

Jan. 24, 1939.

A. H. STEWART

2,145,103

TILE STRUCTURE

Filed Oct. 6, 1936

2 Sheets-Sheet 1

Fig. 1.

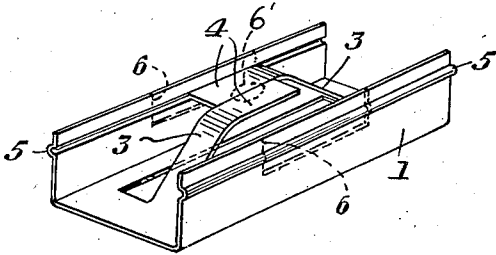


Fig. 2.

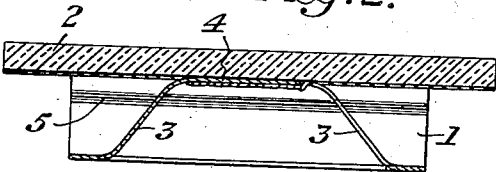


Fig. 4.

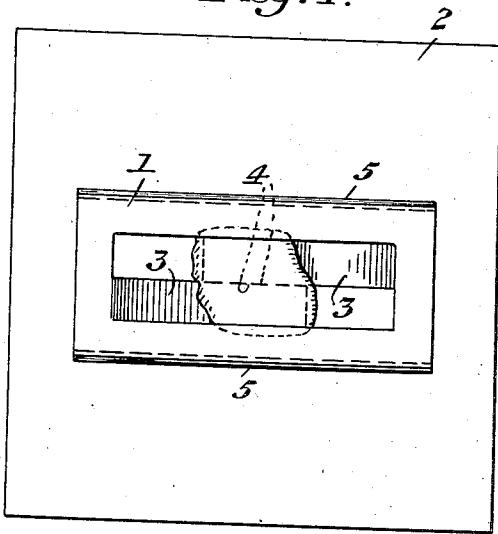


Fig. 5.

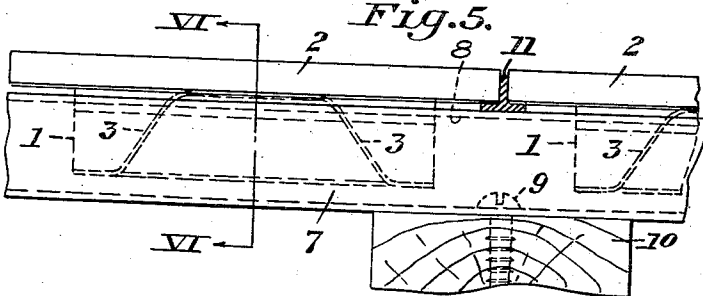


Fig. 3.

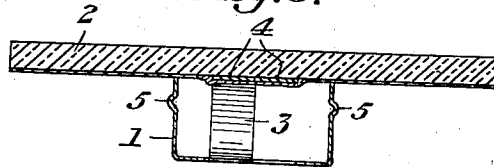


Fig. 7.

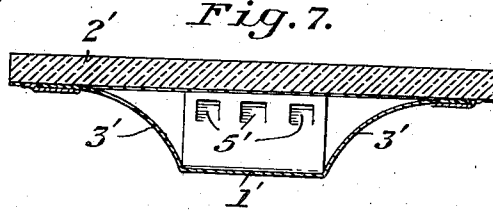
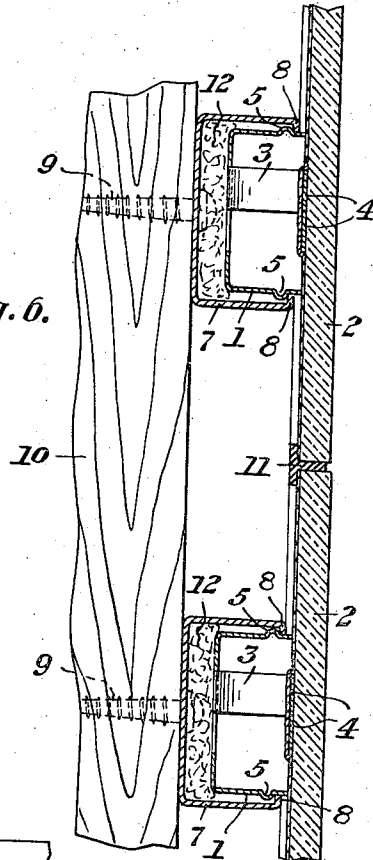


Fig. 6.



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2 Sheets-Sheet 2

Fig. 8.

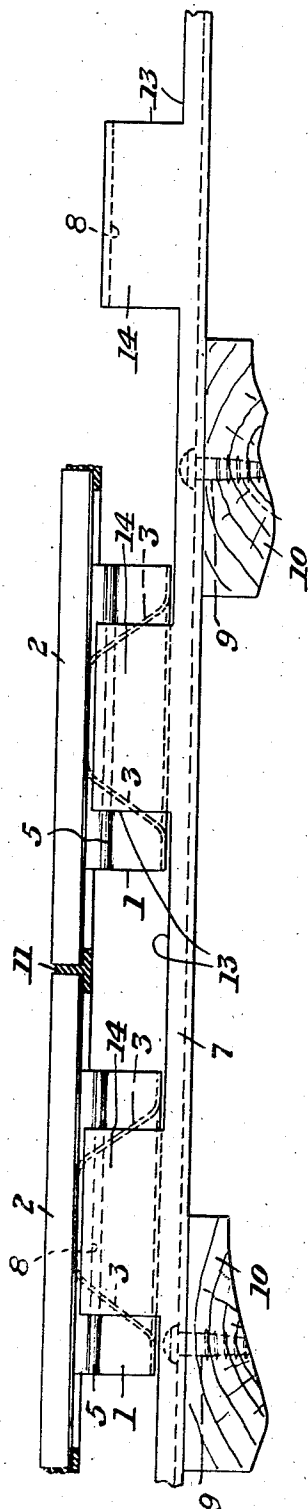
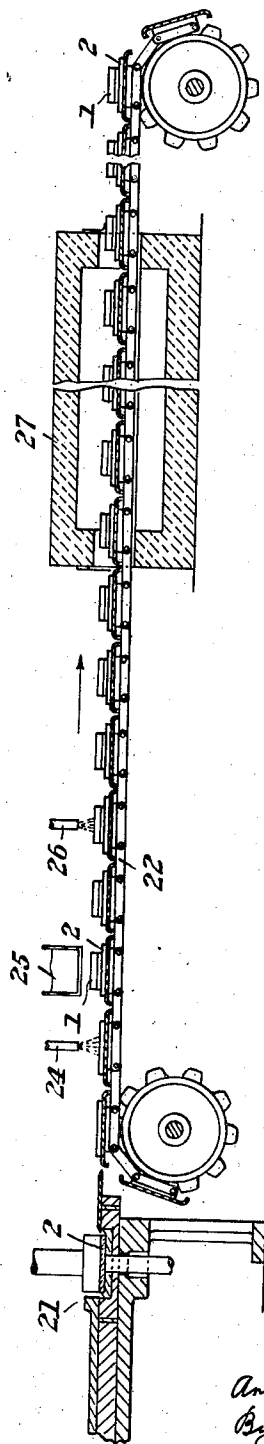


Fig. 9.



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UNITED STATES PATENT OFFICE

2,145,103

TILE STRUCTURE

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Application October 6, 1936, Serial No. 104,186

11 Claims. (Cl. 72—19)

This invention pertains to improved tile mounting structure, and to procedure for manufacturing tile employing such structure.

It has been customary to use cementitious or plastic materials or metal clips in connection with plastic materials for mounting tile on a building construction, but such a mounting does not permit the desired independent expansion and contraction of the tile without sacrificing security of mounting. Considerable difficulty has arisen in devising mount structures which will be commercially practicable and which will permit such independent expansion and contraction between the tile and the wall surface.

Previous to the present invention, no one has been able to physically secure metallic mount elements to the back of a tile in such a manner as to permit sufficient freedom of expansion and contraction of the tile independently of the mounting structure without excessive cost. Tile projections embedded in cementitious material hold the tile rigidly in position.

In view of the above considerations, it has been an object of my invention to devise a successful method for physically securing mount elements, such of metal construction, to tile of ceramic, vitreous, or some similar materials at relatively low cost.

Another object has been to provide a new and improved form of mount structure for tile and similar elements which will permit the tile to sufficiently expand and contract independently of the structure and/or of the building to which it is secured.

A further object has been to provide an improved form of mount structure for tile which may be suitably separately fabricated, and then, physically secured to the tile.

These and many other objects of my invention will appear to those skilled in the art from the description thereof, the claims, and the accompanying drawings, in which—

Figure 1 is a perspective view in elevation of a mount element separately fabricated in accordance with my invention and which is later physically secured to the back of a tile;

Figure 2 is a side section in elevation of a tile constructed in accordance with my invention and having a mount element such as shown in Figure 1 securely and physically attached to the back face thereof;

Figure 3 is an end section in elevation of the structure of Figure 2;

Figure 4 is a back plan view of the structure of Figures 2 and 3;

Figure 5 is a side sectional view through a building construction showing tile mounted in accordance with my invention;

Figure 6 is a section taken along the line VI—VI of Figure 5;

Figure 7 is a section similar to that of Figure 2, but showing a modified form of mount structure, which is especially adaptable for replacing tile;

Figure 8 is a side sectional view similar to Figure 5, but showing a modified wall-positioned mount structure; and

Figure 9 is a longitudinal side elevation, showing somewhat diagrammatically, a manufacturing layout for producing the tile structure of my invention.

Since considerable trouble is generally encountered in obtaining labor sufficiently skilled to properly mount tile in position, an aspect of my invention deals with the provision of a simple form of mount structure such that unskilled workmen may quickly and effectively place the tile in position on the building.

In Figure 1, I have shown a preferable form of mount element 1 of metal suitably fabricated and ready to be physically attached to the back face of a tile, see Figure 2. The channel-shaped element 1 is provided with a pair of centrally pressed in, flexible, strap-like strip portions 3 whose legs incline inwardly and terminate as planar feet portions 4. These legs are elastic enough to prevent severe strain arising due to the expansion and contraction of the parts; that is, they permit the desired amount of independent expansion and contraction between the tile and the mount structure. The feet portions 4 are preferably positioned in such a manner that their outer faces abut the same plane as the bottom edges of the side flanges of the element 1. Thus, these bottom edges as well as the bottom faces of the feet 4 abut the back face of the tile 2 to which the element is to be secured. As shown at 6, adjacent edge portions of the feet 4 may be cut out or spaced with respect to each other in order to permit bonding metal to enter therebetween and provide a central point of attachment.

Each side flange portion of the element 1 is provided with a longitudinally-extending bead 5 that cooperatively engages opposite track portions or bent in side edges 8 of a secondary mount element 7, also preferably of channel form, see Figures 5 and 6. The channel element 7 is adapted to be mounted on the building by any suitable means 9 such as screws, bolts, rivets, etc., located at spaced intervals therealong. In

Figures 3 and 4, the element 7 is removably secured to studs 10. The primary element 1 is mounted in the secondary element 7 by moving or sliding it in endwise along the track portions.

Adjacent tile may be insulated, sealed, and spaced with respect to adjacent tile by a T-shaped, longitudinally-extending element 11 of flexible or resilient material. As seen, each secondary element 7 preferably extends longitudinally the full length of a room of the building and is laterally spaced with respect to adjacent secondary elements, see Figures 5 and 6.

As shown by the dotted lines 6 of Figure 1, the primary mount element 1 may have a central section cut out of each of its sides to eliminate any danger of such side portions becoming metal-sealed when the feet 4 are being secured to the tile 2 by metal spraying. This also enables the uncut portions to slide more easily along the tracks of the secondary mount element 7.

In Figure 6, I show cushioning material 12, such as felt, which may be inserted between the primary and the secondary mount elements 1 and 7, respectively, in order to, if necessary, hold the elements rigidly in position. However, coiled springs or steel wire, etc., may also be employed, with or without the material 12.

In Figure 7, I have shown a modified primary structure 1' which has end straps 3' and snap projections 5' which enable the assembly including tile 2' to be quickly pushed into position between the track portions of the secondary element 7 from the front face of the tiling. This is especially advantageous when one or two broken tile are to be replaced without disturbing the others. A broken tile may be removed by further breaking it into small pieces and the metal mounting section may then be removed by pliers (mechanical means).

The primary mount element 1 of the tile 2 may be mounted in the secondary element 7 by sliding the former in endwise from an end of the latter; in this way, a line of tile 2 may be mounted on the element 7. If the element 2 is sufficiently springy, it may be pressed into position between the flanges of the element 3. I, however, prefer a fairly heavy gauge, for example, 28 gauge, and for this reason the slide method of mounting is preferable.

In the embodiment of Figure 8, I have cut-out opposite side flanges of the secondary, longitudinally-extending mount element 7. As a result, the element 7 has, alternately, flange wall portions 14 and cut out portions 13. The cut-out portions 13 are slightly longer than the length between ends of the element 1, in order that tile 2 may be mounted by first moving its element 1 inwardly between the ends of opposite portions 14, and then, by sliding the tile and its element 1 endwise along opposite wall or flange portions 13.

The secondary or wall mount elements 7 may be provided with spaced cut-out portions in such a manner that the side wall portions are spaced to conform to the spacing between primary mount elements 1 when the tiling is in position, see Figure 8.

In manufacturing my improved form of tile, see Figure 9, the molten glass or other material is fed from a forehearth (not shown) to a press 21 where the tile 2 is formed or shaped by substantially planar faces. The temperature of the forming operation is at and preferably above the deformation temperature of the glass and

this temperature may vary depending on the type of glass used. The range may be between 1200° F. and 3000° F. If flat glass is used by a pre-heating operation, the glass having first been cut to tile form, it may only be heated to from 500° up to its deformation temperature, this temperature depending on the type of glass used. Thus, preformed tile may be used if it is preheated sufficiently to cause adherence of the metal spray and then subsequently annealed. Each tile 2 after being thus formed is successively fed to a continuous conveyor 22 that is continuously moving and that carries each tile past a metal-spraying station 24, a mount element positioning station 25, a mount element bonding station 26, and then through an annealing furnace 27.

The primary elements 1, after having been fabricated in a suitable metal-working machine are successively fed from chute 25 to a position centrally of each tile 2. These elements are preferably preheated to substantially the temperature of the tile before they are positioned upon the tile. Hot fastening or bonding metal is velocity sprayed or impacted upon the feet portions 4, in the spacing between adjacent feet, and upon adjacent portions of the back face of the tile through the opening in the back of the element 1 made by pressing the straps 3 outwardly therefrom, see station 26; see also Fig. 4.

In providing a bond, I preferably melt the metal or alloy with a flame that is preferably neutral and spray the molten metal upon the surface of the glass article while the article is still hot from the shaping operation (800° to 1200° F.). An effective physical adherence is obtained between the glass and sprayed metal; the strap portions are bridged over by the sprayed metal and held securely in place. It may be desirable to punch out the strap portions in corrugated form to more securely fasten them in position. If a transparent or translucent tile is employed, I contemplate spraying its back face with a suitable reflecting material such as aluminum (see station 24), before spray-securing or bonding a primary mount element 1 thereto; this operation is also accomplished while the article is still hot (800° to 1200° F.) from the shaping operation.

Due to the fact that the glass tile is still hot (800° to 1200° F.) from the forming operation, the sprayed metal physically adheres thereto, and securely and rigidly attaches the straps 3 to the back face of the tile. The tile 2 and its primary mount element 1 are then carried to the annealing furnace 27 where the glass is annealed. Since the annealing temperature of the glass is lower than the softening or melting point of the metal mounting, said metal mounting maintains its original shape and its strap portions 3 still retain their resiliency.

If desired, each thus-formed unit may be then dipped in paraffin, asphaltum, or other cushioning medium to which cementitious material will not adhere; such material, of course, will prevent any part of the tile itself from attaching itself to cement or plaster wall and the strap portions will not become rigidly imbedded in any backing up material.

Although I have, for the purpose of illustration, shown the tie legs 3 (see Fig. 1) cut out immediately adjacent each other, it may be preferable to leave a space between them, in other words, to punch out these strap-like portions 3 at spaced

intervals with respect to each other from the web portion of the element 1 or 1'.

Although I have illustrated certain embodiments of my invention, it will be apparent to those skilled in the art that other suitable arrangements may be made, and that additions, substitutions, and other alterations may be made without departing from the scope of my invention as indicated by the appended claims.

10 I claim:

1. In an article of manufacture, a tile having a mount element secured to and extending from a back face thereof, a longitudinally-extending mount element adapted to be mounted on a building construction, said second-mentioned element having track portions slidably receiving said first-mentioned element.

2. In an article of manufacture, a tile having a mount element extending therefrom, a longitudinally-extending mount element adapted to be mounted on a building construction, said second-mentioned element having track portions slidably receiving a plurality of said first-mentioned elements in a longitudinally aligned relationship with respect to each other, said second-mentioned element having cut out portions in said track portions of a length sufficient to permit one of said first-mentioned elements to be inserted thereat and slid along said track portions.

3. In an article of manufacture, a tile of ceramic or vitreous material, a mount element of metal material, said mount element having at least one lug in abutment with a portion of said tile, a metal bond physically adhering to said tile and to said lug for securely attaching said element thereto, said bond being provided by spraying molten metal.

4. In an article of manufacture, a tile, a mount element physically secured to a back face of said tile, said mount element having a substantially channel-like form for cooperating with a building structure and mounting the tile thereon.

5. In an article of manufacture, a tile of ceramic or vitreous material having a suitable shape, a metallic mount element having a physically adherent bond securing it to said tile, a second mount element adapted to be attached to a building structure and having complementary portions adapted to slidably receive said first-mentioned mount portion for mounting the tile on the building structure.

6. In an article of manufacture, a tile, a box-like mount element secured to a face thereof and extending therefrom, said mount element being flexibly secured to said tile in such a manner that expansion and contraction between said element and said tile may occur, said mount element hav-

ing guide portions, a second mount element adapted to be attached to a building construction and to slidably receive the slide portions of said first-mentioned mount element.

7. In an article of manufacture, a tile having suitable planar front and back surfaces, a channel shaped mount element, said mount element having a pair of lugs pressed out from the web thereof, said lugs extending substantially the depth of the flange portions of said element and being adapted to abut the back face of said tile, said mount element being positioned on the back face of said tile and substantially centrally thereof, a physically adherent bond securing said lug to the back of said tile, the flanges of said element having projecting flexible guide portions, a secondary mount element, means removably attaching said secondary mount element to a building construction, said secondary mount element having a channel shape, inturned portions formed on said secondary mount element and cooperating with the said guide portions of said primary mount element for holding said primary mount element in position within said secondary mount element, and for thus attaching the tile to the building construction.

8. In an article of manufacture, a tile of ceramic, nitreous or other suitable material, a mount element positioned thereon and having a metal portion, a metal bond physically-adherent to adjacent surfaces of said mount element metal portion and said tile, said metal bond securely attaching said element to said tile.

9. In an article of manufacture, a tile, a mount element for said tile, said mount element having a flexible member extending therefrom, said flexible member being physically secured to said tile, and means adapted to be attached to a building construction for slidably receiving said mount element.

10. In an article of manufacture, a tile, a box-like mount element secured to a face thereof and extending therefrom, said mount element having snap projections projecting therefrom, a second mount element adapted to be attached to a building construction and to receive said snap projections of said first-mentioned mount element.

11. In an article of manufacture, a tile, a mount element attached to said tile and extending therefrom, a second mount element adapted to be attached to a building construction and being constructed and arranged to receive said first-mentioned mount element, and a flexible material adapted to be positioned between said first-mentioned and said second-mentioned mount elements.

ANDREW H. STEWART.

CERTIFICATE OF CORRECTION.

Patent No. 2,145,103.

January 24, 1939.

ANDREW H. STEWART.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 28, claim 8, for "nitreous" read vitreous; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of March, A.D. 1939.

Henry Van Arsedale.

Acting Commissioner of Patents.

(Seal)