(No Model.)

2 Sheets—Sheet 1.

H. DICKSON.

MAKING BRICK.

No. 346,360. Patented July 27, 1886.

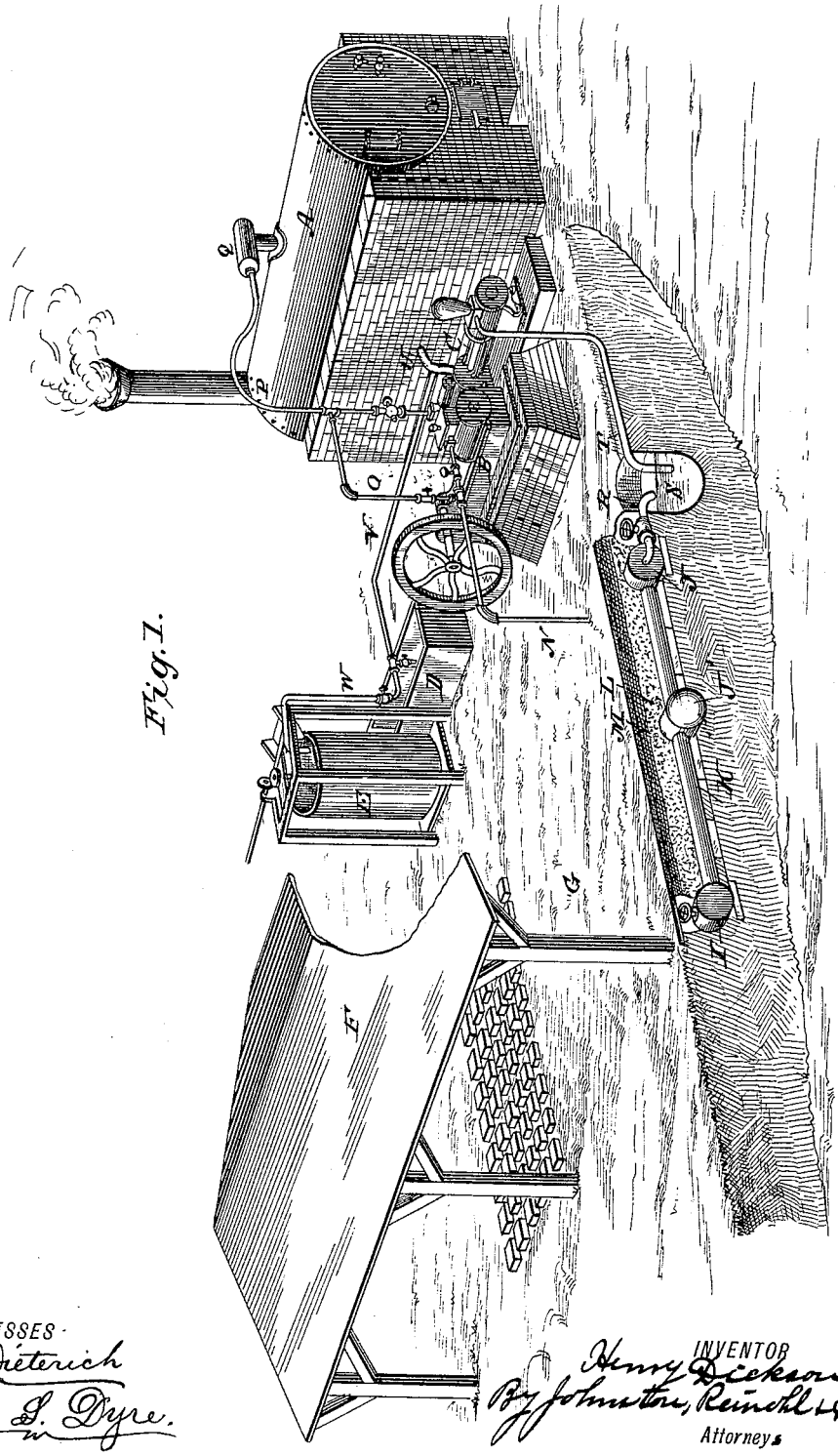

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

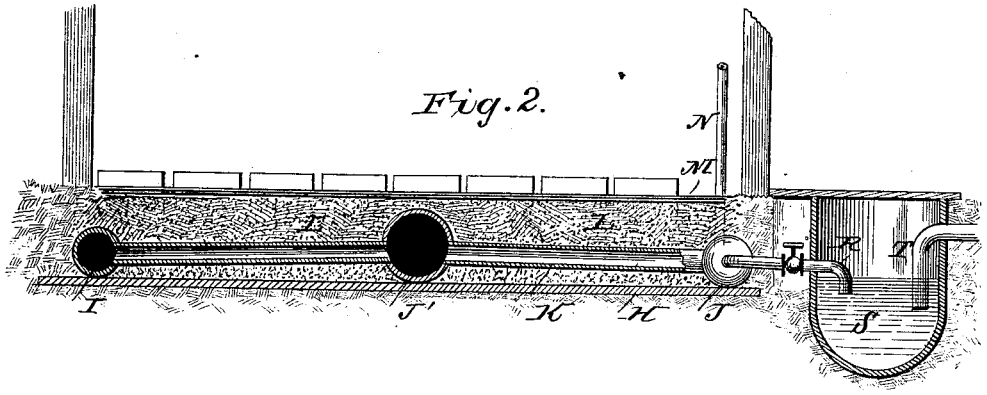
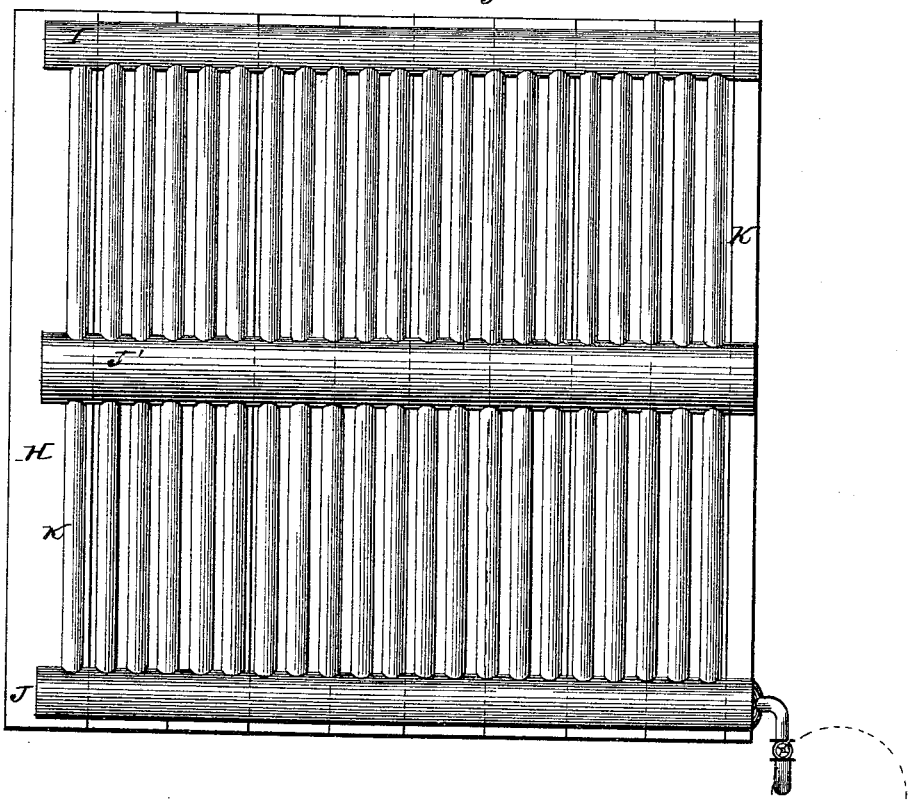


Fig. 3.



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UNITED STATES PATENT OFFICE.

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

MAKING BRICK.

SPECIFICATION forming part of Letters Patent No. 346,360, dated July 27, 1886.

Application filed May 6, 1885. Renewed June 18, 1886. Serial No. 205,593. (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 Making 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.

Experience in brick-making has demonstrated the fact that the class of brick known to the trade as "hand-made brick" are the best for building purposes; and it is also a well-ascertained fact that the class of brick known as "pressed brick," employed in constructing the front walls of buildings, are the best when made from tempered clay and molded by hand prior to being subjected to the action of the brick-press. It is also well understood by brick-manufacturers and bricklayers that the inefficiency of the present state of the art in drying brick is the cause of great loss in the manipulation of the brick and the clipping of them in the process of laying them in the wall, when such clipping is necessary, it being very common for a brick to break into two or more pieces by a single stroke of the trowel. This loss is due to two causes—to wit, a want of density in the brick and the cracking of the green brick in the process of drying.

The great desideratum in brick is density in the body, power to sustain great weight without cracking or crushing, and at the same time readily clipping under the action of the trowel in the process of laying.

My invention has for its object the making of a brick of increased density, with less liability to crack in the drying process, and when burned being susceptible of sustaining a great weight without cracking, and at the same time clipping with ease and certainty under the action of the trowel, which results I obtain by the means hereinafter stated, consisting, briefly, in making brick from clay moistened and heated before it is molded into brick by the application of hot water to the clay in the soaking-vat and tempering-mill, molding the heated and tempered clay into brick, and drying the freshly-molded brick upon an earthen floor heated by steam.

In the accompanying drawings, which form a part of this specification, Figure 1 is a perspective view of a brick-yard provided with my improvement. Fig. 2 is a vertical and transverse section of the drying-floor and the vessel for receiving the product of condensation. Fig. 3 is a top view or plan of the heating-pipes arranged upon a foundation constructed of boards.

Reference being had to the drawings, A represents an ordinary steam-boiler, provided with the usual 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 and 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 for the heater is constructed of boards H, properly embedded, which boards should not be less than one inch in thickness. Upon this floor is arranged, about on a horizontal plane, the heating device, which consists of three large pipes or "manifolds," I J J', connected by transverse pipes K about one inch in diameter, which pipes from center to center should not be more than three inches apart. The pipes are covered with a layer of sharp sand, as indicated at L. Upon this layer of sharp sand an earthen floor, M, is constructed of tempered clay, which should be from about two to three inches thick, made smooth by means of a roller or other suitable device. The heater or manifold communicates with the exhaust of an engine through the medium of a pipe, N, which also communicates by means of a pipe, O, which communicates with the supply-pipe P, which communicates with the steam-drum Q of the boiler A. The manifold communicates by means of a pipe, R, with a well or vessel, S, which receives the product of condensation from the steam heating-pipes. The well or vessel S communicates with the pump C through the medium of a pipe, T. The pump C communicates with the boiler A through the medium of a pipe, U, to which is attached a pipe, V, which communicates with the tempering-mill E and with the soaking-vat D by means of a branch pipe, W. 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, their operation is as follows: Steam is generated in the boiler A, which is conducted to the engine B through the medium of pipe P, which communicates with the steam-drum Q. With the exhaust-port of the engine communicates a pipe, N, which communicates with the pipe J of the manifold heater under the earthen floor G. The exhaust-steam circulates through said heater, and the product of condensation flows into the well or vessel S through the medium of pipe R, which communicates with the manifold heater under the earthen floor G. The well S and steam-pump C communicate with each other through the medium of a pipe, T. The pump also communicates with the boiler A by means of a pipe, U, whereby the product of condensation is carried back into the boiler A, or to the soaking-vat D or tempering-mill E, through the pipe V and its branch W. By suitably adjusting the valves for regulating the flow through the several pipes the boiler is supplied with hot water, the clay in the vat D soaked with hot water, and hot water supplied to the clay in the tempering-mill, whereby the clay as it comes from the tempering-mill to the brick-molder is in a heated condition. The freshly-molded brick are borne off and deposited upon the earther floor G in the usual manner.

It will be observed that, the brick being formed from clay in a heated condition and deposited upon the floor G in said state, several hours in time are saved which were formerly required for bringing the brick up in temperature to the point at which by my process they are deposited upon the floor. The boards H serve a twofold purpose: First, they cut off communication between the floor G and the earth below the boards; second, they act as a non-conductor for preventing the absorption of the heat of the manifold by the earth upon which the drying-floor G is built. The stratum of clean sharp sand L rapidly takes up the heat from the manifold and communicates it to the earthen floor G, which is very solid and compact, and absorbs very rapidly the moisture from the heated brick deposited thereon.

The rapid absorption of the moisture of the brick by the heated floor, in conjunction with the heated condition of the brick when deposited upon said floor, causes them to dry faster and with less liability to crack than can be done by any process known to the art of brick-making.

In the process of making brick experience has demonstrated that different clays require different treatment and different degrees of tempering. Some clays will readily soak, are easily tempered, and work smoothly in the operation of molding, while other clays require much time in soaking and a great amount of stirring in the tempering-mill, and notwithstanding this consumption of time and expenditure of power the tempered clay does not work smoothly in the operation of molding. It has also been ascertained that different kinds of water (by which I mean hard, soft, and water containing sulphur) used in the soaking and tempering operation produce different effects upon the clay, and in the process of burning the brick soft water always producing the best effect.

By my method of soaking and tempering clay with hot water the difficulties above mentioned are obviated, and the bad effect upon the freshly-molded brick of heating them (after being placed upon the drying-floor) from their lower side upward is avoided.

It is self-evident that in the ordinary process of drying the heat must penetrate through the brick from one side, and this causes the clay next to the floor to contract more rapidly than the clay in the upper part of the brick, which unevenness of contraction is very detrimental, as it causes various degrees of cracking, and its effects are observable throughout the drying and burning process.

It will be observed in my process of making brick that in the drying of them the brick when placed upon the drying-floor have a high degree of heat throughout the body of the brick infused by the hot water of condensation. This moist heat is absorbed by the heated drying-floor, and about the last of this moisture is always next to the floor, and by the time that the heated floor has absorbed all of this moisture in the brick they are about ready to set in the kiln. It will be further observed that in the absorption of this heated moisture the brick contract evenly and uniformly without cracking.

In other applications of even date of filing I have claimed the process involved in my invention and the construction of the drying-floor and its appurtenances.

Having thus fully described my invention, what I claim is—

1. In the art of brick-making, the combination of a clay-soaking vat, a tempering-mill, a steam-boiler, a heater below the drying-floor, a receptacle to collect the water of condensation, a pump, and suitable pipes to conduct the hot water to the soaking-vat and tempering-mill, substantially as described.

2. The combination of a steam-boiler, a steam-engine, a heater below the drying-floor connected with the exhaust-port of the engine, a receptacle to collect the water of condensation, a soaking-vat, a tempering-mill, and a pump for supplying the vat and tempering-mill with hot water of condensation, substantially as described.

3. The combination of a steam-boiler, a steam-engine, a brick-drying floor, a heater beneath it connected with the exhaust of the engine, a receptacle to collect the water of condensation, and a pump for returning the

hot water to the boiler, substantially as described.

4. The combination of a steam-boiler, a drying-floor, a heater arranged under the floor and connected with the boiler and the exhaust of the engine, a receptacle to collect the water of condensation, and a pump for returning said water of condensation to the boiler, substantially as described.

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

HENRY DICKSON.

Witnesses:
JAMES J. JOHNSTON,
HENRY F. BRINTON.