United States Patent

Dombroski

[15] **3,676,971**

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[54] TILE STRUCTURE WITH CRUCIFORM SHAPED FOUNDATION SUPPORTING TILES

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[52] **U.S. Cl.** **52/603,** 52/386, 52/573, 52/593, 94/3, 94/13, 94/14

[51] **Int. Cl.** **E04c 1/10,** E04f 13/08

[58] **Field of Search** 52/267, 598–599, 52/603, 604, 386, 392, 593, 573, 126, 13, 14; 94/3, 6, 13, 14

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[57] **ABSTRACT**

A tile walk or patio in which a plurality of cruciform foundation tiles are laid in a layer without cement with their arms forming drainage sumps; a plurality of surface tiles are then laid on the foundation layer without cement, the surface tiles each overlapping a plurality of foundation tiles and sumps. The foundation tiles are formed with tenons or bosses on their upper surfaces that co-operate, with mortices or sockets formed in the under surface of the surface tiles, to lock the surface tiles from horizontal displacement from the foundation layer and to guide a surface tile, displaced vertically by ice, back to its initial position as the ice melts.

2 Claims, 6 Drawing Figures

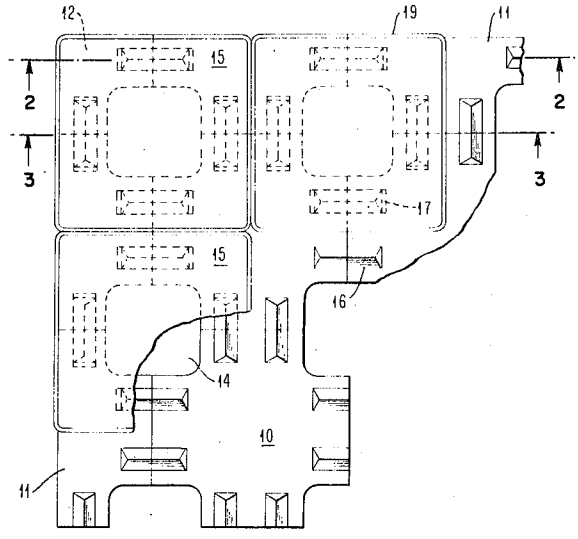


FIG. 1

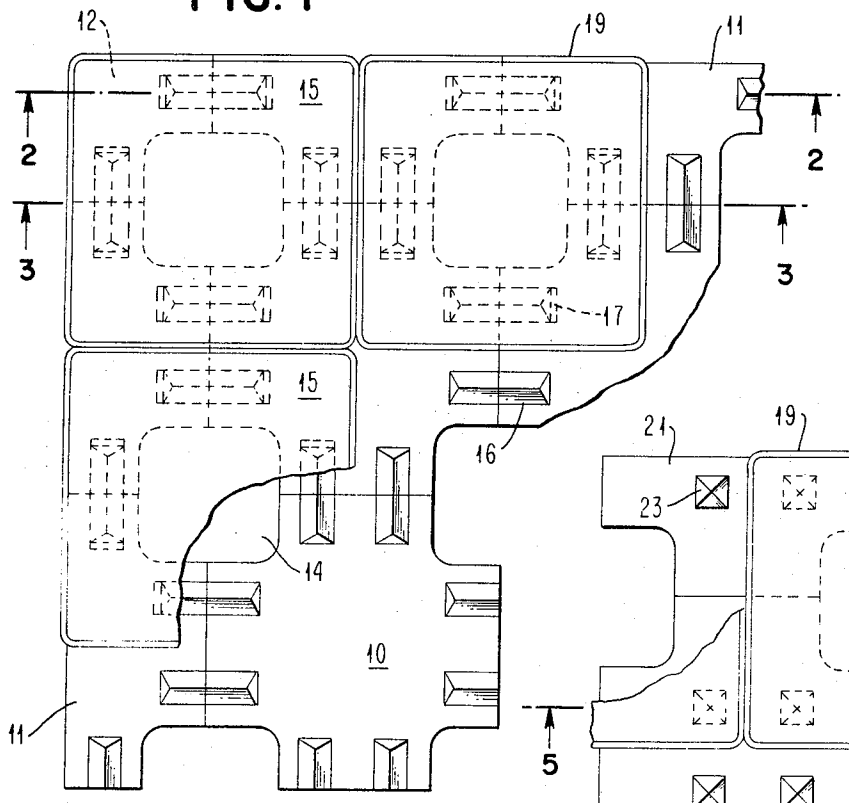


FIG. 4

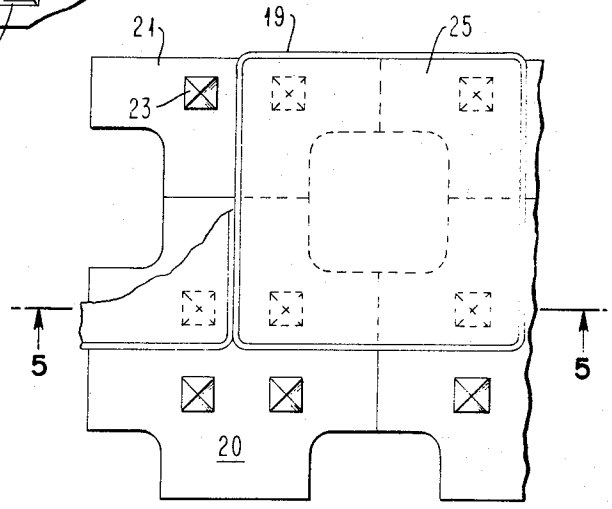


FIG. 6

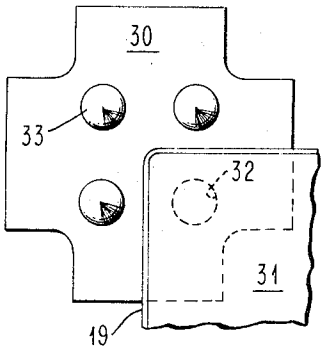
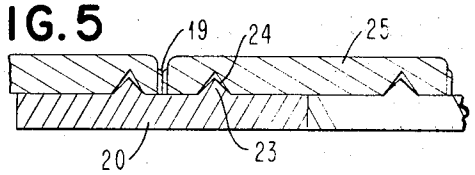


FIG. 5



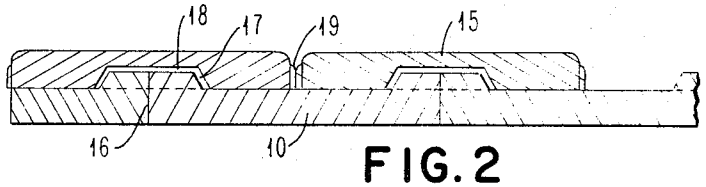


FIG. 2

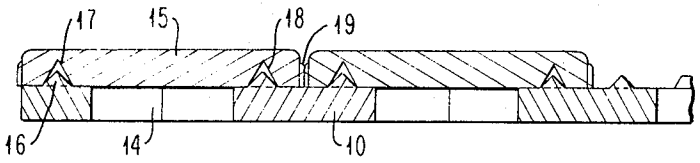


FIG. 3

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TILE STRUCTURE WITH CRUCIFORM SHAPED FOUNDATION SUPPORTING TILES

This invention relates to building tiles and a method of laying said tiles. More particularly it relates to the forming and laying of a floor or the like with tile that will, due to its construction, ensure the relocation of a tile or tiles dislodged by the formation of after the ice melts.

Conventional floor tiles are laid in various well known ways. The usual method being the setting of the tiles in a mastic such as cement for fastening a surface tile to a foundation or to a layer of foundation tiles and filling the spaces between the tiles with a grout of cement or the like. Installations of this character in northern latitudes are subject to action by ice and frost which causes heaving and cracking. In a majority of cases the heaving displaces the tiles to such an extent, that when the ice melts the tiles do not return to their original position. Due to this they often crack leaving an uneven and unsightly floor.

It is therefore the principal object of this invention to provide foundation tiles and surface tiles which when assembled in a prescribed manner will form a smooth and pleasing floor or path the surface of which will return to a normal level condition after being displaced by the forming of ice between the adjacent surfaces of a layer of foundation tiles and surface tiles.

A further object of the invention is to provide a foundation tile having means thereon of engagement with a surface tile, said means also acting to reposition said surface tile after having been displaced by the forming and melting of ice between said tiles.

Another object is to provide a method of laying a tile floor or other surface without the use of a mastic such as cement by providing means on the under surface of a surface tile and on the upper surface of a foundation tile whereby one is anchored to the other.

Another object of the invention is to provide a foundation tile the shape of which is such that when a plurality of said tiles are laid in abutting relation a sump or reservoir is formed.

A still further object is to provide a surface tile having means thereon for locking engagement with a foundation tile, said means also acting to reposition said surface tile after having been displaced by the forming and melting of ice between the surfaces of said tiles.

In the preferred form of the invention a plurality of foundation tiles are laid in a specified formation on a level area. These tiles are formed with projections or tenons having a configuration to conform with similar depressions or mortices formed in the under side of surface tiles. The surface tiles are secured to the foundation tiles without cement by engaging the mortices and tenons on the respective tiles; the mortices and tenons being so shaped and located as to ensure that the surface tiles will not be displaced laterally and will hold the foundation tiles in abutting relation. The mortices of a surface tile that has been displaced by the formation of ice between the layers of tile will, by engagement with the tenons in the foundation layer, be guided into its original position upon melting of the ice.

One advantage of the invention is that a neat floor for a path, patio or the like can be laid by a do-it-yourself home owner without special tools or cement.

Another advantage is that as the surface tiles are laid over the divisions in the foundation layer, weeds are prevented from growing between the surface tiles.

A further advantage is that tiles laid in this manner can be used in a path or driveway under which service lines may be located and since they are not cemented down the tiles may be readily removed to permit access for repair of the service lines.

A more clear conception of the formation, operation and further objects and advantages of the invention may be had from the following specification when read in the light of the attached drawing in which;

FIG. 1 shows a floor in which the tiles are laid in accordance with the invention, certain portions of the surface being broken away to more clearly show underlying members,

FIG. 2 is a cross section taken along line 2—2 of FIG. 1 to show the union between the mortices and tenons,

FIG. 3 is a cross section taken along line 3—3 of FIG. 1 to more clearly show the mortices and tenons,

FIG. 4 shows a modification of the positioning means,

FIG. 5 is a cross section taken along line 5—5 of FIG. 4,

FIG. 6 shows a further modification of the mortices and tenons.

Referring to FIG. 1 which discloses the preferred form of the invention, it will be noted that three forms of tile are used in the foundation layer; a large cruciform tile **10**, an edge tile **11** and a corner tile **12**. The three forms are needed since the surface tiles **15** are laid in overlapping relation to the arms of the foundation tiles. This will insure that all divisions between the foundation tiles as well as the sump **14** formed by the arms of the foundation will be covered. This will prevent a certain amount of seepage of water in between the layers of tiles and what will seep in is caught by the sump **14** thus reducing the possibility of ice forming between the layers of tile. If no edge or corner tiles were provided there would be no support for the outer surface tiles. All three forms of foundation tile have rectangular wedge shaped projections or tenons **16** formed on their upper surfaces. Each corner tile having two tenons, the edge tiles four and all cruciform tiles have eight.

Each surface tile **15** is square in shape and is provided with four depressions or mortices **17** in their under surface. These mortices are the reverse in shape of the tenons **16** on the foundation tiles. As seen in FIGS. **2** and **3** the mortices are larger and are of a sharper angle to provide a clearance that will ensure that when laid in place on a foundation layer the surface tile will be in full frictional engagement with the foundation tiles. Each surface tile has a lip **19** formed on all four sides. This lip is equal to half the proposed distance between tiles and thus insures that they will be held in correct spaced relation to one another when laid.

In laying a porch floor or patio the area is leveled and rolled to form a hard level surface. The foundation tiles **10**, **11** and **12** are laid as shown in FIG. **1** with their projecting arms in abutting relation, the arms forming the sumps **14**. The surface tiles **15** are then laid in overlapping relation to the foundation tiles with the tenons **16** of the foundation tiles engaging the mortices **17** of the surface tiles. When correctly positioned the combined weight and friction of the surface tiles and the engagement of the tenons **16** and mortices **17** will lock both surface and foundation tiles together thus preventing the surface tiles from becoming displaced laterally, the weight of the surface tiles holding them in place vertically.

More important should the sumps **14** fill and ice forms between the surfaces of the foundation tile and the surface tile and one or more surface tiles be displaced the angled surfaces of both the mortices and tenons will guide the displaced tile or tiles into their correctly aligned positions as the ice melts thus relaying a level and even floor.

A modified form of the invention is shown in FIGS. **4** and **5** in which the foundation tiles **20** and **21** are provided with a pyramidal form of mortice **22** and the surface tile **25** carries a tenons **23** of a similar form. These act in the same manner as those of the preferred form but would be used for smaller and lighter tiles.

A further modification of the mortice and tenons is shown in FIG. **6** wherein the foundation tile **30** and surface tile **31** are provided with mortices **32** and tenons **33** of conical configuration that function as described above to hold and guide the surface tiles into place.

It is obvious that many modifications and variations of the above described invention may be made without departing from the spirit and scope thereof and therefore only such limitations should be imposed as are contained in the appended claims.

What is claimed is:

1. A tile structure comprising

a layer of foundation tiles, each of said foundation tiles having a cruciform configuration with four equally spaced extending arms, a flat upper surface and a plurality of

tenons extending from said upper surface and having converging side surfaces,

said foundation tiles being arranged with said arms in abutting relation to form drainage sumps therebetween, and

a layer of surface tiles arranged in abutting relation without cement on said layer of foundation tiles, each of said surface tiles overlapping a plurality of said foundation tiles and having a flat lower surface in contact with said flat upper surfaces of said foundation tiles, said flat lower surfaces of said surface tiles having a plurality of mortises therein having configurations mating with the configuration of said tenons,

said tenons being received in said mortises to prevent horizontal displacement of said surface tiles and said foundation tiles and to guide vertically displaced surface tiles into horizontal alignment.

2. The tile structure as recited in claim 1 wherein said tenons have a pyramidal configuration.

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