

April 14, 1959

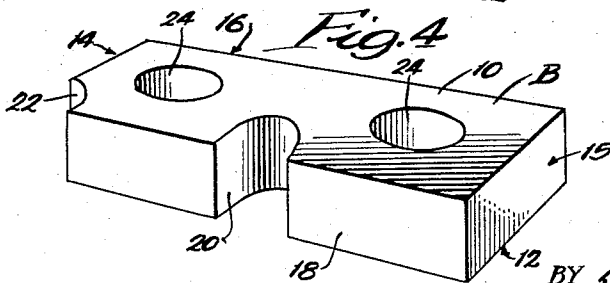
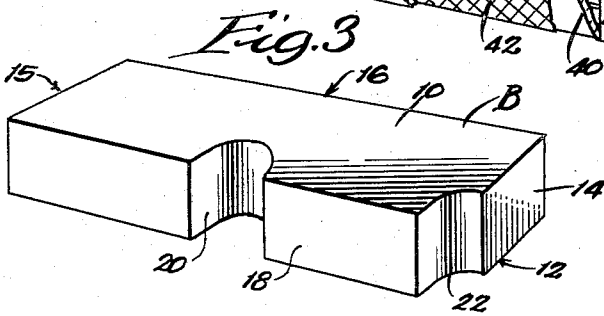
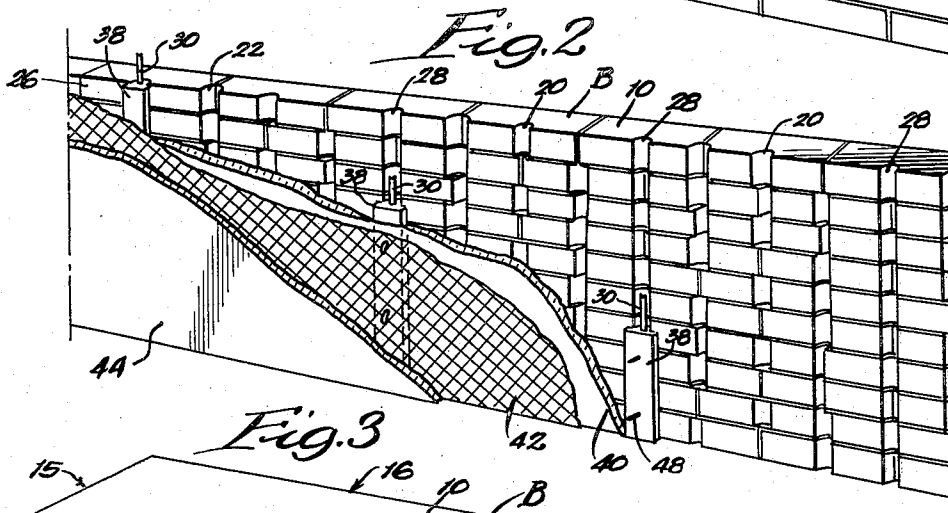
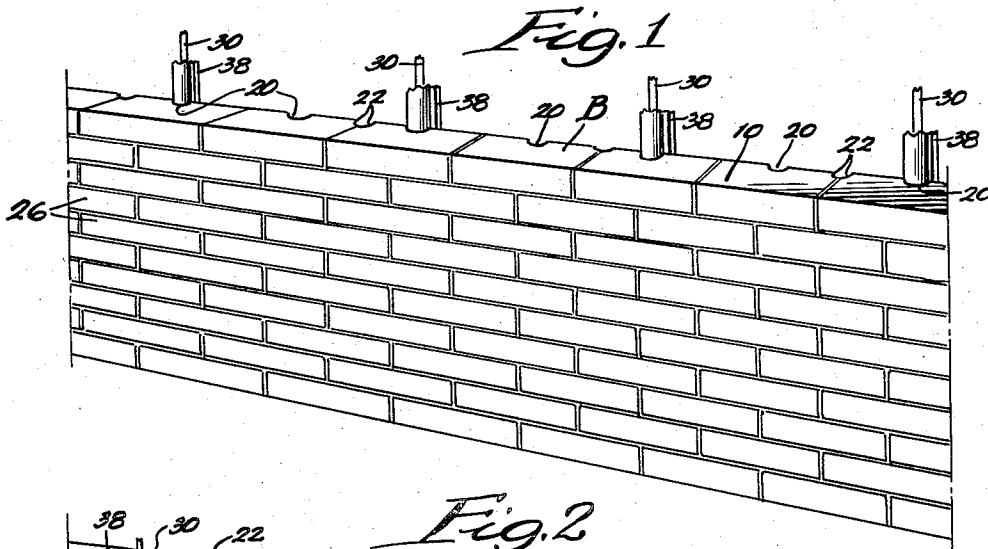
R. B. TAYLOR ET AL

2,881,613

REINFORCED BRICK MASONRY WALL AND BRICK THEREFOR

Filed June 23, 1955

4 Sheets-Sheet 1



INVENTORS:
*Robert B. Taylor and
Paul V. Johnson,*
BY *Edwson & Ooms,*
ATTORNEYS.

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R. B. TAYLOR ET AL

2,881,613

REINFORCED BRICK MASONRY WALL AND BRICK THEREFOR

Filed June 23, 1955

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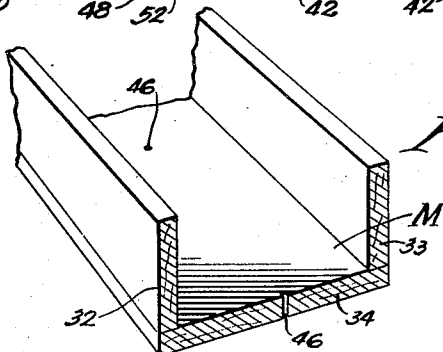
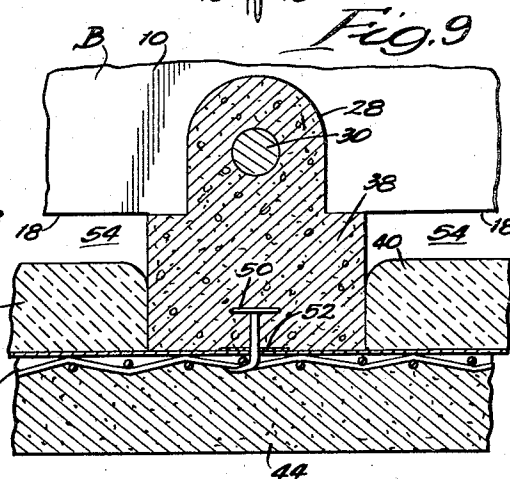
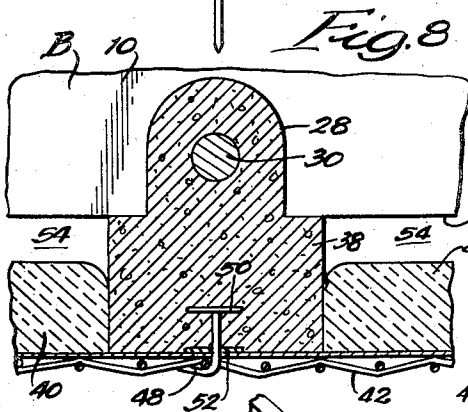
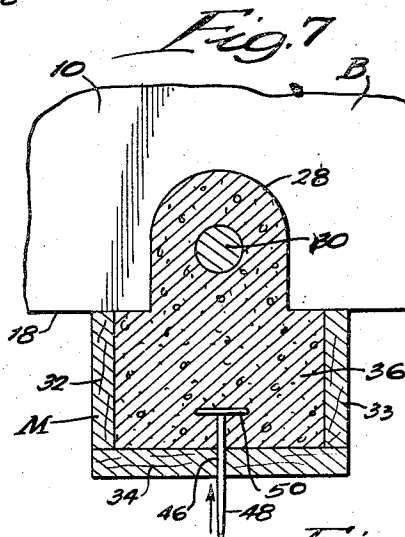
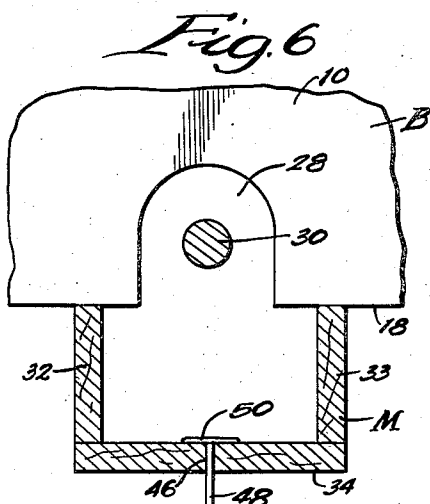
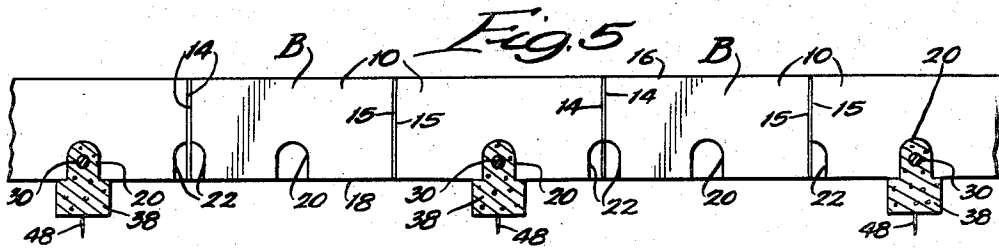


Fig. 10

INVENTORS:

INVENTORS:
Robert B. Taylor and
Paul V. Johnson.

BY Dawson & Coons,
ATTORNEYS.

April 14, 1959

R. B. TAYLOR ET AL

2,881,613

REINFORCED BRICK MASONRY WALL AND BRICK THEREFOR

Filed June 23, 1955

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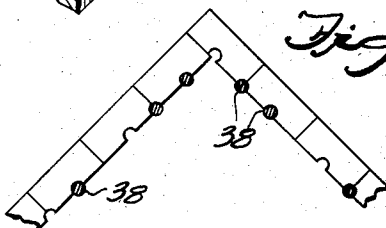
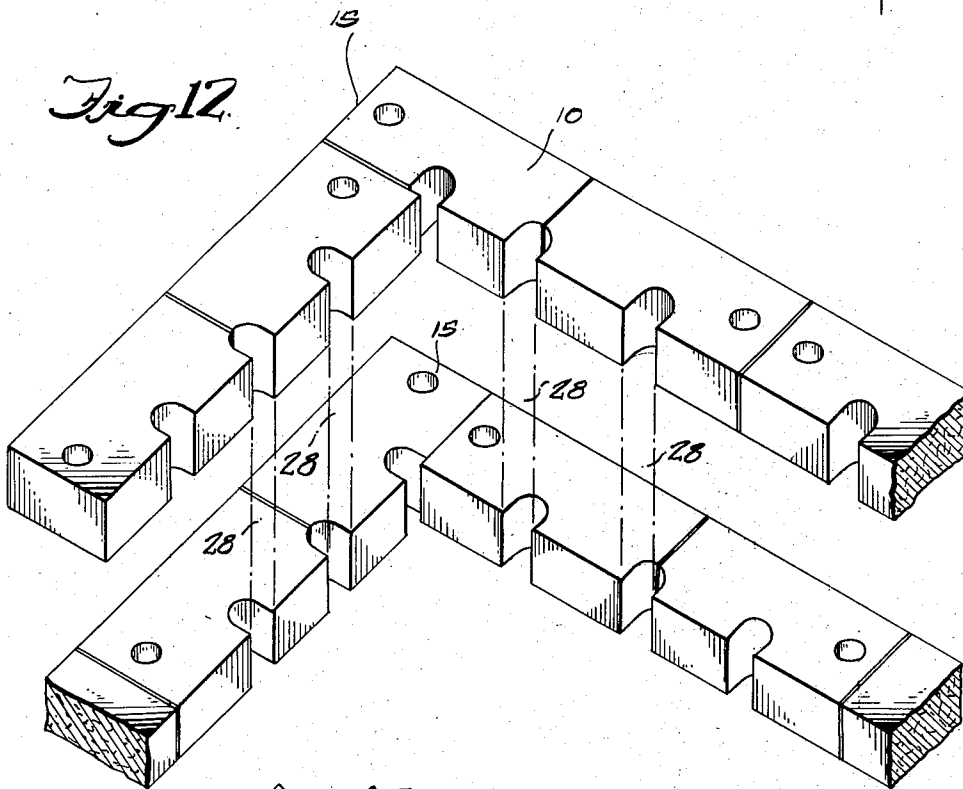
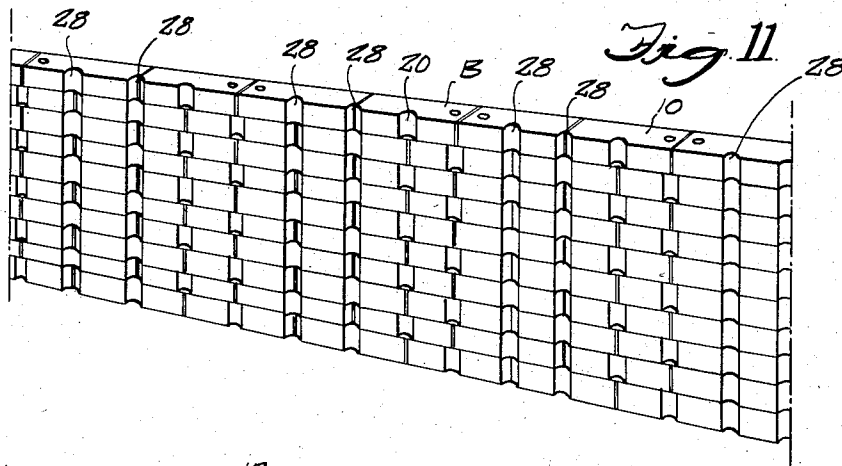


Fig. 13

Inventors
Robert B Taylor
Paul V Johnson
Jack E. Smith
Attorney

April 14, 1959

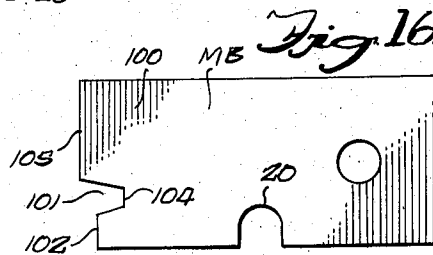
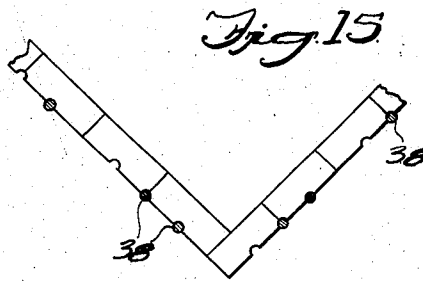
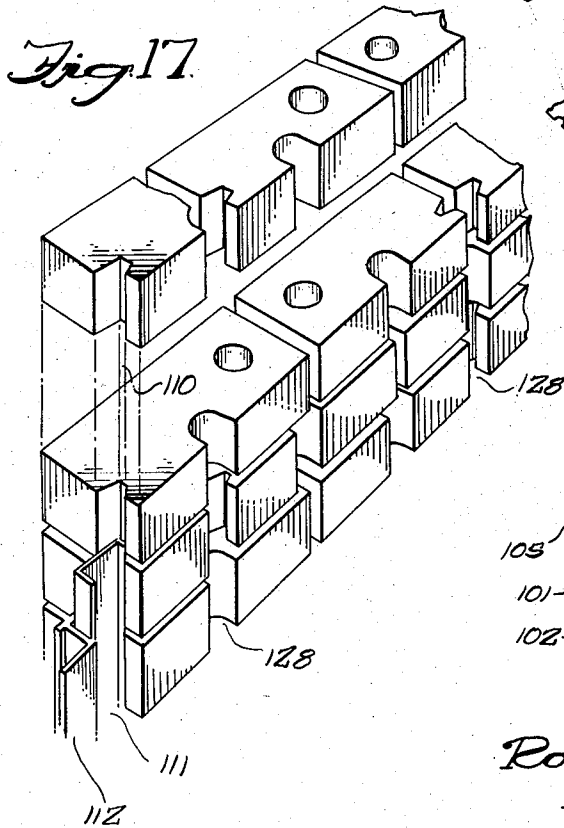
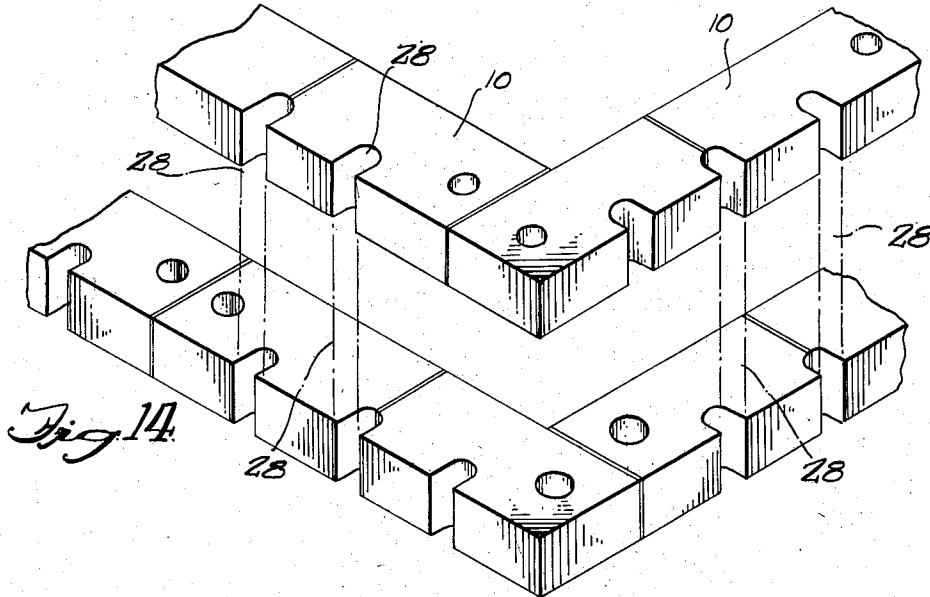
R. B. TAYLOR ET AL

2,881,613

REINFORCED BRICK MASONRY WALL AND BRICK THEREFOR

Filed June 23, 1955

4 Sheets-Sheet 4



Inventor
Robert B. Taylor
Paul V. Johnson
Jack E. Donald
Attorney

1

2,881,613

REINFORCED BRICK MASONRY WALL AND BRICK THEREFOR

Robert B. Taylor, Elmhurst, and Paul V. Johnson, Park Forest, Ill., assignors to Structural Clay Products Research Foundation, Geneva, Ill., a trade association

Application June 23, 1955, Serial No. 517,452

2 Claims. (Cl. 72—40)

The present invention relates to the general art of brick masonry. More particularly the invention contemplates a particular form of brick unit as well as a unique single wythe reinforced wall which may be erected using the brick unit. The specification and claims as well as the drawings form a continuation in part of application Serial Number 234,226, filed June 29, 1951, now abandoned.

Brick masonry walls are constructed in a variety of ways and use a variety of materials depending on the geographic area and the desired accomplished of the wall. The exterior row or wythe of bricks in a load bearing wall is almost universally reinforced or backed up by a second wythe of bricks or tile; or by concrete blocks; or by an elaborate system of wood studding; or by an intricate framework and form of reinforcing rods and wire; or by a combination of any one or more of these structures or systems. The employment of any of these systems or structures in the reinforcement and back-up of brick walls makes the construction of the complete wall expensive and requires a greater number of man hours than a finished brick wall constructed according to our invention.

The instant invention contemplates the use of a unique form of brick which is built in a conventional manner into a single-wythe load bearing wall. The brick units when properly placed into the wall form, at spaced intervals, channels in the back side of the wall. These channels generally receive reinforcing rods and are filled with grout. The grout is retained in the channels by means of a mold form which also allows the grout to fill the form resulting in a reinforcement for the wall when the grout has set. Particularly with a modified brick unit the poured grout is keyed into position and locked in place against displacement either laterally or longitudinally.

The mold may be provided with spaced openings to receive nails so that nails will be imbedded in the reinforcements when the mold is removed. Insulation, lath and plaster or structural clay products may then be applied to finish the wall.

By employing the unique form of brick and technique for wall construction, the use and added expense of an intricate network and form of reinforcing rods is eliminated and made unnecessary. Likewise, an elaborated and expensive method of using and attaching wooden studs to the wall is obviated. Additionally, a satisfactory load bearing wall can be constructed in a shorter period of time and at a lower cost.

The particular brick unit contemplated by the invention provides many unusual features, all of which may be achieved with a single type unit, thereby insuring against confusion at the construction site. By the mason's following the simple rule: lay like ends together, the wall may be erected with uniform spacing for reinforcing. Upon building corners the additional advantage may be achieved of providing a pair of closely spaced reinforcements in close proximity to the corner imparting additional strength at the joint.

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It is therefore a general object of this invention to provide a load bearing brick wall wherein the bricks of uniform configuration, when placed properly into a wall, form channels used for reinforcing the wall.

Another object of this invention is to provide a reinforced brick masonry wall which is simple to construct, durable and inexpensive to erect.

Another object of this invention is to provide a single-wythe brick wall having the requisite strength and rigidity without employing an elaborate framework of reinforcing rods or back-up material.

A further object of this invention is the provision of a brick wall which does not require expensive wooden studding to complete the wall into a finished wall.

Another object of the present invention is to provide a unique brick unit for use in a reinforced single wythe wall which provides for additional reinforcement at corner joints. A related object of the invention is to provide a unique brick for a reinforced wall which readily adapts for use at window and door openings.

These, and other objects and advantages of this invention will hereinafter appear and for purposes of illustration, but not of limitation, an embodiment of this invention is shown in the accompanying drawings in which:

Figure 1 is a perspective view showing a portion of the exterior side of a wall broken away to illustrate the reinforcement;

Figure 2 is a perspective view partially in section of the interior portion of the wall illustrating the various stages of erection of the complete wall;

Figure 3 is a perspective view of the brick unit used in the construction of a wall;

Figure 4 is a perspective view showing the same brick unit with openings therein to reduce the weight;

Figure 5 is a top plan view of a section of the wall fully constructed but without the addition of insulation, lath, plaster, etc.;

Figure 6 is a top plan view of a segment of one of the brick units in the wall showing a channel and a mold;

Figure 7 is a top plan view of a segment of one of the brick units in the wall showing the channel and mold filled with grout;

Figure 8 is a top plan view of a segment of one of the brick units in the wall showing the reinforcement, insulation and lath added thereto;

Figure 9 is a top plan view of a segment of one of the brick units in the wall showing the reinforcement, insulation, lath and plaster added thereto; and

Figure 10 is a fragmentary view of the mold used to help form the reinforcement of the brick wall;

Figure 11 is a perspective partial view of a wall laid with the brick units such as shown in Figs. 3 and 4 with like ends together, showing the positioning of the reinforcing channels;

Figure 12 is a perspective exploded view of the relationship of the reinforcing channels at a salient or outside corner;

Figure 13 is a top diagrammatic view showing the relationship of the reinforcing areas in the corner joint shown in Fig. 12;

Figure 14 is a perspective exploded view of an inside or reentrant corner employing the brick units such as shown in Figs. 3 and 4;

Figure 15 is a top diagrammatic view of Fig. 14 showing the location of the reinforcing channels at the inside or reentrant corner;

Figure 16 is a top view of a modified brick construction for use in erecting a reinforced wall;

Figure 17 is a perspective partial exploded view of the modified brick construction shown in Fig. 16 illustrating how a window section is built.

In broad outline the invention contemplates the erec-

tion of a reinforced single-wythe brick wall by employing a unique brick unit having a central recess and a recess at one corner. According to a modified form of the invention a unique jamb slot is incorporated with the corner recess which serves the two fold purpose of receiving a sash fin at window openings and also mechanically locking the reinforcement in place along the wall. With whatever form of brick is employed the wall may be erected by using like brick units following the rule: lay like ends together. Such a wall will provide pairs of reinforcing stations on half brick spacing with the pairs separated by one and one half brick lengths. At corners, however, where additional strength may be desired, the pairs of reinforcing stations may be located to flank the corner joint within a half brick length of the corner. The details of the brick unit as well as the wall construction will unfold as the specification proceeds.

Referring to the drawings, the brick unit in the wall contemplated by the invention is generally indicated as B (Figure 3) and in all respects has the same composition as bricks presently manufactured. The brick unit B comprises the usual top 10, bottom 12, side walls 14 and 15, exterior face 16 and interior face 18. A groove 20 is provided substantially in the center of the interior face 18 of the brick unit. A partial cut-out section 22 is also provided at the corner of the interior face 18 and either one of the side walls 14 or 15. The brick unit may also contain openings 24 to reduce the weight of the brick unit, as shown in Figure 4, without affecting the above described features of the brick unit.

The brick units are placed into a wall W in the conventional manner except that the brick units in each row or course 26 are generally placed in complementary relation: that is, the side wall 14 having the cut-out section 22 must abut the cut-out section 22 in the adjacent brick unit, or the side wall 15 which does not contain the cut-out section 22 must abut the uncut side wall 15 of the adjoining brick unit B as shown in Figure 5. Stated succinctly the rule for the mason to follow is: lay like ends together. Each course of brick units is also staggered so that the groove 20 of the upper course overlays the ends walls 14, or 14 and 15, or 15 of the course directly beneath.

As will be seen from a careful examination of Fig. 2, the bricks which were laid in that wall were not in all instances laid with "like ends together." If the mason erects the wall with all like ends of the brick facing each other the resulting wall construction will be in the nature of that shown in Fig. 11. There it will be seen that the continuous channels 28 occur in pairs, the centers of the paired channels being one-half a brick length apart. The distance between the outer channels of the adjacent pairs is equivalent to the length of a brick and a half. Having this choice available the reinforcing steel rods 30 and adjacent grout casement 38 such as shown in Figs. 1 and 2 can actually be doubled over the amount shown in Figs. 1 and 2. In locations where particularly strong reinforcement is desired, such as in California and other areas where earthquake resistance is an important factor, the unique brick construction makes this possible in a single wythe wall.

Another unique feature of wall made with the brick 10 is illustrated in Figs. 12 through 15, where the erection of outside and inside or salient and reentrant corners, respectively, are shown. As will be seen from Fig. 12 a typical overlapping corner joint construction is shown. Because the brick 10 is recessed only in one end corner, a perfectly smooth outside face is presented at the exposed corner formed by the uninterrupted brick ends 15. The further advantage of the unique brick unit in the corner construction is better illustrated in Fig. 13 where it will be seen that pairs of reinforcements 38 occurs immediately adjacent the corner construction which, of course, makes it possible to more securely reinforce the

wall at the corner. In addition, this insures the positioning of the reinforcement 38 and attendant fastening means 48 (such as shown in Fig. 2) close to the inside corners so that the inside wall construction may be adequately supported near its inside joint.

An inside or reentrant corner construction using the same type of brick 10 is illustrated in Figs. 14 and 15. There it will be seen that the reinforcing channels 28 occur again as a pair located only a half a brick length away from the corner joint itself. The advantage of locating the reinforcing and fastening elements close to the vertex of the inside corner is even more important when the function of the strips to support the inside finished wall is considered. Thus it will be seen that by using the unique brick the longest unsupported span of inside finished wall material will be the length of only one brick, and in the case of the most common corner, this unsupported length of inside wall material would be only one-half the length of the brick unit employed.

After the wall has been so constructed, a steel rod 30, or the like, may be inserted into the channel 28 and a mold form M comprising side walls 32 and 33 and a connecting wall 34 is placed tightly against and secured in any conventional manner to the brick units B which surround and into which the channel 28 is formed. Thus the mold M encases the channel 28, as shown in Figure 6. Grout 36, preferably quick setting grout, is then poured into the channel and mold form until the channel and mold form are completely filled with the grout 36. When the grout 36 has set the mold M is removed leaving a cement reinforcement 38 having the strength, rigidity and durability required for single-wythe load bearing walls.

For convenience of finishing the brick wall W with insulation 40, lath 42, plaster 44, etc., the mold M may also have openings 46 to receive nails 48, or the like. When nails 48 are used, the heads 50 of the nails 48 are fitted into the openings 46 of the mold on the inside of the mold form so that the heads 50 rest on the inner surface of the connecting wall 34. The mold is then placed against the wall in the manner described above. After the grout 36 has been poured and before it has set, the nails 48 may be pushed inwardly into the grout 36 (see Figure 7) sufficiently to insure a strong and permanent imbedding of the nails 48 in the reinforcement 38 when the grout 36 has set. Of course, double headed nails 52 may also be used (Figure 8).

The brick wall W can easily be finished as desired by applying the insulation 40 against the wall and allowing the nails 48 imbedded in the reinforcement 38 to penetrate the insulation 40. Because the reinforcement 38 extends out from the brick wall W for a short distance, a cavity 54 is generally formed between the wall W and the insulation 40 which contributes to the insulating qualities of the wall as well as to help prevent water penetration. Lath 42 may then be applied in the accepted manner. The ends of the nails 48 may then be struck down or out, as shown in Figure 2, to secure the lath 42 and the insulation 40 to the wall. Obviously, by imbedding the nails 48 in the reinforcements 38 the necessity of drilling holes for or driving nails, which is generally difficult and unsatisfactory, is eliminated and at the same time a rapid and permanent means for securing the insulation and lath are substituted therefor.

A modified form of the brick illustrated in Figs. 3 and 4 is illustrated in Fig. 16. The modified brick 100 differs from the other brick configuration in the nature of the corner groove which includes a unique jamb slot 101. The jamb slot 101 comprises a recessed leading face 102 followed by the J shaped jamb slot 101, its basic geometry being that of an isosceles trapezoid. The base 104 of the jamb slot is parallel with the end 105 of the brick unit and located at a depth sufficient to accommodate a sash fin or similar window construction

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element. The central grove 20 remains as in the basic brick discussed above.

The distinct advantages flowing from the modified brick 100 are best illustrated in Fig. 17 where it will be seen that a vertical sash slot 110 may be built at a window opening to receive a sash fin 111 which subsequently cooperates in holding the window sash 112. Another advantage flowing from the modified jamb slot construction lies in the nature of the vertical reinforcing column recesses 128 which have alternating jamb slot configurations and U-shaped recessed configurations. When the reinforcing rod 30 with its molded reinforcements are molded, the grout will migrate into the base 104 of the jamb slot and thereby key the reinforcement against lateral and longitudinal displacement adding additional strength to the wall. This feature permits a grout to be used which has low surface adhesion properties and yet provides a reinforced column 38 which can bear an extensive lateral loading.

In review it will be seen that by using the unique brick as well as its modified form, a reinforced single-wythe wall may be erected which is susceptible of extensive reinforcement. The corners may be built from homogeneous brick units with the outer faces uninterrupted by unsightly slots, or requiring extensive patching or breaking of bricks in the erection. Provision is made for reinforcing columns closely adjacent to the corner on the inside wall where support for the inside wall construction is more desirably located. In addition, by employing a modified construction, provision is made for mounting window sash and locking the reinforced columns against lateral or longitudinal displacement from the wall.

We claim as our invention:

1. A reinforced brick wall comprising a plurality of rectangular brick units having inside, outside, and end faces and laid horizontally in rows with the brick in adjacent rows staggered relative to each other, each unit

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having one end face uninterrupted and a central groove on the inside face of the brick and a partial groove on a single inside corner of the brick at its other end, the bricks being laid in the wall with the partially grooved ends facing each other and the uninterrupted ends facing each other so that the inside of the wall presents pairs of vertically aligned grooves spaced horizontally a distance of approximately one-half brick length.

2. A reinforced brick wall comprising a plurality of brick units, each brick having an inside and an outside face and a pair of end faces, one of said faces being uninterrupted, means defining a central vertical groove on the inside face, means on said inside face defining a partial vertical groove at one end of the face, the bricks being laid in the wall horizontally in rows with the grooved ends together and the uninterrupted ends together and presenting pairs of vertical grooves spaced apart along the wall approximately one-half brick length, the adjacent pairs of vertical grooves being separated by a distance of one-and-one-half brick lengths, and reinforcing means positioned within said pairs of vertical grooves and secured to the brick defining such grooves.

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