Feb. 15, 1966 J. S. ZIBELL 3,234,702

ANCHORING SYSTEM FOR THE INSTALLATION OF SLABS ON VERTICAL AND OVERHEAD SURFACES

Filed Dec. 27, 1960 2 Sheets-Sheet 1

FIG. 1

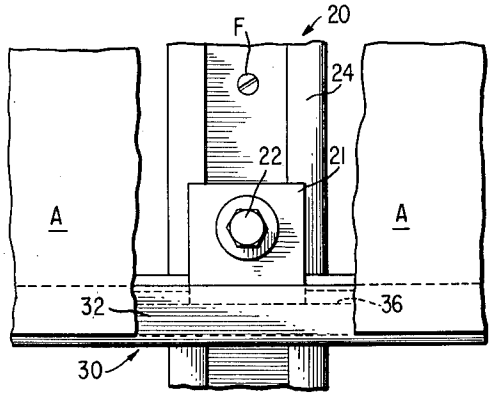


FIG. 2

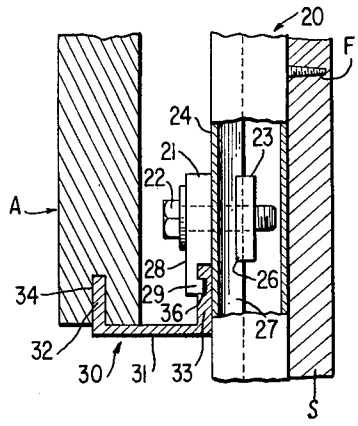


FIG. 4

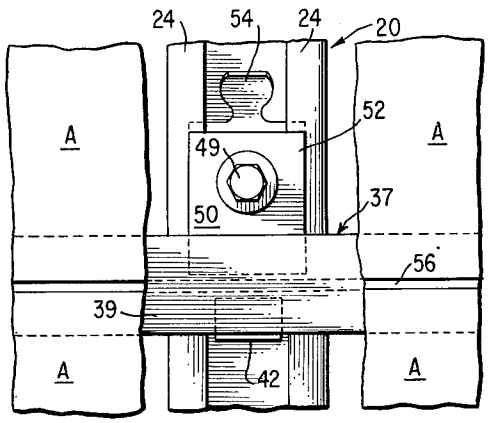
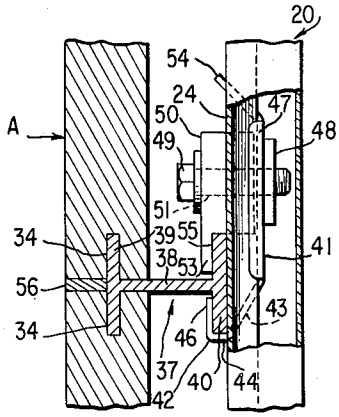


FIG. 5



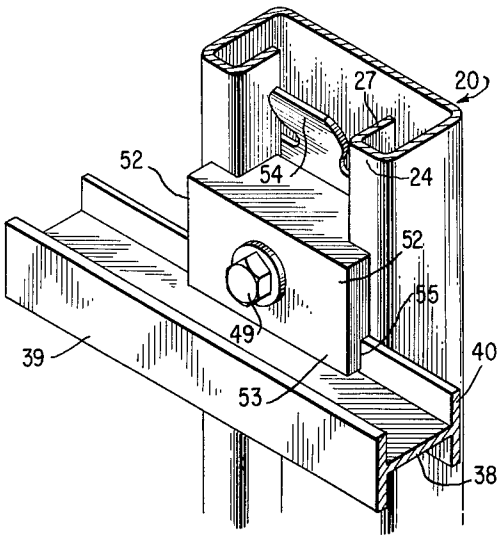


FIG. 3a

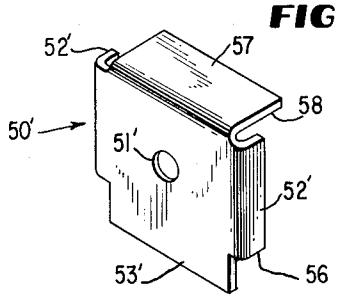


FIG. 3

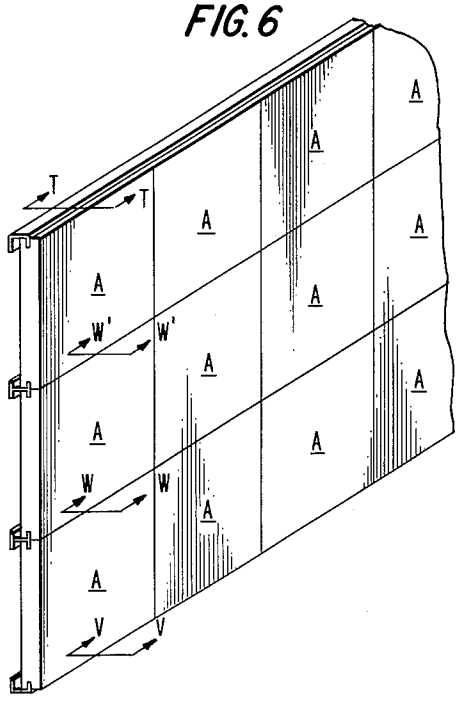
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FIG. 6



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ANCHORING SYSTEM FOR THE INSTALLATION OF SLABS ON VERTICAL AND OVERHEAD SURFACES

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This invention relates in general to the anchoring of wall forming materials to structural members and more particularly to anchoring systems for facing slabs for both interior and exterior construction.

An object of this invention is to provide an improved anchoring system for facing materials wherein the anchoring points are easily aligned and plumbed so as to accurately establish the face of the finished wall.

Another object of this invention is to provide an anchoring system for facing materials which provides continuous support therefor.

Another object of this invention is to provide an anchoring system for facing materials which assures a positive weather seal at the joints of the facing material.

The invention is most advantageously used with slabs, for example, marble, having a kerf or groove formed in at least two peripheral edges thereof. The invention features shaped metal struts having a generally U-shaped configuration with the legs thereof being formed with inwardly facing flanges or re-entrant sections, said shaped metal struts being secured to structural members of the structure which is to be covered with the facing material. These struts are located at desired intervals to provide repeating anchoring points. According to the invention, the facing material is supported from these metal shaped struts by means of anchor members, each of which includes a web portion which spaces the facing material from the struts, a kerf inserted or engaging portion formed on the end of the web and a strut engaging portion secured to the strut. According to one embodiment, a bedding or base channel anchor and cap channel anchor are formed from an extruded U-shaped channel member. Preferably, one leg of the U-shaped member is made longer than the other leg of the U-shaped member and this long leg is formed with a longitudinally extending groove which receives a recessed projection formed on a clip element. The arrangement according to this embodiment is such that the outside surface of the U-shaped strut member and the surface of the clip carrying the recessed projection are coplanar. When a bolting means for securing the clip to the strut member is applied, the U-shaped channel member is rigidly held in place.

According to a second embodiment, an H-shaped extruded channel member is secured to the strut member by means of a two part anchoring clip, one of the clip parts having a hook formed on one end thereof for hooking over a portion of one of the flanges of the H-shaped channel member while the other clip part has an extension which cooperates with the hook on said first clip part to substantially surround the flange of the H-shaped channel member abutting said strut member and secured together and to the strut by a cap screw. A tab formed on one of the clip parts facilitates positioning of the two part clip assembly in the strut member. The other flange of the H-shaped channel member has one-half thereof received in the kerf of an adjacent slab. The arrangement is such that the thickness of the web joining the two flanges of the H-shaped member spaces the two contiguous slabs a sufficient distance apart so that a mortar joint may be formed between the two slabs. In addition, a positive weather seal at the joint is effected.

Other objects, advantages and features of the invention will appear from the following description taken in connection with the drawing, in which:

FIGURE 1 is a front elevational view of one embodiment of this invention;

FIGURE 2 is a cut-away of FIGURE 1;

FIGURE 3 is an isometric view of another embodiment of the invention;

FIGURE 3*a* is a modified clip part of the two part clip assembly shown in FIGURE 3;

FIGURE 4 is a front elevational view of the assembly shown in FIGURE 3;

FIGURE 5 is a cross-sectional view of the arrangement shown in FIGURE 4;

FIG. 6 is a view of a marble slab wall constructed in accordance with the invention.

Referring now to FIGURES 1 and 2 of the drawings a U-shaped metal strut **20** is secured to a structural member S of the structure to which the facing material A is to be applied by any suitable fastening means, as for example, screws F. There will of course be a plurality of such strut members **20** secured to the structural members at desired intervals to provide repeating anchoring points. Each U-shaped metal strut may be formed, rolled or extruded to produce a channel-like section with inwardly facing flanges or re-entrant portions **27**. A clip member **21** is secured by cap screw **22** and locking nut **23** in abutting relation to the planar edges **24** of the strut member **20**. Locking nut **23** has raised edges **26** which fit over the inside edges of the re-entrant portions **27** of the legs of the strut member **20** and prevent turning of the locking nut **23**.

One end **28** of clip member **21** is provided with a recessed projection or ridge **29**. A continuous U-shaped channel member **30** having a web portion **31** and a kerf engaging short leg **32** and a strut abutting long leg **33** is secured by the clip member **21** in abutting relation to the channel strut **20** and supports the slab A when the kerf **34** of the slab is fitted with the kerf engaging leg **32** of the channel member **30**. There will, of course, be a clip member at each intersection or anchoring point of channel member **30** with the struts **20**. Long leg **33** of channel member **30** and clip **21** have complementary locking abutments formed thereon. Thus, long leg **33** of the channel member **30** has a groove **36** which receives the recessed projection **29** of the clip member **21**. It will be noted that the long leg **33** of the channel member **30** is thicker than the short leg **32** so that the groove **36** may be formed in the long leg **33** without unduly weakening the support.

While the foregoing description of FIGURES 1 and 2 relate to a bedding or base channel anchoring arrangement, it will be obvious that this same arrangement may be used as a cap channel anchor for use when changing to another type of material or at window sills, copings, etc. This may be done by securing the clip member **21** in an upright position prior to insertion of the channel member **30**. The channel **30** is placed in the kerf **34** of the slab and driven longitudinally until the recessed projection **29** on the clip member **21** is seated within channel groove **36** to interlock these parts. Of course, the width of recessed projection **29** will be slightly less than the width of channel groove **36** to avoid interference when the channel **30** is driven into place.

The anchor shown in FIGURES 3, 4 and 5 is an intermediate joint anchor and includes an H-shaped channel member **37** having a web **38** joining kerf engaging flange **39** and strut abutting flange **40**. Strut abutting flange **40** is secured in an abutting relationship to edges **24** of channel strut **20** by means of a two part clip assembly. A first clip part **41** has formed on one end thereof a hook

42, the hook being formed with an angle section 43, which angles downwardly and outwardly from the body portion of the clip part 41, a base 44 which extends in a direction normal to the body of the clip part 41 and a third portion which is normal to the direction of the base part 44 of the hook 42. As shown in FIGURE 5, clip part 41 is positioned inside of the channel and has laterally extending flanges or wings 47 which are turned outwardly so as to engage the inside edges of re-entrant portions 27 of the strut 20. A threaded nut 48, which may be integral with the clip part 47, receives a cap screw 49 passing through a second clip part 50. Second clip part 50 is provided with a bore 51 through which passes cap screw 49 so that when cap screw 49 is threadedly engaged with locking nut 48, the clip assembly is secured to the channel strut 20. It will be noted that second clip part 50 has laterally extending flanges or wings 52 which abut edges 24 of the strut member 20. A cut out portion 55 on the lower edge of second clip part 50 fits over the upper portion of flange 40 so that when the cap screw 49 is tightened, the flange 40 of the H-shaped member 37 is clamped to strut 20.

Extension 53, which is formed by the cut-out 55 of the clip part 50 extends substantially to the web portion 38 of the H-shaped channel member 37, as does hook part 46 on clip part 41. By this arrangement, a large area of frictional engagement is formed on the H-shaped channel member. It will be noted that the flange 40 of the H-shaped channel member 37 is substantially completely enclosed by the two clip parts 41 and 50 and a portion 24 of the U-shaped channel strut 20. On the upper end of clip part 41 is formed a tab 54, which tab facilitates the positioning of the clip part in strut 20.

It will also be noted that the web portion 38 of the H-shaped channel member 37 gauges the joint thickness which joint may be filled wit hmortar 56 or other joint filling material.

As shown in FIGURES 3, 4 and 5 clip part 50 is a solid block of metal. Preferably, however, clip part 50 may be fabricated from relatively heavy gauge sheet metal such as shown in FIGURE 3*a*. The part 50′ shown in FIGURE 3*a* may be stamped from sheet metal so that wings 52′ are struck or bent inwardly to form a shoulder 56 which shoulder abuts the upper edge of flange 40 on the H-shaped channel member 37. Likewise, inwardly bent tab 57 is shaped so that its edges 58 engage the inner side of re-entrant portions 27 on the legs of the U-shaped strut member 20.

In a similar fashion, the clip part 21 shown in FIGURE 2 may be fabricated from sheet metal as shown in FIGURE 3*a* with the downward extension 53′ turned inwardly to form an inset or recessed projection similar to the recessed projection 29 shown in FIGURE 2.

FIG. 6 is an isometric view of a wall assembly incorporating the invention. The bed, or bottom anchor joint, at section V—V, is of a load bearing type as is illustrated in FIG. 2. The anchor joint taken on the line W—W may be a load bearing intermediate anchor joint as is illustrated in FIGS. 3, 4 and 5, or similar to the type shown in FIG. 2 wherein channel member 31 is H-shaped similar to channel member 37 of FIGS. 4 and 5. The cap, or top joint, taken along the line T—T may be the assembly shown in FIG. 2 turned around so that the channel 31 opens downwardly. It will also be appreciated that the locking structure shown in FIG. 2 may be applied to the assembly shown in FIGS. 3, 4 and 5 and vice versa.

Although there is shown and described preferred embodiments for anchoring facing materials, it will be understood that various other modifications are feasible which still fall within the spirit and scope of the invention and accordingly the invention is not intended to be limited except as set forth in the following claims.

What is claimed is:

1. In a mounting system for relatively heavy slab facing materials,

a plurality of U-shaped strut members having re-entrant flange portions on the legs thereof,

means securing said strut members in spaced relation to each other to structural members forming the structure on which said facing slabs are to be mounted,

a plurality of channel members spaced with respect to each other and disposed at angles to said struts,

each of said channel members having a strut abutting leg, a leg for supporting a facing slab and a web portion integral with and joining said legs,

said strut abutting leg of each channel member having a longitudinally extending groove formed in the inside surface thereof opposite the strut abutting surface of said strut abutting leg,

a plurality of clip members, one at each intersection of a channel member with a strut member,

a projection formed on each of said clip members and fitted into the groove formed in said inside surface of said abutting legs, and

means for securing said clip members to said strut members to thereby secure said channel members to said strut members by interlocking engagement of said projection on said clip members with said grooves in said channel members, respectively, including a locking nut bearing against the inner edges of said re-entrant flange portions of said strut members and a bolt member passing through said clip members and operatively engaged with said locking nut,

whereby, at least a pair of said channel members cooperatively engage the edges of a plurality of slabs of facing material from opposite sides thereof and between said legs, said web portion of said channel members serving as a spacer by spacing the supported slabs from said strut members and as a joint gauge between successive slabs of facing material.

2. An anchoring system for slab facing materials comprising

a plurality of U-shaped struts each having re-entrant flange portions formed on the legs thereof, and secured in spaced relation to each other to structural members forming the structure on which said slabs are to be anchored,

a plurality of parallel channel members spaced with respect to each other and disposed at angles to said struts,

each said channel member having a web portion joining a strut abutting leg and a slab engaging leg, said strut abutting leg of said channel member having a longitudinally extending groove formed on the inside surface thereof,

a plurality of anchoring clips, one at each intersection of a channel member with one of said struts,

a recessed projection formed on each of said anchoring clips fitted within the groove in said channel members so that the outside surface of said strut abutting leg and the surfaces of said clips having said recessed projection therein are substantially co-planar,

and fastener means securing said clips with said recess projection in said grooves,

said fastener means including a locking nut bearing against the inner edges of said re-entrant flange portions of said strut members, a bolt means passing through said anchoring clips and engaged with said locking nut, respectively,

whereby the slab engaging legs of pairs of adjacent channel members cooperatively support a slab of facing material therebetween.

3. An anchoring assembly for facing materials having kerfs formed in the peripheral edges thereof comprising,

a plurality of U-shaped channel struts, each channel strut having re-entrant flange portions formed on the legs thereof, and each of said channel struts being secured in spaced relation to each other to the struc-

tural members forming the structure on which the materials are to be secured,

a plurality of channel members spaced with respect to each other and disposed at angles to said struts,

each of said channel members having at least two leg members joined by a web member and with one of said leg members being inserted into the kerf of the facing material,

means securing said channel members to said struts in the above-stated relation comprising a plurality of clip members, one at each intersection of a channel member with one of said struts,

complementary locking abutments formed on the other leg of said channel members and on said clip members,

and fastener means for securing said clip members to U-shaped strut members, respectively, with said complementary locking abutments in operative engagement,

said fastener means including a locking nut bearing on the inner edges of said re-entrant flange portions of said strut members and a bolt operatively engaged with said locking nut and passing through said clip members, respectively.

4. An assembly for mounting a pair of relatively heavy slabs such as marble comprising,

a U-shaped channel strut having re-entrant flange portions formed on the legs thereof, respectively,

a pair of oppositely facing channel members each having legs thereon inserted in kerfs formed in the opposite outside edges of said slabs, respectively,

a third channel member having legs thereon inserted in kerfs formed in contiguous edges, respectively, of said slabs,

anchor members securing each of said channel members to said struts,

said anchor members and another leg of said channel members having complementary locking abutments formed thereon,

and fastener means for securing said anchor members to said U-shaped strut members, respectively, with said complementary locking abutments in operative engagement with said anchor members,

said anchor members abutting against the outside edges of the re-entrant flange portions of said U-shaped strut, and including a locking nut on the inside edges of said re-entrant flange portions,

and bolt means operatively engaged with said anchor members and said locking nut.

5. A wall as defined in claim 4 wherein the channel members and anchor members carrying said complementary locking abutments are extruded sections.

6. An assembly for mounting a plurality of relatively heavy slabs such as marble comprising, in combination,

a plurality of U-shaped channel struts having re-entrant flange portions on the legs thereof, said channel struts being secured in spaced relation to structural members forming the structure on which said slabs are to be mounted,

a bottom channel member, a top channel member, and at least one H-shaped intermediate channel member,

each of said channel members having legs thereon inserted in kerfs formed in the edges of said slabs, respectively, with said intermediate channel member having legs thereon inserted in kerfs formed in contiguous edges of adjacent slabs,

and anchor members for each of said channel members at the intersections, respectively, of said channel members with said spaced struts,

said anchor members and another leg of said channel members having complementary locking abutments formed thereon,

and fastener means securing said anchor members to said struts, including a locking nut bearing against the inner edges of said re-entrant flange portions on said struts and a bolt member passing through said anchor members and in operative engagement with said locking nut and said anchor member.

7. A wall comprising a plurality of relatively heavy slabs such as marble, arranged in a generally co-planar assembly, each slab having kerfs in the peripheral edges thereof,

a plurality of U-shaped struts having re-entrant flange portions on the legs thereof, said struts being secured in spaced relation to each other to structural members supporting the wall,

a plurality of channel members, including a top channel member, a bottom channel member, and at least one intermediate channel member,

each of the channel members having legs thereon inserted in the kerfs of said slabs, respectively, with legs of said intermediate channel members being inserted in the kerf formed in contiguous edges of adjacent slabs,

anchor members for each of said channel members at the intersection of a channel member with a strut member, respectively,

said anchor members and another leg of said channel members having complementary locking abutments formed thereon,

and means securing said anchor members to said struts with said complementary locking abutments on said channel members and on said clip members in operative engagement to secure said channel members to said strut members in the above-stated relation, said securing means including a locking nut bearing against the inner edges of said re-entrant flange portions and bolt means passing through said anchor members and operatively engaged with said locking nut.

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