April 11, 1967 N. G. JACKSON 3,313,069

ROOF CONSTRUCTION WITH TILE DRAINAGE MEANS THEREFOR

Filed Sept. 3, 1964 3 Sheets-Sheet 1

FIG. 1

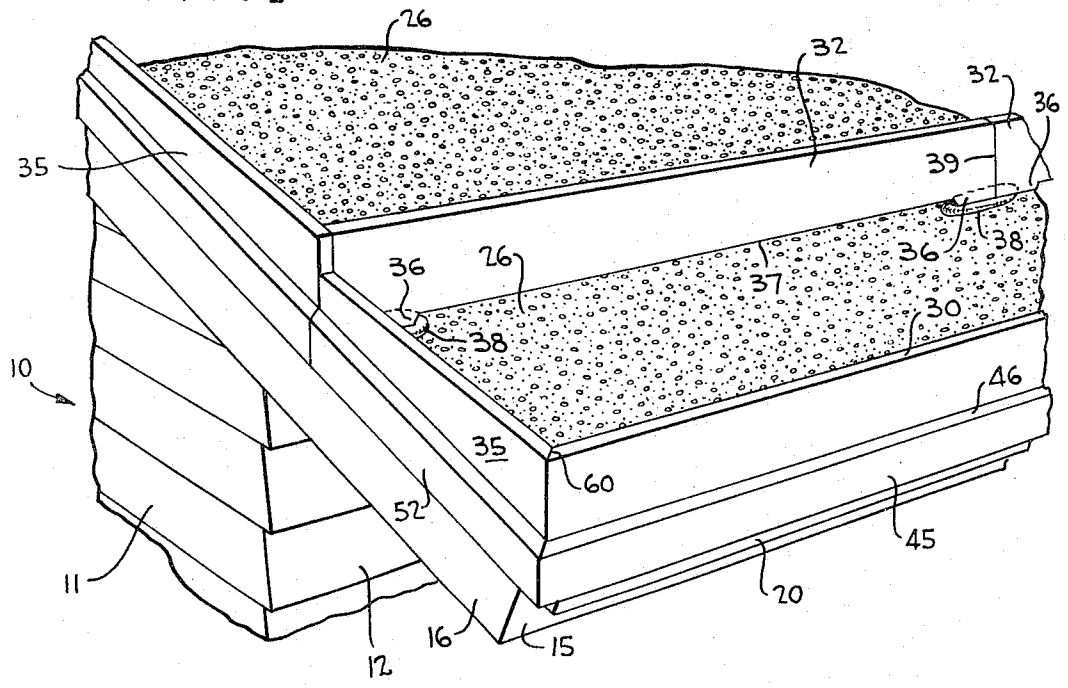
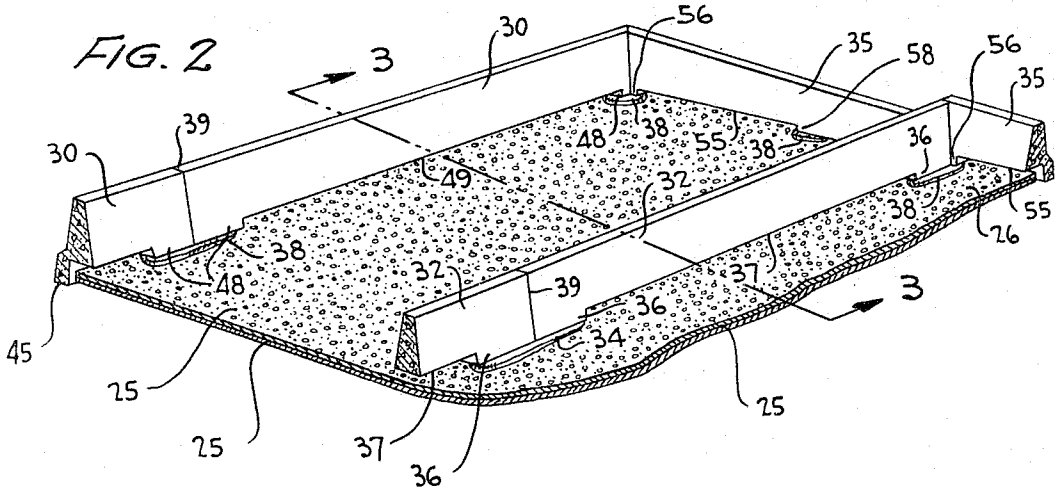


FIG. 2



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FIG. 3

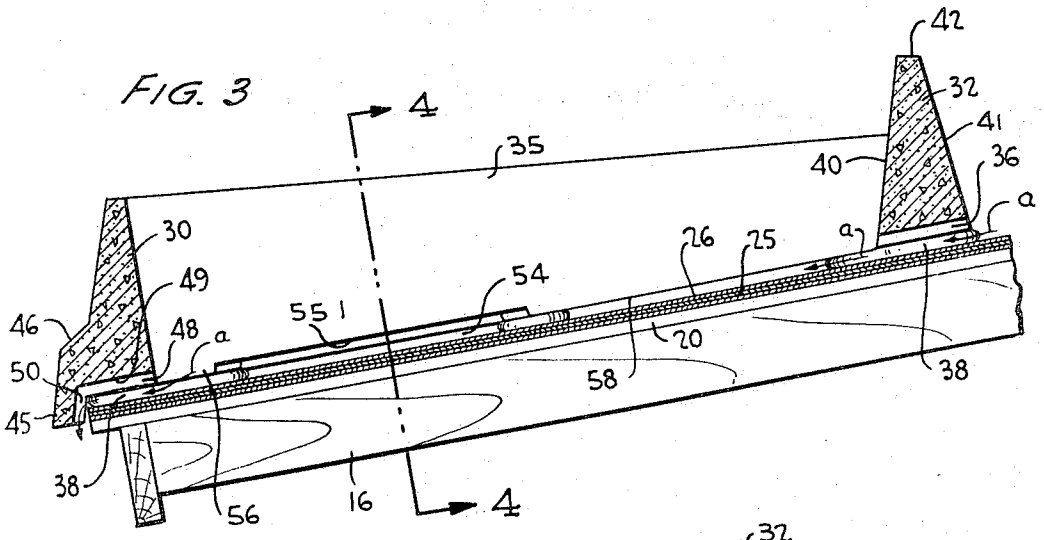


FIG. 4

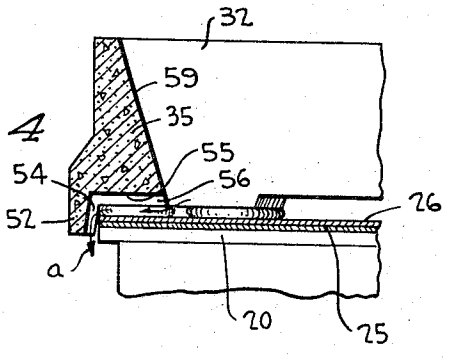
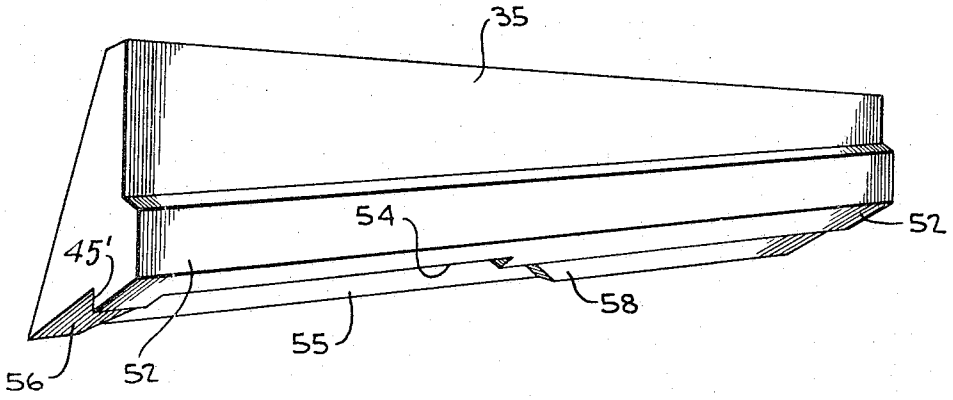


FIG. 5



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FIG. 6

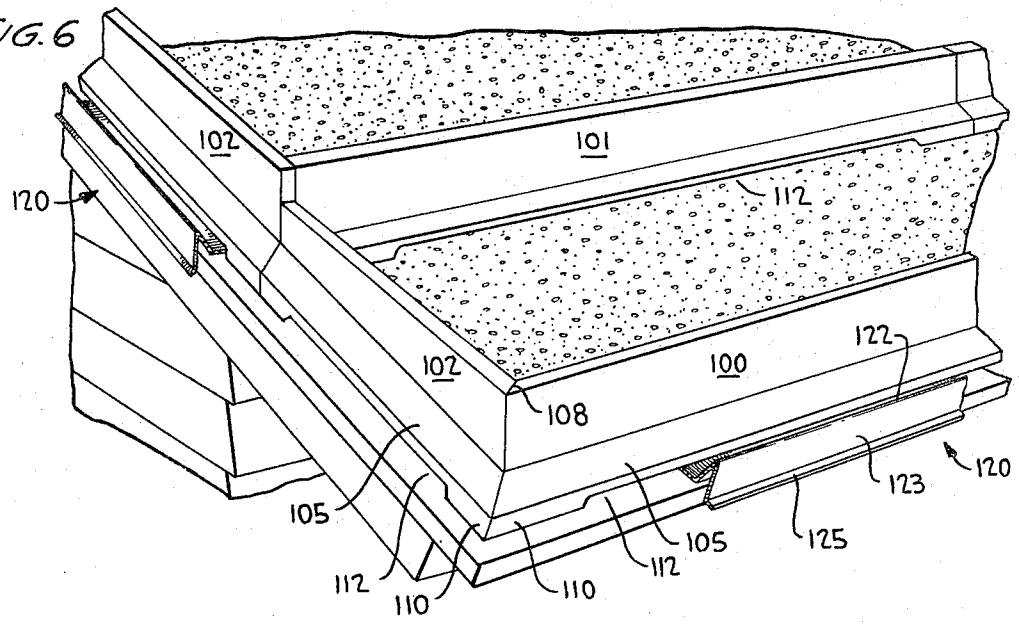


FIG. 7

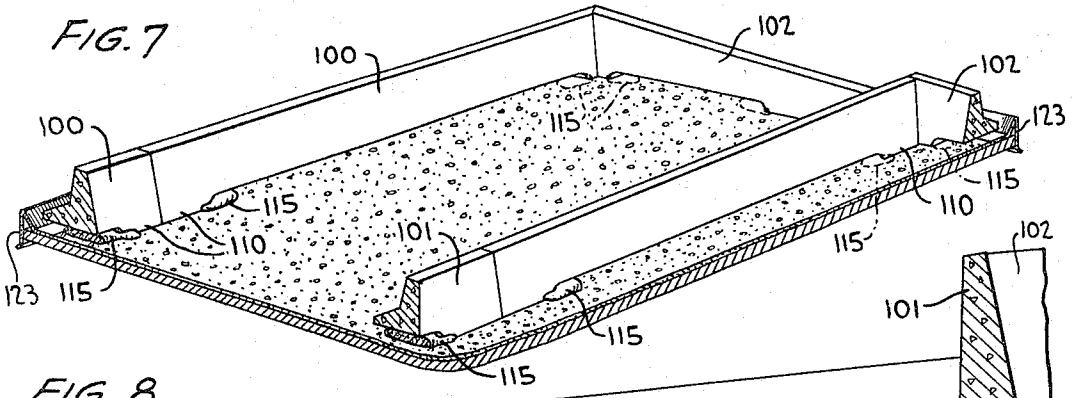
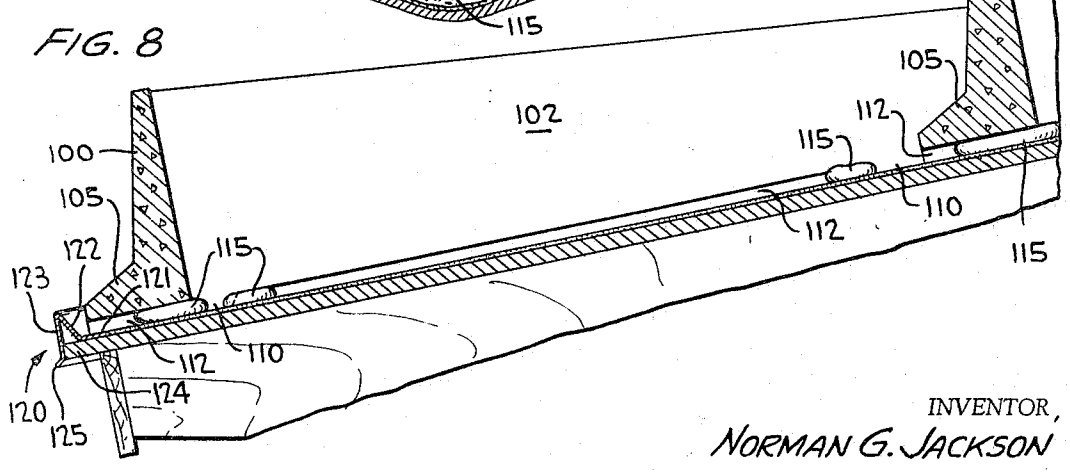


FIG. 8



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United States Patent Office 3,313,069 Patented Apr. 11, 1967

3,313,069

ROOF CONSTRUCTION WITH TILE DRAINAGE MEANS THEREFOR

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Filed Sept. 3, 1964, Ser. No. 394,292
6 Claims. (Cl. 52—24)

This invention relates to roof structures and more particularly to such structures suitable for use on buildings in mild or warm climates and where durability, waterproofness, and especially attractive appearance are desired.

The invention disclosed in the present specification constitutes a modification of the invention disclosed and claimed in my Patent No. 3,133,377, granted May 19, 1964, which provides ornamental finish superstructures installed upon a basic waterproof membrane covering which in itself is sufficient to afford normal protection against the elements but which may be of an unsatisfactory appearance esthetically. The basic covering may, for example, include alternate layers of roofing paper and asphalt or bitumen topped with an aggregate such as gravel or crushed stone. The superposed tile paneling, which may well be of pre-cast concrete, transforms such a drab roof structure into one of beauty and durability. The panel may be finished off in pure white or in pastel or any other coloring in harmony with the tropical or semi-tropical settings where such roofs find their greatest appeal.

The present invention contemplates the provision of novel and improved means for facilitating the drainage of water past the tiling, lightening the weight of the tile units, and effecting other economies in construction, while at the same time preserving the principles of the generic invention in respect to maintaining the over-all pristine white or pastel tropical appearance of the roof as a uniform whole but with a minimum of actual area coverage.

In the use of spaced blocks or tile panel units superposed upon a conventional waterproof basic roofing membrane, some difficulties have been encountered when insufficient drainage has been provided for flow past the rows of tiling; occasionally water might be dammed up excessively and flow over the tops of the rows, or if it puddles behind the panels, it tends to saturate the base portions of the tiles and eventually soak up into the panel face with resulting unsightly staining.

In carrying out these broad objects, the invention in its preferred embodiment contemplates the use of lightweight elongated tile units of relatively soft machinable concrete or similar material, each tile unit having two or more feet each adapted to set upon the basic roofing whereby the greater span of the unit is clear of contact with said basic roofing.

It is further contemplated, within one phase of the present invention to provide a somewhat narrower base for the tiles, reducing or eliminating the usual rearwardly or forwardly extending base flanges, and thus facilitating the laying of the tiles or panels truly and eliminating the plastering of joints between adjacent tiles.

Further objects of the invention involve the provision of a roofing system of the class in which all of the tile units whether eave, field, or gable, are provided with forward or outwardly facing base flanges giving them a somewhat L-shaped section; the correlating of the tiles with the usual gravel stop for concealing the drainage slots, and the cementing of the tiles by the positioning of the dabs or mortar inwardly of the terminal feet at one or both ends of the drainage passages.

Other objects and features of novelty will be apparent

from the following specification in connection with the accompanying drawings in which one embodiment of the invention is illustrated by way of example.

In the drawings:

FIGURE 1 is a fragmentary view in perspective of a corner portion of a roof structure embodying the principles of the invention, as seen from a high level off of the roof area and at an angle to the rectilinear outlines of the building;

FIGURE 2 is a perspective view of the roof corner portion taken from above the roof looking diagonally downwardly toward the intersection of the gable end with the eaves;

FIGURE 3 is a view in vertical section of the portion of the roof shown in FIGURES 1 and 2 taken at right angles to the eaves and parallel with the gable end, as viewed on line **3—3** of FIGURE 2;

FIGURE 4 is a substantially vertical sectional view taken on line **4—4** through the gable end;

FIGURE 5 is a perspective view of one of the gable end tile panel units showing a portion of the bottom of the tile;

FIGURE 6 is a view similar to FIGURE 1, but showing another embodiment of the invention;

FIGURE 7 is a view from the same vantage point as in FIGURE 2, of such a modified form of the invention; and

FIGURE 8 is a sectional view like FIGURE 3 of the modified tiling.

In the form shown in FIGURES 1–5 of the drawings, the building wall structure is suggested at **10**, a side wall surface being indicated at **11** and a front wall at **12**. The basic roof framing structure may include such elements as the facing piece **15** and the corresponding gable end piece **16** and the roof deck or sheathing shown best in FIGURES 3 and 4 at **20**.

An overlying laminated waterproof membrane structure is superposed upon the sheathing **20** and is indicated in its entirety by the reference numeral **25**. This membrane may be of any conventional or suitable construction, for example, in accordance with the laminar structure described in my co-pending application wherein multiple layers of roofing felt and bitumen or asphalt are employed surmounted by a flood coat of bitumen in which is embedded the surfacing gravel, rock, or aggregate suggested at **26** in the drawings.

Such basic waterproof roofing structure is frequently finished off at the edges, especially at the eaves, with an angular metal strip usually designated a "gravel stop." The use of such a strip is contemplated alternatively in the application of the present invention, but for the sake of simplicity it has been omitted from some of the drawings and the roof edges shown merely as terminating with the laminations just described.

In conformity with the broad purpose of this invention and the parent invention disclosed in my copending application, whereby forwardly disposed laterally extending panels conceal considerable areas of the basic roof structure and give the appearence of a completely tiled roof, the superstructure of the present invention includes the eave panel composed of tile units designated **30**, the field panel units designated **32** which extend in successive tiers rearwardly and upwardly of the roof, and the gable end wall panel the individual units of which are indicated by the reference numerals **35**.

The field blocks or tiles **32** will be described first with reference particularly to FIGURES 1, 2 and 3 of the drawings. Each of the tile units **32** is provided with a foot **36** at each end which raises the intermediate bottom portion of the span of the tile sufficiently from the surface of the basic roofing to permit freer flow of the drainage water thereunder as indicated by the arrows *a*. Each

of these feet **36** is firmly embedded in a small bed of mortar or grouting indicated at **38**. The ends of adjacent field tiles **32** are abutted as at **39** and due to the fact that there are no pronounced forwardly or rearwardly extending base flanges on the tiles the tiles can be adjusted within the beds of mortar while the latter are still soft, to fit true with respect to the adjacent tiles. In fact, by preference, the bottom width of the tile or panel unit in the direction of the ridge-to-eave extent of the roof (which is the maximum width of the unit) is considerably less than the vertical dimension of the unit. For example, in the case of a tile or panel unit of a height of from say eight inches to ten inches, the crosssectional width at the bottom of the unit would most appropriately be from about three inches to about four and one-half inches. It will be seen therefore that any slight tilting adjustment of a tile to conform to the position of an abutting tile may be made while the mortar is still soft without such difficulty as would arise if the tile were formed with a wide base flange.

As shown particularly in FIGURE 3 of the drawings, the field tile is provided with converging front and rear walls **40** and **41** and a narrow top surface **42** which can be either bevelled or disposed in a horizontal plane. The front wall **40** preferably inclines slightly rearwardly of the vertical and the rear wall **41** may incline forwardly giving the tile a substantially prismatic appearance.

The eave tile or panel **30** differs from the field tile **32** in that it has a forwardly and downwardly projecting lower lip or skirt portion **45** which at least partially conceals the forward edge of the main waterproof roofing base **25**. Besides being inclined somewhat the portion **45** of the tile is offset from the main body portion as suggested at **46**.

The eave tile **30**, like the field tile **32**, is provided with feet **48** at each end thereof leaving the intermediate span of the tile **30** raised slightly from the basic roof surface as at **49**. One of the feet **48** is indicated in FIGURE 3 of the drawings and the mortar or grouting bed **38** in which it is embedded is also indicated in FIGURES 2 and 3. Not only is the intermediate portion **49** of the bottom surface of the tile **30** raised above the surface of the roof, but the intermediate portion of the skirt or overhanging lip **45** is also spaced away from the forward edge of the basic roof by having the intermediate portion of the rear part of the skirt **45** cut away as indicated at **50** in FIGURE 3 so that the drainage water will have a clear and unobstructed passage beneath the intermediate portion of the tile and thence downwardly behind the skirt **45** at the eaves of the roof, the end portions of the skirt serving as abutments as at **45'** to maintain the intermediate portion of the skirt properly spaced from the roof edge.

The main body portion of the eave tile **30** may be of the generally prismatic configuration as the field tiles, and the angularity of the tiles with respect to the plane of the basic roof surface is such that the general aspect of the eave tiles is that of a vertically disposed panel rather than a forwardly inclined one.

At the gable ends of the roof structure the gable tiles **35**, as shown best in FIGURE 4 of the drawings, are also provided with a depending skirt portion **52** similar to the skirt **45** on the eave tiles **30** and also provided with a rearwardly cut-away intermediate portion **54** for drainage purposes. The intermediate bottom portions of the gable tiles **45** are also raised as indicated at **55** due to the provision of feet similar to those employed in the other tile but of variable extent such as in the case of the forward foot **56** shown in FIGURES 2, 3 and 4, and the quite elongated footing **58** shown best in FIGURES 2 and 3. Thus, the elevation of only a portion of the bottom of the gable tile as at **55** serves to provide a sufficient channel to take care of the relatively minor drainage at the gable ends of the roof.

The provision of the elongated foot **58** permits the casting of the gable end tile units in maximum lengths to take care of the widest spacing of the eave and field tiles, and then cropping the tail ends of the gable tiles to shorten them to fit smaller spacings. Thus, the rearward footing provision for the gable tiles is preserved regardless of variations in length within practical limits.

It will be noted from an inspection of FIGURE 4 that the gable end wall tile unit is preferably disposed in a generally vertical position, the outer walls of the skirt and of the main body portion of the tile being vertical. The rear surface may be inclined as indicated at **59** in the general conformity to the prismatic section of most of the tiles.

There remains only to be described the abutment of the eave and field tiles with the gable end tiles and this may be accomplished either by bevelling the adjacent ends of the respective tiles as suggested at **60** in FIGURE 1, where the visible rear portions of the adjacent respective feet **48** and **56** are considerably shortened due to the cutting of the tile ends on a 45° angle. This is clearly illustrated at the top of FIGURE 2 of the drawings.

As illustrated at the right-hand end of FIGURE 2 where the field tile **32** joins the nearest gable end tile **35** there is a right angle abutment connection where the end of the tile **32** is ground off to conform to the profile of the rear surface of the gable tile **35** and thus a portion of the forward foot **56** of the gable tile is obscured leaving only a minor portion exposed as shown, or even concealing the leg entirely, whereas the leg **36** of the tile **32** is shown in its full extent.

These abutting junctions may be varied as desired and a right angle abutment may be employed between the eave tile **30** and the adjacent gable tile or a 45° angle interfitting may be effected between the field tile **32** and its gable tile **35**.

Due to the limited extent of cross-section of these tiles, their feet may be embedded in the mortar and allowed to be set at a much more readily adjustable angle than if an extremely long angular flange were provided, and thus the interfitting of the abutting edges of the tiles as at **39** can be accomplished much more accurately, and thus preclude the necessity of plastering the joints. If any minor evening up of the joints is needed, the panels can be readily sanded since it is preferred that they be made of light-weight concrete which is relatively soft.

In the embodiment shown in FIGURES 6, 7 and 8 of the drawings, the eave tiles are indicated at **100**, the field tiles at **101**, and the gable end tiles at **102**. Each of these tiles is characterized by the provision of forward and slightly downwardly inclined base flanges **105**. The eave and field tiles are shown very clearly in vertical section in FIGURE 8 of the drawings and the gable tiles **102** are of quite similar configuration except for the stepped formation which is clearly depicted in FIGURES 6 and 8.

At the junction of the foremost gable tile **102** and the end one of the eave tiles **100**, the tiles are mitered as at **108** in similar fashion to the joining of the corresponding tiles of the earlier described embodiment as indicated at **60** in FIGURE 1.

All three of these types of tiles are provided with end feet **110** which are similar to the corresponding feet depicted at **36**, **48** and **56** in the earlier described form of the invention. These feet are only of sufficient height to provide an under-flow or drainage slit or passageway **112** beneath the central portions of the tiles, just as in the case of those previously described.

However, in this embodiment, the small dabs or beds of mortar **115** are preferably disposed at the ends of the drainagle slits **112** and not directly beneath the feet **110** (and, of course, this manner of securing the tiles upon the basic roof structure may be followed in respect to the prismatic tiles illustrated in the earlier figures of drawing). One advantage of this method of securement is that it provides a better gauge of uniformity of positioning of the tiles with the feet **110** resting squarely upon

the roof surface. Thus, the levelling need not depend on the uniformity of thickness of the mortar bed.

In this modified form of the invention, the overhang such as indicated at **45** in the earlier figures of drawing is omitted in the case of the eaves tiles and the visibility of the water passage slit **112** is obscured by the gravel stop **120**. This gravel stop has a rearwardly directed flange **121** tucked beneath the toe of the tile and an inverted V-shaped upward ridge **122** which is slightly higher than the height of the rain slit **112**. The front face **123** of the gravel stop extends substantially flush with the basic roof structure suggested at **124** and an angled apron or flange **125** extends along the lower edge of the gravel stop strip. Of course, it may be preferable to paint the gravel stop in the same color as the color of the tiles themselves.

Thus, it will be clearly seen, especially as viewed in FIGURE 8, that the drainage flow of rain water passes under the slits **112** of the eaves tiles and the gable tiles and thence over the gravel stop **120**. In many constructions, the gravel stop is only about one inch high and thus the upper edge of the ridge **122** is in most cases somewhat lower than the rear edge of the tile **100**, and furthermore openings can be provided in the junction of the eaves and gable gravel stops at the corners of the roof and prevent any undue accumulation of water behind the gravel stops or beneath the tiles.

Thus, provision is made for drainage of this roof structure by the passage of water past the tiles, mainly through the slits **112**, without the water damming up and cascading over the tops of the tiles with the resultant staining of the front surfaces.

Various changes and modifications may be made in the embodiments illustrated and described herein without departing from the scope of the invention as defined by the following claims.

It will be noted that some of the drainage features are applied to both the eaves of the roof structure and the edges of the gable ends thereof; thus, where such features are claimed, it is to be understood that the term "eaves" shall be interpreted as broad enough to indicate the actual eaves edge of the structure or the edge extending up a gable end of the structure.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A building roof construction sloping downwardly and forwardly toward the eaves and comprising a basic water-resistant covering layer which in itself is of a character affording normal protection against the elements but which may be of unsatisfactory appearance esthetically; and, positioned thereon, additional roof covering structure comprising a plurality of substantially horizontally disposed panels extending in transverse directions intersecting the direction of slope of the roof, each panel comprising a wall of substantial vertical dimensions and said panels being spaced apart along the slope of the roof leaving uncovered intervening areas of said basic covering layer; the spacing between successive panels being such that, taking into consideration the angle of slope of the roof and the height of the panels, the front faces of said panels will conceal the intervening areas of the uncovered basic layer from view at normal eye level from in front of the building; each of said panels comprising a plurality of block units disposed end-to-end and each provided with short narrow supporting feet at each end providing a slightly raised intermediate span, providing a narrow slit between the bottom surface of the block unit and the basic roof covering layer and extending horizontaly for the major portion of the lateral extent of the span for water drainage, said end supporting feet resting directly upon said basic layer, and beds of mortar applied within portions of said narrow slit to secure the block to the basic layer, said slit thus serving the dual purpose of providing for drainage and for the anchoring of the block with the feet making direct contact with the basic layer.

2. A building roof construction sloping downwardly and forwardly toward the eaves and comprising a basic water-resistant covering layer which in itself is of a character affording normal protection against the elements but which may be of unsatisfactory appearance esthetically; and, positioned thereon, additional roof covering structure comprising a plurality of substantially horizontally disposed panels extending in transverse directions intersecting the direction of slope of the roof, each panel comprising a wall of substantial vertical dimensions and said panels being spaced apart along the slope of the roof leaving uncovered intervening areas of said basic covering layer; the spacing between successive panels being such that, taking into consideration the angle of slope of the roof and the height of the panels, the front faces of said panels will conceal the intervening areas of the uncovered basic layer from view at normal eye level from in front of the building; each of said panels comprising a plurality of block units disposed end-to-end and having at least a portion of their bases embedded in a shallow bed of mortar, the bottom portion of the unit being of a dimension in the direction of the slope of the roof which is from approximately one-quarter to approximately one-half of the height of the unit, whereby any necessary adjustment of the tilt of a unit in the direction of its narrow dimension to square it up with an adjacent unit may be effected readily with only a minor adjustment of the embedment of the base of the unit within the bed of mortar before setting, each block unit being provided with low embossments at each end of its bottom surface providing feet for securement to the basic roof structure and adapted to afford a slight clearance between the intermediate span of the block unit and the surface of the underlying basic structure, the foot embossment at one end of said unit being of greater longitudinal extent than that at the other end, whereby the unit may be fitted into a shorter than normal space by cropping the end thereof and still retaining a useful length of foot.

3. A building roof construction sloping downwardly and forwardly toward the eaves and comprising a basic water-resistant covering layer which in itself is of a character affording normal protection against the elements but which may be of unsatisfactory appearance aesthetically; and, positioned thereon, additional roof covering structure comprising a plurality of substantially horizontally disposed panels extending in transverse directions intersecting the direction of slope of the roof, each panel comprising a wall of substantial vertical dimensions and said panels being spaced apart along the slope of the roof leaving uncovered intervening areas of said basic covering layer; the spacing between successive panels being such that, taking into consideration the angle of slope of the roof and the height of the panels, the front faces of said panels will conceal the intervening areas of the uncovered basic layer from view at normal eye level from in front of the building; each of said panels comprising a plurality of block units disposed end-to-end and each provided with short narrow supporting feet at each end providing a slightly raised intermediate span, providing a narrow slit between the bottom surface of the block unit and the basic roof covering layer and extending horizontally for the major portion of the lateral extent of the span, the foremost panel being the eaves panel thus subject to be exposed to view from top to bottom including the outlet of the drainage slit, and a vertically extending portion of said roof structure standing in front of said slit to conceal it from view but not to seriously restrict the discharge of water therefrom.

4. The roof construction as set forth in claim **3** in which said vertically extending structural portion comprises a skirt formed integrally with the lower front edge of each of the block units comprising the said eaves panel, said skirt extending downwardly beyond the level of the eaves

edges of the basic roof structure and also spaced forwardly from said edge.

5. The roof construction as set forth in claim 3 in which said vertical structural portion comprises a gravel stop of conventional construction projecting upwardly from the eaves edge of the basic roof structure, and the front edge of the applied eaves panel being accordingly spaced slightly rearwardly of said gravel stop to afford flow from said drainage slit.

6. For use in a roof super-structure of the class described at the edges thereof, a tile block of relatively narrow thickness as compared with its height, said block provided with low embossments at each end of its bottom surface providing widely spaced feet for supporting it upon a basic roof surface, thus leaving a wide low clearance slit at the bottom of said block between the feet for drainage of water, said block also being provided with a skirt along its forward bottom edge portion, said skirt depending below the bottom surface of the major portion of said block including said feet, whereby to overlie the edge portion of the roof structure, and abutments at the ends of the bottom surface of the block and being of slightly

greater inward extent than said skirt but also extending somewhat below the said major portion, said abutments adapted to contact the edge of the basic roof structure to maintain the skirt spaced at a slight distance from the edge of said structure for drainage discharge.

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