

[54] VENTILATED ROOF CONSTRUCTION

3,702,045 11/1972 Selvaag..... 52/95 X

[76] Inventor: **Howard L. Grange**, P. O. Box E,
Darlington, Wis. 53530

Primary Examiner—Alfred C. Perham

Attorney, Agent, or Firm—Andrus, Sceales, Starke & Sawall

[22] Filed: **July 17, 1972**

[21] Appl. No.: 272,380

[57]

ABSTRACT

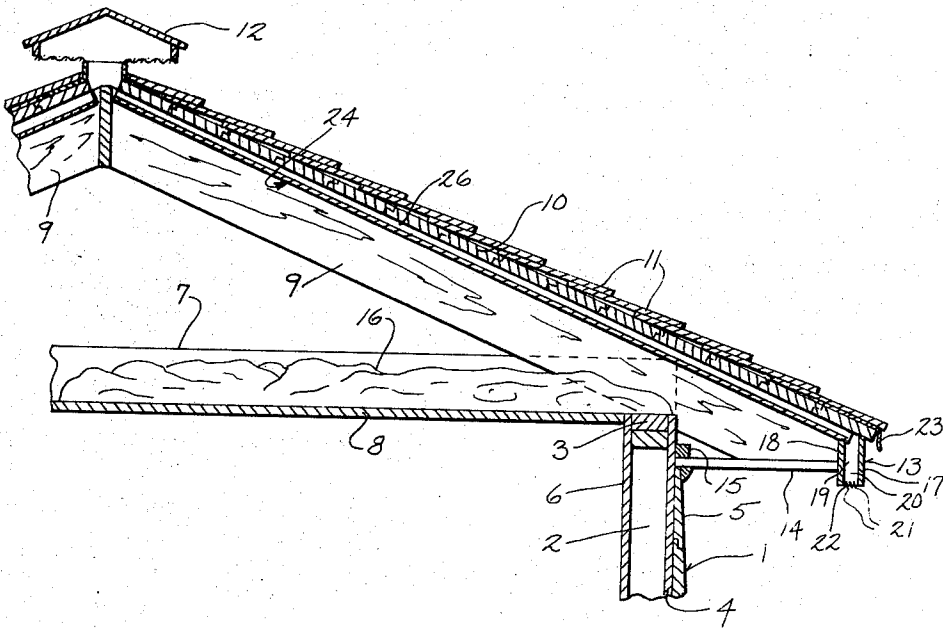
A roof construction employs a continuous corrugated baffle between adjacent parallel spaced roof members which is secured between the roof deck and the roof members. The baffle may extend from the fascia to the ridge or any intermediate area therebetween and provides at least one channel between adjacent roof members for conducting air from the fascia to a vent at the ridge to prevent the formation of ice dams on the roof in the winter as well as providing an interior flashing for collecting and removing water which incidentally seeps through the roof deck. A second embodiment employs a continuous sheet as a baffle while a third embodiment employs a continuous sheet having spacing fins for forming the channels.

8 Claims, 6 Drawing Figures

[56] **References Cited**

UNITED STATES PATENTS

612,024	10/1898	Drake	52/22
1,150,133	8/1915	Lester	52/22
2,816,323	12/1957	Munger	52/309 X
673,646	5/1901	Marshall	52/22
2,688,291	9/1954	Cannard	52/302
2,318,820	5/1943	Voight et al.	52/303
3,086,323	4/1963	Pine	52/199



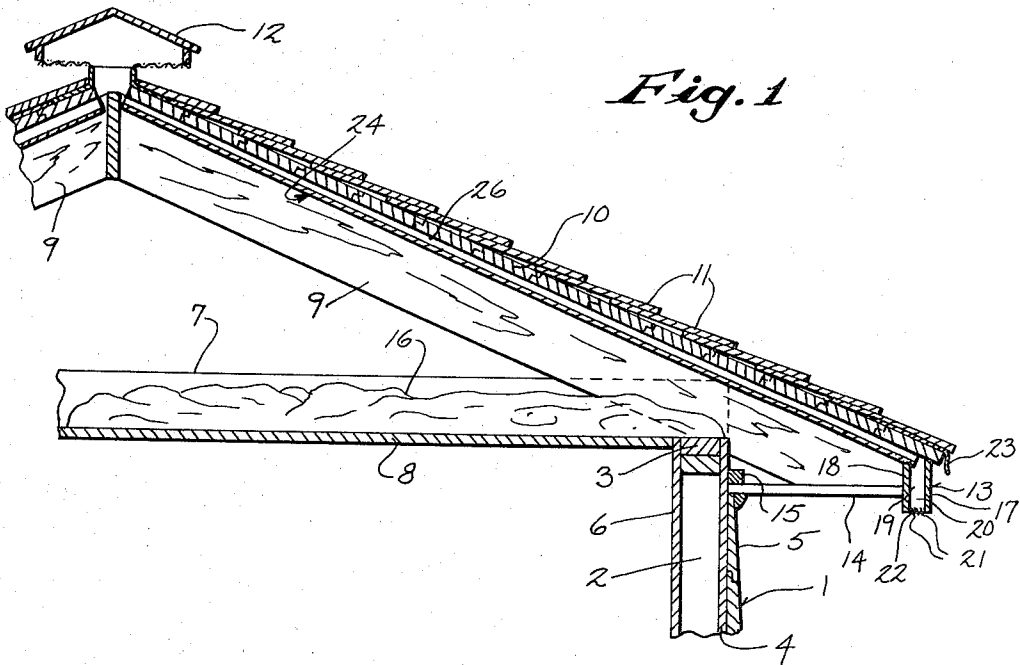


Fig. 1

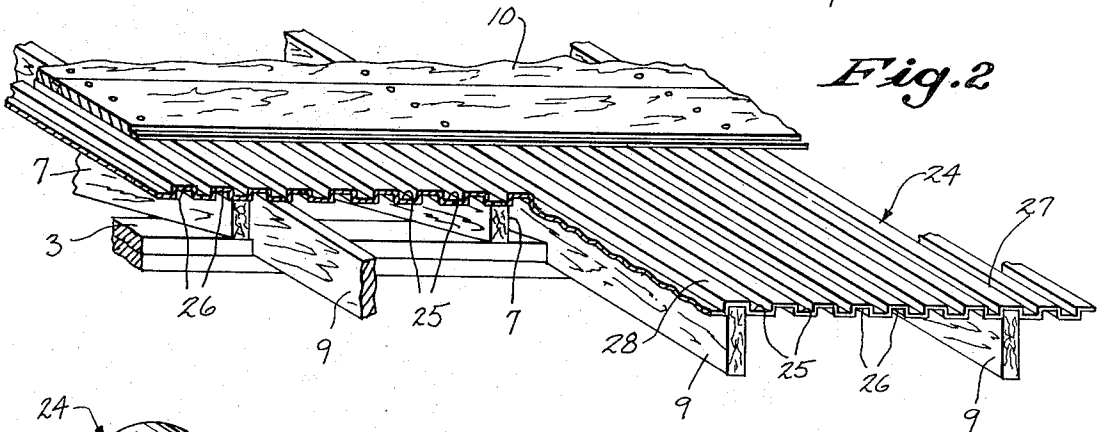


Fig. 2

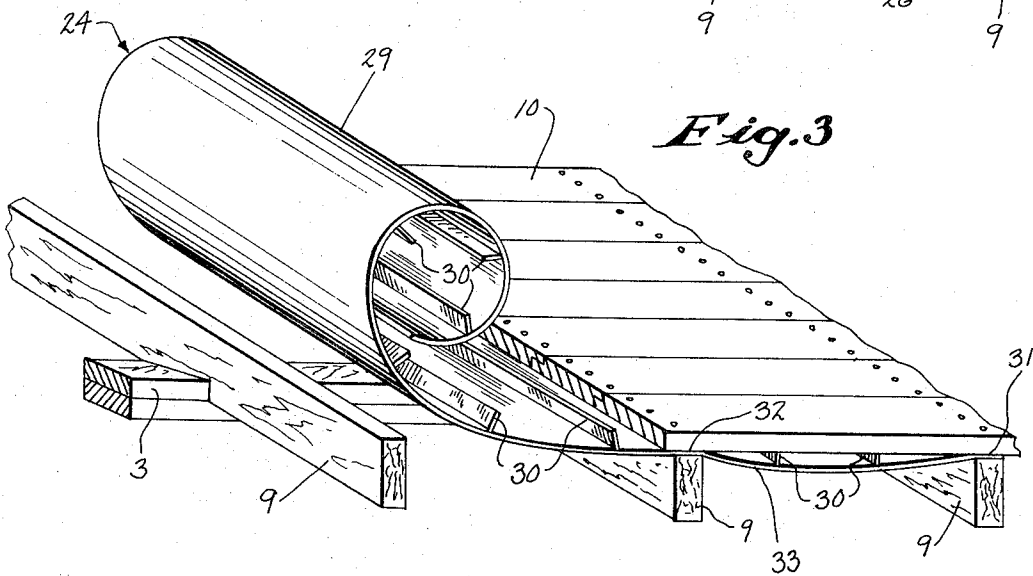


Fig. 3

Fig. 4

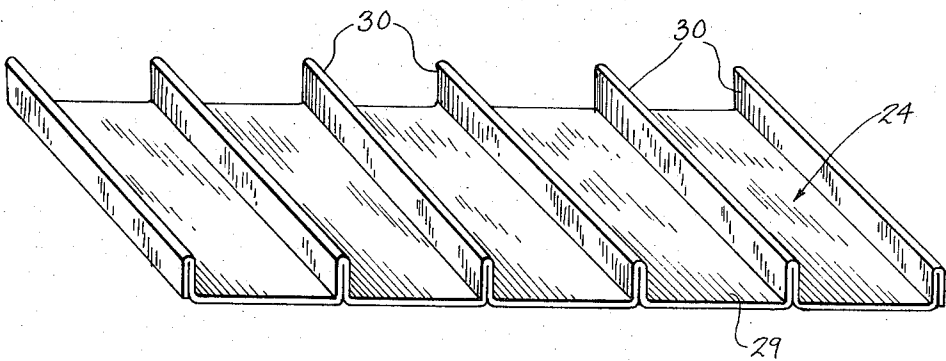


Fig. 5

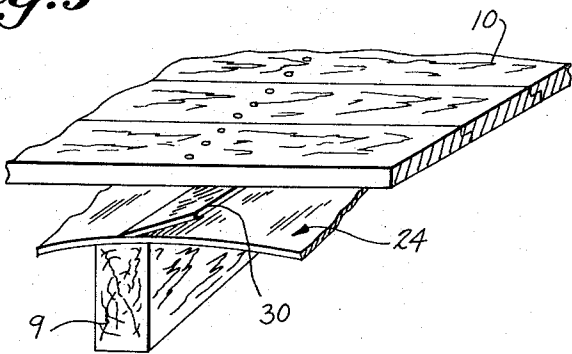
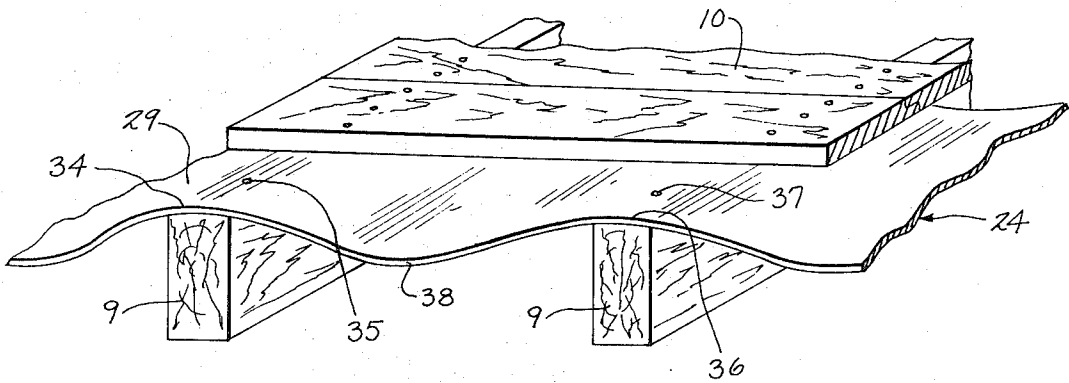


Fig. 6



VENTILATED ROOF CONSTRUCTION

This invention relates to a roof construction designed to provide air flow along the undersurface of the roof deck from the fascia to the ridge to prevent formation of ice dams on the roof in winter, and further to collect and remove liquid which has seeped through the roof deck.

The problems associated with ice formations on roof structures and particularly at the eaves or overhang of roof structures existing in northern climates has been recognized in applicant's copending application entitled Roof Construction having Ser. No. 45,278 filed on June 11, 1970 now U.S. Pat. No. 3,683,785, which was a continuation-in-part of an application having Ser. No. 745,298 filed on July 16, 1968, now abandoned. In the copending application, the formation of ice packs or dams were prevented by reducing or eliminating the thermal gradients existing particularly during the wintertime along the roof surface from the eaves to the ridge by providing a dual wall fascia member which provided an air inlet to permit air flow along the underside of the roof deck. Such an air flow prevented the formation of ice packs upon the outer roof surface which cause water from melting snow to seep through the roof deck and into and along the walls of the building. A baffle member was also movably positioned below the roof deck and positioned above the vertical outside wall which extended outward to engage the fascia member and extended inward from the exterior wall for a short distance to prevent the obstruction of the space between adjacent rafters or roof members by insulation. The inner end of the baffle in the copending application was disposed for vertical movement in response to the packing of the insulation and thus varied in distance from the roof deck.

Prior roof constructions have generally utilized exterior flashings which are nailed to the exterior surface of the roof deck at or near the roof eave. Applicant has recognized that ice packs or dams frequently form immediately above the externally applied flashing which results in water seepage and roof damage. Such exterior flashings also readily deteriorate by oxidization, corrosion, erosion and other abrasive elements frequently provided by wind, water, dirt and repairmen ascending to the roof surface. In addition, nail holes or punctures perforated into the roof when installing externally applied flashing frequently causes water leaks.

The present invention provides an improved baffle member which is easily applied across the open roof members or rafters immediately prior to placement of the roof deck to provide at least one channel between adjacent rafters for not only conducting air between the fascia and the attic and ridge, but provides an interior flashing serving as a second line of protection from incidental leaks and water seepage. The novel roof construction thus provides essentially a double roof deck wherein the baffle member provides a secondary layer of protection against moisture or the like existing immediately below the conventional roof deck while further providing channels for controlled vapor flow to prevent thermal gradients from appearing along the roof between the ridge and the eaves. In addition, the novel baffle member further prevents air or vapor turbulence which might otherwise disturb or misplace in-

sulation located between the ceiling joists and elsewhere within the attic area.

The baffle member of the subject invention is preferably applied as a continuous strip and secured by nails, staples or the like to the upper edges of the roof members or rafters and thereafter covered by the roof deck in the customary manner. A portion of the baffle member between adjacent rafters is spaced from the roof deck to provide at least one groove or channel with a plurality of such grooves provided by a corrugated baffle member having a plurality of alternately spaced grooves and ridges. The use of a corrugated baffle member conveniently provides ridges which can be laterally adjusted to envelope the upper portions of the roof members or rafters while the plurality of ridges existing between adjacent rafters provide spacing elements for the alternately positioned grooves to maintain the grooves in spaced relationship with respect to the roof deck surface for maintaining the plurality of channels.

In a modified form of the invention, the baffle member is provided by a continuous sheet which is applied so that an intermediate portion existing between adjacent rafters provides channels. In a further modified form of the invention, such a continuous sheet member provides spaced projections or fins secured to the upper side thereof for maintaining the baffle in spaced relationship with respect to the roof deck in the area between adjacent roof members or rafters. Such spacing members or fins are preferably flexible to deform into the plane of the flat baffle surface when sandwiched between a roof member or rafter and the roof deck while a rigid fin might also be utilized which is adapted to snap or break under such a sandwiching condition. The fins may be conveniently secured to a sheet forming the baffle member by welding or soldering or may be formed by crimping such a sheet member at spaced locations.

Other objects and advantages will appear in the course of the following description.

The drawings illustrate the best mode presently contemplated of carrying out the invention.

In the drawings:

FIG. 1 is a vertical section of a typical dwelling embodying the roof construction of the invention;

FIG. 2 is a perspective view of the roof structure illustrating the placement of the baffle structure;

FIG. 3 is a perspective view of a roof structure showing a modified form of the baffle structure;

FIG. 4 is a perspective view of the baffle structure shown in FIG. 3;

FIG. 5 is a perspective view showing the placement of the baffle member of FIG. 3 between a rafter and the roof deck; and

FIG. 6 shows a perspective view of the roof structure illustrating a second modified form of the baffle structure.

The drawings illustrate a typical dwelling including a vertical outside wall 1 which is formed of a series of spaced studs 2. A top plate 3 is secured to the upper ends of the studs 2, and sheeting 4 and siding 5 are applied to the outer surface of the studs to provide the outer wall, while a layer of plasterboard or plaster 6 is applied to the inner surface of the studs 2 to provide the interior wall surface.

A series of ceiling joists 7 are supported on the top plate 3 and a ceiling 8 is formed of plasterboard or plaster and is supported from the ceiling joists 7.

The roof includes a series of rafters 9 which are supported on the top-plate 3 and are nailed to the ceiling joists 7. The rafters carry a roof deck 10 and conventional wood, asbestos or asphalt shingles 11 are secured to the outer surface of the roof deck.

The ridge or high point of the roof is provided with a continuous louvered vent 12 so that air supplied from a plurality of channels located beneath the roof deck, as hereinafter described, and air located within the attic space above the ceiling 8 can flow outwardly and escape the dwelling.

A fascia 13 is secured to the outer ends of the rafters 9 and a soffit board 14 is nailed to the lower ends of the rafters 9 as well as to a stringer 15 secured to the studs 2.

To retard the loss of heat from the interior of the dwelling, insulation 16 is located between the ceiling joists 7 and may take the form of batts of fiberglass or loose insulation such as rock wool or the like. In some cases, the insulation 16 may extend over the top-plate 3 to the area above the soffit 14.

The fascia 13 is constructed of an outer fascia board 17 spaced from an inner backing member 18 by a plurality of spacing members 19 thereby providing a vertical passageway 20. A screen 21 connects the bottom edges of the outer and inner members 17 and 18 to provide vertical passages 22 which permit external air to pass into the vertical passageway 20. The fascia construction is specifically set forth in applicant's copending continuation-in-part application having Ser. No. 45,278 filed on June 11, 1970, now U.S. Pat. No. 3,683,785, as previously discussed.

A conventional eave flashing 23 is shown secured between the roof deck 10 and the shingles 11 immediately above the fascia 13 for providing protection to the fascia from external moisture or the like.

According to the invention, a baffle member 24 is secured between the plurality of rafters 9 and the roof deck 10 and spans the space existing between adjacent rafters. As shown in FIG. 2, a corrugated baffle 24 is illustrated having a plurality of grooves or recesses 25 and a plurality of alternately spaced ridges or ribs 26. The ridges 27 designates a first portion of the baffle 24 which is adapted to be secured over the upper portion of one rafter 9 while the ridge 28 designates a second portion which is adapted to engage the upper portion of an adjacent rafter. The portions 27 and 28 are generally secured to the upper portions of rafters 9 by nails, staples or the like followed by the normal application of the roof deck 10 such that the first and second portions 27 and 28, respectively, are sandwiched between the roof members or rafters 9 and the overlying roof deck 10.

The plurality of grooves 25 are spaced from the overlying roof deck 10 by spacing members provided by the ridges 26 existing between adjacent rafters 9 to provide a plurality of channels. As shown in FIG. 1, the grooves or channels 25 conduct air from the vertical passageway 20 within the fascia 13 under roof deck 10 to substantially reduce or eliminate temperature gradients thereon for preventing or eliminating ice packs or dams from forming on the external roof surface.

The baffle member 24 also conveniently provides an internal flashing for the roof to establish a second line

of protection from incidental leaks which might possibly occur through the roof deck 10. The securing of the baffle 24 to the plurality of rafters 9 at the first and second portions 27 and 28 by nails or the like eliminates the occurrence of perforations or openings in the baffle or flashing 24 at the critical areas existing between adjacent rafters to provide a water-tight secondary roof deck. The employment of the baffle or flashing 24 beneath the roof deck 10 sandwiched above the rafters 9 provides a durable flashing construction which does not readily deteriorate by oxidization, corrosion, erosion or by other abrasive forces normally experienced by externally applied flashings.

Baffle 24 may conveniently be fabricated into a corrugated construction from thin aluminum sheets which provide an inexpensive and extremely durable baffle and flashing member which may be transported and applied in the form of rolls. The corrugated construction conveniently allows lateral expansion so that portions 27 and 28 may be aligned with the upper portions of adjacent rafters 9.

The present invention contemplates that the baffle 24 may be applied over the rafters 9 to extend outward to a vapor inlet such as the fascia 13 and preferably communicate with the vertical passageway 20 and extend inwardly to a vapor outlet such as the louvered vent 12, although the baffled area may terminate at a vapor outlet within the attic area and therefore exclusively cover selected portions of the roof area. In any event, it is particularly pertinent that the baffle 24 be applied in the roof area above the vertical outside walls 1 and immediately outside and inside thereof where ice packs or dams frequently occur during the wintertime.

The employment of baffle 24 as sandwiched between the rafters 9 and the roof deck 10 further allows easy and convenient placement of insulation 16 between the ceiling joists 7, over the soffit board 14, and even between adjacent rafters 9 without interfering with the plurality of grooves 25 which provide channels for conducting air over the lower surface of the roof deck 10 and for further conducting moisture from the roof deck 10.

FIGS. 3-5 show a modified version of the baffle 24 which is illustrated being applied across a plurality of parallel spaced roof members or rafters 9 in the form of a continuous roll of sheet-like material 29. A plurality of spaced projections or fins 30 are secured to the upper portion of material 29 and provide spacing members utilized to separate the sheet 29 from the roof deck 10 within the area between adjacent rafters 9. The first and second portions 31 and 32 of the baffle member 24 are sandwiched between adjacent rafters 9 and the roof deck 10. A third portion 33 of the baffle member 24 is defined to exist between the first and second portions 31 and 32 and is maintained in spaced relationship from the roof deck 10 by the fins 30.

The baffle 24 illustrated in FIG. 3 may be fabricated from a continuous sheet of thin aluminum sheeting material by crimping the material at spaced intervals as illustrated in FIG. 4 to provide the plurality of ridges or fins 30. Alternatively, the fins 30 can be attached to the sheet material 29 by welding, soldering, or the like. Such projections or fins 30 are designed to be collapsible when sandwiched between a rafter 9 and the roof deck 10, as illustrated in FIG. 5. It is further contemplated that projections or fins 30 could be constructed

5

of a brittle material, such as hard plastic for example, which is adapted to break or snap when being sandwiched between a rafter 9 and the roof deck 10.

FIG. 6 illustrates a second embodiment of the baffle member 24 and shows a continuous roll of sheet material 29 being applied over adjacent rafters 9 such that a first portion 34 is secured by nails 35 to one rafter 9 while a second portion 36 is secured by nails 37 to an adjacent rafter such that a third portion 38 is permitted to sag to be in spaced relationship to the roof deck 10 thereby providing a groove or channel.

The use of baffle 24 thus provides a passage for air flow over the critical area above the top plate 3 of the exterior wall 1 and assures that air will be directed along the undersurface of the roof deck 10 without interference from insulation. In addition, circulating air is prevented from disrupting loose insulation located between the ceiling joists 7 and possibly located between the rafters 9. By insuring the free flow of air along the undersurface of the roof deck 10, ice packs or dams on the roof will be substantially reduced or eliminated. The baffle 24 further provides an internal flashing designed for durability and a long life which collects and conducts incidental moisture leaks from the roof deck area to prevent damage to surrounding structure.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims, particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. In a dwelling, a vertical exterior wall, a series of generally parallel spaced roof members supported on the wall, a roof deck supported by said roof members, baffle means including a member having first and second portions confined between the upper edges of adjacent roof members and the roof deck and third portions located between said adjacent roof members and spaced from said roof deck to define at least one chan-

6

nel therebetween for conducting ventilating vapor beneath the roof deck and removing liquid which has leaked through the roof deck, air inlet means located outwardly of the vertical wall and communicating with the outer end of said channel, and air outlet means located inwardly of said vertical wall and communicating with the inner end of said channel, whereby air will enter said air inlet means and flow through said channel in contact with the undersurface of said roof deck to said outlet means.

2. The dwelling of claim 1, wherein said baffle means includes a continuous corrugated strip having a plurality of alternately spaced ridges and grooves with certain of said ridges adapted to grip the upper portion of said spaced roof members and said grooves defining a plurality of channels.

3. The dwelling of claim 2, wherein said ridges between adjacent roof members define spacing means adapted to maintain said grooves in spaced relationship with respect to said roof deck.

4. The dwelling of claim 1, wherein said baffle means includes spacing means engageable with the undersurface of the roof deck for maintaining said third portion in spaced relationship to said roof deck.

5. The dwelling of claim 4, wherein said spacing means includes at least one projection connected to said baffle means and disposed to collapse when sandwiched between one of said roof members and said roof deck.

6. The dwelling of claim 4, wherein said spacing means includes a plurality of fins formed at spaced intervals along the upper surface of said baffle member.

7. The dwelling of claim 6, wherein said fins comprise spaced folds within a continuous sheet material.

8. The dwelling of claim 6, wherein said fins include a brittle material connected to said baffle member and adapted to break when sandwiched between one of said roof members and said roof deck.

* * * * *

45

50

55

60

65