No. 767,414. PATENTED AUG. 16, 1904.

F. E. KIDDER.

WALL CONSTRUCTION.

APPLICATION FILED FEB. 29, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

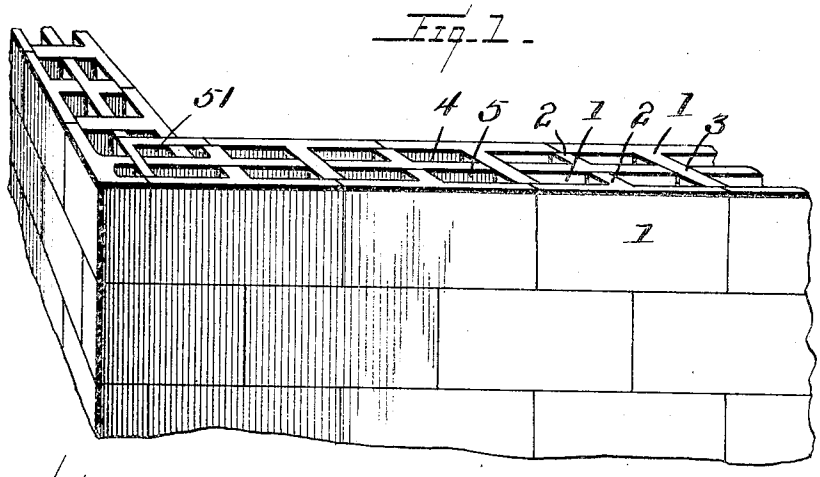


Fig. 2.

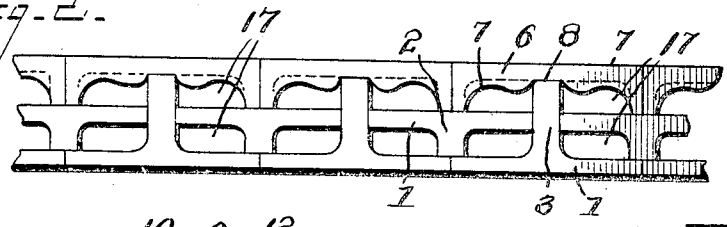


Fig. 3.

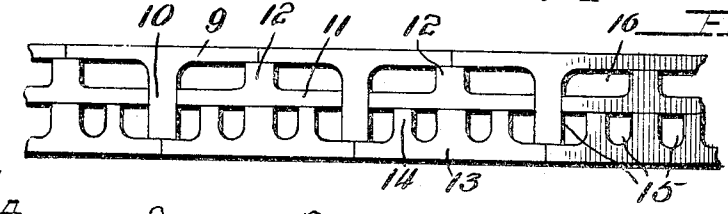


Fig. 4.

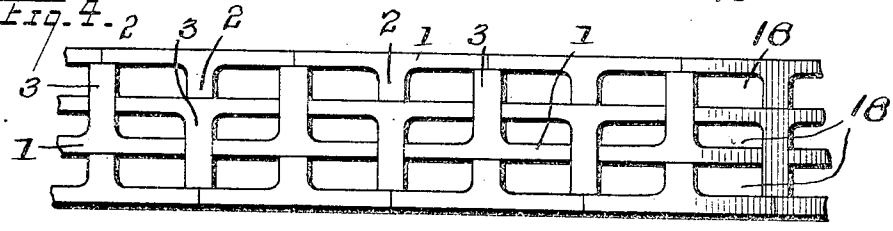
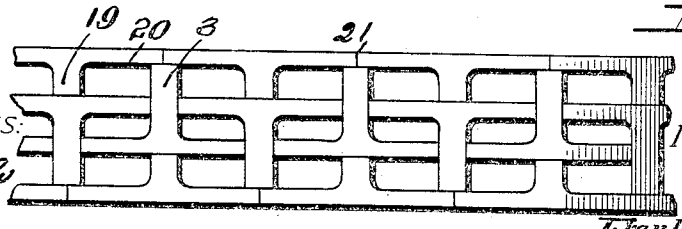


Fig. 5.



WITNESSES:

H. T. Rowe

F. A. Spencer.

INVENTOR

Frank E. Kidder;

by E. W. Bond Attorney

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 6.

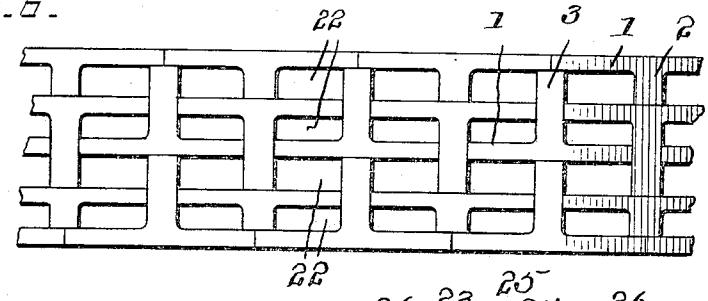


Fig. 7.

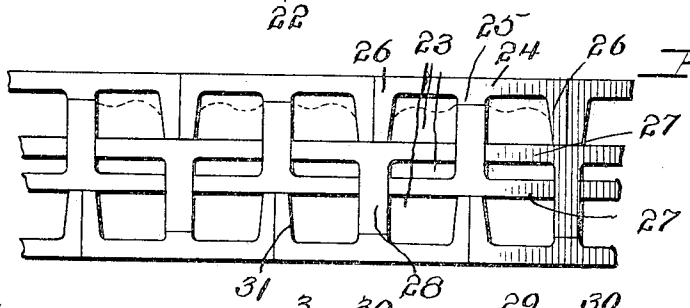


Fig. 8.

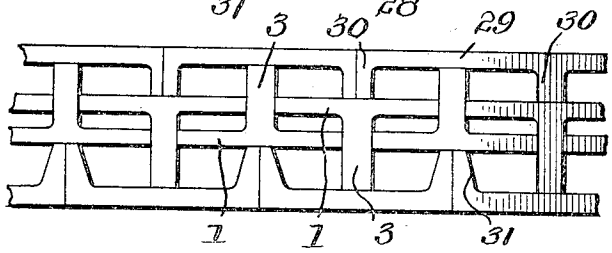


Fig. 9.

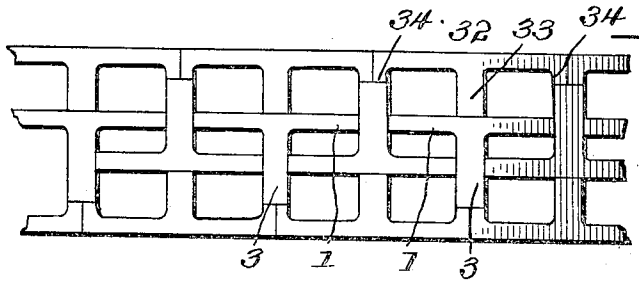
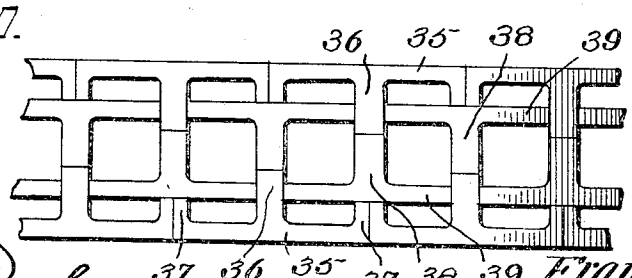


Fig. 10.



WITNESSES:

W. F. Doyle.

F. A. Spencer.

INVENTOR

Frank E. Kidder,

BY

E. M. Bond

Attorney

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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 11.

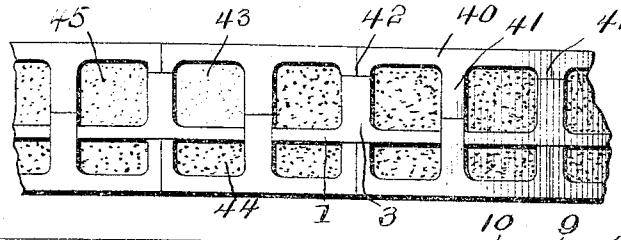


Fig. 12.

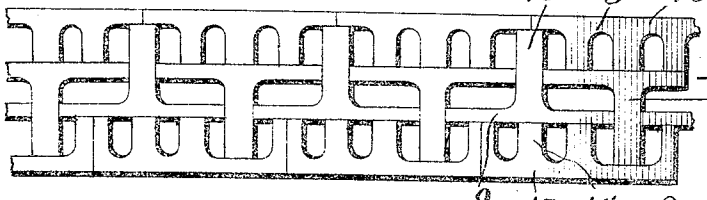


Fig. 13.

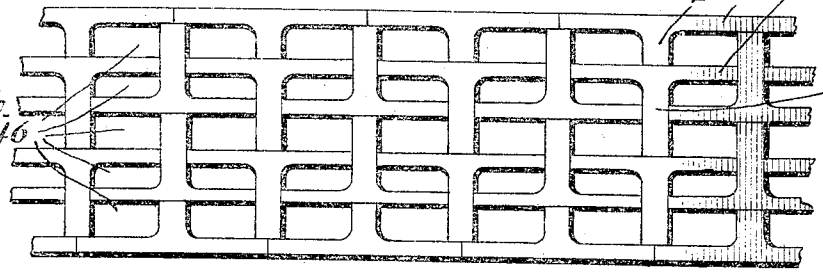


Fig. 14.

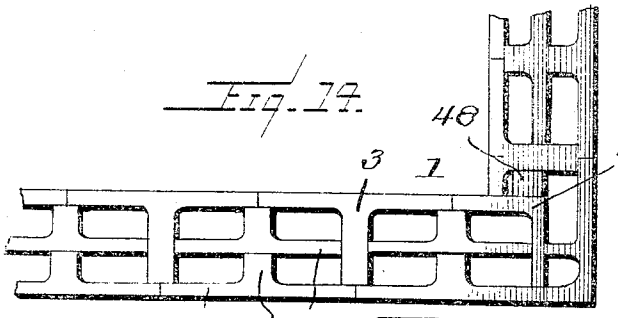


Fig. 15.

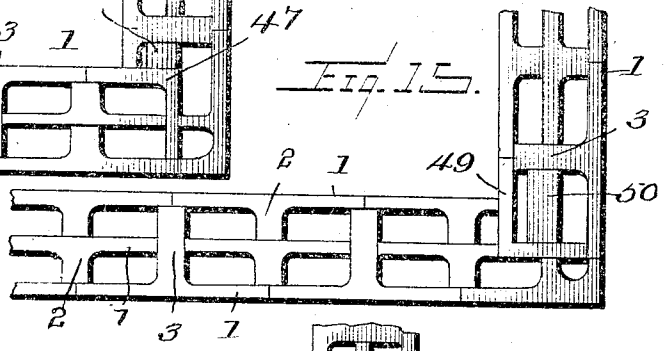
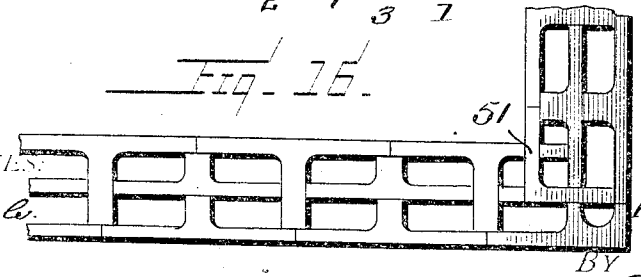


Fig. 16.



WITNESSES:

H. F. Keyes.

H. C. Spencer.

INVENTOR

Frank E. Kidder;

BY

E. G. Bond

Attorney

No. 767,414. Patented August 16, 1904.

UNITED STATES PATENT OFFICE.

FRANK E. KIDDER, OF DENVER, COLORADO, ASSIGNOR TO K. FERGUSON, OF DENVER, COLORADO.

WALL CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 767,414, dated August 16, 1904.

Application filed February 29, 1904. Serial No. 195,874. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. KIDDER, a citizen of the United States of America, and a resident of Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Wall Construction, of which the following is a specification.

This invention relates to wall construction or masonry of a character in which the wall is composed of a plurality of building-blocks of concrete, cement, or any other suitable material in which the blocks are arranged in horizontally-disposed layers with the joints in the blocks of one layer at the center of the blocks of the next succeeding layer, the said blocks being so disposed as to form air-spaces arranged in vertical rows, there being a plurality of rows of air-spaces in depth—that is, between the inner and outer faces of the wall there are a plurality of such air-spaces.

It has for its object, among others, to provide a wall possessing maximum strength, durability, and thickness, combined with heat, cold, and moisture resisting properties.

It has for a further object to provide a wall which can be built up of a plurality of blocks laid in horizontal rows, the said blocks being of different shapes, and thus permitting of the increase of the wall in thickness and also in the number of air-spaces in depth by merely adding the desired number of blocks. The blocks may be of the same size or of different sizes, dependent upon the character of the wall which it is desired to construct.

It has for a further object to provide for the better bonding of the blocks in the wall as well as for the better bonding of the different corners one to another.

A still further object is to provide a strong and efficient bonding at the corners, whereby greater strength and rigidity are provided at such points.

Broadly stated, the invention consists in a wall composed of a plurality of blocks, each formed with a projection or arm or projections or arms extending from one side only thereof, said blocks in a horizontal row constituting one course being of different shapes and said arm or arms being practically headless, the said blocks being arranged in the wall with the arms of the blocks in one vertical row extending in a direction opposite to those of the blocks in the same horizontal but different vertical row and the blocks so disposed and laid in the wall as to form a plurality of rows of air-spaces in depth.

By the term "in depth" I mean the thickness of the wall—that is, between the inner and outer faces thereof.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a perspective view of a portion of a wall embodying the principle of my present invention. Fig. 2 is a plan view of a portion of a wall in which a different form of block is employed. Fig. 3 is a similar view showing the employment of other forms of blocks. Fig. 4 is a like view showing a wall having three rows of air-spaces in depth. Fig. 5 is a like view showing the alternate course of the last-named wall. Fig. 6 is a plan view of a wall in which there are four rows of air-spaces in depth. Fig. 7 is a plan view showing another form of three-air-space construction. Fig. 8 shows a modified form thereof. Fig. 9 illustrates still another form. Fig. 10 shows yet another form of the three-air-space construction. Fig. 11 shows a modified form of the double-air-space construction with a heat-resisting filling for the air-spaces. Fig. 12 shows still another form of the triple-air-space construction. Fig. 13 shows a wall having five rows of air-spaces in depth. Fig. 14 shows in top plan the manner of bonding the wall at the corner. Fig. 15 is a similar view of a modified form. Fig. 16 is a like view showing still another modification.

Like numerals of reference indicate like parts throughout the several views.

The principle of the present invention is capable of embodiment in many forms. Those herein illustrated and briefly referred to above

comprise only a portion thereof, but are deemed sufficient for the purposes of a clear understanding of the principle and of some of the preferable forms of embodiment thereof. It is to be understood, however, that other forms of blocks and other arrangements thereof to form a wall having a double, triple, or quadruple or greater multiplicity of rows of air-spaces in depth may be employed and yet be within the range of the generic idea herein expressed.

Referring to the details as herein illustrated, and having reference first to Fig. 1, the numeral 1 indicates the body portion of a block of concrete, cement, or any of the substances well suited to such purposes, and this block is shown as having a single arm or projection 2 extending at substantially a right angle from its face, the said arm or projection being headless. In constructing the wall these blocks are laid in courses, and in this form three blocks are employed within the thickness of the wall, there being two arranged with their arms or projections 2 extending in the same direction and the other block having its arm or projection 3, which is of greater length, extending in the opposite direction. In this instance the arm 3 is of a length equal to the length of the two arms 2 and the thickness of the body portion 1. In laying these blocks the end of the longer arm 3 comes opposite a point between the body portion of the two blocks upon the opposite side of the wall, the said long arm being disposed between the adjacent ends of the intermediate row of blocks, and the end of the arm of the intermediate row of blocks comes opposite the joint between the two adjacent blocks on the other side of the wall. In laying the blocks the next succeeding course will have the blocks moved one-half their length to either the right or left, so as to break joints upon the interior, and it will thus be seen that in said course the longer arms 3 will be in a vertical plane above the shorter arms 2 2, thus effecting a most rigid and complete bonding of the blocks within the wall. This forms two rows 4 and 5 of air-spaces in depth or within the thickness of the wall.

In Fig. 2 there is illustrated another form of double-air-space construction employing the same number of blocks within the thickness of the wall, the construction being substantially the same except as to the contour of the blocks, it being noted that the block 6 has the inner face of its body portion formed upon a compound curve, as at 7, and between the adjacent ends of the compound curves is a recess or socket 8, into which the adjacent end of the long arm 3 of the opposite block is engaged.

In Fig. 3 I have illustrated still another form of double-air-space construction composed of the same number of blocks in thickness, but the blocks being of three different forms, the block 9, with its long arm 10, being substantially the same as the block in Fig. 1 with its long arm, and the block 11, with its short arm 12, being substantially the same as the block with the short arm 2 in Fig. 1. The block 13, however, is formed with three arms 14, the middle one of which may or may not be wider than the others, as illustrated, and this center arm or projection comes in line with the projection 12 of the block 11. By this means the plurality of air-spaces 15 are formed in one row, while the air-spaces 16 in the other row are substantially the same as the air-spaces 17 in the form seen in Fig. 2.

In Fig. 4 I have shown how a wall may be constructed of blocks 1 with short arms 2 and similar blocks with long arms 3, the same as employed in Fig. 1, but having these arms alternately oppositely disposed, so as to form triple air-spaces 18 in depth or within the thickness of the wall.

In Fig. 5 there is shown the alternate or next succeeding course in the wall, (illustrated in Fig. 4,) it being noted that the blocks are shifted one-half their length to the left, and the short arms 19 of the blocks 20 will come over the joint 21 in the course seen in Fig. 4 and overlap the long arm 3 of the block 1 therein. The long arm 3 of the next block will overlap the joints between the short arm 2 and the longer arm 3, so that there is a continuous alternate reverse arrangement and bonding effect produced.

In Fig. 6 I have shown blocks 1 with long arms 2 and similar blocks with long arms 3, such as employed in Figs. 1 and 4, laid in a wall, so as to form a quadruple set of air-spaces 22, it being noted that the blocks are so disposed that their long and short arms are alternately inversely or oppositely disposed.

Fig. 7 illustrates another arrangement whereby a triple-air-space construction is provided, the air-spaces 23 upon the inner and outer sides being formed by the arms of the blocks 24, which blocks are provided with the central short arm 25 and the longer side arms 26, the intermediate blocks 27 having the longer arms 28 and arranged with these longer arms extending alternately in opposite directions, whereby a most complete bonding effect is produced and the intermediate air-spaces 23 are also formed.

In Fig. 8 a modification of this last-described construction is shown, being substantially similar except that the blocks 29 have no intermediate arms, but are provided at their ends with the short arms 30, the intermediate blocks 1, with the long arms 3, being employed the same as in the construction disclosed in Fig. 7. It will also be noted that in Figs. 7 and 8 the blocks 24 and 29, having their end arms formed with their inner faces 31 inclined, provide greater strength.

Fig. 9 shows a triple-air-space construction similar to that shown in Figs. 7 and 8, but

having the blocks 32 provided with the long central arm or projection 33 and the short end arms or projections 34 and the blocks so laid in the wall that the two adjacent short arms 34 of the two adjacent blocks abut against the ends of the long arms 3 of the intermediate blocks, which intermediate blocks are substantially the same as those employed in Fig. 1 and of the intermediate blocks in Figs. 7 and 8.

In Fig. 10 there is illustrated another form of triple-air-space construction, in which the inner and outer blocks 35 are provided with the central arms or projections 36 and the shorter side arms 37, the center arms 36 being of the same length as the arms 38 of the intermediate blocks 39. By this construction a different bonding effect is produced.

In Fig. 11 there is shown a modification of the double-air-space construction, in which the outer blocks 40 have the longer center arm 41 and short end arms 42, the intermediate blocks 1 having the one center long arm 3, and these blocks are arranged, as shown, so as to form the two sets or rows of air-spaces 43 and 44, which vary in their dimensions.

For the purpose of adding to the heat-resisting quality of the wall I may sometimes employ in the air-spaces a filling 45, of asbestos or any other suitable material, as seen in Fig. 11, and which may serve further as a sound deadener. It will be understood that although this filling 45 is shown in connection with the form illustrated in Fig. 11 only it may be employed in any or all of the other forms of construction herein illustrated equally as well.

In Fig. 12 I have shown a triple-air-space construction in which are employed the same form of blocks as are shown in Fig. 3, the said blocks being arranged, as shown, with two intermediate sets of blocks 9 with their arms 10 and two sets of blocks 13 with their arms 14, one set upon the outside and the other upon the inside of the wall, it being noted that the arms of the two intermediate sets of blocks are of the same length, but alternately oppositely disposed.

In Fig. 13 I have shown a wall built up of blocks 1 with the long arms 2 and similar blocks with the long arms 3, substantially the same as those employed in the construction shown in Fig. 1, with the long and short arms alternately oppositely disposed, so as to form the air-spaces 46 (five in number) within the depth or thickness of the wall.

In Fig. 14 there is illustrated a double-air-space construction of blocks similar to those employed in the construction seen in Fig. 1, except that at the corner I employ the angular block 47, which bonds into the intermediate blocks, as shown, a filling-piece 48 being employed where necessary.

In Fig. 15 I have shown a corner construction in which an angle bonding-piece 49 is employed and a larger filling-piece 50, interposed between the arm thereof and the long arm 3 of the next adjacent block.

Fig. 16 shows the alternate course of the wall (illustrated in Fig. 14) at the corner, it being noted that the angle bonding-piece 51 is inversely arranged, so that the bonding of the one course with the other and the tying of all of the blocks in the wall are accomplished in a most efficient manner.

It is to be observed that in all of the forms hereinbefore described the same principle is embodied and that in each and every form I employ a block having a headless arm or projection, which, for reasons hereinbefore stated, I find to be the best construction. It is also to be noted that in all the forms the arm of one block is opposed to or has a bearing against the two opposing faces of the next adjacent blocks, by which arrangement solidity is assured and most efficient bonding attained. It will further be noted that each course has each and every one of its blocks bonded to the other and that each course is most efficiently bonded to the next succeeding one and that this most essential feature is involved and carried out in each and every form of the construction illustrated, whether it be a double, triple, or greater number of air-space construction.

From the above it will be noted that I have devised a simple, easily-constructed, efficient, and durable wall, and while the structural embodiments as hereinbefore disclosed are what I at the present time consider preferable it is evident that the same are subject to changes, variations, and modifications without departing from the spirit of the invention or sacrificing any of its advantages. I therefore do not intend to restrict myself to the form, proportions, or details hereinbefore specifically described, but reserve the right to make such changes, variations, and modifications as come properly within the scope of the protection prayed.

What I claim as new is—

1. A wall having a plurality of rows of air-spaces, in depth, formed by blocks with headless projections extending from one face only, the projections overlapping and being disposed to form bonds.

2. A wall composed of blocks, each with a headless projection extending from one side only thereof, and the blocks arranged with a plurality in depth in each course, with the projections arranged alternately disposed and to form a plurality of air-spaces in depth, and the projections laid in the wall to form bonds.

3. A wall composed of a plurality of blocks arranged side by side and having alternately oppositely disposed headless projections extending from one face only thereof and forming a plurality of air-spaces in parallel lateral planes said projections being bonded to each other and to the wall.

4. A wall composed of a plurality of blocks having headless projections extending from

one side only thereof and alternately oppositely disposed and overlapped and bonded to form a plurality of air-spaces in a series of rows intermediate the inner and outer faces of said wall.

5. A wall composed of a plurality of blocks having headless projections extending from one side only thereof, with the blocks arranged with their projections alternately oppositely disposed and interengaged to form a plurality of side-by-side air-spaces.

6. A wall composed of blocks, the blocks having headless projections extending from one side only thereof and said blocks arranged with the projections alternately oppositely disposed and overlapped and disposed to form a plurality of side-by-side air-spaces.

7. A wall composed of a plurality of blocks, said blocks having each a headless projection extending from one side only thereof, and the blocks arranged with the projections alternately oppositely disposed and bonded to each other and in the wall, said blocks being arranged in juxtaposition to form a plurality of air-spaces intermediate the inner and outer faces of the wall.

8. A wall composed of blocks, each block having a headless projection extending from one side only thereof and the blocks disposed in one course with their projections alternately oppositely arranged and forming a plurality of side-by-side air-spaces, and the next course laid with the projections disposed in the opposite direction said projections being bonded to each other and in the wall.

9. A wall having a plurality of air-spaces in depth and composed of blocks, each block having a headless projection, and said blocks laid in the wall with the projections overlapping and bonded and with the end of one projection disposed opposite the joint between the adjacent sections in the next horizontal row of blocks.

10. In a wall composed of blocks each having a projection and the blocks laid in the wall to form by said projections a plurality of air-spaces in depth, an angular bonding-piece at the corner of such wall.

11. In a wall composed of blocks each having a projection and the blocks laid in the wall to form by said projections a plurality of air-spaces in depth, an angular bonding-piece at the corner of such wall and bonded with the projections of the blocks of the wall.

12. A wall having a plurality of air-spaces in depth, said wall being composed of blocks in horizontal rows, each horizontal row comprising a plurality of blocks, said blocks being of different shapes.

Signed by me at Denver, Colorado, this 25th day of February, 1904.

FRANK E. KIDDER.

Witnesses:
HARMON H. RICE,
EMMA L. KEMP.