

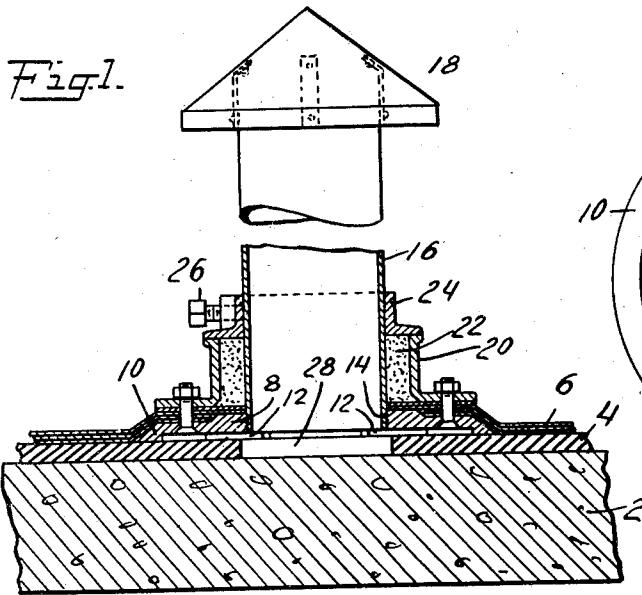
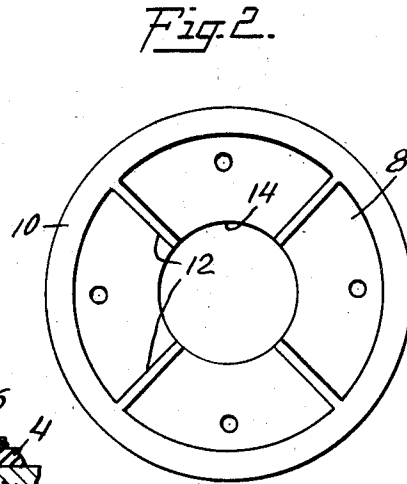
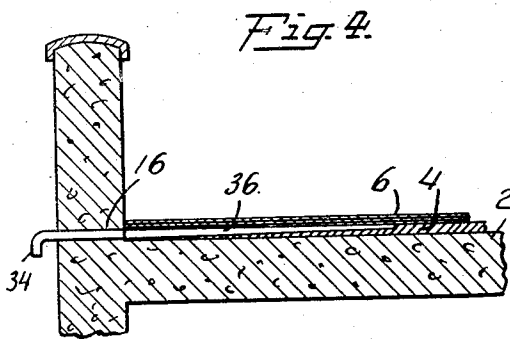
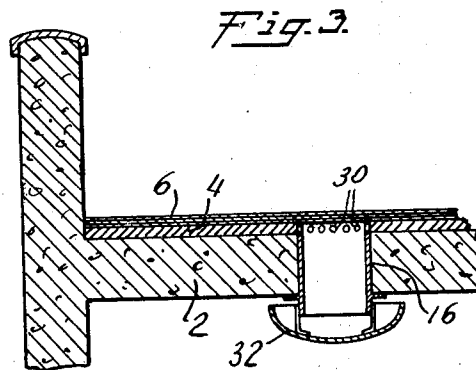
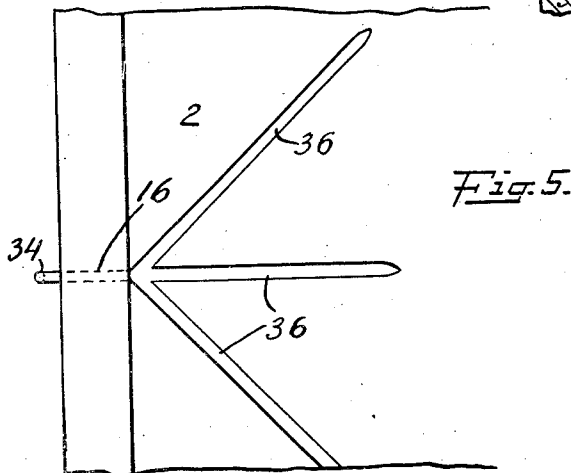
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1,931,066

VENTILATED ROOF AND SIMILAR STRUCTURE

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VENTILATED ROOF AND SIMILAR
STRUCTURE

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This invention relates to built up roofs and similar structures and particularly to that class of structure in which a layer of insulating material is interposed between an impervious foundation
5 such as a roof deck and an outer layer of water-proof material.

In constructing built up roofs, that is, roofs comprising a plurality of layers of material having different characteristics, it is often desirable to employ a layer of insulating material such as fibre board, plaster board, gypsum block, porous cement and the like. Such materials are relatively porous and are often allowed to stand in the open, unprotected from moisture or rain, while the roof
10 is being constructed, so that they may contain substantial amounts of moisture when laid. These materials in a typical roof may be laid over a roof deck of concrete or other material which is impervious or only slightly pervious to water.
20 One or more layers for example of bituminous saturated felt, or other water-proof membrane, are then laid over the insulating material and cemented together and in place by pitch, asphalt, or similar material so as to form an impervious
25 layer. When the roof deck or the roofing layer below the insulation is substantially impervious to gases or vapors, any moisture which may be contained in the pervious layer of insulating material or which is present upon or in the upper surface of the roof deck is thus effectively sealed
30 within the roof so that it cannot readily evaporate or escape. The moisture and sometimes air thus entrapped in the roof form soft spots or "blisters" which are readily punctured, especially
35 if the roof is subjected to traffic. Furthermore, the presence of moisture tends to cause decomposition or deterioration of the insulating material or other elements of the built up roof with the formation of gases. The gases thus formed aggravate the blistering effect by pulling the piles of material apart, often causing a permanent separation of the layers of material, and ultimately resulting in the failure and leaking of the roof. This blistering is especially troublesome in warm
45 weather when decomposition occurs more rapidly and any gases or air present in or between the layers of material expand with the heat.

Walls and some times floors are also built in a similar way; that is, a layer of insulating material
50 is laid on the wall, floor or other foundation, and over this is applied a water-proof layer of tarred felt or the like. In all such cases the built up structure may be constructed in accordance with my invention.

55 The principal object of the present invention is

to eliminate or diminish the difficulties set forth above and to provide a built up roof or similar structure from which moisture trapped therein will readily be eliminated. It has been discovered that by providing ventilators or passageways communicating with the layers of the material which may contain moisture or air to allow the moisture and air to evaporate or escape from the pervious layers or between the layers of the material, the defects and objections heretofore presented in
60 such structures are overcome.

The invention will be more fully understood by reference to the accompanying figures of the drawing which illustrate alternative forms of ventilators as applied to built up roofs but which
65 are suitable for permitting the escape of moisture and air from the layers of material comprising other types of built up structures as well.

In the drawing:

Fig. 1 is a vertical sectional view of a ventilator
75 and built up roof embodying the present invention;

Fig. 2 is a detail of the invention as seen from below;

Fig. 3 is a vertical sectional view of an alternative form of ventilator applied to a roof construction similar to that illustrated in Fig. 1;

Fig. 4 is a vertical sectional view of another type of ventilator employed in a roof such as that illustrated in Fig. 1; and
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Fig. 5 is a plan view of the form of the invention illustrated in Fig. 4, showing the channels leading to the ventilators from points remote therefrom.

In the form of the invention illustrated in Fig. 90 1 the roof comprises a roof deck 2 which may be made of cement, tile or any other suitable material. A layer of insulating material 4, such as fibre board, porous cement, etc., is laid over the roof deck. One or more layers of bituminous
95 saturated felt 6 or other water-proofing material is applied over the layer of insulating material, the water-proofing layers being sealed to the edges of the roof and to each other by pitch, asphalt or similar material. If desired a layer
100 of pitch or asphalt may be laid over the layer of insulating material between the insulating material and the bituminous saturated felt layers.

At those points where the ventilators are to be located a metal plate 8 is secured to the roof
105 deck 2 by nails, bolts or screws, the plate being located beneath the water-proofing material and over the insulating material. This plate is provided with a downwardly extending periphery
110 10 and inwardly extending ribs 12 to provide a

relatively large exposed area of insulating material. The central portion of the plate is provided with an opening 14 which is screw-threaded to receive a vertical ventilator pipe 16. The pipe 16 extends through an opening in the layers of water-proofing material and projects above the surface of the roof a short distance. The upper end of the ventilator pipe 16 is provided with a cone-shaped hood 18 spaced above the end of the pipe 16 and extending outwardly and downwardly a sufficient distance from the pipe 16 to prevent rain or water from entering the pipe but to allow the ready escape of air and moisture.

The layers of bituminous saturated felt 6 are secured in place about the pipe 16 and over the plate 8 by means of a circular retaining member 20 which is bolted to the plate 8 so as to hold the felt securely in place. Oakum or other suitable packing 22 is inserted between the retaining member 20 and the pipe 16 to insure a water-tight joint between the surface layers of the roof and the pipe 16.

The upper end of the pipe 16 and the retaining member 20 are secured in position by a ring 24 through which pass positioning screws 26.

The insulating material 4 is preferably provided with an opening or cut out portion 28 concentric with the pipe 16 to allow the evaporation of moisture from the roof deck and from the space between the roof deck and insulating material.

The ventilator thus provides a means for allowing ready escape of gases and evaporation of any moisture in the insulating material, roof deck or other foundation over which the impervious layer is placed or between the various layers of the built up structure. At the same time the ventilator is shielded so that rain cannot pass down the ventilator pipe to the roof deck. The water-proofing surface is secured in contact with the ventilator pipe and the packing prevents rain or water from leaking past the water-proofing material adjacent the ventilator pipe.

Fig. 3 of the drawing illustrates a type of ventilator which may be employed for allowing the escape of air and moisture into the space below a roof deck or floor. This form of the invention has the additional advantage that the upper surface of the structure is not encumbered by the ventilator. As illustrated, the ventilator pipe 16 is provided with apertures 30 through which moisture may pass from the layers making up the roof, and the lower end of the pipe 16 is provided with a cup-shaped member 32 for catching any water which may drip from the ventilator pipe.

Figs. 4 and 5 illustrate a form of the invention which provides lateral ventilation or drainage of the layers of the built up structure. In this form of the invention the passageway indicated at 16 gives access to the air through the lateral walls or parapet of the building. The outer end 34 of the member forming the passageway 16 is turned downwardly to prevent rain from entering the passageway. In any of the forms of the invention and particularly with the form illustrated in Figs. 4 and 5 grids, channels, grooves or the like 36 leading from remote points to the ventilators may be provided in the insulation or foundation to afford ready passage of moisture, air or gases from points under the impervious covering located at some distance from the outlets or vents to the ventilators.

The invention is not limited to its use with roofs but may be applied to walls, floors and other structures as well. Nor is the invention to be limited to structures constructed with water-

proofing layers of bituminous saturated felt as described since it is also applicable to other structures having surface layers of pitch, asphalt, tile or other impervious materials and to structures in which the insulating material is formed of any pervious material or the surface is formed of layers of material applied directly to a foundation such as a roof deck, wall or floor which is itself porous or which may contain moisture.

The particular construction, position and location of the ventilators is subject to innumerable changes and arrangements and, therefore, it is not intended that the invention should be limited to the particular form illustrated and described except as defined by the claims.

I claim:

1. A structure comprising an impervious foundation, a layer of insulating material which is pervious to water laid over the foundation and an overlying layer of water-proofing material covering said insulating material and sealing the same whereby moisture and gases present in the pervious insulating material are confined between the impervious foundation and the waterproofing material, said structure having one or more vents through which moisture and gases so confined may escape or be removed from the insulating material or from between said materials.

2. A roof comprising a layer of pervious material and a layer of water-proofing material covering the pervious material, said roof having a fixed member extending upwardly through the water-proofing layer to allow the escape of gases and moisture from the pervious material.

3. A roof comprising an impervious roof deck, insulating material laid over the roof deck and one or more layers of water-proofing material applied over the insulating material, said roof having a fixed member extending upwardly through the layer of water-proofing material and communicating with the insulating material to allow the escape or removal of moisture and air from the insulating material or from between the various layers of material.

4. A roof comprising an impervious roof deck, a layer of insulating material applied over the roof deck and a water-proofing surface layer of bituminous saturated felt, said roof having means forming a passageway through the surface layer and communicating with the insulating material to allow the moisture and gases in said material or between said layers to escape.

5. A roof comprising an impervious roof deck, a layer of material which is pervious to water laid over the roof deck and a water-proofing layer covering said layer of pervious material, said roof having a fixed member extending through said water-proofing layer and providing a passageway communicating with the pervious layer of material.

6. A roof comprising an impervious roof deck, a layer of water-proofing material positioned above the roof deck, a plate located beneath said water-proofing material and above the roof deck, and a ventilator pipe secured to said plate and passing through said water-proofing layer but terminating short of the roof deck.

7. A roof comprising an impervious roof deck, a layer of water-proofing material covering the roof deck, a plate located beneath the water-proofing layer and above the roof deck, a ventilator pipe carried by said plate and extending through said water-proofing layer but terminating short of the roof deck, and means for securing the water-proofing layer to said plate.

8. A roof comprising an impervious roof deck,
a layer of material which is pervious to water
laid over the roof deck and a water-proofing
layer covering said layer of pervious material,
5 said roof having a fixed member extending up-
wardly through said water-proofing layer pro-
viding a passageway communicating with said
pervious layer and having its upper end open to
the air, and sealing means surrounding said fixed
10 member to prevent the leakage of water into the
pervious layer adjacent the fixed member.

9. A structure comprising an impervious foun-
dation, a layer of material which is pervious to
water laid over the foundation and a water-
15 proofing layer covering said layer of pervious
material whereby moisture and gases present in
the pervious material are confined between the
impervious foundation and the waterproofing
layer, said structure having a fixed member pro-
20 viding a passageway located above said impervi-
ous foundation communicating with said pervi-
ous layer and open to the air, and a channel lead-
ing to said fixed member from points remote
therefrom.

10. A roof comprising an impervious roof deck,
a layer of material which is pervious to water
laid over the roof deck and a water-proofing layer
covering said layer of pervious material, said roof
having a fixed member extending through said
80 water-proofing layer providing a passageway
communicating with the pervious layer of ma-
terial, and a channel leading from a point in
said roof remote from said fixed member and
communicating with said passageway.

11. A roof structure comprising an impervious
roof foundation, a layer of pervious insulating
material laid over the roof foundation and an
overlying layer of waterproofing material cover-
ing said pervious insulating material and sealing
90 the same whereby moisture and gases present
in the pervious insulating material are confined
between the impervious roof foundation and the
waterproofing material, said roof structure hav-
ing vents through which moisture and gases so
95 confined may escape from the insulating material
to the atmosphere.

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