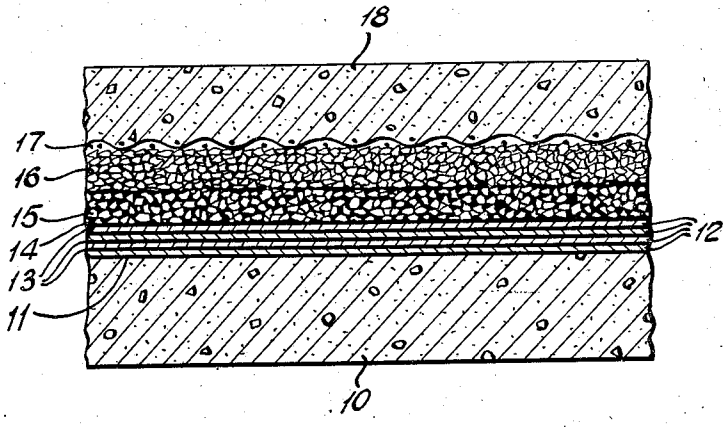
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COMPOSITE ROOF

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COMPOSITE ROOF

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This invention relates to a composite roof, more particularly to an industrial roof of the type known as a "built-up roof" having a wear-resisting surface. Built-up roofs are generally formed of a membrane consisting of a plurality of layers of roofing felt saturated with a bituminous substance, such as coal tar pitch or asphalt, each layer having a coating of similar bituminous substance applied thereon, the coating on the top layer being thicker than the others and having gravel or slag embedded therein.

While such a roof is satisfactory from the standpoint of providing a durable watertight covering, it is unsuitable for use where the surface is to be subjected to hard wear, as in the case of a roof garden, play ground, or where motor vehicles or other heavy articles are to be moved and stored on the roof.

To remedy this defect it has been proposed to provide such a roof with a wear-resistant surface of cement, concrete, or the like. One such proposal is disclosed in my Patent No. 1,977,669 of October 23, 1934, which describes a roof of the built-up type having a wearing surface of bituminous concrete of the kind used in the surfacing of roads.

Heretofore the top or wearing surface layer, whether of cement, bituminous concrete, or other substance, has been bonded to the underlying layer of bituminous substance and keyed thereto by the gravel or slag embedded therein. The surfacing material has usually been poured directly on the bituminous layer.

Principally by reason of differentials in the coefficients of expansion of the materials used, and the wide range of climatic conditions to which roofs are exposed, it has been found that the underlying membrane of a built-up roof provided with a concrete surface soon tears and causes leaks due to fissures or cracks developed in the surface by the expansion and contraction factor of the concrete slab itself. Use of expansion joints, such as are employed in the construction of concrete roads, has been proposed but it has been found that they do not wholly solve the problem of preventing leaks.

The primary object of the present invention is to provide a roof having a wear-resistant surface so constructed as to prevent tearing of the membrane due to expansion and contraction of the surface.

Another object is to provide a roof in which the wearing surface is not directly bonded to the underlying layer of bituminous substance.

A further object is to provide a roof having a reenforced concrete wearing surface that is separated from the roofing membrane by an intervening cushioning layer of loose gravel.

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I accomplish these objects, as well as others, by means of the construction hereinafter described and illustrated in the accompanying drawing which represents diagrammatically a section of a roof embodying the invention.

The composite roof covering shown in the drawing is applied over a random level roof deck or base 10 of concrete or other suitable material. The deck is coated over the entire area to be covered with a coating layer 11 of bituminous substance, preferably coal tar pitch. A plurality of layers 12, usually from three to five layers, of sheets of bituminized roofing felt, such as tarred felt, are applied successively, each sheet overlapping the preceding one and having a coating 13 of bituminous substance, similar to the coating 12, applied on its upper surface so that the felt sheets will not directly contact each other at any place. A coating layer 14 of molten coal tar pitch or other suitable bituminous substance is poured or applied uniformly over the top felt layer, and while the coating is still hot, gravel or slag 15 is embedded therein. The gravel, which should be dry and substantially free from dirt, usually ranges from about ¼ to ⅝ inch in size and is applied in an amount of about 300 to 400 pounds per "square," that is for each 100 square feet of roof surface. The construction above-described is that which is more or less commonly used in making a built-up roof or membrane.

According to the present invention, I apply a layer 16 of loose dry gravel over the entire roof area, preferably in an amount of about 100 pounds per square, and rake or grade the surface smooth and even. On the surface of this layer of gravel, which is free from any bituminous substance, there is applied a layer 17 of wire mesh, such as galvanized chicken wire or hardware cloth, preferably having a mesh of not larger than ½ inch. The sections of the wire mesh may be wired together at their ends and side edges to form a continuous mat.

A wearing surface of concrete 18 or other suitable wear-resistant material is poured or applied on the wire mesh to a depth of about 2 inches and is screeded smooth and to grade. The concrete mix may suitably consist of about 1 part of Portland or hydraulic cement, 2½ parts of dry sand, 3½ parts gravel, and about 6 gallons of water for each sack of cement. Conventional expansion-joints (not shown) may be

applied at suitable intervals throughout the area of the wearing surface.

The layer 16 of loose gravel provides a cushioning support for the concrete wearing surface and serves to prevent the membrane from tearing by expansion or contraction of the concrete. The wire mesh 17 prevents the large aggregate in the concrete slab from falling through into the loose gravel and provides a reenforcement of the concrete slab to minimize formation of temperature cracks in the slab.

What I claim is:

1. A composite roof comprising a roof deck, a plurality of layers of bituminized roofing felt, a coating of bituminous substance on each felt layer, the coating on the top felt layer being thicker than the others and having gravel embedded therein, a layer of loose gravel overlying said graveled bituminous layer, and a surfacing of wear-resistant material applied over the layer of loose gravel.

2. A composite roof comprising a roof deck, a plurality of layers of bituminized roofing felt, a coating of bituminous substance on each felt layer, the coating on the top felt layer being thicker than the others and having gravel embedded therein, a layer of loose gravel overlying said graveled bituminous layer, a wire mesh mat covering the layer of loose gravel, and a surfacing of wear-resistant material applied on the wire mat.

3. A composite roof comprising a concrete roof deck, a plurality of layers of tarred felt, a coating of coal tar pitch on each layer, the coating on the top layer being thicker than the others and having gravel embedded therein, a layer of loose gravel overlying said layer of graveled coal tar pitch, and a surfacing of wear-resistant concrete applied over the layer of loose gravel.

4. A composite roof comprising a concrete roof deck, a plurality of layers of tarred felt, a coating of coal tar pitch on each layer, the coating on the top layer being thicker than the others and having gravel embedded therein, a layer of loose gravel overlying said layer of graveled coal tar pitch, a wire mesh mat covering the layer of loose gravel, and a surfacing of wear-resistant concrete applied over the wire mat.

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