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BRICK WALL AND WATERPROOFING MEANS THEREFOR

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2 Sheets-Sheet 1

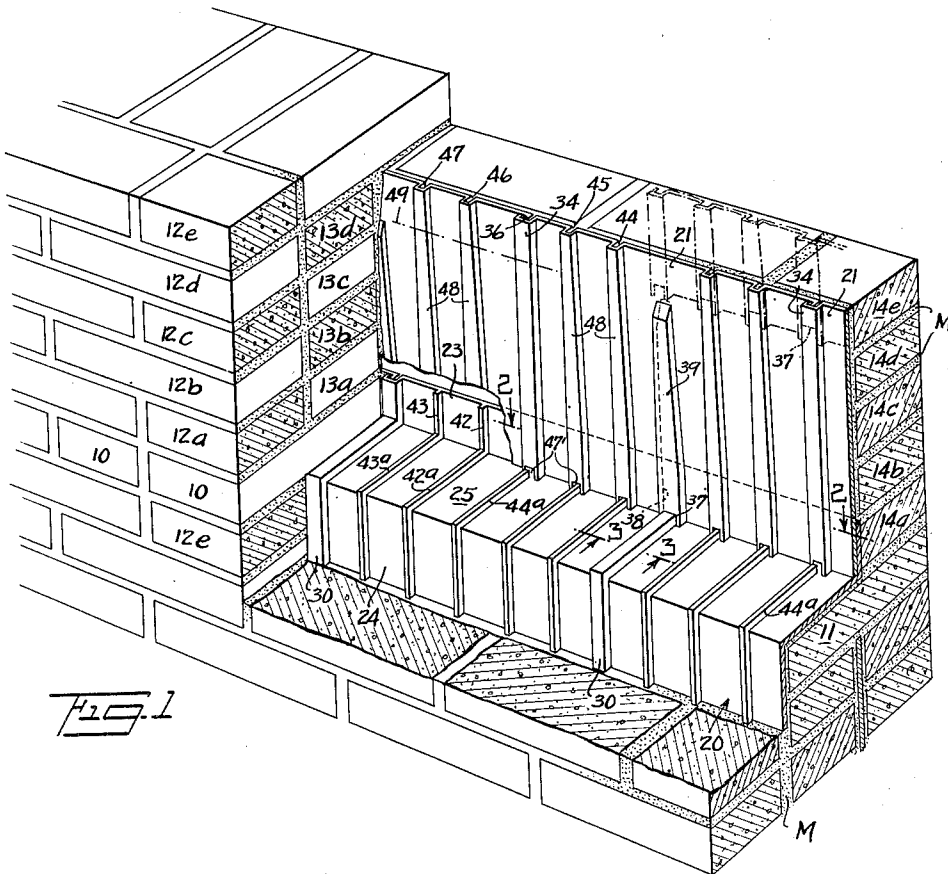


Fig. 1

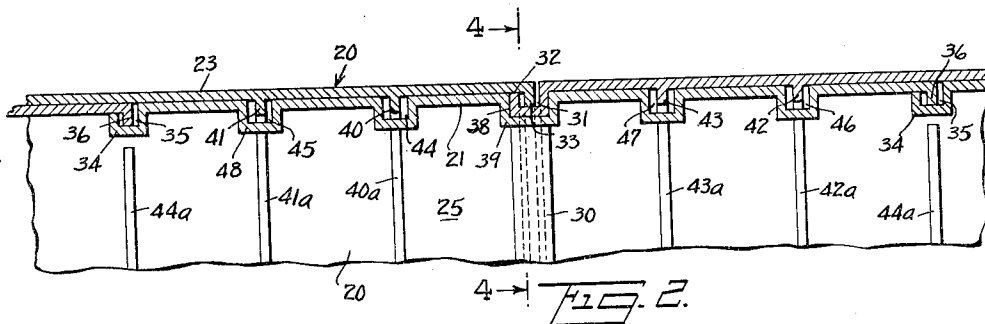


Fig. 2.

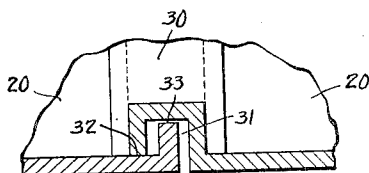


Fig. 3.

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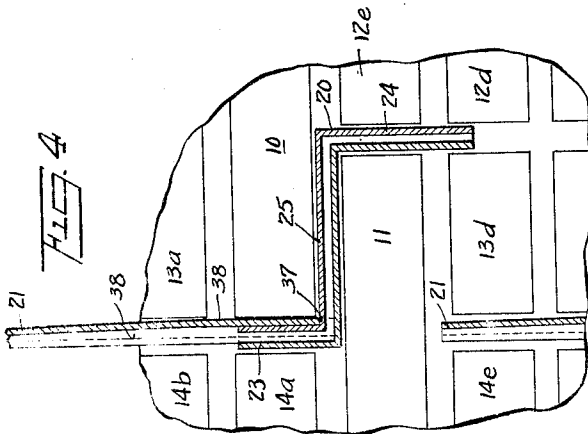
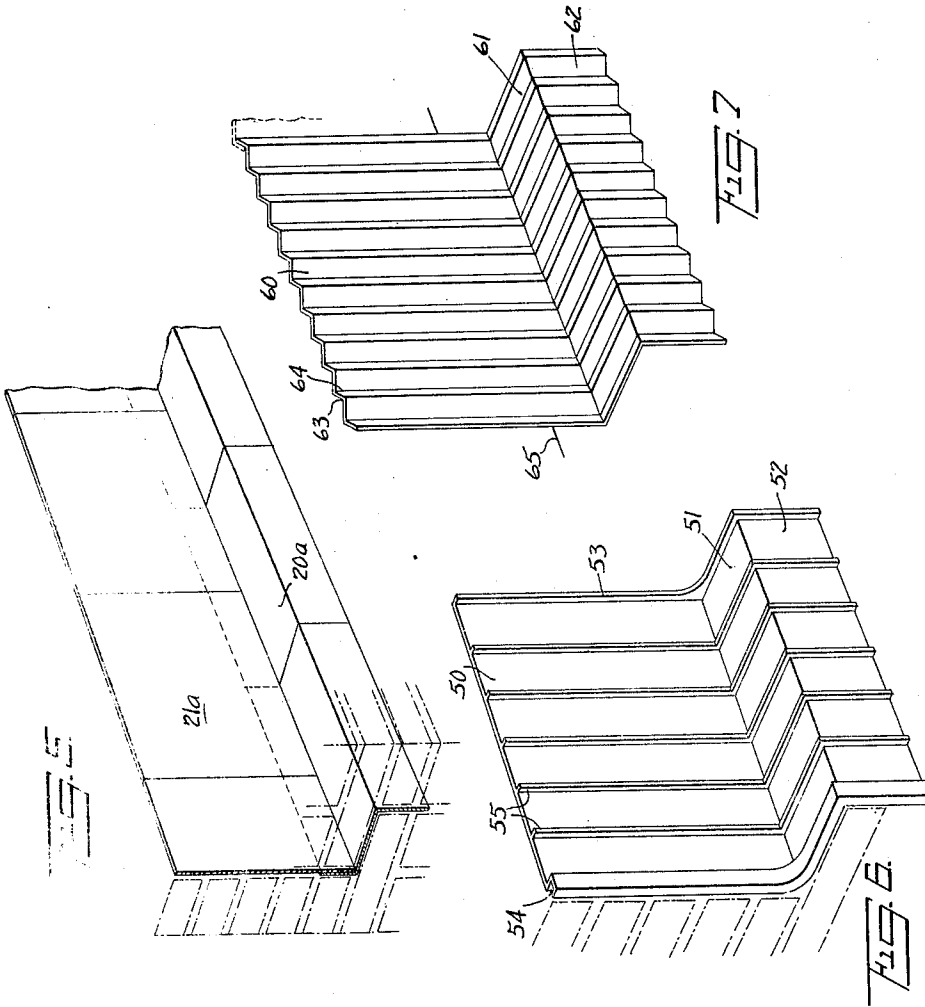
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2 Sheets-Sheet 2



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BRICK WALL AND WATERPROOFING MEANS
THEREFOR

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29 Claims. (Cl. 72-127)

The present invention relates to brick walls and water proofing means therefor.

Brick walls, composed of brick and mortar, laid in the customary manner, have been found to be so porous that some expedient must be resorted to for the exclusion of water. The bricks themselves are porous and cracks and seams of greater or less size are always present in the mortar. These seams are caused by carelessness in the laying of the mortar, shrinkage of the mortar, vibration, settling, or for other reasons. The net result of these conditions is likely to be a leaky wall. Rain water, especially where driven by a hard wind, readily passes through these walls and ruins the finish applied to the walls.

Where no attempt is made to damp proof the wall itself, various expedients are resorted to to permit a dry surface to be had inside. The more common expedient is applying furring strips on the wall and then some form of lath to which plaster, mastic, or other surfacing is affixed. These add to the expense and waste room space.

The use of metal flashing between the courses of brick has also been tried, but this has serious objections. The bonding of the wall is seriously impaired, for mortar does not adhere to smooth metal, making it necessary to fabricate the metal in an expensive manner. To place the flashing, a sheet metal worker is usually required, so that two trades must be working on the wall at the same time, causing confusion and delay.

Various arrangements of felt, fabric, asbestos sheet, etc., have been tried, but these are inadequate, difficult to lay and weaken the wall.

The present invention contemplates the provision of water proofing means made out of a material which overcomes these difficulties. The material employed is impervious to water, rigid, nonshatterable, inexpensive both to make, ship, and handle. It forms a perfect bond with the mortar and has a compressive strength comparable to that of brick so as not to be squeezed out of place and can be placed in the wall by the brick mason as the work progresses.

The water proofing means may be embodied in various forms. It is preferably designed so that all of one of the vertical mortar joints between corresponding header courses together with the joint between the lapped parts of the header brick and a part of the other vertical mortar joint, contain the water proofing means. It is made up in pieces of convenient size which fit into the wall as the work progresses and to occupy part of the regular mortar space. These units are preferably overlapped to reduce seepage of water

lengthwise of the wall and may be tongued and grooved.

The invention also contemplates that these pieces of waterproofing material may be constructed so that a single piece of waterproofing will waterproof the wall from below one inner header course up to the next inner header course, or so that two pieces may be used. In the first case the unit is of Z-shape cross section having one long side equal to the spacing between the header courses, while in the other case a flat plate and a Z-shaped plate are employed.

Other and further objects of the invention will appear as the description proceeds.

The accompanying drawings show, for purposes of illustrating the present invention, several of the many possible embodiments in which it may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Figure 1 is a perspective view of a brick wall with parts broken away to show a form of waterproofing means employing plates of two shapes;

Figure 2 is a horizontal section on the line 2-2 of Figure 1 showing the waterproofing means;

Figure 3 is a fragmentary vertical section on the line 3-3 of Figure 1;

Figure 4 is a vertical section through a wall on the line 4-4 of Figure 2;

Figure 5 is a view illustrating the employment of another form of waterproofing employing two plates; and

Figures 6 and 7 illustrate forms of waterproofing means employing plates of a single shape.

In the drawings, the invention is illustrated in connection with the customary twelve inch "American bond" wall having header courses comprising an outer course of brick indicated at 10 and an inner course of brick indicated at 11, which overlap to provide a transverse bond, and five courses of stretcher brick, the front brick being indicated at 12a-e inclusive, the middle brick 13a-d inclusive, and the inner brick 14a-e inclusive. The mortar joints are indicated by the letter M. The invention is, however, applicable to English, Flemish, or other forms of bonded wall, and where the wall is more than 12 inches thick.

The water proofing means is placed in front of the inner courses stretcher brick 14a-e inclusive and above and in front of the inner courses of header brick 11, and thus comes behind the middle courses 13a-d of stretcher brick and underneath and behind the front course 10 of header

brick and behind the stretcher courses 12e. It will be noted that the waterproofing preserves many of the brick to mortar joints. All the outer stretchers and headers are joined by regular mortar joints; and similarly all the inner stretchers and headers. The intermediate stretchers are similarly joined to the headers and to adjacent stretchers.

As shown in Figs. 1-6 of the drawings, this form of water proofing means employs a number of Z-shaped plates or members 20 and vertical plates 21. The vertical plates are made high enough to cover the five courses of stretcher brick on the inner face of the wall and preferably of a length equal to one and one half bricks. The Z-shaped plates are of the same length (1½ bricks) and have inner flanges 23 and outer flanges 24, the latter having a depth somewhat greater than the thickness of a brick plus a mortar joint. These flanges are at right angles to the mid-portion 25 of the plate, the width of this mid portion being slightly more than one half the length of a brick.

The plates 20 and 21 are preferably made of some rigid impervious non-shattering, non-corrosive material having a surface to which mortar adheres and which has bearing properties and compressive strength comparable with that of brick, so that the wall functions as a unit in bearing loads and with its strength unimpaired by the plates. The preferred material is a hard molded plate of asbestos fibres and Portland cement. This asbestos plate or cement lumber is comparable with the asbestos shingles commonly employed for roofing hips, ridges, and for siding.

In the simplest form of construction, the plate 20 may have the Z-shape and the plate 21 be flat, and the plates butted together at their side edges, such simple plates are shown in Figure 5 at 20a and 21a. These plates would however not afford the most complete form of protection against seepage of water, for it might pass in small amounts through the seams or cracks between the waterproofing plates. To overcome any such leakage, the plates shown in Figures 1-4 are designed so as to form tongue and groove joints along their side edges.

The left hand margin of the Z-shaped plate 20 has a ridge or bead 30 extending the entire length thereof and is cut out on the lower and rear portions to form a groove 31. The outer wall portion forming the groove stops at 32, in the planes of the rear and upper parts of the body of the plate. The right margin of the plate 20 has a forwardly extending tongue 33 adapted to enter the groove 31, as will be clear from Figures 2 and 3.

The vertical plates 21 are provided with similar ridges or beads 34, grooves 35 and tongues 36 which interfit as shown in Figures 1 and 2. To permit the lower edge of the plates 21 to rest in the upper face of the plate 20, the plates 21 are provided with a centrally located notch 37 large enough to receive the ridges or beads 30 on the Z-shaped plates. A groove 38 in plate 21 receives the upper part of the ridge or bead 30 in the lower Z-shaped plate. This also serves to bring about a regular breaking of joints between the waterproofing plates. This groove extends nearly to the top of the plate and is covered by a bead or ridge 39. By placing the beads at the left and the tongues at the right hand edges of the plates, the waterproofing builds up from left to right and thereby adopts the standard practice of brick masons, as will be clear from Figure 1.

The plates constructed as herebefore described

extend over approximately 12 inches of wall, and are entirely satisfactory for use in the portions of the wall where the wall continues for distances sufficient to receive the full sized plates, but along window and door openings and inside and outside corners, it is necessary to provide for lengths of 2, 4, 6, 8, or 12 inches.

To care for the conditions just referred to, some or all the plates are provided with supplemental features of design. The rear walls 23 of the Z-shaped plates are provided with fins 40, 41, 42, and 43, and the mid portion with fins 40a, 41a, 42a, 43a, and 44a, as indicated. The rear faces of the vertical plates 21 are provided with grooves 44, 45, 46, and 47 preferably extending the entire height of these plates and adapted at their lower ends to receive the fins. They are notched as indicated at 47'. The grooves and notches are preferably somewhat wider than the fins for a purpose to be set forth. The plates 21 are provided with vertical beads or ridges 48 which provide material about the grooves 44-47 inclusive. These ridges preferably taper upwardly as shown so that narrow fins appear at the upper edge adapted to fit into grooves in a similar plate where a height of more than 5 courses is to be covered, as in a spandrel. This is indicated in dotted lines in Figure 1. These ridges also form a convenient grip for the mason so that he can easily hold the plate in one hand while applying mortar with a trowel held in the other hand. The grooves receive mortar and facilitate the bonding of the wall.

When it is necessary to fit a space of less than 12 inches, the plates may be readily broken along vertical scoring lines formed adjacent the right edge of these fins, and in the right hand side of the groove. The scoring may be done by the mason with any shape instrument or tool. The plates may be sawed, or cut in the same way as an asbestos shingle. The remaining fin at the edge of the shortened Z-shaped plate or narrowed vertical plate forms a tongue to enter the groove in the other Z-shaped plate or vertical plate, and the waterproofing properties are continued.

Where the odd dimension to be compensated for is less than two inches, the excess width of grooves over the thickness of the tongues makes it possible to extend a number of plates over the extra distance.

The plates 21 will be too high where less than 5 courses of stretcher brick are employed, as for example under a window. The plates may be scored as indicated at 49 so as to facilitate breaking away the upper margins.

In the arrangement shown in Figure 6, the waterproofing means is made of a single piece of material. It has an upper rear portion 50, a horizontal portion 51, and a lower front portion 52, and is provided with a tongue 53 along one edge to fit a groove 54 formed along the other edge and fins 55 as indicated. It occupies the same space in the wall as the other type of construction, and functions in general in the same way.

In the arrangement shown in Figure 7, the plate is designed to fit into the wall in the same way as the plate of Figure 6. This plate has an upper rear portion 60, a horizontal portion 61 and a lower front portion 62. The plate is provided with a zigzag cross section so as to have ridges and valleys 63 and 64 extending from top to bottom as indicated. One can readily break the plate along any one of the vertical lines formed by these crests, and these plates readily

overlap as indicated. The zigzag arrangement may be used on two plates having the general outline shown in Figure 5. In this event, the vertical plate will correspond with the portion 60 and the Z-shaped plate will extend up to the line 65.

The material employed (preferably analogous to asbestos shingles or cement lumber) is about $\frac{1}{8}$ inch in thickness and the maximum dimension of the beads or ridges is $\frac{1}{2}$ inch so that the plates may be received within the usual $\frac{1}{2}$ inch space allotted to mortar. The brick may be so laid that the beads enter the vertical joints between the header bricks. This automatically spaces the brick the proper distance. The wall thickness may be increased slightly by reason of the mortar behind the vertical plates, but this is of no consequence for exact inside dimensions are not generally required.

Any water which does enter this wall through the seams or front brick is intercepted by the impervious plates and drained downwardly without being allowed to pass to the inner bricks. The wall will therefore have a dry surface and can receive plaster or other finish without the use of furring or other expedients used to protect the plaster from the moist wall.

It is obvious that the invention may be embodied in many forms and constructions, and I wish it to be understood that the particular forms shown are but a few of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. A brick wall having stretcher and header courses on each face thereof with the header courses lapped transversely and all held together with mortar, and waterproofing means comprising impervious Z-shaped plates and vertical plates composed of incompressible material to which mortar adheres, the plates being placed between header courses in front of the innermost bricks of the stretcher courses, the Z-shaped plates being disposed behind the lower edges of the vertical plates across the top and down the front faces of the rear headers, the thickness of said plates being not greater than the thickness of mortar in a standard mortar joint.

2. A wall as claimed in claim 1, wherein each joint between the vertical plates includes a tongue and a groove.

3. A wall as claimed in claim 1, wherein each joint between adjacent Z-shaped members includes a tongue and groove.

4. A wall as claimed in claim 1, wherein all the plates are of zigzag cross section in planes longitudinal of the wall and overlapped along their side edges.

5. A wall as claimed in claim 1, wherein the joints between the vertical plates are broken with respect to the joints between the Z-shaped plates.

6. A wall as claimed in claim 1, wherein each joint between the vertical plates includes a tongue and a groove, and each joint between the Z-shaped plates includes a tongue and groove, the joints between the vertical plates being broken with respect to the joints between the Z-shaped plates.

7. A wall as claimed in claim 1, wherein the lower front portion of the Z-shaped plates projects below the lower faces of the rear header brick an amount at least equal to the thickness of the mortar in the joint below the header brick.

8. A wall comprising brick laid in mortar and

having header and stretcher courses, the header courses being transversely overlapped to bond the wall transversely, and waterproofing means comprising impervious, vertical plates extending through the mortar space in front of the rear stretchers and from the top of one rear header to the bottom of the other rear header, and impervious Z-shaped plates having flanges at right angles to the mid-portions thereof, the upper flanges being behind the lower edges of the vertical plates, the mid-portion on top of the outer ends of the rear headers and the lower flanges in front of the rear headers, said Z-shaped plates occupying mortar space between said header courses and the adjacent stretcher courses, all the plates being composed of material of a nature to adhere to the mortar and of a compressive strength comparable to that of the brick.

9. Waterproofing means for brick walls comprising a plurality of Z-shaped plates and substantially flat plates, both plates being made out of hard, impervious material capable of adhering to mortar and having a compressive strength comparable with brick, the Z-shaped plates having normally horizontal mid-portions adapted to rest on header courses of brick, front flanges to overlie the front ends of said header courses and rear flanges to extend upwardly from said header courses, the flat plates being adapted at their lower edges to overlie the front faces of the upper flanges of the Z-shaped plates and to cover the front faces of stretcher bricks laid above the header courses, the plates having thicknesses less than the thickness of a standard mortar joint whereby they are receivable within the joints of the wall.

10. Waterproofing means for brick walls as claimed in claim 9, wherein the vertical edges of the plates are provided with forwardly and upwardly projecting tongues, and with downwardly and rearwardly opening grooves the groove on one plate receiving the tongue on the adjacent, corresponding plate.

11. Waterproofing means for brick walls as claimed in claim 9, wherein the vertical edges of the plates are provided with forwardly and upwardly projecting tongues, and with downwardly and rearwardly opening grooves, the groove on one plate receiving the tongue on the adjacent, corresponding plate, wherein the center of the lower edge of the flat plates are notched to receive the material about the enlarged portions of the Z-shaped plates which contain the grooves.

12. Waterproofing means for brick walls as claimed in claim 9, wherein the vertical edges of the plates are provided with forwardly and upwardly projecting tongues, and with downwardly and rearwardly opening grooves, the groove on one plate receiving the tongue on the adjacent, corresponding plate, the rear flanges of the Z-shaped plates having fins, and the lower portions of the flat plates having grooves to receive the fins.

13. Waterproofing means for brick walls comprising a plurality of Z-shaped plates and substantially flat plates, both plates being made out of hard, impervious material capable of adhering to mortar and having a compressive strength comparable with brick, the Z-shaped plates having normally horizontal mid-portions adapted to rest on header courses of brick, front flanges to overlie the front ends of said header courses and rear flanges to extend upwardly from said header courses, one vertical edge of

each Z-shaped plate having a tongue while the other edge has a groove to receive the tongue of an adjacent Z-shaped plate, the rear flanges having regularly spaced vertical fins, the flat plates being adapted at their lower edges to overlie the front faces of the upper flanges of the Z-shaped plates and to cover the front faces of stretcher bricks laid above the header courses, one vertical edge of each flat plate having a tongue while the other edge has a groove to receive the tongue of an adjacent flat plate, and grooves to receive the fins, the plates having thicknesses less than the thickness of a standard mortar joint whereby they are receivable within the joints of the wall, the plates having registering means to place the joints between adjacent flat plates mid-way between the joints between adjacent Z-shaped plates.

14. Waterproofing means for brick walls comprising a plurality of Z-shaped plates and substantially flat plates, both plates being made out of hard, impervious material capable of adhering to mortar and having a compressive strength comparable with brick, the Z-shaped plates having normally horizontal mid-portions adapted to rest on header courses of brick, front flanges to overlie the front ends of said header courses and rear flanges to extend upwardly from said header courses, one vertical edge of each Z-shaped plate having a tongue while the other edge has a groove to receive the tongue of an adjacent Z-shaped plate, the rear flanges having regularly spaced vertical fins, the flat plates being adapted at their lower edges to overlie the front faces of the upper flanges of the Z-shaped plates and to cover the front faces of stretcher bricks laid above the header courses, one vertical edge of each flat plate having a tongue while the other edge has a groove to receive the tongue of an adjacent flat plate, and grooves to receive the fins, the plates having thicknesses less than the thickness of a standard mortar joint whereby they are receivable within the joints of the wall, the flat plates having ribs extending upwardly on the front face thereof above the fin receiving grooves.

15. A waterproofing plate of substantially incompressible, impervious material to which mortar adheres and adapted to be placed in a vertical position inside a brick wall, said plate having a rearwardly opening groove along one side edge and a forwardly extending tongue along the other side edge and being of a thickness to be received within the space of a standard mortar joint, whereby lapped joints may be produced when the plates are assembled edge to edge along the interior of the wall.

16. A waterproofing plate as claimed in claim 15 having on the front face vertically extending fins each adapted to form a tongue when the plate is broken alongside the fin.

17. A waterproofing plate of substantially incompressible, impervious material to which mortar adheres and adapted to be placed in a vertical position inside a brick wall, said plate having an upper rear vertical portion of a height equal to the thickness of a plurality of stretcher courses of brick, a horizontal portion of a width of substantially one-half the length of a brick, and a lower front portion, one side edge of the plate having a rearwardly and downwardly opening groove, the other side edge having a forwardly extending tongue adapted to enter the groove on an adjacent plate, the thickness of the plate being

such that it may be received within the space of a standard mortar joint.

18. A waterproofing plate as claimed in claim 17, having on the front face of the upper rear portion and on the top face of the horizontal portion a plurality of continuous fins each adapted to form a tongue when the plate is broken alongside any fin.

19. A solid brick wall having header and stretcher courses on each face thereof with header courses lapped transversely and all held together with mortar, and waterproofing elements composed of substantially incompressible, impervious material to which mortar adheres so that strength of the wall is not impaired, said elements being thin and occupying substantially the entire height of one of the vertical mortar joint spaces between header courses and a portion of the other vertical mortar joint space and the portion of the horizontal mortar joint space where the headers are lapped, whereby water entering the wall through the front header and stretcher courses is prevented from passing to the stretcher and header courses protected thereby.

20. A solid brick wall having header and stretcher courses on each face thereof with header courses lapped transversely and all held together with mortar, and waterproofing means composed of plates of substantially incompressible, impervious material to which mortar adheres so that strength of the wall is not impaired, said plates being thin and occupying part of the vertical mortar joint space between header courses on the inside of the wall and part of the mortar joint spaces above and in front of these header courses, the side edges of the plates having forwardly extending tongues entering rearwardly opening grooves whereby water entering the wall through the front header and stretcher courses is prevented from passing to the stretcher and header courses protected thereby.

21. A solid brick wall having header and stretcher courses on each face thereof with header courses lapped transversely and all held together with mortar, and waterproofing means composed of plates of substantially incompressible, impervious material to which mortar adheres so that strength of the wall is not impaired, said plates being thin and occupying part of the vertical mortar joint space between header courses on the inside of the wall and part of the mortar joint spaces above and in front of these header courses, the side edges of the plates having forwardly extending tongues entering rearwardly opening grooves whereby water entering the wall through the front header and stretcher courses is prevented from passing to the stretcher and header courses protected thereby, the plates having vertically extending fins to provide tongues when the plates are broken adjacent the fins so that narrower plates may be formed by breaking away material between a fin and the tongue bearing edge.

22. A brick wall as claimed in claim 19 where- in the waterproofing elements have a zigzag cross section in planes longitudinal of the wall and are overlapped along their side edges.

23. A brick wall as claimed in claim 19 where- in the waterproofing elements have a zigzag cross section in planes longitudinal of the wall and are overlapped along their side edges and wherein certain of the plates are Z-shaped in vertical section and other plates are substantially flat and disposed above the Z-shaped plates with

their lower margins in front of the upper rear flanges of the Z-shaped plates.

24. A brick wall having header and stretcher courses in each face thereof with the header courses lapped transversely, there being horizontal mortar joints between the courses of brick and vertical mortar joints between opposite stretcher courses and between opposite header and stretcher courses, and Z-shaped water proofing elements each having a horizontal intermediate part which occupies a portion of the mortar joint space where the header courses are lapped, and vertical parts one of which is longer than the other and occupies a portion of the vertical mortar joint space extending to an adjacent corresponding header course and crossing the horizontal mortar joints between the stretcher courses to prevent passage of water across said vertical mortar joint, the other shorter part occupying a portion of the other vertical mortar joint space and extending across one horizontal mortar joint space to prevent the passage of water through the horizontal mortar joint not crossed by the longer vertical part of the adjacent waterproofing element.

25. A wall as claimed in claim 24, wherein the edges of the Z-shaped elements are overlapped.

26. A brick wall as claimed in claim 24, wherein the longer vertical part of the waterproofing element is in the vertical mortar space adjacent the innermost stretcher bricks.

27. A brick wall having header and stretcher courses in each face thereof with the header courses lapped transversely, there being horizontal mortar joints between the courses of brick and vertical mortar joints between opposite stretcher courses and between opposite header and stretcher courses, and Z-shaped waterproofing elements extending through all the vertical mortar joints adjacent one wall face, all the portions of the horizontal mortar joints where the headers are lapped and a portion only of the other vertical mortar joint whereby passage of

water horizontally through the wall is prevented and whereby horizontal and vertical bonding of the wall by joints composed of brick and mortar only is preserved.

28. A Z-shaped plate for waterproofing brick walls, said plate being made out of impervious material capable of adhering to mortar and having a compressive strength comparable with brick, and having a normally horizontal midportion adapted to rest on a header course of brick, a front flange deep enough to overlie the front face of said header course and extend below said course, and a rear flange to extend upwardly from said header course for a distance greater than the thickness of a course, the thickness of the plate being less than the thickness of a standard mortar joint whereby the plate may occupy mortar spaces, the plate having an upwardly and forwardly projecting tongue along one edge and a downwardly and rearwardly opening groove along the other edge to receive the tongue along the edge of another similar plate.

29. A Z-shaped plate for waterproofing brick walls, said plate being made out of impervious material capable of adhering to mortar and having a compressive strength comparable with brick, and having a normally horizontal midportion adapted to rest on a header course of brick, a front flange deep enough to overlie the front face of said header course and extend below said course, and a rear flange to extend upwardly from said header course for a distance greater than the thickness of a course, the thickness of the plate being less than the thickness of a standard mortar joint whereby the plate may occupy mortar spaces, the plate having a zigzag cross section forming vertical grooves extending through the flanges and midportion, whereby the plates may be lapped along their sides and a plate may be readily broken along vertical lines to make a narrower plate out of a wider plate.

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