United States Patent [19]

Kneisel

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[54] **ROOF FLASHINGS FOR USE WITH ROOF PLANKING**

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[21] Appl. No.: **376,597**

Related U.S. Application Data

[63] Continuation of Ser. No. 101,982, Feb. 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 885,148, Dec. 15, 1969, Pat. No. 3,626,439.

[52] **U.S. Cl.** **52/58;** 52/276
[51] **Int. Cl.** **E04d 3/38;** E04d 1/36
[58] **Field of Search** 52/276, 542, 516, 515, 52/60, 13

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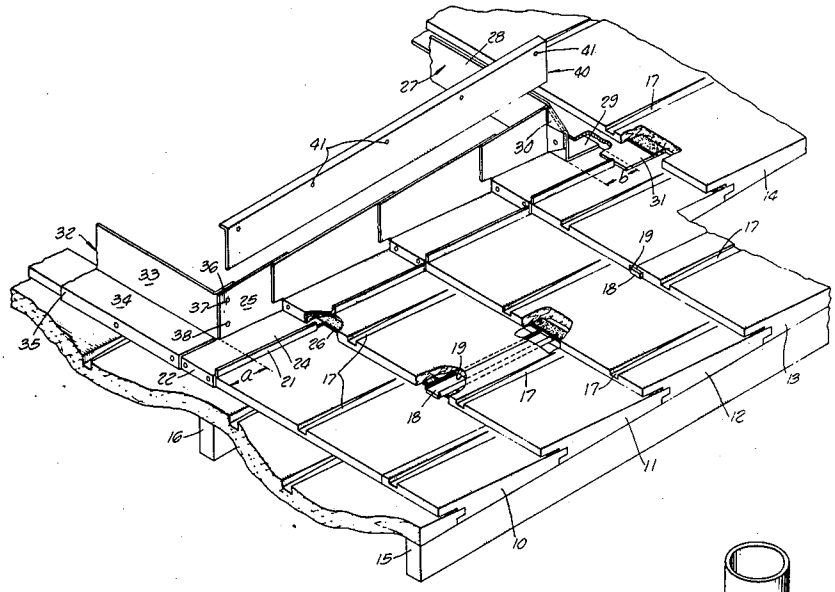
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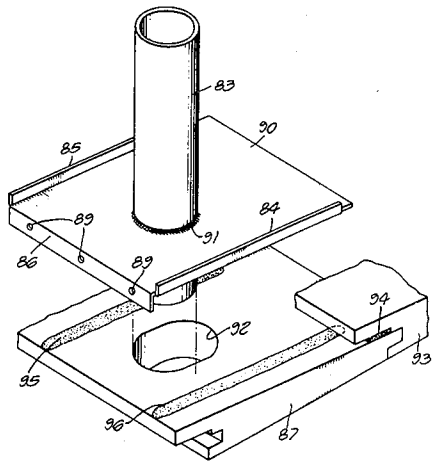
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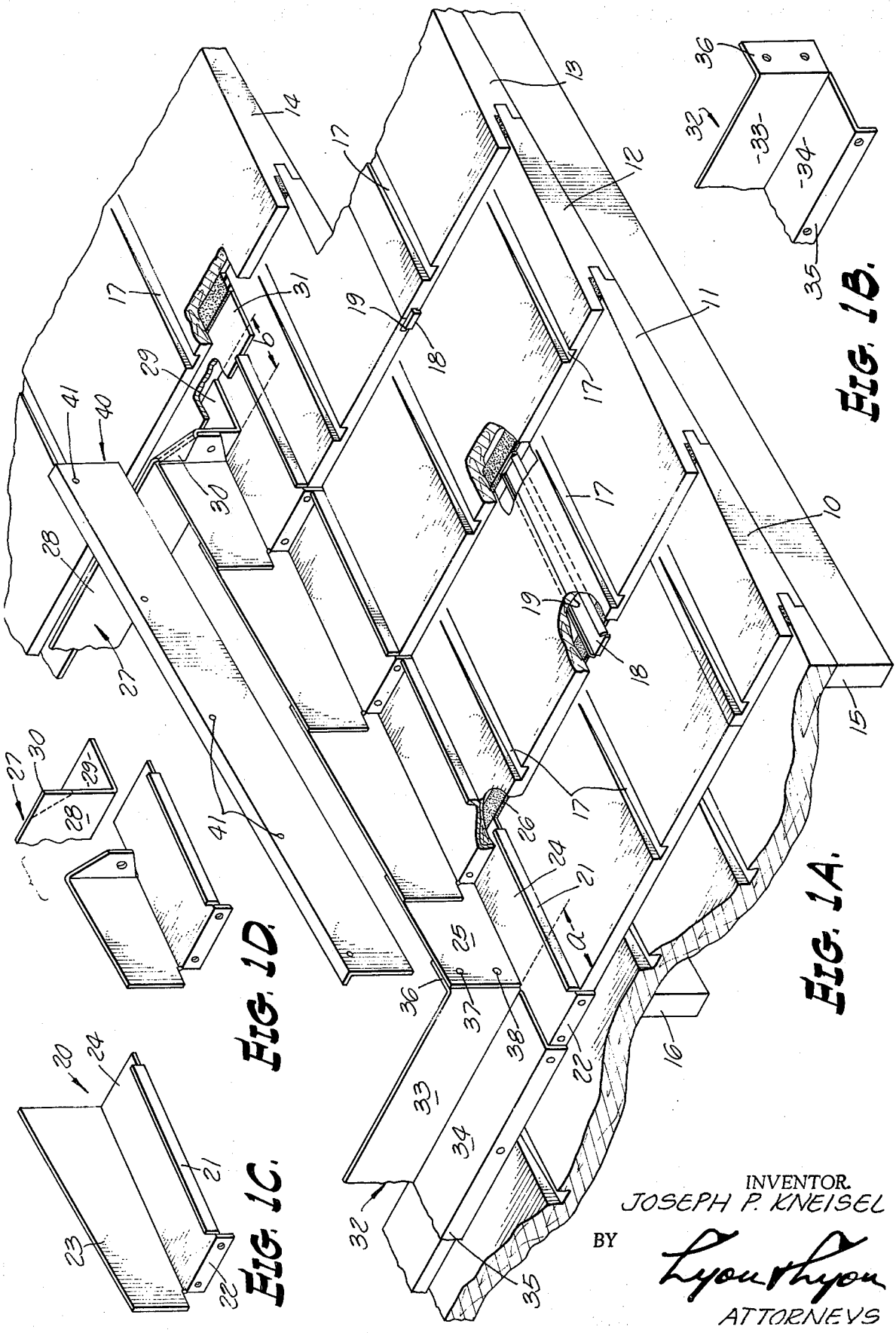
[57] **ABSTRACT**

There is disclosed herein a series of roof flashings used for water-proofing various joints in roofing fabricated from roof planking. Flashing configurations disclosed are useful for water-proofing joints at roof valleys, roof hips, chimneys, dormers, vents and the like. The flashing may be fabricated from any thin material such as metal or plastic which in turn may be subsequently coated. The flashing pieces disclosed are particularly useful when the roofing material is in the form of planks such as those disclosed in applicant's parent application identified below.

5 Claims, 12 Drawing Figures






FIG. 1A.
FIG. 1B.
FIG. 1C.
FIG. 1D.
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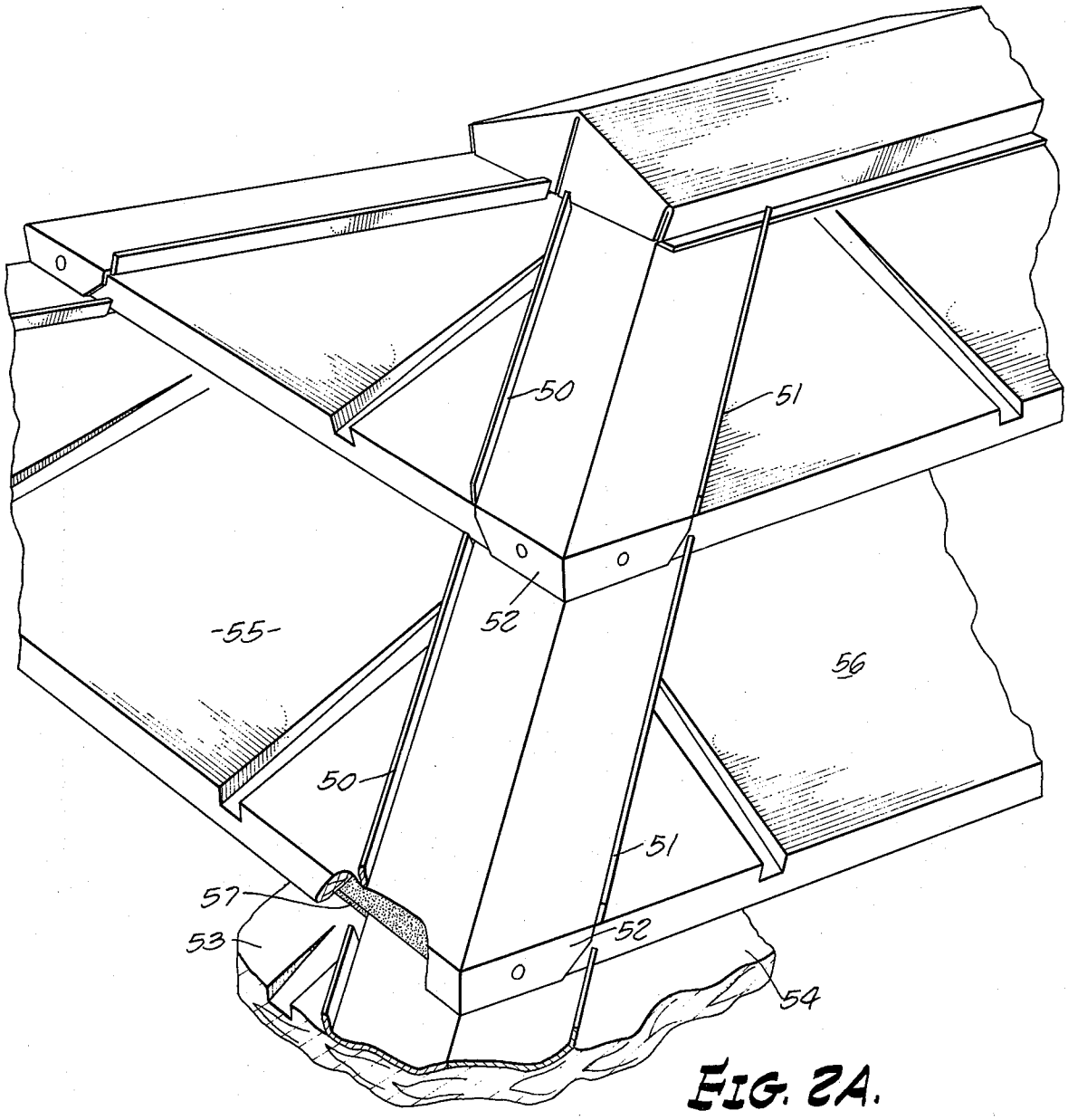


FIG. 2A.

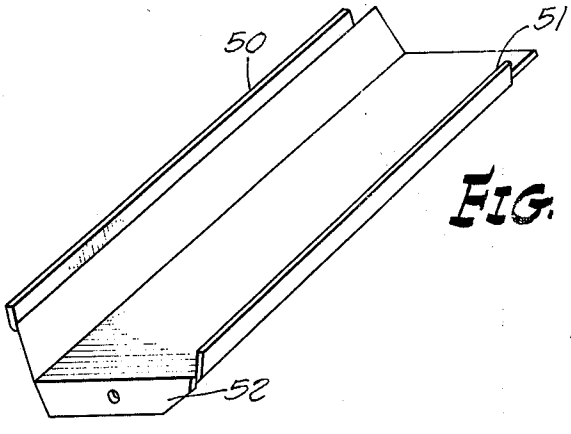


FIG. 2B.

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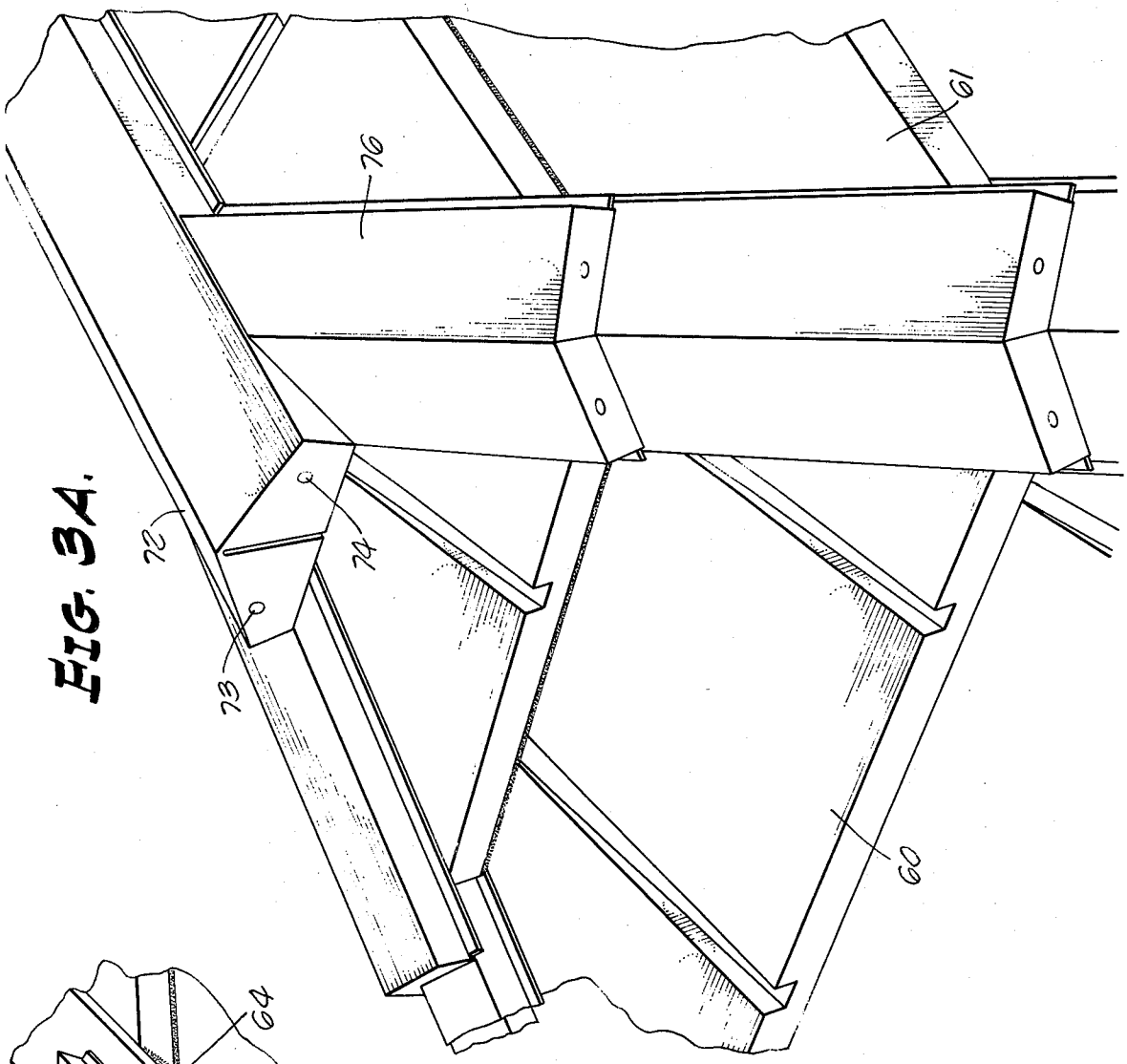


FIG. 3A.

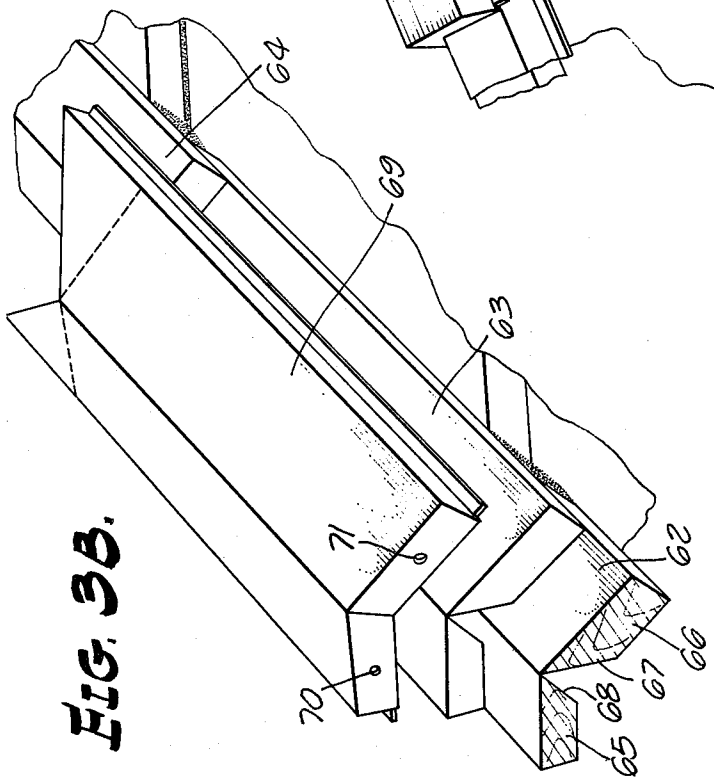


FIG. 3B.

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FIG. 4A.

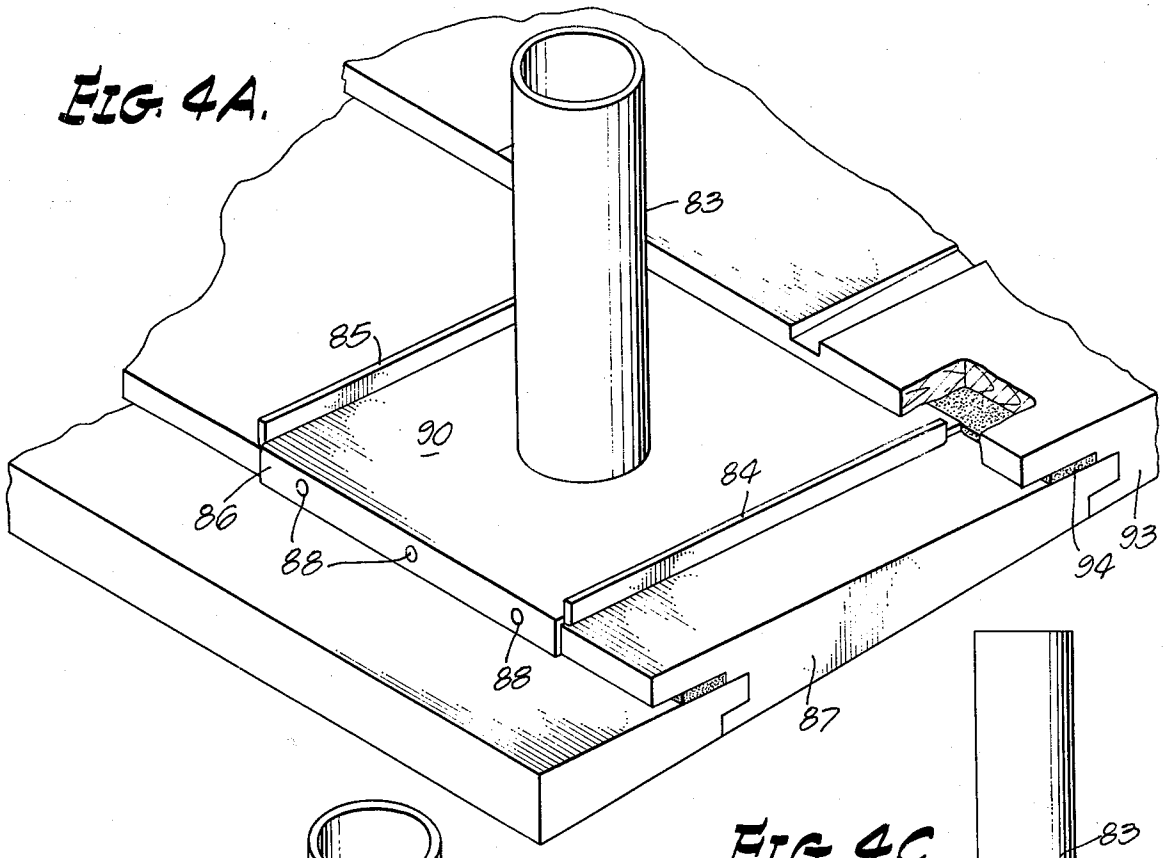


FIG. 4B.

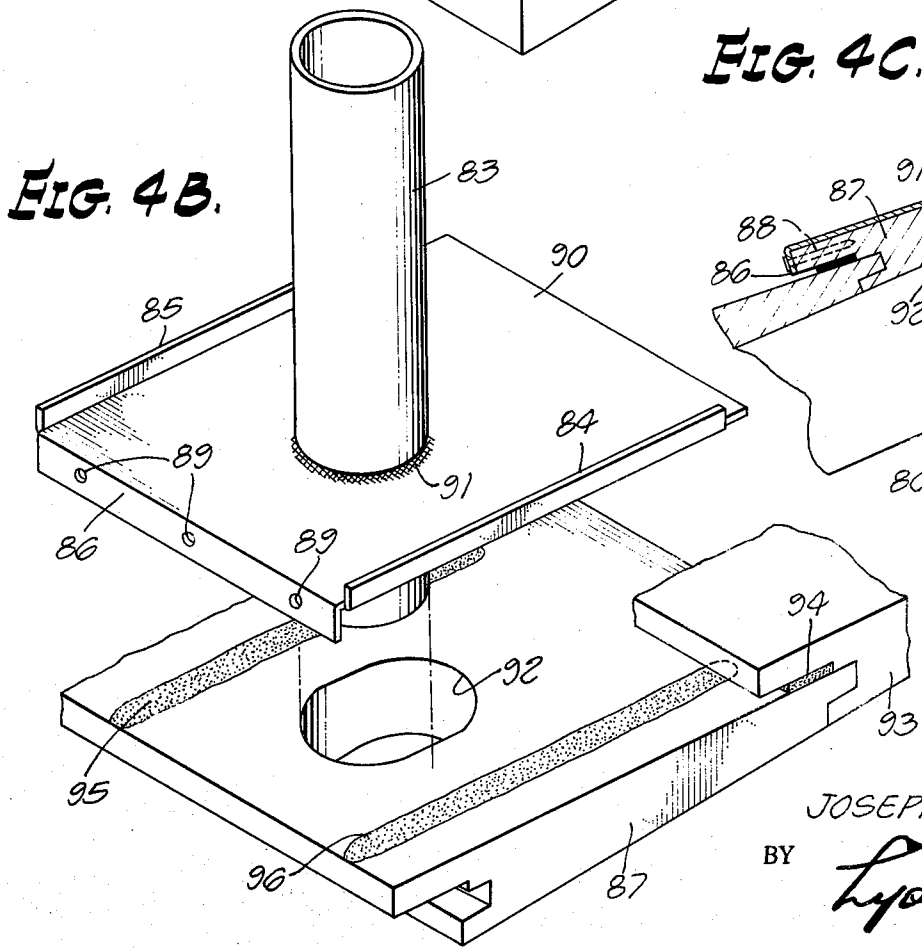
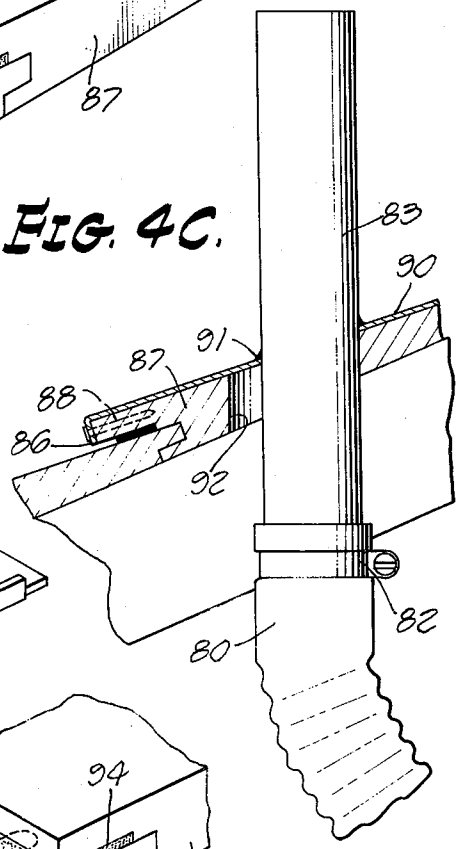


FIG. 4C.



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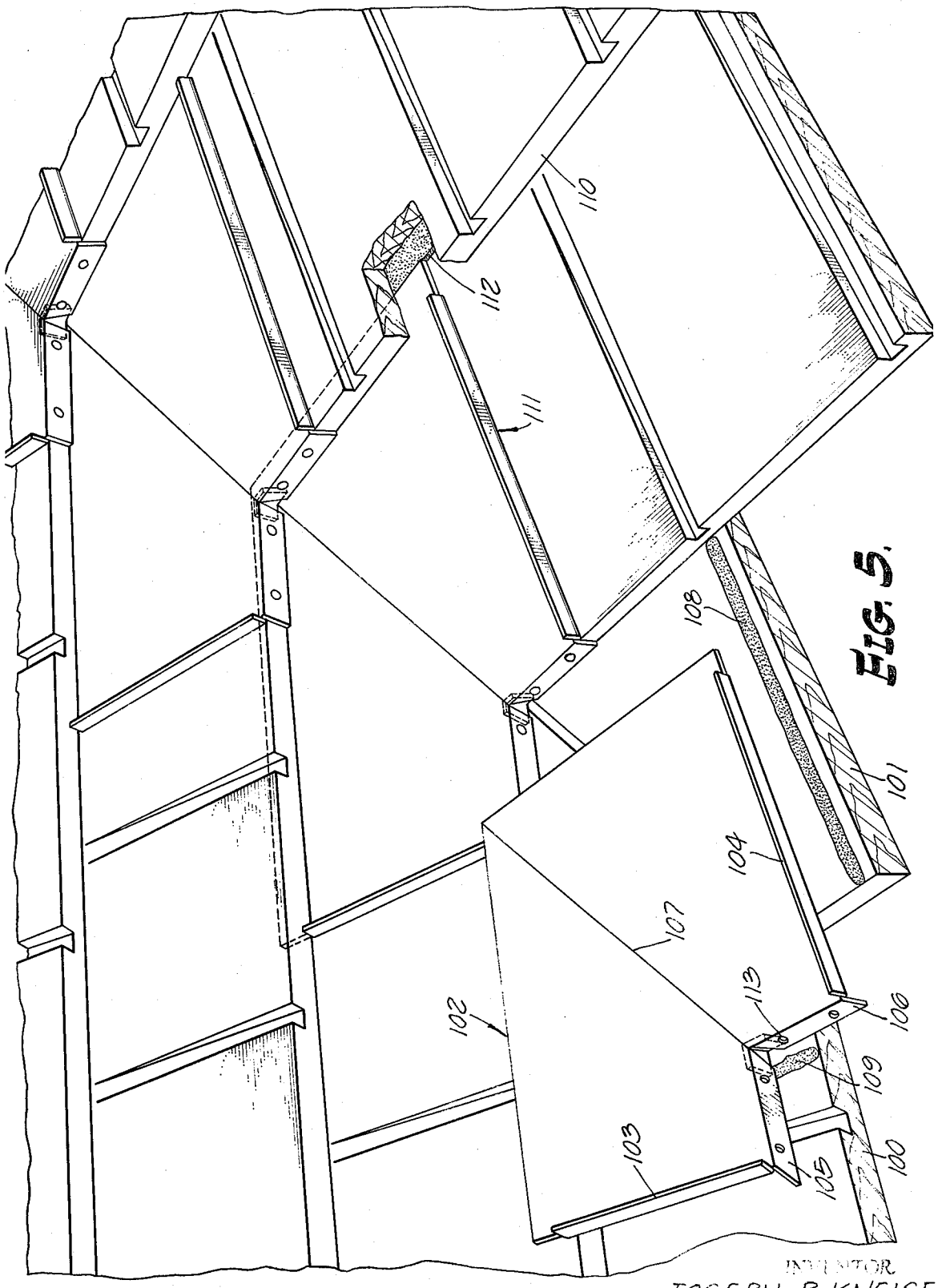


Fig. 5.

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ROOF FLASHINGS FOR USE WITH ROOF PLANKING

This is a continuation of application Ser. No. **101,982**, filed Feb. **28, 1970** and now abandoned, which was a continuation in part of applicant's application Ser. No. **885,148** filed Dec. **15, 1969** and now U.S. Pat. No. **3,626,439.**

BACKGROUND OF THE INVENTION

The field of the invention is roof flashing. Flashing is commonly made up of sheet metal such as galvanized steel, copper, or other metal which may be further treated to reduce corrosion. More recently flashing has also been made from sheets of plastic such as polyvinyl chloride.

With increased labor costs there is continuing interest in developing roofing systems which are more quickly installed than wooden or asphaltic shingles. Many steps are involved in applying the typical roof to the rafters of a building. First, sheathing is nailed to the rafters. Such sheathing usually is in the form of plywood sheets, or **1** by **4** boards laid several inches apart. Then, a layer of felt, such as **15** pound felt, is laid over the sheathing. Finally, individual shingles, usually asphalt or shake, are nailed to the underlying materials, one at a time.

Roof construction of this nature suffers from a number of disadvantage in addition to the high cost of the various materials and installation. Such shingles do not seal themselves on top of each other because both sides usually are rough. They tend to shrink apart and curl. Only the felt, which serves as a membrane, prevents leaking; however, the nails which hold the shingles puncture the felt giving rise to leaks. In order to facilitate more rapid installation, minimum and insufficient nailing is a common practice. This gives rise to an unsturdy construction. Also, in the event of rain and a slight wind, water is easily blown underneath the shingles and under severe wind conditions the shingles can be blown completely from the roof.

Other types of roof construction involve tar paper and rock, ceramic tiles, aluminum and so forth. The tar paper and rock construction is relatively cheap but is less durable than shingle roofs because the tar paper deteriorates from exposure to the sun. A ceramic tile roof requires a very heavy rafter and sheathing structure, and still requires a membrane which is punctured with nails which hold the furring to which the tiles are secured. Aluminum shingles have most of the constructional disadvantages of wood shingles plus the fact that they are extremely fragile and cannot be walked upon after installation.

Turning again to prior art shingle, pane or plank type roofs, several have been devised employing various types of joints between roofing units. Each involves certain deficiencies. Typically, no provision is made for correction of accumulated error, without disturbing the integrity of the joint, when laying the various courses of the roof units. Subsequent shrinkage of the material renders the joint ineffective from both a structural and water proofing standpoint. Other roofing configurations have very complex joints, but they involve water leakage problems and costly manufacture procedures and equipment. In many instances, the securing nails are exposed thereby giving rise to ultimate corrosion as well as leakage problems. Others must be installed from

the roof ridge down which causes a problem at the eave line. Examples of patents illustrating joints similar to those which have been used in roofing construction are found in U.S. Pat. Nos. **492,736; 2,013,218; 2,241,642; 2,390,087** and **2,659,938.**

During the construction of a building, various joints must be made water tight. These joints exist at the intersection of roof planes and around chimneys, vents, dormers and the like. Applicant's parent application filed Dec. **15, 1969,** Ser. No. **885,148** describes a new roof construction together with means for forming a water proof joint at the roof peak and the disclosure of this application is incorporated by reference herein. Various means have been devised to waterproof valleys which occur when two different roof planes intersect to form an angle less than **180°.** Commonly a length of creased sheet metal is placed lengthwise along the valley and the shingles are subsequently laid over each edge of the sheet. When two roof planes intersect and form an exterior angle greater than **180°,** a roof hip is formed. These hips are commonly waterproofed by nailing shingles over the hip. These shingles are cut to form a joint composed of the longitudinal edge of one shingle with the underside of its abutting shingle.

The roof joints around chimneys and dormers are most commonly waterproofed by pieces of sheet metal together with a layer of mastic. The sheet metal underlies the shingles near the chimney edge. Similarly, vent pipes are commonly waterproofed by placing a flat metal sheet over the vent pipe which extends above the roof plane. This metal sheet is then sealed to the vent pipe and shingles are placed over the extending edges of flat sheet.

While these prior art methods may be adapted for use with roof planking such as that disclosed in Applicant's parent application, the present inventive concepts involve new roof flashings which are particularly useful with roof planking and result in a considerable labor saving together with improved waterproofing characteristics.

SUMMARY

A novel and easily applied family of flashing members has been devised which forms a waterproof joint at discontinuities in roof planking. The term "roof planking" is used herein to refer to roofing of the general type disclosed in Applicant's parent application. This general type of roofing is made from generally flat planks or long boards. These planks are distinguished from common wooden shingles in that they are substantially longer in the direction parallel to the eaves and further they are substantially thicker. Roof planking may have decorative grooves cut in the outer surface and may be pre-coated with a weather and fire proofing coating. The roof planking preferably is thick enough along its lower edge so that nails, staples or the like may be driven into the edge without splitting the planking.

The family of flashing members of this invention have a generally flat roof-mating surface which lies along the surface of the roof planking. These members may also have reinforcing sections formed along one or two edges of the flashing. They also have a downwardly extending section which overhangs the lower edge or face of the roof planking and permits the driving of nails, staples or the like into the lower edge of the roof planking so as to eliminate leakage problems occasioned by

the fasteners need. These flashing members are modified depending upon the particular shape of the joint to be sealed.

In some instances the flashing members are bent or initially formed to conform to the slope of the particular roof to be sealed. It is preferable that one edge of the flashing abut against a bead of resilient material located under the overhanging edge of the roof planking. Thus, the upper edge of the flashing members has no vertically extending section so that it may fit up under the overhang.

Accordingly, it is a principle object of the present invention to provide a new flashing construction.

It is another object of this invention to provide a novel roof flashing which may be applied to roof valleys formed from roof planking.

Another object of this invention is to provide roof flashing for use over roof hips formed from joints in roof planking.

It is yet another object of this invention to provide chimney and dormer flashings for use with roof planking.

It is yet another object of this invention to provide vent flashings for use with roof planking. bent

These and other objects and features of the present invention will become better understood through a consideration of the following description taken in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1*a*, 1*b*, 1*c* and 1*d* are perspective views of the roof flashing of the present invention as applied to an opening in roof planking.

FIGS. 2*a* and 2*b* are perspective views showing the flashing of the present invention as applied to a Bermuda type hip.

FIGS. 3*a* and 3*b* are partial perspective views of the flashing of the present invention as applied to a shingle type hip.

FIGS. 4*a* and 4*b* are partial perspective views of the vent flashing of the present invention, and FIG. 4*c* is a side elevation partly in cross section of the vent of FIGS. 4*a* and 4*b*.

FIG. 5 is a partial perspective view of the valley flashing of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to the drawings, and particularly to FIG. 1*a* there is shown a portion of a roof formed from roof planking which is described in Applicant's parent application Ser. No. **885,148** which is incorporated by reference herein. Briefly, the roof planking is formed from longitudinally grooved planks which come in various lengths but a typical length would be **10** feet. These planks indicated as **10, 11, 12, 13** and **14** in FIG. 1*a* may be applied directly to the rafters **15** and **16** of a building or other enclosure. Each plank typically is manufactured one foot wide and is of wood, which may either be solid, laminated as in plywood, or other construction such as that made from wood chips and the like. The upper surface of the plank may be textured to simulate a plurality of shingles or shakes as illustrated by numeral **17** in FIG. 1*a*. Joint drain clips **18** are inserted to prevent leakage at the end joints between planks. These clips are hammered into end grooves such as groove **19** formed in each end of the planks. The shingles may be colored and fire-proofed at the time of manufacture or after construction is complete. Any suitable type of decorative and protective finish may be applied but a sprayable concrete emulsion coating manufactured by Concrete Emulsion Company, Los Angeles, California is particularly effective.

The planking is cut to form an opening around the chimney, dormer or the like. Flashing members of the shape shown in FIG. 1*c* are used to form the flashing which is parallel to the rafters. This member may be made from metal since it is thus easily bent during installation on the job site as described below. The metal may be copper, lead, galvanized iron, zinc, tin, aluminum or any metal possessing the characteristics of weatherability and reasonable cost. It would be possible to form this flashing from a plastic such as polyvinyl chloride which can be deformed by heating, bending and cooling.

The flashing member **20** shown in FIG. 1*c* has a vertical wall **23,** a horizontal section **24,** a second smaller vertical section **21** and a downwardly extending section **22.** Section **21** gives additional strength to the member. Section **22** is provided with one or more holes for nailing to the planking. The flashing may also be made without holes and the nails are then driven through the metal. This is particularly useful for soft metals such as aluminum.

In order to cover an opening, a first flashing member **25** is cut to remove a portion of the vertical wall **23** dependent upon the distance of the opening from the end of the lowest plank through which the opening extends. This distance is shown by the letter *a* in FIG. 1*a*. The vertical wall section **23** and the horizontal section **24** surrounds the lower opening of the plank **10.** The end of the horizontal section **24** abutts against the bead of resilient material **26** which is located underneath the lower edge of plank **11.** A bead of mastic material may be placed under the horizontal section **24** to further decrease any chance of water from leaking under the flashing. Only a small amount of mastic is needed because of the relatively smooth even surface of roof planking. One or more nails may be driven through downwardly extending section **22** into the lower extending side of plank **10.** Similarly, flashing members **20** are placed over planks **11, 12** and **13.** A cut and bend is made in the last or uppermost flashing member which in FIG. 1*a* is placed on plank **13.** The cut and bent flashing member is shown in FIG. 1*d* where the distance of the cut is determined by the distance from the upper end of the flashing member to the uppermost end of the opening. This distance is indicated by the letter *b* in FIG. 1*a*.

A length of metal or plastic flashing **27** is next laid across the upper side of the opening. This piece is preferably lent so that the vertical wall **28** is vertical when the bottom section **29** is placed against the roofing surface. This member may be bent on the job site by means commonly used in the prior art installation of flashings such as with a board and mallet in the case of metal flashing or by heating, bending and cooling for plastic flashing. The corner **30** is then bent at the dotted line to secure it to the flashing member on plank **13.** A rivet may also be placed through an appropriate hole drilled beneath the bent portion. A strip of flashing material **31** is next placed under plank **14.** The width of this section is determined by the distance from the end of the smaller vertical section of the flashing on plank

13 to the bead of resilient material of plank 14. This strip of flashing material overlies flashing 27 and prevents any leakage of water under flashing 27.

A lower flashing member 32 has a vertical wall 33, a horizontal section 34 and a downwardly extending section 35. The end section of lower flashing member 32 is shown in FIG. 1*b* and has a bent section 36 which permits attachment to the lowest flashing member shown in FIG. 1*a* on plank 10. Once again the particular angle between walls 33 and 34 is dependent upon the slope of the roof and this angle may be formed or altered at the job site. The lower flashing member is secured to the lowest side flashing member 20 by one or more rivets shown in FIG. 1*a* as 37 and 38. The portion of the flashing which is not shown in FIG. 1*a* is similarly treated except that the side flashing members are formed in a mirror image configuration. The flashing is completed by placing an overlap flashing 40 over the side flashings 20. This overlapping flashing is most readily secured in a chimney by sawing a kerf in the chimney with a carbide saw parallel to the upper vertical wall of the flashing members. This overlap flashing may then be secured by nailing through holes 41 or by the use of an appropriate adhesive. The flashing members may be pre-painted or sprayed on the job.

Turning now to FIG. 2, there is illustrated in FIG. 2*a* the application of flashing to a bermuda-type hip shown in the drawing near the roof ridge. A section of hip flashing is shown in FIG. 2*b*. The flashing has two small vertical walls 50 and 51 which add structural stiffness to the flashing. One of the two downwardly extending sections 52 is shown in FIG. 2*b* and contains a hole for a nail or the like.

The roof planking members 53 and 54 are first secured to the roof rafters and a butt joint is formed at the intersection. The flashing piece is then placed over this joint as more clearly seen in FIG. 2*a* over the joint between planks 55 and 56. The flashing is then secured by driving a nail into plank 56 through the hole in the downwardly extending section 52. The flashing fits under the extending portion of the planking. This is shown in the broken away portion of plank 55 where the flashing covering the joint between 53 and 54 is shown abutting against the resilient member 57 which forms a portion of plank 55. The use of mastic is not necessary for this flashing but can be used to provide additional insurance against leakage if desired. The method for joining the flashing over the roof ridge is described below.

Turning not to FIGS. 3*a* and 3*b* there is illustrated the flashing of the present invention over a shingle type hip. Once again a butt joint is formed between the intersecting rows of roof planking such as planks 60 and 61. Starting at the lowest plank in the hip and working upwardly, a cap locking strip such as those shown in FIG. 3*b* and indicated by reference characters 62, 63 and 64 is nailed over the hip joint of the lowest plank. This cap locking strip is formed from two lengths of wood 65 and 66 and may be joined at the center by a strip of water proof tape such as that sold under the name Tedlar. The inner edges of the strips 65 and 66 are tapered as shown at 67 and 68 to permit installation over hips with different angles. A piece of shingle hip flashing shown in FIG. 3*b* as 69 is then nailed over the lowest cap locking strip by driving nails through holes 70 and 71 into the ends of the cap locking strip. The next cap locking strip is then nailed to the next plank intersection and this similarly is covered with another shingle hip flashing piece.

The roof ridge is similarly first covered with a cap locking strip which may have a waterproof tape such as that sold under the name Tedlar along its joint. This cap locking strip is attached by nails or adhesive to the uppermost planks. A layer of mastic may be placed at the end of the cap locking strip and the end cap 72 is then placed over the cap locking strip and secured to the cap locking strip by nails 73 and 74. The uppermost shingle hip flashing 76 is cut on a bevel to match the end cap 72 and a layer of mastic is placed under this intersection to prevent leakage at this point. It has been generally found unnecessary to utilize a mastic under the other shingle hip flashing members and that the water readily drains away from the hip flashing.

Turning now to FIGS. 4*a* through 4*c* there is shown the novel vent flashing of this invention. Whereas normal vents are extended above the roof line prior to the shingling operation, the vents of the present invention are terminated below the roof line. A length of flexible venting is then attached to the upper end of this terminated vent and the other end of the flexible venting is attached to the novel vent and flashing of this invention. This permits the vent to be located in the middle of an existing plank rather than the arbitrary location resulting from normal prior art venting methods.

The flexible venting is indicated by the reference character 80 in FIG 4*c* and may be plastic or steel flexible tubing which may be attached to both the upper end of the lower vent, now shown, and the section of vent 83 which will extend through the roof by a clamp 82. Various types of clamps are useful for this purpose and any clamp will form a secure bond between the flexible venting and the flashing vent may be used. The flashing around the vent is shown most clearly in FIG. 4*b* where 84 and 85 are vertical sections which add structural strength to the flashing and the downwardly extending section 86 permits attachement to the grooved plank 87. This attachment may be carried out by driving nails 88 through holes 89 into plank 87. The flat portion 90 of the flashing has a hole therein through which the vent section 83 is attached such as by welding or appropriate adhesives shown by reference character 91 in FIG. 4*c*. Any attachment means which will provide good structural strength together with a leak-free bond may be used at 91. The method of installing the vent and attached flashing is shown best in FIG. 4*b* where an oversized hole 92 is cut through plank 87. This hole is shown as an oblong in FIG. 4*b* but this could also be an oversized circular hole. The purpose of having the hole larger than the vent piece is to permit an upward sliding of the flashing under the groove in plank 93 shown in FIG. 4*a*. The amount of oversizing is not critical but should be at least about 3/4 of an inch to permit the vent to be dropped in the hole and then slid upwardly against the gasket 94 of plank 93. In order to prevent lateral water-leakage two beads of mastic material 95 and 96 should be placed along the width of plank 87 prior to dropping the flashing into the opening 92. It has been determined that 26 gauge steel is sufficient to form the flashing vent 83.

Turning now to FIG. 5, there is illustrated the flashing of the present invention as applied to a roof valley formed by the intersection of two roof planes. Once again, the roof planks such as 100 and 101 are attached

to the roof and the ends of these planks are cut on an angle to form an abutting joint. The valley flashing **102** has two smaller vertical sections **103** and **104** to give added structural strength to the flashing. It also has two downwardly extending sections **105** and **106** each of which has two holes therein for driving nails through the flashing into the planking. A bend is formed at **107** and this bend is dependent upon the pitch of the roof to be covered, the more steeply pitched roof requiring a greater bend. In order to apply the valley flashing, a strip of mastic **108** is applied to the upper surface of plank **101** and a second strip **109** of mastic is applied to plank **100.** This mastic may be applied in approximately pencil diameter thickness and prevents lateral water leakage at the valley. Next, the flashing **102** is placed over the intersection of planks **100** and **101** and then pushed upwardly against the gaskets which underlie the planks above **101** and **102.** This feature is best shown in the cut-away portion of plank **110** where valley flashing **111** abutts against gasketing material **112** which is attached to the underside of plank **110.** The valley flashing is then secured by nailing through the holes in the downwardly extending sections **105** and **106.** It is necessary that the roof planking be smooth enough so that a layer of mastic can form a waterproof seal between the planking and the flashing. The normal decorative grooves which are illustrated in the drawings and described in Applicant's parent application do not inhibit the use of this flashing since the mastic may be applied in a line parallel to and not crossing a groove.

Note that there is a V-shaped opening between downwardly extending sections **105** and **106.** It is preferable that this opening be covered by a small rectangular strip **113** which can be adhered to the underside of sections **105** and **106.**

Sheet metal such as galvanized steel, copper, aluminum, hard lead, zinc, tin and the like may be used in the practice of the present invention. Likewise, it is possible to use formed plastic such as polyvinyl chloride, but, when this is done, provisions must be made to permit the bending of the plastic. This may be accomplished by warming the plastic in the area of the bend and then cooling the plastic after it has been bent the desired amount. When metal flashing is used, it is desirable to coat the exposed portions of the flashing with appropriate weather-proof coatings. One particularly effective weather-proof coating is a concrete emulsion sold under the name by Concrete Emulsions Company, Los Angeles, California. This coating may be done either before or after application to the roof.

The thickness of the flashing is dependent upon the particular material from which the flashing is constructed. For instance, when the flashing is galvanized steel, a thickness of **26** gage has been found to be satisfactory. In general, the flashing thickness should be about the same as that used in prior art flashing. While the flashing described herein is particularly effective with the roof planking described in Applicant's parent application, it may also be used with any other roof planking which has the following characteristics. First, the roofing surface should be relatively smooth, that is smooth enough so that a bead of mastic will form a water tight seal with the flashing. Secondly, the roofing material should have periodic vertical surfaces into which the flashing material may be nailed. Thirdly, the roofing material should have a strip of gasket material or other soft material located at or beneath the overhang of each plank.

The present embodiments of this invention are to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims therefore are intended to be embraced therein.

What is claimed is:

1. A weatherproof joint of the type forming a seal at a roofing intersection of at least one length of roof planking and a member such as a chimney, vent or dormer or between intersecting ends of said lengths such as peaks, valleys, or hips wherein the improvement comprises:

at least one length of roof planking having a relatively smooth upper surface having upper and lower edges extending downwardly from its upper surface and having a deformable member positioned adjacent its lower surface and near the lower edge thereof;

at least one flashing member affixed to said length of roof planking, said flashing member having an upper and lower edge, a pair of side edges and at least one flat roof-mating surface positioned against the upper surface of said planking, at least one upwardly extending vertical reinforcing section adjacent a side edge of said roof-mating surface said verticle section being formed from the same piece of material as said roof-mating surface and being terminated away from the roof-mating surface of said flashing member, said upper edge of said flashing abutting said deformable member and forming a weather tight seal therewith, at least one downwardly extending section adjacent a different edge of said roof-mating surface than either said vertical section or said upper edge, said downwardly extending section being formed from the same piece of material as said roof-mating surface and attachment means affixed to said downwardly extending section to hold said downwardly extending section to said lower edge of said length of roof planking and to hold the upper edge of said flashing member against said deformable member.

2. The weatherproof joint of claim **1** wherein said roofing intersection is formed with a vertically extending structure such as a chimney or dormer wherein said flashing member comprises:

a single flat roof mating surface;

a single reinforcing section parallel to one side of said roof mating surface, said reinforcing section terminating before the upper end of said roof mating surface;

a single vertical structure mating surface formed on the side of said roof mating surface opposite said vertical reinforcing section; and

a single downwardly extending section.

3. The weatherproof joint of claim **1** wherein said roofing intersection is a Bermuda hip wherein said flashing member comprises:

roof-mating surface forming an elongated rectangle and having an angled bend along the longitudinal center line of said elongated roof-mating surface, said bend being such that the roof-mating surface fits against each roof surface of the Bermuda hip;

two upwardly extending vertical reinforcing sections, each of said two vertical reinforcing sections being parallel to the longitudinal center line of said elongated roof-mating surface and located along the edge thereof and terminating before the upper end of said elongated roof-mating surface and positioned so that said upper edge abuts said deformable member; and

two downwardly extending sections along the lower edge of said elongated roof-mating surface, said angled sections each forming a substantially right angle with respect to its corresponding roof-mating surface and further being angled from said angled bend of said roof-mating surface so that each of said downwardly extending sections abuts against the lower edge of said roof planking.

4. The weatherproof joint of claim **1** wherein said roofing intersection is between said roof planking and a vent opening therein wherein said roof flashing member comprises:

one roof mating surface forming a flat rectangle and having a length of vent pipe sealed therethrough;

two vertical reinforcing sections along opposite sides of said rectangular roof mating surface, said vertical sections being terminated before the upper end of said roof mating surface; and

one downwardly extending section along the lower adjacent vertical surface of the roof planking.

5. The weatherproof joint of claim **1** wherein said roofing intersection is a roof valley wherein said flashing member comprises:

one roof mating surface, said roof mating surface being bent to form an angle bisecting one corner of said roof mating surface, said angle being such that said roof mating surface mates with two abutting relatively smooth roof surfaces and extending from each lower edge of the abutting relatively smooth roof surfaces into sealing engagement with the joints at the upper edges thereof;

two vertical reinforcing sections located along the side edges of said roof mating surface, said vertical edges terminating before the upper edges of said roof mating surface; and

two downwardly extending sections positioned adjacent the vertical surfaces of the two abutting roof planks and intersecting at said angle.

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