No. 769,257. PATENTED SEPT. 6, 1904.

L. D. EWING.

INTERIORLY VENTILATED FIREPROOF WALL.

APPLICATION FILED OCT. 12, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

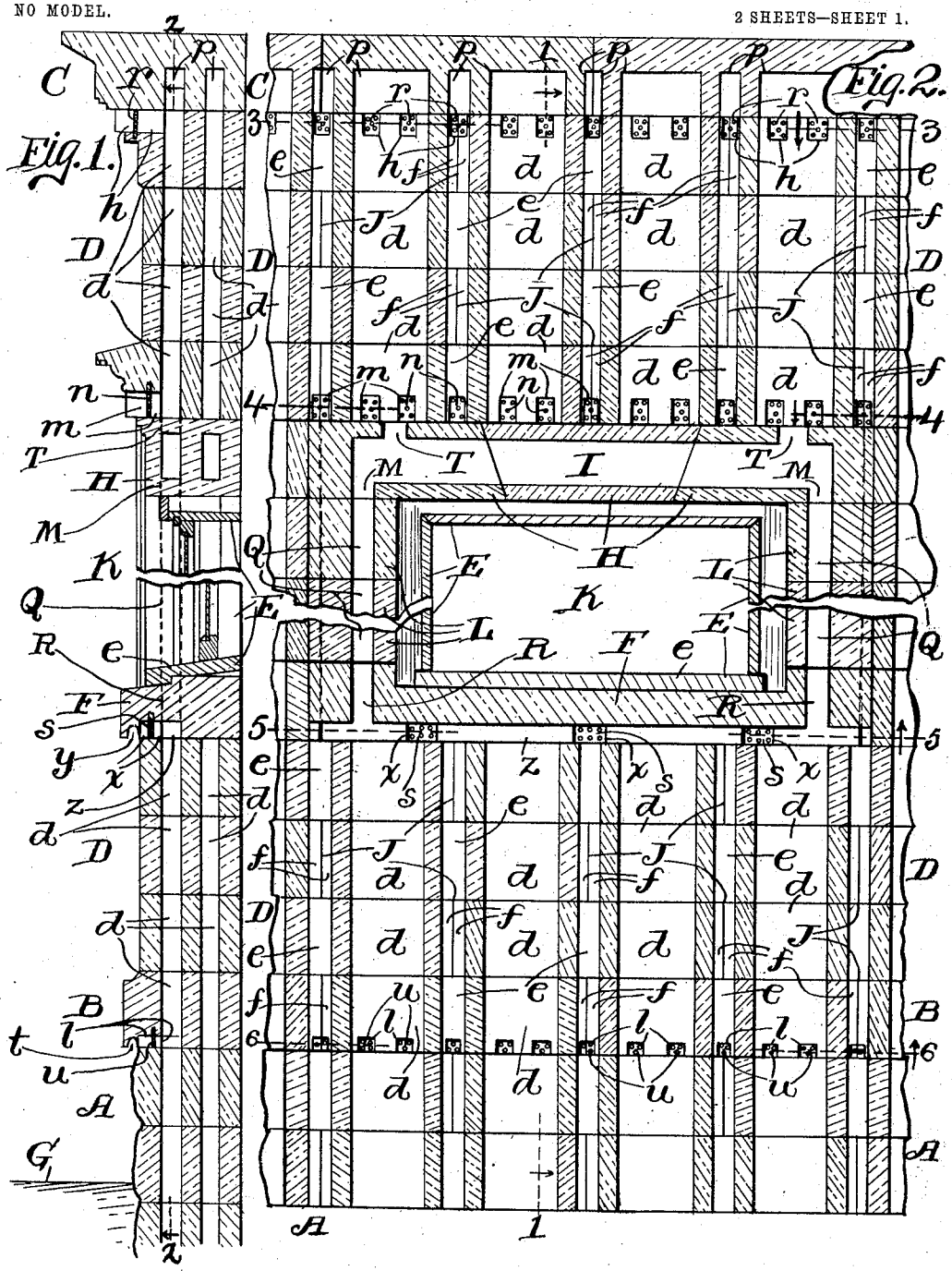

Fig. 2.

WITNESSES:

Daniel E. Daly.

J. M. Hayes.

INVENTOR

Lewis D. Ewing

BY

Church & Dorer

his ATTORNEYS

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Fig. 3.

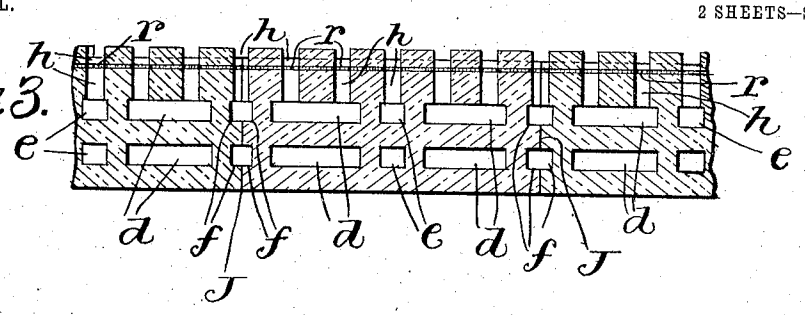


Fig. 4.

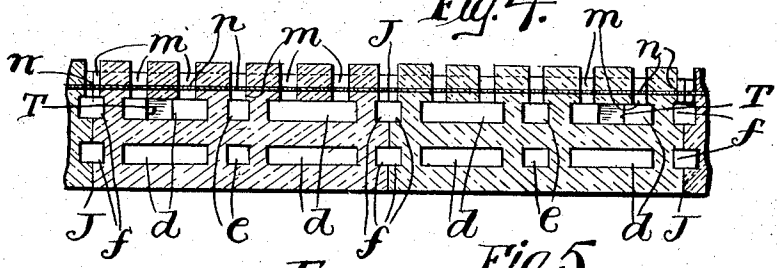


Fig. 5.

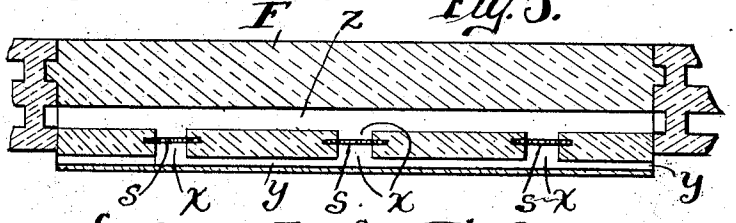


Fig. 6.

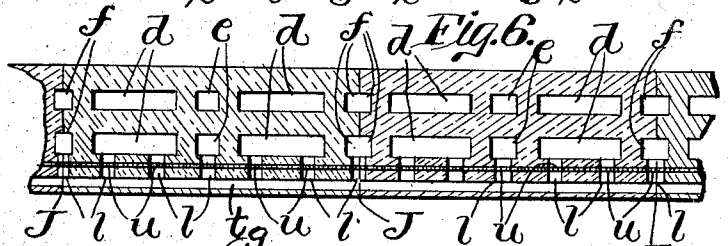


Fig. 7.

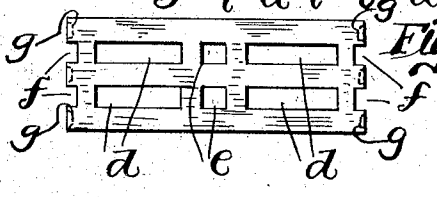
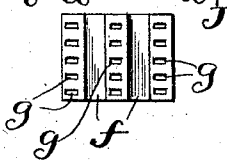


Fig. 8.



WITNESSES:

Daniel E. Daly.

G. M. Hayes.

INVENTOR

Lewis D. Ewing.

BY

Lynch & Dorer

his ATTORNEYS

No. 769,257. Patented September 6, 1904.

UNITED STATES PATENT OFFICE.

LEWIS D. EWING, OF AKRON, OHIO.

INTERIORLY-VENTILATED FIREPROOF WALL.

SPECIFICATION forming part of Letters Patent No. 769,257, dated September 6, 1904.

Application filed October 12, 1903. Serial No. 176,581. (No model.)

To all whom it may concern:

Be it known that I, LEWIS D. EWING, a citizen of the United States of America, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Interiorly-Ventilated Fireproof Walls; and I 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 pertains to make and use the same.

This invention relates to an interiorly-ventilated fireproof wall, and pertains more especially to a fireproof wall composed of building-blocks of hardened concrete or cementitious material.

One object of this invention is to construct a wall of the character indicated which is ventilated by air passage-ways which extend from within the lower portion of the said wall upwardly through the wall and communicate at both ends with the external atmosphere at the outer side of the wall, so as to establish a circulation vertically through the said portion of and thereby ventilate the wall and maintain the wall in a dry condition.

Another object is not only to provide the inner portion of the said wall interiorly with air-chambers for the purpose of rendering the wall as far as inexpensively practicable a non-conductor of heat, cold, and sound, but also to establish a circulation of moisture-absorbing air through the outer portion of the wall and independently of the said air-chambers.

Another object is to prevent the ingress into the outer ventilating passage-ways of the wall of birds and other matter which would be liable to obstruct or impede the operation of the said passage-ways were they to pass into the said passage-ways.

Another object is to ventilate the wall above and below a window with which the wall is provided.

Another object of this invention is to ventilate the wall around the window-frame of the said window by providing within the building-blocks which form the surrounding walls of the aperture or opening containing the said frame interior chambers arranged as required to form an air passage-way extending around the window and placed in communication with the external atmosphere at the outer side of the wall.

With these objects in view and to the end of realizing other advantages hereinafter appearing this invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a transverse vertical section on line 1 1, Fig. 2, of a fireproof wall embodying my invention. Fig. 2 is a side elevation in section on line 2 2, Fig. 1, looking outwardly. Portions are broken away in Figs. 1 and 2 to reduce the size of the drawings. Fig. 3 is a top plan in section on line 3 3, Fig. 2. Fig. 4 is a top plan in section on line 4 4, Fig. 2. Fig. 5 is a bottom plan in section on line 5 5, Fig. 2. Fig. 6 is a bottom plan in section on line 6 6, Fig. 2. Fig. 7 is a plan of one of the building-blocks used in the main in constructing my improved wall, and Fig. 8 is an end view of the said block.

Referring to the drawings, A designates the foundation of my improved wall, which foundation extends in the usual manner a suitable distance above as well as below the grade-line G.

B represents the water-table on the foundation A, and C designates the cornice or top of my improved upright wall D, which extends from the table B upwardly a suitable distance. The wall D is shown provided with a window K, which is formed in any approved manner, and E represents the window-frame of the said window, which frame has bearing at the bottom upon an artificial stone F, which is arranged horizontally below and longitudinally of the sill *e* of the said frame and participates in the formation of the wall.

The building-blocks employed in building up the foundation A, the water-table B, and the wall D and its cornice C are composed, preferably, of hardened concrete or cementitious material and, except a limited number of blocks employed in forming the surrounding walls of the said window-frame-containing aperture of the wall, are assembled so as to break joints, as shown in Fig. 2, wherein J represents joints between adjacent blocks

in the same layer of blocks, and so that adjacent blocks of the lower of two horizontal layers of blocks will be equidistantly overlapped on top by a block of the upper of the said layers—that is, each joint J, formed between adjacent blocks of the lower of two horizontal layers of blocks, is central between the ends of a block of the upper of the said layers. Each building-block participating in the formation of the joints J is provided in its outer portion and also in its inner portion with a pair of comparatively large corresponding vertically-arranged openings *d* and *d*, which, as shown very clearly in Figs. 2, 3, 4, 6, and 7, are arranged a suitable distance apart and in line longitudinally of the block and equidistantly from opposite ends, respectively, of the block. The said block is provided centrally between the openings of each pair of openings *d* and centrally between the ends of the block with a hole *e*, which extends vertically through the block. The said block is provided in each end thereof and adjacent the outer end of each opening *d* with a recess *f*, which extends vertically through the block, and the relative arrangement of the recesses *f*, holes *e*, and openings *d* of the block is such that adjacent recesses *f* in adjacent ends of adjacent blocks of a layer of blocks register with each other, that each hole *e* in each block of the upper of two adjacent layers of blocks registers with recesses *f* in the adjacent ends of the two blocks in the lower of the said layers, as shown in Fig. 2, when the blocks of the said layers are assembled so as to break joints, as hereinbefore described, and that the openings of each pair of openings *d* of adjacent blocks in a layer of blocks register with the different openings, respectively, of the adjacent pair of openings *d* of an adjacent block or blocks in the adjacent layer or layers of blocks. Each block employed in forming the uppermost layer of blocks next below the cornice C, which covers the openings *d*, holes *e*, and recesses *f* in the said blocks, as shown in Figs. 1, 2, and 3, is provided at the top and at the outer side of the openings *d*, hole *e*, and recesses *f* in the outer portion of the block with lateral screened apertures *h*, connecting the said last-mentioned recesses *f*, hole *e*, and openings *d* with the external atmosphere, and the screens *r*, which screen the said apertures, prevent the ingress of birds or anything else large enough to obstruct the said outer openings, hole, and recesses, which screens are preferably embedded within the cementitious material or concrete composing the said block when the block is molded. Each block employed in forming the water-table B projects beyond the outer side of the foundation A and is provided in the bottom thereof and at the outer side of the recesses *f*, hole *e*, and openings *d* of the said outer portion of the said block with recesses or apertures *l*, which, as shown in Figs. 1, 2, and 6, are arranged transversely of the said block and extend from the lower surface of the block at the outer side of the foundation A inwardly and connect with the said openings *d*, hole *e*, and recesses *f* of the block and establish communication between the said recesses, hole, and openings and the external atmosphere, and the said block is provided at its under side and at the outer side of the foundation A with a groove *t*, extending longitudinally and from end to end of the block, and each aperture *l* of the said block communicates at its outer end with the said groove. The apertures *l* are preferably screened by screens *u*, which prevent the ingress of birds and other matter into the openings *d*, holes *e*, and recesses *f* in the outer portions of the blocks which form the water-table.

By the construction hereinbefore described it will be observed that the openings *d*, holes *e*, and recesses *f*, formed in the outer portions of the building-blocks employed in forming the wall D, are for ventilating purposes, and the passage-ways which are formed in the outer portion of the said wall by the said openings, holes, and recesses, except the passage-ways below the stone or block F and above the flat arch H, which forms the top wall of the window-frame-containing aperture, extend from within the water-table upwardly to the cornice and communicate with the external atmosphere at the bottom of the water-table and next below the cornice. Hence a circulation of air vertically through the outer portion of the wall D is provided at each side of the window K, and the said wall is ventilated and kept in a dry condition. The currents of air thus passing through the outer portion of the wall D are valuable in cold weather because they absorb moisture, and therefore keep the wall dry, and in warm weather the said currents of air materially participate in keeping the wall in a cool condition.

It is obvious that the location of a window K in the wall D interrupts the extension of some air passage-ways from the water-table to the cornice. The stone or block F, which forms a base for the sill *e* of the window-frame E, projects beyond the outer side of the adjacent portions of the wall D and, as shown in Figs. 1, 2, and 5, is provided in its under side with apertures *x*, which are arranged transversely of the said side of the said base and communicate at their outer ends with a groove *y*, formed in and extending longitudinally and from end to end of the said side of the said base, which groove communicates with the external atmosphere at the outer side of any building block or blocks next below the said base, and the aforesaid apertures *x* open at their inner ends into a groove *z*, which is formed in the under side and extends from end to end of the said base and communicates with the openings *d*, hole *e*, and recesses *f* in the outer portions of the said last-mentioned block or blocks. Hence

a circulation of air vertically through the outer portion of the wall D below the window is established. The apertures *x* are preferably screened by screens *s*, applied in any approved manner.

Each building-block arranged next above the arch H is, as shown in Figs. 1, 2, and 4, provided at the bottom and outer side of the openings *d*, hole *e*, and recesses *f* in the outer portion of the block with lateral screened apertures *m*, establishing communication between the said last-mentioned recesses, hole, and openings and the external atmosphere, and the screens *n*, which screen the said apertures, are applied in any approved manner. It is obvious, therefore, that a circulation of air vertically through the outer portion of the wall D above the window K is established.

The openings *d*, hole *e*, and recesses *f* in the inner portions of the building-blocks employed in the formation of the wall D form air-chambers which render the wall as far as practicable a non-conductor of heat, cold, and sound and also render the wall lighter than it would be were it not provided with said air-chambers.

The building-blocks which form the cornice C are preferably chambered, as at *p*, in their under side next above the openings *d*, holes *e*, and recesses *f* of the blocks next below the cornice.

One of the building-blocks mainly employed in the construction of the wall D is shown isolated in Figs. 7 and 8 and provided in each end thereof with shallow cavities *g*, which are useful in receiving mortar or cement in applying the latter to the adjacent ends of adjacent blocks in the construction of the wall D, and thereby forming a more effective bond between the said blocks.

The building-blocks composing the arch H (see Figs. 1 and 2) are interiorly and longitudinally chambered to form a passage-way I, arranged within and extending longitudinally of the arch. The blocks L, composing the side walls of the window-frame-containing aperture, are provided with openings Q, extending vertically therethrough and forming passage-ways which extend from top to bottom of the said walls. The end blocks of the arch H are provided at the bottom with apertures M, arranged to establish communication between the passage-ways Q and the passage-way I. The base F is provided in the ends thereof with vertical openings R, which establish communication between the passage-ways Q and the groove *z*. The end blocks of the arch H are provided in the top thereof with apertures T, establishing communication between the passage-way I and openings *d* in the building-blocks next above the arch. It will be observed, therefore, that ventilation within the wall D completely around the window-frame is established.

What I claim is—

1. In combination, the foundation, the water-table on the foundation, and a wall extending upwardly from the table, and the said table and the said wall being composed of building-blocks which are provided with openings or holes extending vertically therethrough and arranged to form passage-ways which extend from within the table upwardly into the wall a suitable distance and communicate, at the upper ends, with the external atmosphere at the outer side of the wall, and the building-blocks composing the table being provided, at their under sides, with apertures opening into the said passage-ways and being in communication with the external atmosphere.

2. In combination, the foundation, the water-table on the foundation, and a wall extending upwardly from the table, and the said wall being composed of building-blocks which are provided with openings or holes extending vertically therethrough and arranged to form passage-ways extending from within the lower portion of the wall to the cornice and communicating at their lower ends with the external atmosphere, and the building-blocks next below the cornice being provided with apertures establishing communication between the said passage-ways and the external atmosphere.

3. In combination, the foundation, the water-table on the foundation, the cornice, and the wall extending between the table and the cornice, and the said table and the said wall being composed of building-blocks which are provided with openings or holes extending vertically therethrough and arranged to form passage-ways extending from within the table to the cornice, and the blocks next below the cornice being provided with apertures opening into the said passage-ways and communicating with the external atmosphere, and the blocks composing the table being provided with apertures opening into the said passage-ways and being in communication with the external atmosphere.

4. The combination of the foundation, the water-table on the foundation, and a wall extending upwardly from the table, and the said table and the said wall being composed of building-blocks which are provided with openings or holes arranged to form passage-ways which extend from within the table upwardly a suitable distance and communicate, at their upper ends, with the external atmosphere, and the blocks composing the table being provided, in their under sides and at the outer side of the foundation, with grooves which extend longitudinally of the blocks, and having apertures establishing communication between the aforesaid passage-ways and the said grooves.

5. An upright wall having its outer portion exposed to the external atmosphere and composed of building-blocks provided, in their

inner portions, with openings or holes extending vertically through the blocks and arranged to form air-chambers extending up and down interiorly of the inner portion of the wall, which blocks are provided, in their outer portions, with openings or holes extending vertically through the blocks and arranged to form passage-ways extending up and down interiorly of the outer portion of the wall, and the said last-mentioned passage-ways being in communication above and below with the external atmosphere.

6. The combination of the foundation, the water-table on the foundation, the wall extending upwardly from the water-table and provided with a window, and the said table and the said wall between the window and the table being composed of building-blocks which are provided with openings or holes extending vertically therethrough and arranged to form passage-ways extending from within the table upwardly into the wall below the window, and the said passage-ways communicating with the external atmosphere at the bottom of the table and below and in suitable proximity to the window.

7. The combination of the foundation, the water-table on the foundation, and a wall extending upwardly from the table and provided with a window, and the said wall being composed of building-blocks which are provided with openings or holes arranged to form passage-ways extending from the table upwardly into suitable proximity to the window, and communicating at the table and adjacent the window with the external atmosphere.

8. The combination of an upright wall having a window and above the said window being composed of building-blocks which are provided with openings or holes extending vertically therethrough and arranged to form passage-ways extending from above and adjacent the window upwardly a suitable distance and communicating above and below with the external atmosphere.

9. The combination of an upright wall provided with a window and having an arch arranged over the window, which wall above the arch is composed of building-blocks which are provided with openings or holes extending vertically therethrough and arranged to form passage-ways extending upwardly from the said arch, which passage-ways communicate with the external atmosphere at the top of the arch and at their upper ends.

10. The combination of an upright wall provided with a window and having an arch arranged over the window, which wall above the arch is composed of building-blocks which are provided with openings or holes extending vertically therethrough and arranged to form passage-ways extending upwardly from the said arch, which passage-ways communicate, at their upper ends, with the external atmosphere, and the blocks next above the arch being provided, in their under side, with apertures which connect at their inner ends with the aforesaid passage-ways and communicate at their outer ends with the external atmosphere.

11. The combination of a wall provided with a window, which wall comprises building-blocks suitably arranged around the window and interiorly chambered to form passage-ways arranged to ventilate the said wall interiorly around the window, which passage-ways are in communication with the external atmosphere at the top and bottom of the window.

12. An upright wall having its outer side exposed to the external atmosphere and provided with air-chambers extending up and down interiorly of the inner portion of the wall, and the said wall being also provided with passage-ways which extend up and down interiorly of the outer portion of the wall and communicate, at their upper and lower ends, with the external atmosphere.

13. The combination of the foundation, the water-table on the foundation, the cornice, and the wall extending between the table and the cornice and provided interiorly with passage-ways extending from the table to the cornice and communicating at their lower ends and at the cornice with the external atmosphere.

14. An upright wall having a window and provided, above and below the window and interiorly, with upright passage-ways communicating at their ends with the external atmosphere.

15. An upright wall having a window and provided, above and below the window and interiorly, with upright passage-ways communicating at their upper and lower ends with the external atmosphere at the outer side of the wall.

In testimony whereof I sign the foregoing specification, in the presence of two witnesses, this 26th day of September, 1903, at Cleveland, Ohio.

LEWIS D. EWING.

Witnesses:
C. H. DORER,
G. M. HAYES.