

Nov. 21, 1967

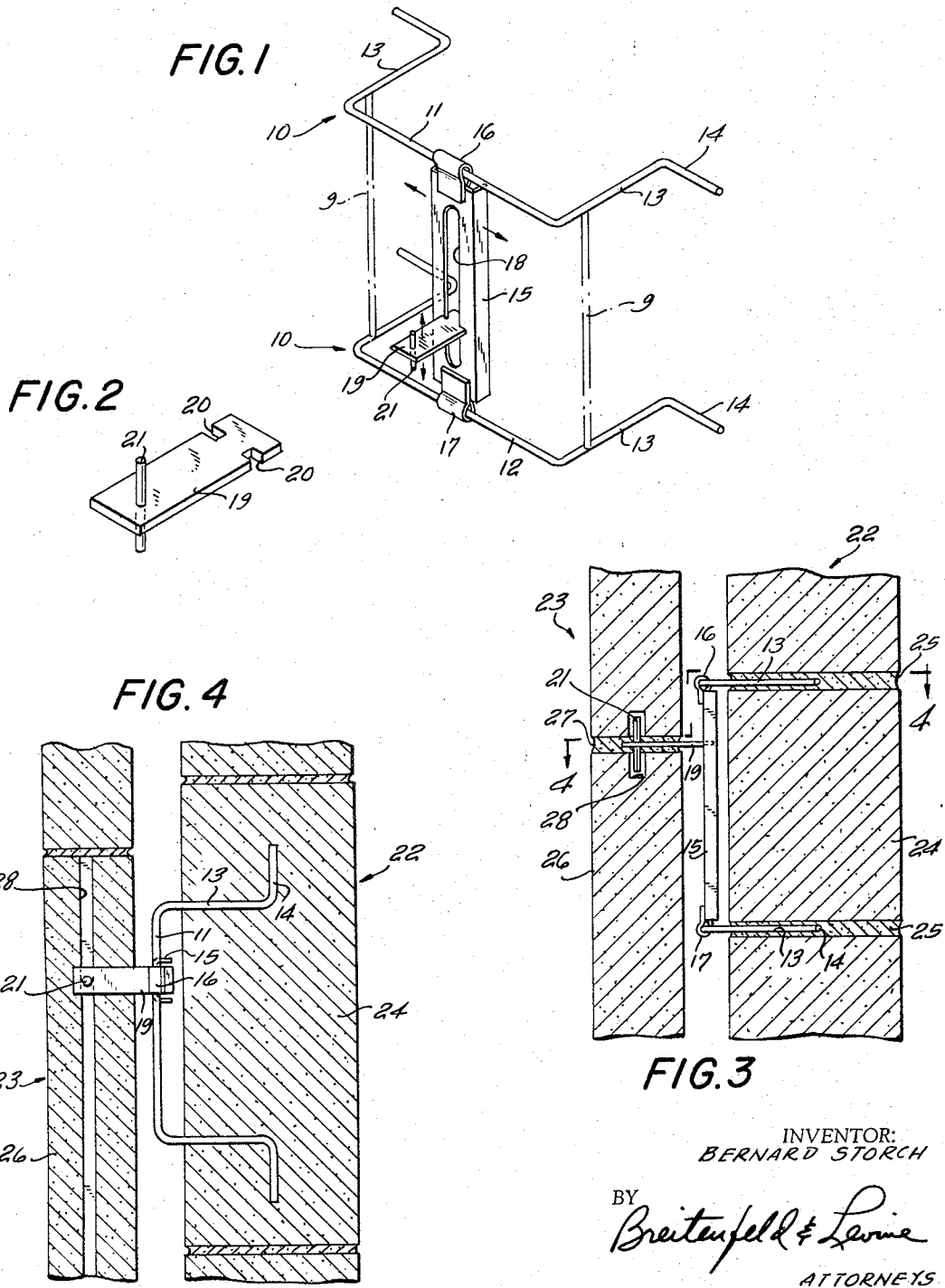
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3,353,312

ADJUSTABLE ANCHORING MEANS FOR MASONRY WALLS

Filed May 11, 1966

3 Sheets-Sheet 1



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FIG. 5

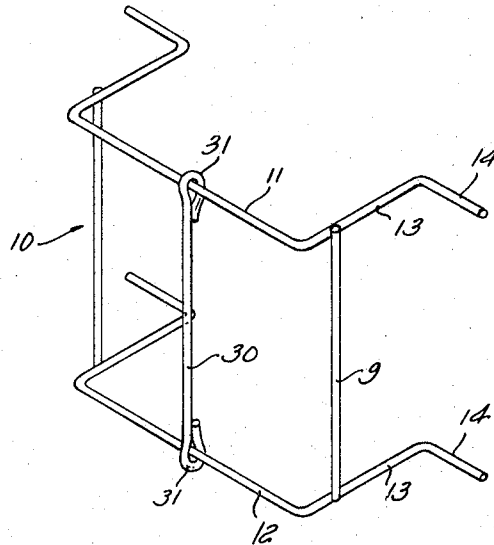
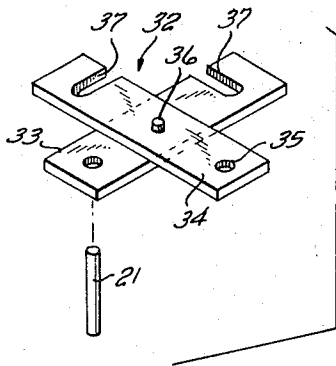


FIG. 6

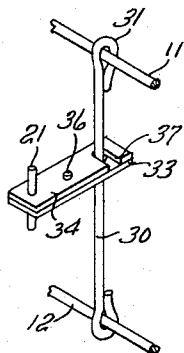


FIG. 6a

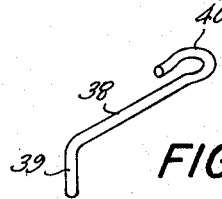


FIG. 7

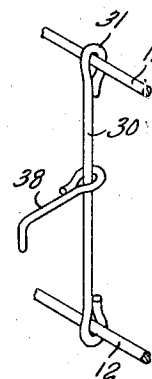


FIG. 7a

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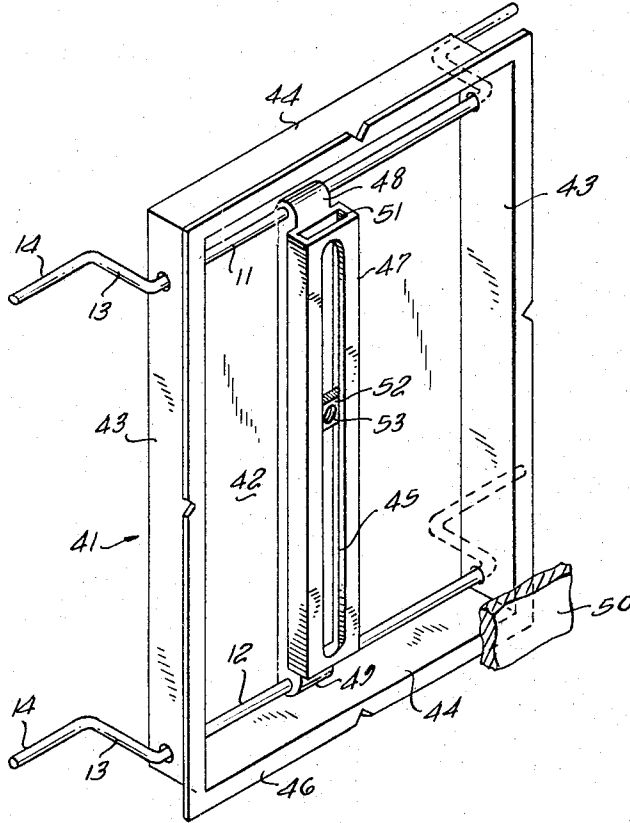


FIG.8

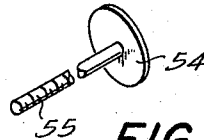


FIG. 9

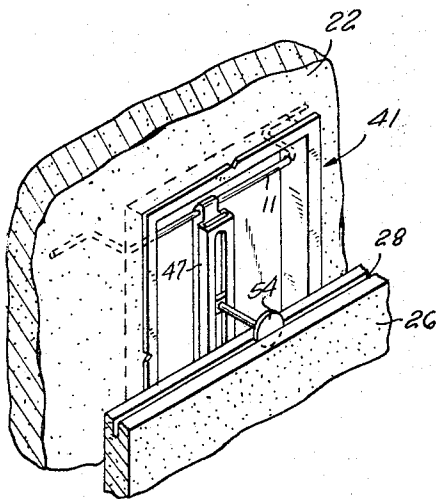


FIG. 10

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ADJUSTABLE ANCHORING MEANS FOR MASONRY WALLS

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8 Claims. (Cl. 52—713)

This invention relates to building wall construction, and in particular to means for anchoring an outer facing wall to an inner masonry wall.

In the construction of walls of buildings, it is well-known practice to first construct an inner wall made of a masonry material, such as concrete blocks or poured concrete, to establish the core or shell of the building construction, and then to construct a facing wall made of material such as brick or stone, which is spaced a relatively small distance from the masonry wall and stands substantially parallel to the inner inner masonry wall. The material of the facing wall provides an improved aesthetic appearance to the building. In this manner a wall construction is obtained which combines the strength of the concrete masonry structure, and the pleasing appearance provided by the outer facing wall.

In such constructions it is necessary to provide means for anchoring the outer facing wall to the inner masonry wall. In many present constructions of the type described, one end of a metal strap is first imbedded in the masonry wall, and the free end of the strap is thereafter embedded in a joint of the facing wall. The free end of the strap is brought to the proper level of the facing wall joint by bending and manipulating the strap until the end of the strap extends at the level of the joint of the facing wall. This known anchoring means has serious disadvantages in that there is a tendency for the strap to fracture or break during the installation operation due to the stresses formed in the strap as a result of its being flexed. The straps also tend to fracture or twist out of shape after the construction of the wall, due to uneven settling of the inner and outer walls, causing the facing wall to be inadequately supported.

It is therefore a general object of this invention to provide a masonry anchoring means which retains the outer facing wall to the inner masonry wall and which overcomes the deficiencies of presently known masonry anchors.

It is a further object of this invention to provide a masonry anchoring means particularly adapted for use with conventional sizes of masonry building elements such as concrete blocks. It is another object of this invention to provide a masonry anchoring means wherein the anchor which is to be imbedded in the facing wall, can be readily moved both vertically and horizontally to align it with respect to a joint being formed in the facing wall.

It is another object of the invention to provide an adjustable connection between the facing wall and the inner wall so that the facing wall will not crack or fail due to movement in the inner wall which may be caused by settlement of the foundation, difference in the rates of expansion, or vibrations caused by winds or earthquakes.

It is a further object of the invention to provide an anchoring means which is completely adjustable in a vertical plane and whose adjustability is not hampered by being embedded in a poured concrete wall.

In accordance with these objects the masonry anchoring means of this invention comprises wire elements which are spaced from one another at a distance corresponding to the height of conventional building blocks, so that a section of the wire which extends rearwardly may be readily embedded into the mortar or cement joint between the blocks forming the inner masonry wall. Extending

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between the two wires is a bracket slidable along the wires in a horizontal direction. The anchor to be embedded in a joint between the stones or other building elements of the facing wall, is mounted in a slidable fashion on the bracket in a manner which permits free vertical motion with respect to the bracket. It can thus be seen that the anchor can be easily and accurately positioned both horizontally and vertically to obtain precise placement of the anchor with respect to the joints in facing wall, and to permit adjustment of the anchor, after completion of the structure, to compensate for relative movement between the inner and outer walls.

Further objects and features of this invention will be apparent from the following detailed description of several embodiments thereof and the accompanying drawings in which:

FIG. 1 is a perspective view of one embodiment of a masonry anchoring means according to the present invention;

FIG. 2 is an enlarged view of the anchor shown in FIG. 1;

FIG. 3 is a vertical section of a building wall construction showing the manner in which the anchoring means shown in FIG. 1 is employed in connecting an outer facing wall to an inner masonry wall;

FIG. 4 is a horizontal section taken along line 4—4 of FIG. 3;

FIG. 5 is a perspective view of a second embodiment of the present invention;

FIG. 6 is an enlarged view of one form of anchor which may be used with the embodiment of FIG. 5;

FIG. 6a is a fragmentary view illustrating the manner in which the anchor of FIG. 6 engages the vertical wire member of the embodiment of FIG. 5;

FIG. 7 is an alternative anchor which may be used with the embodiment shown in FIG. 5;

FIG. 7a illustrates the manner in which the fastener of FIG. 7 engages the vertical wire member of the embodiment shown in FIG. 5;

FIG. 8 is a perspective view showing a third embodiment of the present invention illustrating the manner in which a pan is placed around the anchoring means to enable it to be embedded in poured concrete;

FIG. 9 is an anchor which may be used with the embodiment shown in FIG. 8; and

FIG. 10 is a fragmentary view of a wall construction illustrating the manner in which the anchoring means shown in FIG. 8 is employed in a typical wall construction.

Referring now to the drawings, there is shown in FIGS. 1—4 one embodiment of a masonry anchoring means comprising a frame 10, including two horizontal, substantially parallel wires having straight central portions 11 and 12. Each wire is provided with parallel rearwardly extending legs 13 which are given a second bend near their ends to form oppositely extending feet 14 which extend substantially parallel to the central sections of the wires. The dot-dash lines 9 in FIG. 1 represent optional supporting rods which may be fixed, as by welding, between the legs 13 of the wires to hold the wires in spaced parallel relationship. However, the absence of the rods 9 enables the wires to be pivoted about the ends of bracket 15 (described below) into overlapping relation to provide greater ease of packaging and shipment of the anchoring means.

Disposed between the central sections 11 and 12 of the wires is a bracket 15 which has attachment sleeves 16 and 17 securely fastened to its upper and lower ends, the sleeves surrounding the central runs 11 and 12 of the wires in a manner enabling free horizontal movement of bracket 15 along the horizontal runs 11 and 12. Bracket 15 has a U-shaped cross-section, and its central wall is formed with a longitudinally extending, vertical slot 18.

Vertically slidable within slot 18 is a forwardly projecting anchor 19 comprising a rigid strip having notches 20 formed in its opposite sides near the inner end of the anchor. At the other end of anchor 19, a fixed pin 21 extends vertically above and below the rigid strip as shown in FIG. 2. The notches 20 of anchor 19 engage the longitudinal edges of slot 18 in a manner providing free vertical movement of anchor 19 within slot 18 so that the level of bracket 19 can be set at any point along the longitudinal axis of slot 18. Therefore it will be seen that by the use of the novel anchoring means of the present invention, the position of pin 21 on anchor 19 may be freely set in both the vertical and horizontal directions to insure precise and relatively simple adjustment of the end of the anchor carrying pin 21.

The application in a wall construction of the masonry anchoring means of FIG. 1 is shown in FIGS. 3 and 4. The bracket 15 is positioned between an inner masonry wall 22 and an outer facing wall 23. As seen in FIG. 3 the frame 10 is adapted to straddle an individual concrete block 24 of the inner wall and the legs 13 and feet 14 of the wires extend into joints 25 between individual blocks of masonry wall 22. These joints 25 are filled with material such as cement or mortar. The facing wall 23 is similarly composed of a number of individual building units 26 made of material such as stone, marble, or brick, which are joined together, by cement or mortar at joints 27. A groove 28 is formed in the upper and lower edge of each facing wall unit 26 as shown in FIGS. 3 and 4. Grooves 28 are of sufficient depth to receive pin 21 of anchor 19. Thus, with the legs 13 of frame 10 embedded in the inner wall 22, and the pin 21 of the anchor 19 embedded in the facing wall, an adjustable connection between the walls is effected by the interengagement of the anchor 19 and bracket 15.

As the joints 27 of the outer wall 23 may not be aligned with the joints 25 of inner wall 22, it can be seen that it is of importance to be able to accurately position anchor 19 in proper position so that pin 21 may be readily embedded within the joints of the facing wall. From FIG. 4 it can be seen that anchor 19 and pin 21 may be horizontally moved by means of the slidable connection between sleeves 16 and 17 and frame sections 11 and 12, near the centerline of building unit 26, and the anchor can be moved vertically with respect to the bracket 15 to align the anchor with a horizontal joint between units 26.

A second embodiment of the present invention is shown in FIGS. 5 through 7a. In these figures, elements which are similar to those shown in the first described embodiment, are described by similar reference numerals. In FIG. 5, two rods 9 may be secured by means such as welding to the horizontal wires of frame 10 for the purposes discussed with reference to the dot-dash lines shown in FIG. 1. In place of the bracket 15 of FIGS. 1-4, this embodiment employs a wire 30 having hooks 31 formed at each end which are slidably placed over the central sections 11 and 12 of the frame 10. In this manner wire bracket 30 may be moved horizontally, either to the left or the right, along wire sections 11 and 12.

FIGS. 6 and 6a illustrate one possible form of anchor adapted to cooperate with bracket 30 and to be embedded within the joints of the facing wall 23. The anchor 32 is formed of two rectangular plates 33 and 34, pivotally connected at their centers by a pivot pin 36. Each plate has a hole 35 formed near one end, the holes 35 being brought into superposed relation when the plates 33 and 34 are pivoted into alignment. Near the opposite end of each plate, slots 37 are formed so that when the plates are pivoted into alignment, as shown in FIG. 6a, slots 37 will come together to form an aperture through which wire bracket 30 can slidably pass. A pin 21, equivalent to the pin described with reference to the first described embodiment, is placed through holes 35 and is adapted to be embedded within grooves 28 of the facing wall building units 26. In the arrangement shown in FIGS. 6 and

6a, anchor 32 is engaged with wire bracket 30 by placing the groove 37 of the lower plate 33 around wire 30 and then pivoting the upper plate 34 in a clockwise direction into alignment with lower plate 33. When pin 21 is placed through holes 35, further pivoting of plates 33 and 34 is prevented.

An alternative form of anchor which is to be embedded in the outer facing wall is shown in FIGS. 7 and 7a. A rigid wire 38 is formed with a bend 39 which corresponds in function to pin 21 of the previously described embodiments. At the other end of wire 38, a hook 40 is formed which slidably engages wire bracket 30. The assembly of anchor 38 with bracket 30 is shown in FIG. 7a wherein it is seen that bracket 30 is free to move horizontally along wire sections 11 and 12, while anchor 38 is free to move vertically along bracket 30.

A third embodiment of the present invention is shown in FIGURES 8, 9, and 10, in which once again, parallel spaced wires have straight central portions 11 and 12, rearwardly extending legs 13, and feet 14, the legs and feet being adapted to be embedded in an inner masonry wall. This embodiment of the invention is particularly adapted for use with constructions in which the inner masonry wall is formed of poured concrete rather than concrete blocks. A pan 41 of generally rectangular shape, is disposed around the central sections 11 and 12 of the wires, and the legs 13 and feet 14 extend externally of the pan 41. The placement of pan 41 about the central sections 11 and 12 of the wires permits the masonry anchoring means to be used with poured concrete since the pan prevents the concrete from covering the wire sections 11 and 12, and hence the bracket 47 can slide on the wire sections. When the poured concrete has hardened, the pan 41, legs 13, and feet 14 are embedded within the inner masonry wall, as shown in FIG. 10, but the wire sections 11 and 12 are spaced from the wall.

Pan 41 comprises a rear wall 42 from which side walls 43 and top and bottom walls 44 extend in a forward direction. A flange 46 extends about the perimeter of the walls 43 and 44. In practice, the pan is temporarily secured, by means of flange 46, to the inner face of the outer wall 50 of the form into which the concrete is poured to produce the inner wall 22 (FIG. 10). A bracket 47 is provided with sleeves 48 and 49 at the top and bottom ends thereof. Sleeves 48 and 49 slidably accommodate wire sections 11 and 12 respectively to permit free horizontal movement of bracket 47 along wire sections 11 and 12. A central longitudinal slot 45 is formed within the front wall of bracket 47 and the bracket has a hollow interior 51 in the form of a rectangular slot which extends longitudinally within the bracket 47. The slot 51, which is wider than the slot 47, accommodates a nut 52, having an internally threaded hole 53 formed therein, the unit being free to slide along the entire length of bracket 47.

One form of anchor which may be used with the embodiment of FIG. 8 is shown in FIG. 9 and includes a circular disk 54 from which a threaded stud 55 extends, the stud being located at the center of the disk and arranged perpendicular to the disk. Threaded stud 55 is adapted to threadedly engage the threaded hole 53 of nut 52 so that the anchor may be mounted to move vertically along the length of bracket 47. Since the bracket is movable horizontally along wire portions 11 and 12, it will be appreciated that the anchor can be adjusted both vertically and horizontally. The manner in which disk 54 and stud 55 are connected to bracket 47 is shown in FIG. 10, which also shows the outer periphery of disk 54 engaging the longitudinal groove 28 of a building unit of the outer wall 23.

It is to be understood that the embodiments shown and described in the drawings and specification are primarily for purposes of illustration and are not meant to limit the scope of the present invention, for which reference should be had to the claims appended below.

What is claimed is:

1. For use in a masonry wall construction having an inner masonry wall and an outer facing wall, means for anchoring said facing wall to said masonry wall comprising:

- a pair of spaced parallel wire members adapted to be embedded in said masonry wall,
- a bracket slidably supported at either end thereof to said wire members, said bracket being adapted to be disposed in the spacing between said masonry and facing walls, and

an anchor projecting outwardly from said bracket and slidable along the length of said bracket, said anchor being adapted to engage a building unit of said facing wall,

whereby said bracket is free to move parallel to said wire members and said anchor is free to move perpendicular to the direction of movement of said bracket.

2. A masonry anchoring means as recited in claim 1 wherein said bracket is provided with a longitudinal slot, and said anchor carries at its end means slidably cooperable with said slot.

3. A masonry anchoring means as recited in claim 2 wherein said anchor comprises a rigid strip, and said cooperable means includes notches formed in opposite sides of said strip for engaging the periphery of said slot, and including a laterally projecting member fixedly mounted near the outer end of said strip for engaging a building unit of said facing wall.

4. A masonry anchoring means as recited in claim 2 wherein said anchor comprises a threaded stud, and said cooperable means includes a unit slidably arranged in said slot and adapted to threadably accommodate said stud, and including a disk fixed to the outer end of said stud for engaging a building unit of said facing wall.

5. A masonry anchoring means as recited in claim 1 wherein each of said wires is bent at either end thereof at substantially right angles to form a pair of rearwardly extending sections, each of said rearwardly extending sections being bent at substantially right angles to form oppositely directed segments substantially parallel to the central portion of said wire, the rearwardly extending sections of said wires being spaced apart a distance equal to the height of a masonry block so that the anchoring means can straddle such a block.

6. A masonry anchoring means as recited in claim 1 further comprising a rectangular pan having a pair of opposing side walls having openings formed therein, through which said wires are passed.

7. A masonry anchoring means as recited in claim 1 wherein said bracket comprises a third wire having a hook formed at either end thereof for freely engaging each of said spaced wires.

8. A masonry anchoring means as recited in claim 7 wherein said bracket comprises a fourth wire having a hook formed at one end for freely engaging said third wire, and a laterally extending portion formed at its other end for engaging a building unit of said facing wall.

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