R. C. PENFIELD.

WALLING AND DAUBING BRICK KILNS.

APPLICATION FILED FEB. 9, 1911.

1,014,901.

Patented Jan. 16, 1912.

Fig. 1.

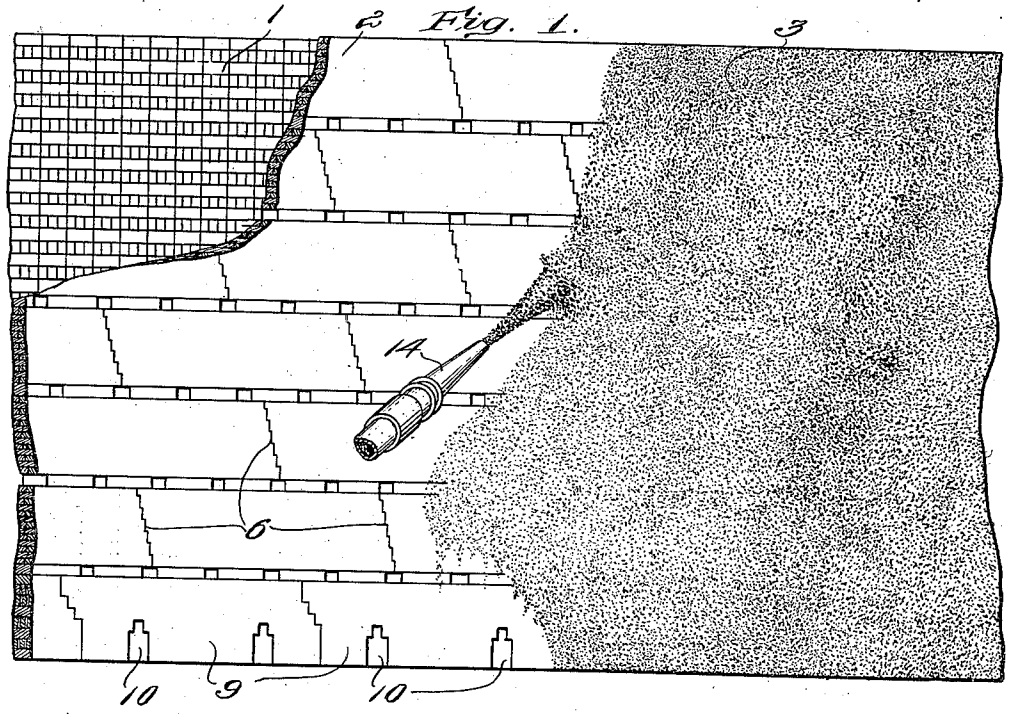


Fig. 2.

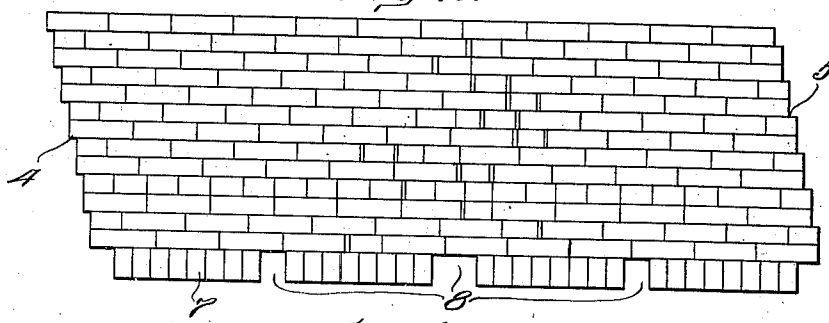


Fig. 4.

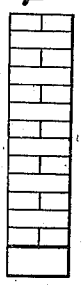


Fig. 3.

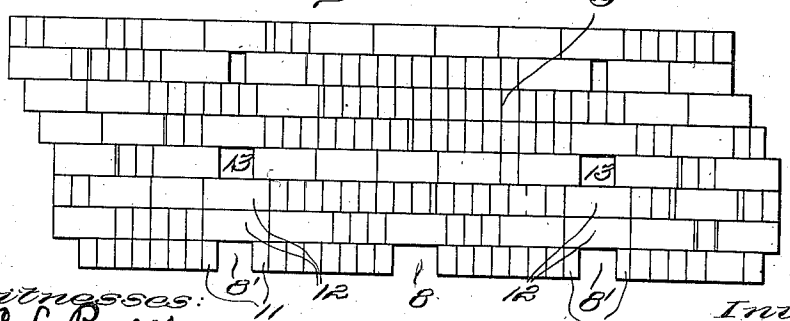
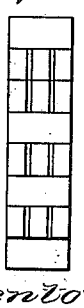


Fig. 5.



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UNITED STATES PATENT OFFICE.

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WALLING AND DAUBING BRICK-KILNS.

1,014,901. Specification of Letters Patent. Patented Jan. 16, 1912.

Application filed February 9, 1911. Serial No. 607,651.

To all whom it may concern.

Be it known that I, RAYMOND C. PENFIELD, a citizen of the United States, and a resident of the city, county, and State of New York, have invented an Improvement in Walling and Daubing Brick-Kilns, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In a customary method of burning bricks, the dried green bricks having been stacked in proper separated relation for burning are incased with a wall of burned bricks, these burned bricks being placed around the dried bricks usually eight inches in thickness. This wall of burned bricks is then daubed over with a mixture of clay and loam of the consistency of soft mud, the hand being used to smear over the burned bricks with a layer of proper thickness which thus fills the interstices between the bricks and adheres thereto. These operations have involved long and expensive handwork, the burned bricks being usually brought upon wheel barrows and placed in the wall individually by hand while the smearing above mentioned is likewise a slow, tedious operation requiring that a scaffolding be built all around the kiln, while the clay mixture made up and handled in segregated small quantities by the workmen by hand is of uneven, uncertain consistency and often not properly applied.

My invention provides a method and system for dispensing with this expensive and difficult manipulation and operation and enables the incasing wall of dry, porous, burned bricks to be set in place in relatively large units by a mechanical setter, while the daubing or smearing over of this dry, burned-brick wall is effected mechanically, whereby these operations are very greatly accelerated. To this end, the clay mixture is thinned considerably more than would be usual or practicable for hand application, being brought to a substantially fluid consistency so that it is capable of flowing and being projected through a nozzle, by a pumping pressure imparted thereto, in a continuous stream or spray. I have discovered that this application of the daub mixture in this thin flowable condition is possible for the reason that the wall to which it is to be applied, being of thoroughly dried, burned bricks and highly porous, instantly absorbs and takes up the excess of water in the clay mixture as soon as the smear spray strikes the wall, so that the material at once thickens and adheres to the wall in a relatively thick coat, which is thus applied much more evenly and effectively, as well as more quickly, than by hand application. A further advantage of this mechanical projection of the thinned mixture is that the clay, when mixed with a relatively large amount of water, becomes more viscous and colloidal, so that its spreading and adhering power is increased and the smear coat thus formed clings more firmly to the wall than is the case when the mixture is put on relatively thick by hand application. Further, as applied by hand, air is apt to be entrapped and water globules segregated, which tends to leave pores in the smear coat and impairs its usefulness. My improved method also makes it possible to apply the smear coat to the wall when hot even more advantageously than when cool, for the reason that the excess water in this case is not only absorbed in the pores of the bricks but also largely evaporated.

The invention will be better understood from the following detailed description in connection with the accompanying drawings, wherein a preferred embodiment is fully disclosed.

Referring to the drawings; Figure 1, is a broken away side elevation showing a portion of the incasing wall of a brick stack and illustrating the process of daubing the same in accordance with my invention; Fig. 2, is an enlarged side view of one of the assembled units of bricks forming the incasing wall; Fig. 3, is a like enlarged view of modified units used for the base course of the wall; and Figs. 4, 5, are end views of the units shown in Figs. 2 and 3 respectively.

The stack of dried bricks 1 arranged in hacked relation for burning has an incasing wall 2 of burned bricks built around it, this wall being then coated with a layer of clay and loam daub 3. In building this wall the burned bricks are assembled in units consisting of a large number of bricks in a suitable form, the bricks being arranged in overlapping relation so that they are mutually bound together as shown in Fig. 2, and the form being preferably constructed so that the ends of the unit have overhanging or

notched portions as shown at 4, 5 to interfit with similarly notched or irregular ends of adjacent units as seen at 6. The purpose of this construction is to effect a tying together of the units so far as possible and to prevent vertical cracks forming in the sides of the kiln at this point. The bottom layer 7 of these units is set transversely edgewise, finger spaces 8 being left at intervals to receive the mechanical fingers or arms of the handling machine, which is to set them in place in the wall. When the units are in place in the wall these finger spaces may be filled in by additional bricks. The bottom tier of units 9 for the wall may be assembled similarly to the other units, but in Fig. 3 I have shown one of these bottom units formed so that it can be readily re-arranged to leave fire holes 10 at intervals. In this unit as shown finger spaces 8 are left in like manner as above explained. The bricks 11, 12 about adjacent alternate ones 8′ of these spaces are arranged so as to be readily removable to make a relatively large opening in connection with the further holes 13 which may be left in the unit to form fire holes as customary in the side of the brick kiln; these surplus bricks 11, 12 thus removed may be used to fill in the other finger spaces 8. This construction applies to the sides of the kiln; the ends of the kiln are built up in the same general manner except there, the arrangement for forming the fire holes is omitted.

In carrying out my process to do away with the slow and expensive method of hand daubing I preferably prepare the clay for smearing in a blunger at some convenient point near the kiln shed, where the clay may be mixed with loam and thoroughly blunged to bring it to about the consistency of slip. This clay wash or batter is then applied to the surface of the burned brick wall mechanically and for this purpose I prefer to use compressed air or a suitable slip pump which will project this material or force it in a stream so that it can be directed against the outer surface of the kiln walls in a much more thorough and expeditious manner than has been possible by hand. By this forcible mechanical projection of the fluid or semi-fluid batter, it is obvious that it can be driven into all the interstices between the bricks and the cracks therein much more effectively than would be possible by the hand application thereof which could only, at best, superficially and imperfectly fill such interstices, and thus the smear coat is not only more quickly and easily, but also more securely and reliably applied to the walling. Further the batter or wash can be applied to the kiln in this manner quite as readily when the kiln is hot as otherwise, which is often an important consideration for the saving of time. Any ordinary spray or nozzle, shown for example at 14, connected to a hose is all that is required to properly make the application to the sides of the kiln. The clay batter thus projected fills in any small spaces that may be left between the units by inexact interfitting thereof as they are laid in place, as well as into the cracks between the bricks of each unit and this facilitates adhesion of the daub or smear to the wall, and at the same time seals the wall more effectually than ordinarily results from the hand method of application.

It is to be understood that my improved process of mechanically applying the smear coat of clay mixture to the wall while entering into combination as above set forth with the novel method of forming the wall in units deposited by a mechanical setter, is not limited in its scope to use in this relation but is likewise advantageous and valuable for daubing or smearing walls of brick kilns, however they may have been formed.

Having now described the invention, what I claim as new and desire to secure by Letters Patent, is as follows:

1. The herein described method, which consists in walling up a stack of green bricks with a wall of burned, dry, porous bricks, and mechanically projecting a daubing mixture to form a smear coat thereon in a relatively thin condition so that it is capable of flowing and being forced in a stream or spray against said wall, whereby the excess of water in said mixture is at once absorbed as it strikes the wall, so that a continuous and substantial smear coat is produced over the wall.

2. The herein described method, which consists in incasing a stack of green bricks with a wall of burned, dry, porous bricks, and mechanically projecting a relatively thin clay mixture in a spray or stream against said wall in such a direction and manner that it is forced into the interstices of the wall and evenly spread thereover, the bricks of said wall being adapted to instantly absorb the excess water in said mixture whereby a substantial, continuous smear coat will adhere to the wall.

3. The herein described method, which consists in reducing a wall-daubing clay mixture to a relatively thin condition so as to be capable of projection in a stream or spray, and mechanically forcing the same against an incasing wall of burned, dry, porous bricks, whereby said bricks take up the excess water in said mixture so that a substantial, continuous smear coat is formed over said wall.

4. The herein described method, which consists in reducing a daubing mixture to a relatively thin condition capable of being projected in a stream or spray, and forcing the same mechanically as a nozzle stream over the different portions of a kiln wall of burned, dry, porous bricks, whereby said

bricks absorb the excess of water and said mixture adheres to the wall in a relatively thick, continuous coating.

5. The herein described method, which consists in reducing a daubing mixture of clay and loam to a relatively thin condition capable of being projected in a stream or spray, and forcing the same mechanically as a nozzle stream over the different portions of a kiln wall of burned, dry, porous bricks, whereby said bricks absorb the excess of water and said mixture adheres to the wall in a relatively thick, continuous coating.

6. The herein described method, which consists in providing a fluid daubing mixture capable of being projected in a stream or spray, walling up a stack of green bricks with a wall of burned dry bricks placed on top of each other in a sufficiently loose arrangement to leave the interstices capable of receiving and retaining said daubing mixture, and then mechanically flowing under pressure said daubing mixture against said wall in the form of a nozzle stream directed substantially in line with said interstices and approximately perpendicular to said wall with sufficient force to weld the mixture onto the face of the wall and clench portions thereof between the bricks by the forcible packing thereof into the interstices under the pressure blast.

7. The method of walling a kiln which consists in assembling burned bricks in units and with an arrangement capable of receiving and retaining a semi-fluid daubing mixture, transferring said units bodily to build up the wall and mechanically applying a daubing mixture in a condition capable of flowing to fill the interstices in the wall so formed and produce a smear-coat thereon.

8. The method of walling a kiln which consists in assembling burned bricks in units and with an arrangement capable of receiving and retaining a semi-fluid daubing mixture with notched or overhanging ends, transferring said units bodily and interfitting with same to build the wall and applying mechanically a clay mixture in a condition capable of flowing to fill the interstices in the wall so formed and produce a smear coat thereon.

9. The method of walling a kiln which consists in assembling burned bricks as units and with an arrangement capable of receiving and retaining a semi-fluid daubing mixture in a form with notched ends, transferring said units bodily and interfitting the same to form a wall about a green brick-stack, reducing a clay and loam mixture to a fluid consistency and in projecting the same mechanically upon said wall to fill the interstices therein, and form a coating thereon.

10. In a method of walling a brick kiln the steps which consist in arranging burned bricks into units in a form in overlapping relation and of a width adapted to the thickness of a kiln-incasing wall, and transferring units bodily and fitting the same to form successive wall portions around a green brick stack.

11. In a method of walling brick kilns the steps which consist in arranging burned bricks into units in a form in overlapping relation and of a width adapted to the thickness of a kiln-incasing wall, the several units having correspondingly notched or irregular edges, transferring said units bodily and interfitting the same to form successive portions of the wall around a green brick stack.

12. The method of walling a brick kiln which consists of arranging burned bricks into units with successive layers in overlapping relation, in transferring said units bodily and fitting the same together to form the wall and in forcing a daubing mixture against the wall so formed to enter the interstices between bricks and between units and form a smear coat over the wall.

13. The method of producing a kiln walling which consists in assembling burned bricks into units, the successive layers being arranged in overlapping relation and holes being provided at the bottom to receive lifter fingers, transferring said units into position in the wall and forcing a smear coat over the wall so produced to enter the interstices between the bricks and between the units.

14. The method of walling a brick kiln which consists in arranging burned bricks in units with successive layers overlapping to tie the units together, the bottom layer extending transversely edgewise and provided with openings to receive the fingers of a mechanical lifter, transferring said units bodily and fitting the same to form successive portions of a walling about a green brick stack, and smearing over the wall so formed with a daubing mixture.

15. The method of walling a brick kiln which consists in arranging burned bricks in units with the bottom layer set edgewise transversely and having apertures at intervals, and the layers thereabove laid in overlapping relation, transferring such units bodily and fitting the same together to form successive portions of a walling about a green brick stack.

16. The method of walling a brick kiln which consists in arranging burned bricks in units with the bottom layer set to form spaced apart transverse openings and the bricks in the layers thereabove overlapping to tie the units together, the ends of different layers projecting different distances to produce a notched or irregular contour, transferring such units bodily and interfit-

ting such irregular edges to form a continuous walling of burned bricks about a green brick stack.

17. The method of walling a brick kiln which consists in arranging burned bricks into units with the bricks in successive layers overlapping to tie the units together, and the bottom layer provided with spaced apart openings to receive lifting fingers, and the bricks adjacent certain of said openings being placed so as to be readily removable to form fire holes, and in transferring the units so formed and fitting the same together to form the base portion of a walling about a green brick stack.

18. The method of walling a brick kiln which consists in arranging burned bricks in units of a series of layers with bricks of successive layers overlapping, the bottom layer being provided with spaced apart holes for receiving lifting fingers and a layer farther up being provided with holes over said finger holes, the bricks between such holes being placed so as to be readily removable to form fire holes, transferring the units so formed to constitute the base of a walling, and in building up thereover by the successive deposit of other units, a wall of burned bricks about a green brick stack.

19. The method of walling a brick kiln which consists in arranging burned bricks into units with a bottom layer of bricks provided with spaced apart holes to receive lifter fingers, and a layer farther up provided with other holes in vertical alinement with said first named holes, the intervening bricks being placed so as to be readily removable to form fire holes, transferring the units so formed bodily to produce the base portion of a walling, fitting thereover other brick units to complete a walling of burned bricks about a green stack, and forcing a daubing mixture against the wall so formed to enter the interstices between bricks and between units and produce a smear coat thereon.

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

RAYMOND C. PENFIELD.

Witnesses:
S. H. SMART,
C. P. MERTENS.