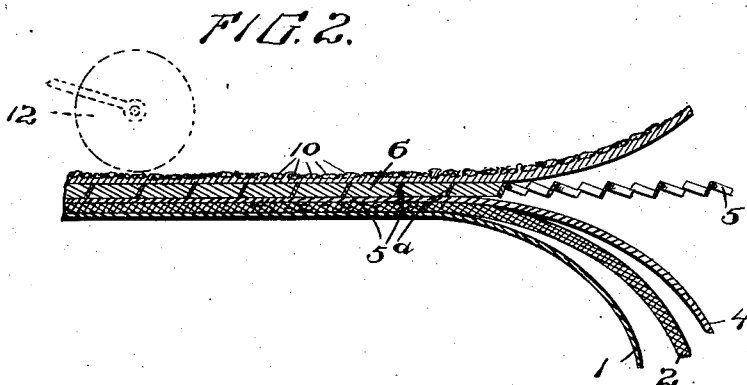
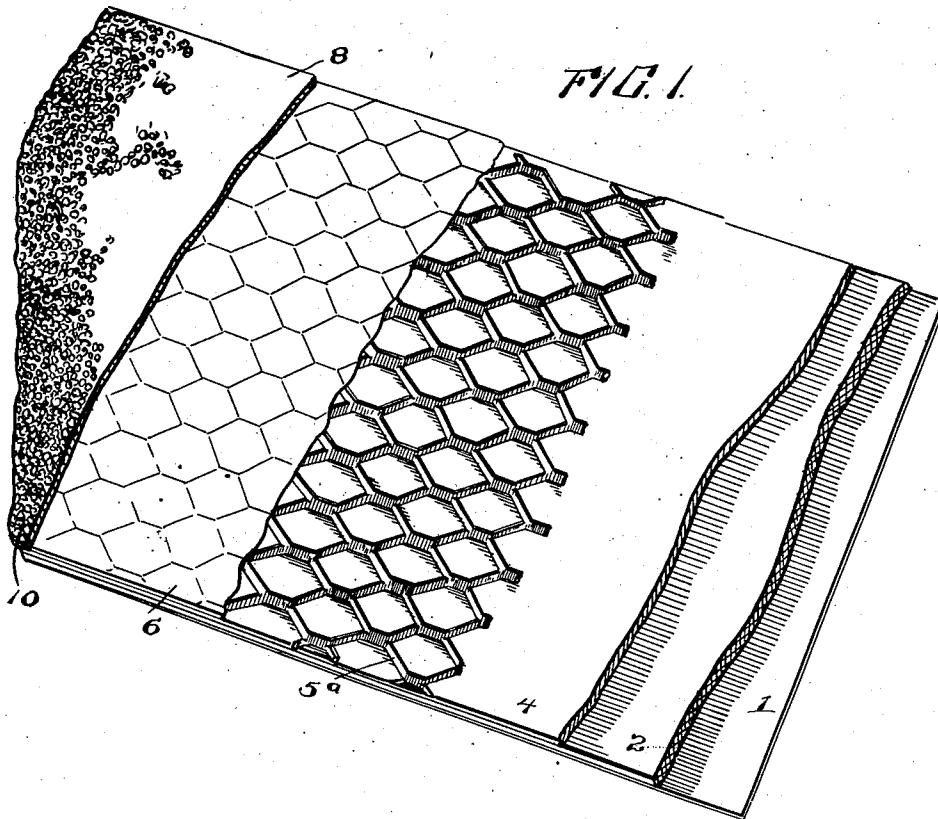


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COMPOSITE ROOFING.
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Patented Sept. 30, 1913.



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COMPOSITE ROOFING.

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To all whom it may concern:

Be it known that I, WILLIAM L. BARNHART, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Composite Roofing, of which the following is a specification.

My invention relates to composite roofing which is formed on the roof as distinguished from ready-made roofing which is manufactured in sheets and merely laid upon the roof.

One of the objects of my invention is to provide a roofing construction having means for maintaining a compact body of asphalt or equivalent material of considerable depth and into which a protective surface of gravel or sand is embedded.

A further object is to provide a composite molded roofing in which metal reinforcement provides a cellular structure having walls which hold the asphalt body firmly in position and also serve to protect the roofing from injury due to falling objects or direct blows.

Other objects of my invention will appear from the following description while its scope will be pointed out in the appended claims.

In the accompanying drawings Figure 1 is a perspective view of a section of roofing embodying my invention and showing the successive layers cut away to show the manner in which it is constructed; and Fig. 2, is a cross-section of the same.

In constructing a composite roofing in accordance with my invention, I first lay upon the roof boards or other support, a foundation consisting of an asbestos sheet 1, and a sheet of felt. On buildings which have heavy splined roof boards, the initial sheet of asbestos may be omitted. Upon this foundation is mopped a coating of melted asphalt, 4. As previously pointed out, I desire to maintain a thick solid body of asphalt in the composite roofing since this is not affected by dampness, and fumes, or any weather conditions. Prior to my invention, it has been impossible to lay a solid body of asphalt upon a roof and maintain it intact throughout its extent under the rigid conditions of extreme heat and cold to which it is subjected.

It has been proposed to reinforce roofing compositions which are manufactured and

shipped from the factory in the form of sheets or shingles by introducing wire netting. While this serves its intended purpose of materially increasing the tensile strength of the sheet so that it may be safely transported, yet it does not provide separating walls to form deep cells such as I have found is necessary to accomplish the purpose of my present invention. I, therefore, lay over the coated foundation sheets prepared as above described, a cellular metal structure 5, which may be of the expanded metal type in which the strips 5^a are turned transversely of the sheet and form inclosing walls about the separate cellular spaces. These cellular walls are preferably slightly inclined so that they slant slightly upward when the roofing is placed upon a slanting roof.

It will be observed that the height of the cellular walls 5^a is sufficient to receive and hold a considerable body of asphalt. After the metal sheet has been placed in position upon the foundation coating of asphalt 4, it may be secured firmly to the roof boards by means of staples or other fastening means. Hot or cold semi-liquid asphalt 6 is then spread or flooded over the cellular structure and is rolled into the spaces to completely fill them and form a compact solid body. This intermediate compacted main body 6, is preferably formed of an asphalt of a harder nature, such as "rock asphalt" combined with an asphalt flux. When this is compacted into the cells between the metal walls of the expanded metal structure during the rolling operation, it forms a very firm hard body, which is practically unbreakable and of an entirely different nature from the top and bottom layers which are preferably composed of Trinidad steep asphalt. The hard central body, however, is united or cemented to the upper and lower layers so that the entire roofing becomes a unitary structure. It will be observed that the asphalt in each individual cell is maintained in position and prevented from creeping or flowing even when it becomes very much heated during the hot days of summer, by the surrounding walls 5^a. A certain uniform depth of the asphalt body is, therefore, maintained whether the roof is flat or slanting. The importance of this will be appreciated by experts in roofing structures.

For the purpose of thoroughly covering the tops of the cellular metal walls and also

to form an embedding coating for the outer finishing material, a coating or mopping of asphalt 8, is spread over the top of the rolled asphalt body 6. To protect the roofing from abrasion and wear, it is covered with a finishing coat of small gravel or coarse sand 10, which is rolled down into the top coating as by means of a roller 12, for the purpose of embedding and securing the particles in the asphalt and forming a smooth surface. In this manner I insure the stability of the gravel coating and form a comparatively smooth unobstructed stone surface which will permit the snow and ice to slide thereover easily and in which the particles will not separate and roll down into the gutters, as in the case of the ordinary gravel-covered roof in which reliance is placed solely upon the contact adherence of the particles lying upon the surface of the tar or other coating. In my composite roof, on the contrary, the gravel particles are forced down into the top asphalt coating, so that the top layer is a true composite of stone and asphalt.

The many advantages possessed by my composite roofing will now be evident. The cellular metal structure furnishes retaining walls for the individual portions of asphalt and segregates it in a manner to insure a thick uniform body and at the same time the metal walls passing transversely across the body, protect it against injury from falling objects or pressures to which it may be subjected. The upper and lower coatings of asphalt serve to cement the several layers into a solid composite roofing, and the smooth embedded gravel coating constitutes a wear-resisting surface which thoroughly protects the weather-proof body.

While I prefer to form the body or filling of asphalt, yet the advantages of my cellular roof construction will be preserved if fillers are employed, such as asphalt and sand, coal-tar, pitch, or a combination of these with Portland cement, asbestos fibrous cement or rubber cement. Likewise, the outer protective coating may embody asbestos or magnesia, ground slate, mica, graphite, soap-stone or the like.

The construction of my composite roofing enables one to form a very permanent and perfect union with the parapet walls. The foundation layers are turned up against the walls the proper height and secured by means of hot asphalt, while the intermediate cellular metal structure is also anchored by sprigs or rough nails driven into

the mortar joints. After the filler of asphalt has been forced into the cellular structure, the outside is mopped with hot asphalt and stripped with felt or cloth and again mopped. The whole is then preferably covered with a sheet metal counter-flashing which is secured above in a mortar-joint and is brought down to the roof. There is no danger, therefore, of any water getting between the union of the roofing and the parapet walls.

I claim:—

1. A composite roofing, comprising a cellular sheet metal structure having thin intersecting strips turned transversal of the metal sheet forming retaining walls for segregated cellular spaces, a body of amorphous bituminous material compacted into a hard, stable mass within said cellular spaces, said retaining walls preventing any movement or shifting of the individual portions of said body material and protecting it against transverse stresses or blows, and foundation and protective coatings united respectively to the bottom and top of the body portion.

2. A composite roofing comprising a foundation sheet of fibrous material, a cellular metal sheet structure formed of thin intersecting strips having their edges extending transversely of the sheet to provide segregated closed spaces, a body of amorphous bituminous material compacted into a hard, stable mass within the cellular spaces of said structure, a bituminous coating united to the top of said body, and a protective surface of hard mineral particles embedded therein.

3. A composite roofing comprising a foundation sheet of fibrous material, a cellular metal sheet structure formed of thin intersecting strips having their edges extending transversely of the sheet to provide segregated closed spaces, a body of amorphous bituminous material compacted into a hard, stable mass within the cellular spaces of said structure, an adherent coating forming a bond between said foundation sheet and the bottom of said body, a bituminous coating united to the top of said body, and a protective surface of hard mineral particles embedded therein.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM L. BARNHART.

Witnesses:

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