

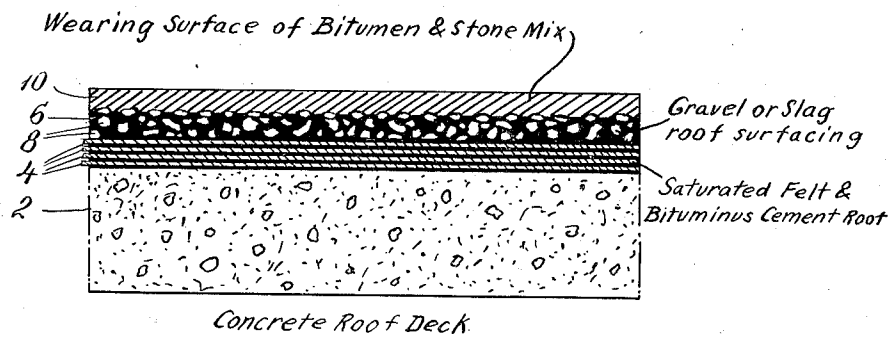
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ROOF

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ROOF

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This invention relates to roofs and to methods of constructing or laying the same.

Roofs as ordinarily constructed are not capable of withstanding the severe wear of relatively heavy traffic such as is required of roofs to be used for play grounds and roof gardens or for the storage of motor vehicles. In order to enable roofs to be used for these purposes the wearing surface of the roof must be constructed of much more durable material than that of the ordinary roof in order to withstand the severe usage to which such roofs are subjected. Roofings to be used under such conditions have been constructed heretofore of a wearing surface of cement or cement and tile laid upon a suitable roof deck, but these materials have relatively high coefficients of expansion so that they expand and contract with the wide changes in temperature to which the roofs are subjected, thereby developing leaks, and therefore, it has been necessary to provide expansion joints between the tiles or at intervals throughout the roof to permit the tile or cement to expand freely. Even when so constructed the roofs may be cracked by the freezing of water which penetrates the relatively porous material of which the roof is constructed and are liable to leak at the joints. Furthermore, cement and tile roofs are expensive to lay and repair and in many instances the cost of constructing such a roof is prohibitive.

Although bituminous materials have been used as constituents of roofing materials, roofs constructed of these materials have not been of such character or so applied to the roof deck that they have been capable of withstanding the heavy traffic to which roofs used for play grounds, roof gardens or the storage of motor vehicles are subjected. However, bituminous materials are eminently suited for producing wear resistant surfaces, as is evidenced by their wide use in road construction. Bituminous materials have the additional advantages of being cheap and possessing relatively small coefficients of expansion so that the tendency for the material to crack with changes of temperature is not encountered.

It is an object of the present invention to improve the construction and method of laying roofs in order to decrease or overcome the objections which have characterized roofs heretofore employed under conditions of severe wear or heavy traffic.

Another object of the invention is to reduce the cost and increase the durability and wearing characteristics of roofs used for such purposes.

A further object of the invention is to utilize

bituminous materials such as have been employed in road construction as a constituent of roofs to be used under conditions of heavy traffic.

These and other important objects and features of the invention will appear from the following description and the figure of the drawing which illustrates a preferred embodiment of invention.

Roofs containing bituminous material have heretofore been laid by applying several layers of water-proof material such as felt saturated with pitch or other bituminous water-proof material to the roof deck in overlying layers. The successive layers of saturated felt are given a coating of bituminous material so that the felt of one layer is separated from the felt of the next succeeding layer by a bituminous coating. For example, four such layers of felt coated with pitch may be applied to the roof deck. A relatively thick layer of pitch or bituminous material is then applied over the felt layers and gravel may then be applied to the coating of bituminous material and embedded in the surface thereof.

In accordance with the present invention a roof of any suitable character such as that described above is applied to a roof deck and then a water-proof and traffic-resisting wearing surface is applied thereto as described in detail hereinafter.

As illustrated in the figure of the drawing, a roof deck 2 has a plurality of layers of saturated felt 4 applied thereto and a layer of pitch or other bituminous material 6 is laid over the superimposed layers of saturated felt. Gravel or slag, preferably from one-fourth to five-eighths inch in diameter, is embedded in the pitch 6, preferably while it is still hot, as indicated at 8. The amount of gravel embedded in the pitch preferably does not exceed about 200 lbs. per square (of 100 square feet). When the pitch has cooled, the surface is swept to remove loose particles of slag or gravel and a wear resisting bituminous surfacing material 10 of the type ordinarily used in the surfacing of roads is applied over the layer of pitch and embedded gravel.

As an example of the surfacing material which may be used for this purpose, bituminous concrete may be prepared by mixing bituminous material (preferably a coal tar distillation residue fluid at ordinary temperatures) and air dried gravel or slag.

The bituminous concrete or other wear resisting surface layer may vary in composition, but a preferred mixture may be made by adding from 12 to 15 gallons of coal tar residue fluid at ordinary temperatures to each cubic yard of gravel

or slag to be employed on the roof. The gravel or slag should contain at least 75% of particles from one-fourth to one-half inch in diameter and be thoroughly air dried. The pitch and gravel are intimately mixed by means of an ordinary cement mixer or any other suitable device so that each particle of solid material is thoroughly coated with pitch. The mixture in this prepared form is then laid over the layer of pitch and embedded gravel to the desired depth, for instance, approximately two inches. The bituminous concrete may be allowed to set for twelve hours and then forced into intimate contact with the gravel 8 embedded in the bituminous material 6 by means of a roller weighing about 500 pounds. After the layer of bituminous concrete has been compacted to a thickness of approximately one and one-half inches, it is allowed to set for a period of a week or ten days, after which if desired a light coat of bituminous material and sand may be applied to the surface of the bituminous concrete.

It is important in the construction of roofs of this character that the composition of the bituminous material employed in the layers 6 and 10 should be similar, that is, if the layer 6 consists of coal tar pitch, the wear resisting surface layer of bituminous concrete or other material should also contain coal tar pitch or distillation residue as a constituent. Similarly, if the layer 6 is composed of asphalt, the bituminous concrete or wear resisting surface layer should contain asphalt as a constituent. This similarity of composition of the layers 6 and 10 is preferred in order to prevent oils or constituents of the composition of one layer, from having a solvent or softening action upon the adjacent layer with which it is in engagement when applied to the roof. The gravel 8 embedded in the bituminous material 6 acts as a key which engages with the layer of bituminous concrete 10 so as to prevent relative movement of the concrete and bituminous material 6 under the stress of traffic carried by the roof.

In constructing roofs in accordance with the present invention, the bituminous material of the layer 6 should be a product such as pitch or asphalt that is substantially free from inert filler materials such as sand or clay which would render the bituminous material undesirably hard and stiff and difficult to apply to a roof. Furthermore, by using for the layer 6, materials such as pitch and asphalt which, when heated, are comparatively soft or fluid, the gravel subsequently applied to and embedded in the bituminous material is firmly held thereby as the bituminous material cools and hardens so that a strong bond is provided between the layer 6 and the overlying layer 10 of bituminous concrete. Therefore, the terms "bituminous material" and "pitch" as used throughout the specification and claims and particularly as applied to the layer 6 in which the gravel is embedded, refer to bituminous materials and pitch which are substantially free from inert filler materials such as sand and clay.

The composition of the bituminous concrete employed may vary considerably and contain other materials beside pitch or asphalt and gravel and other mixtures or surfacing materials containing bituminous material may also be employed. The invention therefore is not limited to the specific composition of bituminous concrete cited in the example, since other compositions or mixtures may be suitable or particularly adapted for some specific conditions of use. Furthermore, it is not intended that the invention should be limited to its application to a roof made up of layers of felt water-proof material having an upper layer of pitch and gravel such as that described, since the wear resisting surface may be applied to other existing roof constructions or layed over other surfaces than that described without departing from the spirit and scope of the invention as defined by the claims.

I claim:

1. A roof adapted to be used as a play ground, roof garden, or for the storage of motor vehicles, comprising a roof deck, a plurality of layers of bitumen-saturated felt applied to the deck, said layers of felt being coated with bituminous material, a layer of bituminous material applied over the top layer of felt, a layer of gravel applied to the surface of the bituminous layer, said gravel being pressed into and firmly embedded in the bituminous layer, the said layers providing a firm foundation, and a layer of bituminous concrete overlying said gravel and pressed into intimate contact therewith, said gravel forming a strong interlocking bond between the bituminous material and the overlying layer of bituminous concrete, said bituminous material coating said felt and the said bituminous concrete all having substantially the same coefficients of expansion whereby tendencies to rupture said felt due to temperature changes to which the roof is subjected is minimized.

2. A roof adapted to be used as a play ground, roof garden, or for the storage of motor vehicles, comprising a concrete roof deck, a plurality of layers of bitumen-saturated felt applied to the deck, said layers of felt being coated with bituminous material, a relatively thick layer of bituminous material substantially free from admixed inert material applied over the top layer of felt, a layer of gravel applied to the surface of the bituminous layer, said gravel being pressed into and firmly embedded in the bituminous layer, the said layers providing a firm foundation, and a layer of bituminous concrete overlying said gravel and pressed into intimate contact therewith, said gravel forming a strong interlocking bond between the bituminous material and the overlying layer of bituminous concrete, said bituminous material coating said felt and the said bituminous concrete all having substantially the same coefficients of expansion whereby tendencies to rupture said felt due to temperature changes to which the roof is subjected is minimized.

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