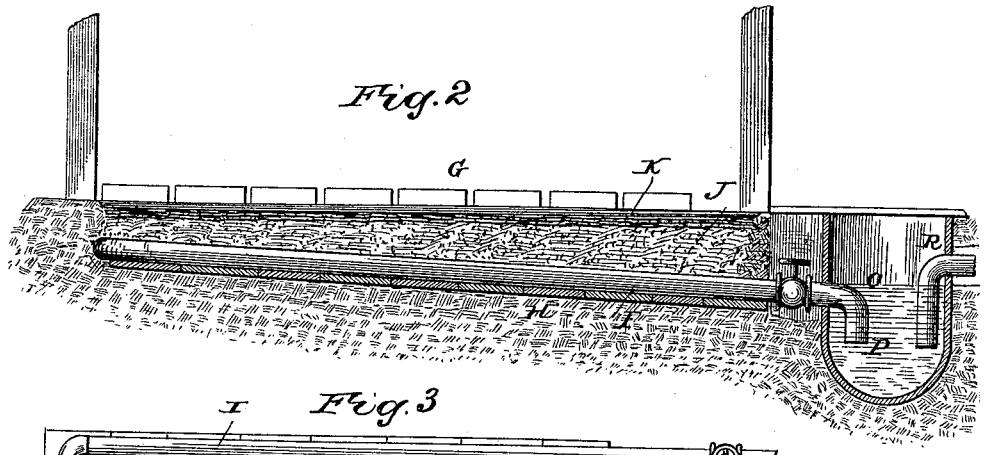
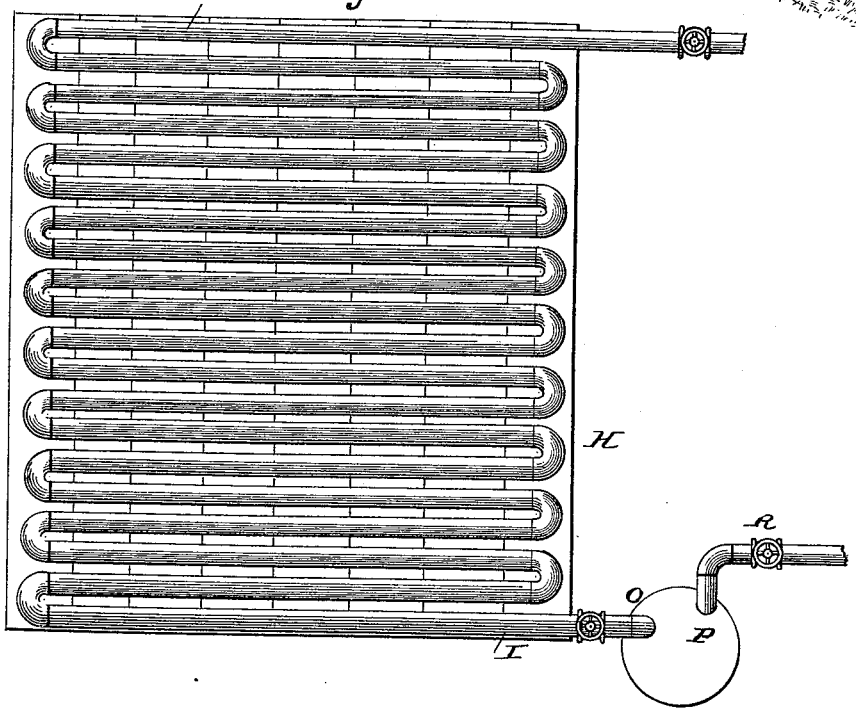


Fig. 3



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Attorneys

UNITED STATES PATENT OFFICE.

HENRY DICKSON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO SUSAN CATHERINE DICKSON, OF SAME PLACE.

DRYING BRICK.

SPECIFICATION forming part of Letters Patent No. 346,362, dated July 27, 1886.

Application filed May 6, 1885. Renewed June 18, 1886. Serial No. 205,595. (No model.)

To all whom it may concern:

Be it known that I, HENRY DICKSON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Drying Brick; and I 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.

My invention relates to the construction of a floor for drying brick, and has for its object the drying of freshly-molded brick with facility, economy of heat, and without liability of cracking or injuring said brick by rapidly drying them.

One of the greatest difficulties and the most annoying and perplexing features connected with the manufacture of brick is the drying of the green brick preparatory to setting them in the kiln for burning.

In the instrumentalities known to the art and employed by brick-manufacturers, the absence of uniformity of heat and the proper utilization of it is attended with loss of heat and great expense to the manufacturer, and is also attended with loss in the freshly-molded brick and a subsequent loss in the burning of the brick. The defects enumerated are due to the improper combined action of absorption and expelling the moisture from the green brick, which is occasioned by the variation of the heat in the drying-floor, its improper construction for meeting the condition required, and the undue absorption of the heat by the earth below the floor.

My invention consists in constructing a drying-floor for freshly-molded brick, in which a heater is interposed between an earthen floor and a non-conductor of heat, the latter placed between the heater and the earth below it, and interposing between the heating-pipes and the earthen drying-floor a stratum of granular material—such as sand—which rapidly absorbs and transmits the heat from the heater to said drying-floor.

In the accompanying drawings, which form part of this specification, Figure 1 is a perspective view of a brick-yard provided with my improvements. Fig. 2 is a vertical and transverse section of the drying-floor and a vessel for receiving the product of condensation. Fig. 3 is a top view or plan of a heater resting upon a non-conductor of heat.

Reference being had to the drawings, A represents an ordinary steam-boiler, provided with a furnace and stack and the appendages common to steam-boilers.

B represents an ordinary steam-engine.

C represents an ordinary steam-pump for supplying the boiler A, soaking-vat D, and tempering-mill E with water.

F represents a shed covering the drying-floor G, which is constructed as follows: The earth being suitably excavated, a floor or foundation is laid of a material which is a non-conductor of heat, and for which purpose I may use any of the known materials which will produce the desired result.

To illustrate my invention I have shown a floor made of boards H, properly embedded, and which should not be less than about one inch in thickness. This floor or foundation of material, which is a good non-conductor of heat, prevents the absorption of the heat from the heater by the earth below the said heater, my object being to cause all of the heat to be absorbed by the earthen floor upon which the brick are to be laid for drying.

Upon the floor of a non-conducting material is arranged a heating device about on a horizontal plane, having sufficient inclination to conduct the water of condensation off by gravity. The heating device consists of a continuous pipe, I, bent in the form shown, and extends throughout nearly the entire area of the drying-floor. The pipe constituting the heater is covered with a layer or stratum of sharp sand, as indicated at J. Upon this layer or stratum of sharp sand an earthen floor, K, is constructed of tempered clay, which should be from about two to three inches thick, made smooth and compact by means of a roller or other suitable device. The sand interposed between the heater and the earthen floor ab-

sorbs the heat from the heating medium and transmits it to the drying-floor. The heater communicates with the exhaust of an engine by a pipe, L, which communicates by means of a pipe, M, with the supply-pipe N, which is connected with the steam-drum O of the boiler A. The water of condensation from the heater is conducted to a well or vessel, P, by means of a pipe, Q. The well or vessel P communicates with the pump C through the medium of a pipe, R. The pump C communicates with the boiler A by means of pipe S, to which is attached a pipe, T, which communicates with the tempering-mill E and with the soaking-vat D by means of a branch, U. The several pipes mentioned are provided with suitable valves for the purpose of regulating the flow of steam or water through them.

All of the parts being constructed as described, the operation is as follows: Steam is generated in the boiler A, which is conducted to the engine B through the medium of the pipe N. With the exhaust-port of the engine communicates a pipe, L, which communicates with the pipe I, constituting the heater under the earthen floor G. The exhaust steam circulates through the heater, heating the sand J, which heat is transmitted to the earthen floor G, for drying the freshly-molded brick laid thereon. The product of condensation flows from the heater into the well or vessel P through the pipe Q, from which it may be pumped into the boiler A, the soaking-vat D, or the tempering-mill E, the supply of water being regulated by the valves in the pipes leading to the respective receptacles. It will be observed that the stratum of sand J takes up the heat from the pipe or heater I rapidly, and transmits it to the earthen floor G, which, being very solid and compact, absorbs the moisture from the green brick deposited thereon very rapidly, while the floor or foundation of non-conducting material prevents the absorption of the heat passing through the heater by the earth beneath. Thus all or nearly all of the heat is utilized for drying the brick, and that portion of the heat not so utilized is conducted into the boiler or used in soaking and tempering the clay. The solid clay drying-floor G resting upon the stratum of sharp sand, and the pipe or pipes of the heater being embedded in the sand, the heat of the steam in the pipe or pipes is diffused thoroughly and evenly through the stratum of sand, and from said stratum through the solid clay drying-floor. When the freshly-molded brick are deposited upon this clay floor, the moisture of the brick is inducted into or absorbed by the heated clay floor, and from this heated clay floor into the stratum of sharp sand, and from it the metal pipe or pipes take up the moisture. In other words, the action of the heat of the floor thus constructed is inductive instead of conductive, as under my means the moisture of the brick is absorbed by the floor instead of being expelled or driven off into the atmosphere, as under former systems. This is clearly seen in the product of condensation as it flows into the well.

The great distinction between the inductive and the conductive system is, that in the former the moisture in the green or freshly-molded brick is gradually and evenly withdrawn from them, thereby causing the brick to dry and shrink in all parts alike, and the necessity of "upedging" and "hacking" is dispensed with, whereby much labor is saved and time economized. In the other or ordinary mode of drying, the hard drying-floor is conductive of heat, and the heat is absorbed by the green brick. Therefore the brick from necessity dry faster on the under side than on the upper side, which causes an uneven shrinkage, which uneven shrinkage causes cracking of the brick in various degrees, the effect of which cracking continues throughout the drying and burning process, which is seen in the loss of brick after the burning process has been completed, and in the clipping of the brick in the laying of them in the wall.

The difference between the inductive and the conductive or expelling system of operation will be readily observed in the fact that in the former the first action of the steam in the pipe or pipes of the heater is to impart its heat to said pipes, and from said pipes to the sand, and from the sand to the clay floor. The inverse action is for the clay floor to take up the moisture of the brick, which moisture is taken from the floor by the stratum of sharp sand, which, acting upon the pipes, tends to effect the condensation of the steam, the product of which is subsequently utilized, as hereinbefore stated.

In the conductive or expelling process the heat of the flues, whether heated from the furnace or hot air, is taken up by the drying-floor and transmitted from the bottom of the brick upward, which is thrown off from the brick in the form of vapor, thereby causing a very considerable waste of heat, and in order to secure any uniformity in the drying of the brick they are required to be upedged and subsequently hacked before they are ready for setting in the kiln, which upedging and hacking require much labor, resulting in the loss of time and very considerable expense, when compared with my improved manner of treating brick in the drying process.

In other applications for Letters Patent of even date of filing I have claimed the methods or processes involved in my invention and the means employed for making brick from clay soaked and tempered with hot water and molded into brick while in a heated condition.

Having thus fully described my invention what I claim is—

1. A drying-floor for green brick, composed of tempered clay, in combination with a

heater embedded in sand, and a stratum of material which is a non-conductor of heat, arranged under the heater, substantially as claimed.

2. A drying-floor for green brick, comprising, in combination, a clay floor, a stratum of sand, a heater, a stratum of material which is a non-conductor of heat, and a vessel for collecting the water of condensation from the heater, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY DICKSON.

Witnesses:

JAMES J. JOHNSTON,

HENRY F. BRINTON.