Sept. 8, 1964 R. O. SHANTON 3,147,570

WALL BRACES AND METHOD OF USING SAME

Filed April 28, 1959

3 Sheets-Sheet 1

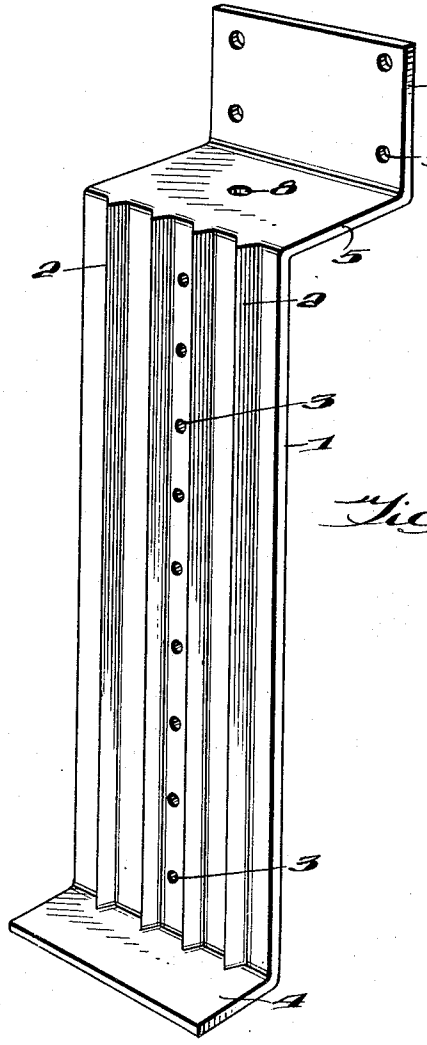


Fig. 1.

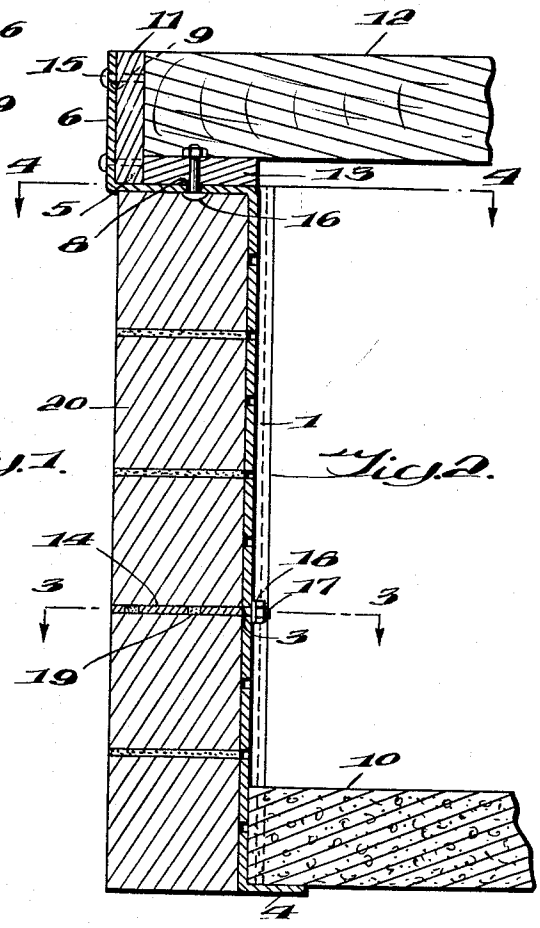
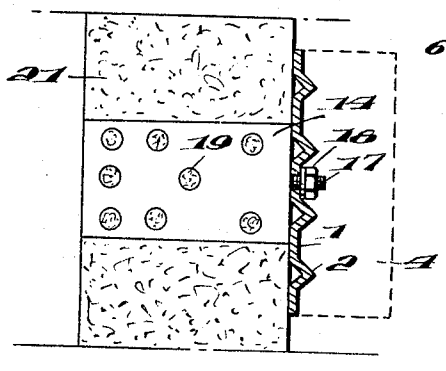
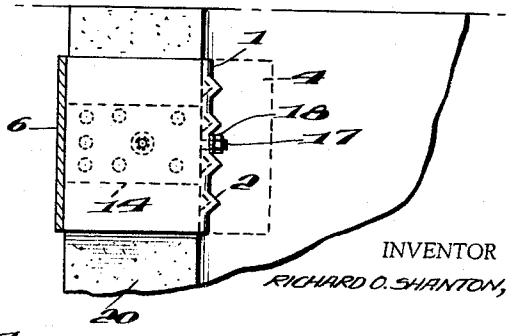


Fig. 2.

Fig. 4.

Fig. 3.





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Fig. 5.

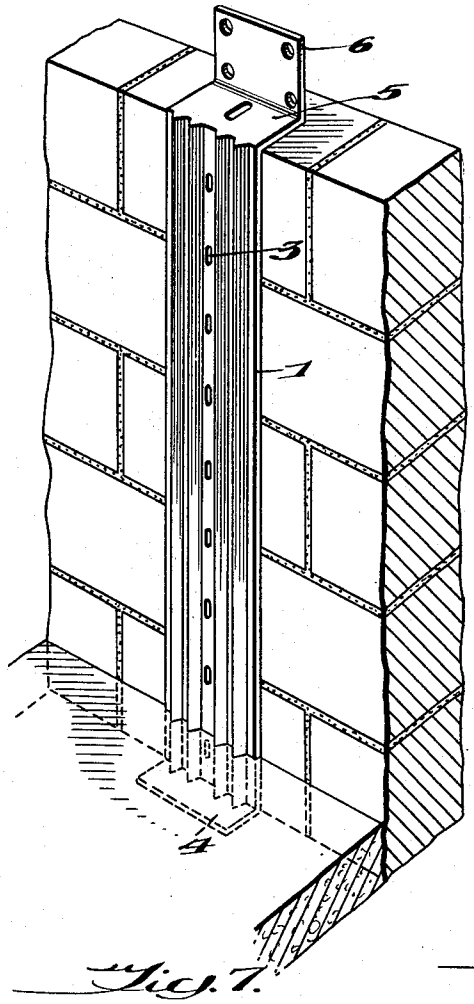


Fig. 6.

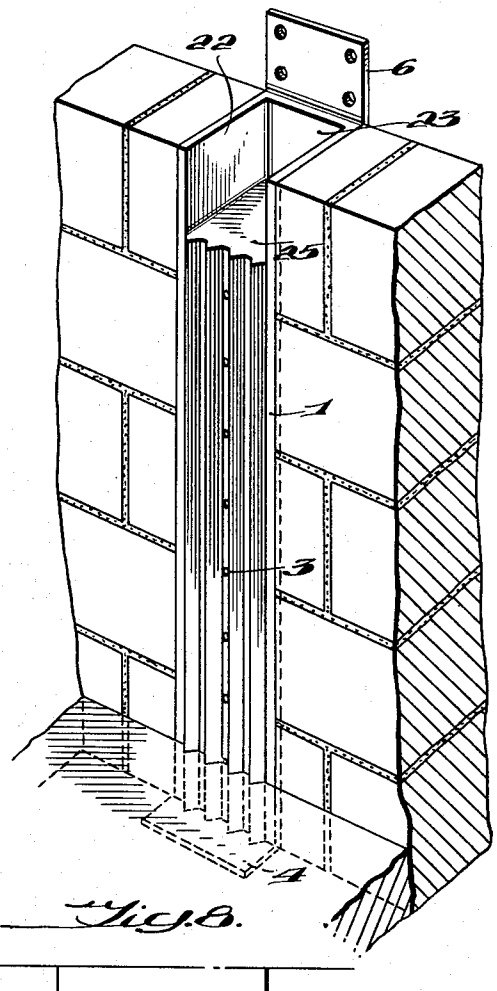


Fig. 8.

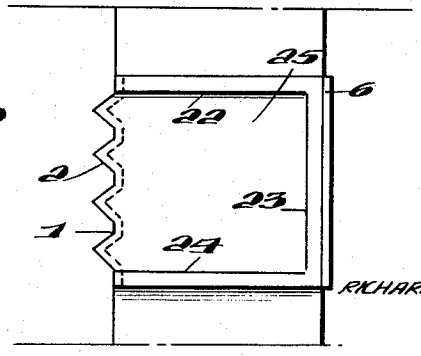
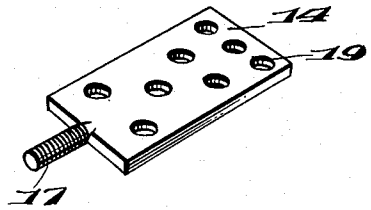


Fig. 7.



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Fig. 10.

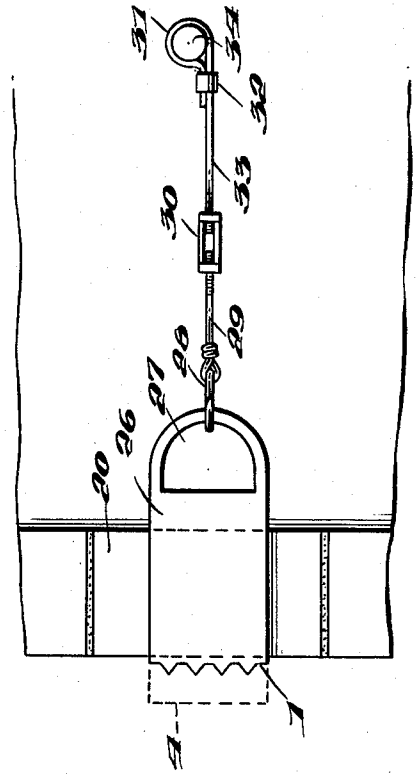


Fig. 11.

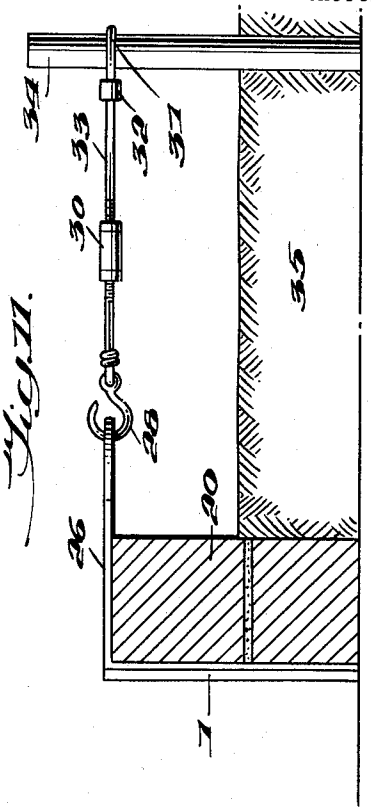
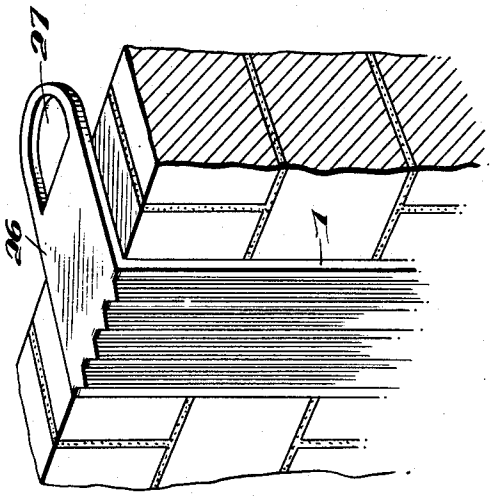


Fig. 9.



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WALL BRACES AND METHOD OF USING SAME

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2 Claims. (Cl. 50—181)

This invention relates to wall braces suitable for use in the construction of houses, garages, retaining walls and similar structures. More particularly this invention relates to metal braces for use in bracing or supporting masonry walls made of cinder block, concrete block, brick or similar materials.

Many houses and similar structures are destroyed by floods and tornadoes as a result of failure of the exterior walls. In the case of floods, the pressure of water against the basement or foundation walls causes the walls to be forced inwardly and eventualy to collapse, leaving no support for the upper floors of the building. In the case of tornadoes, the pressure of the wind against the walls causes the walls to collapse, permitting the wind to exert pressure against the roof to thereby raise it from the supporting walls. A need therefore exists for a wall brace for supporting the basement and other exterior walls of buildings.

Therefore, it is an object of this invention to provide an economical wall brace for bracing walls against pressure which might be exerted against the face of the wall.

Another object of this invention is to provide a wall brace of the character described which is quickly and easily installed and requires only a minimum of space.

Another object of this invention is to provide a wall brace of the character described which will further provide a rigid connection between roof members and the foundation of a building.

It is a further object of this invention to provide a wall brace for supporting retaining walls, said brace being economical and easy to install.

A still further object of this invention is to provide methods of bracing masonry walls against pressures which may be exerted against the face of said walls.

The invention will be described with reference to the accompanying drawing in which:

FIG. 1 is a perspective view of the preferred form of the invention;

FIG. 2 is a side view of the brace, positioned to support a wall and showing the relationship between the brace, joist, and floor;

FIG. 3 is a sectional view of FIG. 2, taken along the line 3—3, and showing an anchor plate bolted to the brace;

FIG. 4 is a sectional view of FIG. 2, taken along the line 4—4, and showing the corrugations in the brace and the manner in which the brace is fastened to the wall with anchor plate bolts;

FIG. 5 shows a preferred form of brace suitable for use on a building having a brick veneer;

FIG. 6 shows another preferred form of the invention suitable for receiving and supporting an I-beam;

FIG. 7 shows an anchor plate suitable for fastening the brace to a masonary wall;

FIG. 8 shows a top view of the brace shown in FIG. 6;

FIG. 9 shows the details of the upper portion of a preferred embodiment of the invention suitable for bracing retaining walls;

FIG. 10 shows the details of the anchor assembly used in conjunction with the brace of FIG. 9, and

FIG. 11 is a side view of FIG. 10.

Referring now to FIG. 1, there is shown a preferred form of the invention comprising a vertical member **1**, having corrugations **2** and mounting holes **3**. Connected to the bottom of vertical member **1** is a horizontal member **4**. Extending from the top of the vertical member **1** is an angle member comprising a horizontal member **5** connected at right angles to said vertical member and a second vertical member **6** connected at right angles to said horizontal member. The horizontal member **5** may have one or more bolt holes **8** and the vertical member **6** has a plurality of bolt holes **9** for fastening an outside joist thereto. The brace may be formed from a single metal plate, or, alternatively, the vertical and horizontal members may be welded together or connected by other known means. The corrugations **2** are employed to give strength and rigidity to the vertical member **1**.

FIG. 2 shows a typical masonry wall with the brace in position for supporting a wall. The wall shown is a masonry block wall such as is used in the basements of many homes. The wall is constructed in a normal manner with the exception that plates **14** are inserted or embedded in the mortar joints. After the wall is built to the desired height the masonry brace is then placed in position.

Referring to FIG. 3 there is shown a typical anchor plate such as is embedded in the mortar joints of the wall. The plate **14** has a plurality of holes **19**. Attached to one end of the anchor plate is a threaded portion **17** for receiving a nut **18**. As the anchor plate is embedded in the mortar joints the wet mortar fills the holes **19** to provide a stronger bond.

Although FIG. 2 shows only one such anchor plate it will be understood that there are a plurality of plates in vertical rows embedded in the mortar joints so that the threaded portions **17** will extend through the holes **3** of the masonry brace when it is put in position. After the brace **1** is placed in position, nuts **18** are tightened to hold the brace against the masonry wall, as shown in FIG. 3.

The concrete floor **10** is then poured over the lower horizontal flange **4**. Thus, any force applied to the blocks **20** or to the brace **1** will be counteracted by the force exerted against the flange **4** by the floor as the brace tends to pivot about the point where the vertical member **1** and horizontal member **4** are joined. While the flange **4** is shown as being under the floor **10**, it is to be understood that the flange may be embedded in the floor at any desired depth and should be of sufficient size to distribute the expected pressure over a large area of the floor or base.

When the brace is secured in position, the outside joist is bolted to the vertical member **6** by lag screws **15**, and the top plate **13** is bolted to the horizontal member **5** by means of bolts **16**. The floor joist **12** rests on the top plate **13** and is fastened to the outside joist **11**. This construction may be understood readily from FIGS. 2 and 4.

If the wall shown in FIG. 2 is considered to be the outside wall of a building, such as a garage, it is readily seen that the top plate **13**, bolts **16**, and the wall brace **1** serve to firmly connect the roof members to the floor of the building.

In the case of long walls, the anchor plates **14** should be placed in vertical rows 10 to 12 ft. apart and a masonry brace clamped to each vertical row.

FIG. 5 illustrates a modification of the brace shown in FIG. 1, and is particularly adapted for use in brick veneer construction. In this embodiment the horizontal member **5** does not extend for the full width of the wall but extends only to within approximately 4 inches of the outside of the wall. This leaves room on the outside of the vertical plate **6** to lay the brick veneer. This embodiment also shows the holes **3** and **8** to be elongated thus requiring less accuracy in placing the anchor plates **14** and their threaded portions **17**.

FIGS. 6 and 8 show another form of masonry brace adapted to receive an I-beam. Fastened to the upper end of the vertical member **1** is a horizontal member **25** which

forms the bottom of a box-like recess. Connected to the horizontal member **25** are three plates **22**, **23** and **24** forming vertical sidewalls. Connected to plate **23** is the vertical member **6** to which the outside joist is fastened. The length of the vertical member **1** is determined by the height of the wall. The only requirement for the length is that the horizontal member **4** be embedded in or under the floor and the plates **22**, **23** and **24** rise to but not above the level of the top layer of the masonry block. The center I-beam is then placed in the box-like recess formed in the brace. The I-beam may be fastened to the brace by any suitable means as welding. Thus the I-beam serves to give added strength to the brace and to the walls since any force against the walls would have to move the I-beam as well as the brace.

FIG. 9 shows an embodiment of the invention suitable for use in bracing a retaining wall. In this embodiment there is connected to the top of the vertical member **1**, a horizontal member **26** having an eyelet **27**. The brace is placed in position against the wall so that the eyelet **27** extends in the direction from which the force will be exerted.

FIGS. 10 and 11 show the details of an anchor arrangement suitable for use with the embodiment of FIG. 9. A post **34** is driven into the ground some distance from the wall **20**. A turnbuckle arrangement having a hook **28** and an eyelet **31** is connected between the post **34** and the eyelet **27**. The turnbuckle arrangement is then tightened by the double nut element **30** such that the vertical member **1** applies pressure against the wall **20** which is to be retained.

It is obvious that the present invention provides an economical wall brace which is quickly and easily installed, said brace requiring less floor space and providing greater wall support than braces heretofore available.

While the fundamental novel features of the invention as applied to preferred embodiments have been shown and described, it will be understood that various substitutions and changes in the details of the device illustrated may be made by those skilled in the art, without departing from the scope or sphere of the invention as set forth in the claims.

What is claimed is:

1. A construction for bracing masonry walls comprising a wall; horizontal anchor plates embedded in the mortar joints of said wall; a brace substantially coextensive with the height of said wall including a corrugated vertical member, a first horizontal member attached to the base of said corrugated vertical member, a second horizontal member attached to the upper end of said corrugated vertical member and extending outwardly from said corrugated vertical member in an opposite direction from said first horizontal member and three vertical members attached to said second horizontal member to form a recess for holding a beam which may be fastened to at least one of said three vertical members, whereby said corrugated vertical member, said first and second horizontal members and said three vertical members form a unitary structure; means to fasten said corrugated vertical member of said brace to said anchor plates, and means to prevent movement of said first horizontal member of said brace.

2. A reinforced structure including a wall of masonry blocks and mortar joints; horizontal anchor plates embedded in the mortar joints of said wall; a brace comprising a corrugated vertical member substantially coextensive with the height of said wall, a first horizontal member attached to the bottom of said corrugated vertical member and extending outwardly, a second horizontal member attached to the top of said corrugated vertical member and extending outwardly in a direction opposite from the outward extent of said first horizontal member, and a second vertical member attached to said second horizontal member opposite from said corrugated vertical member and extending upwardly in a direction parallel to and away from said corrugated vertical member; means to fasten said corrugated vertical member to said horizontal anchor plates; means to anchor said first horizontal member against movement; and means to fasten a structural joist member to said second vertical member, whereby said wall is supported against lateral forces exerted against the face of the wall.

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