June 30, 1936. W. J. HAMMERSLEY 2,045,707

ROOFING CONSTRUCTION

Filed Jan. 21, 1932 4 Sheets-Sheet 1

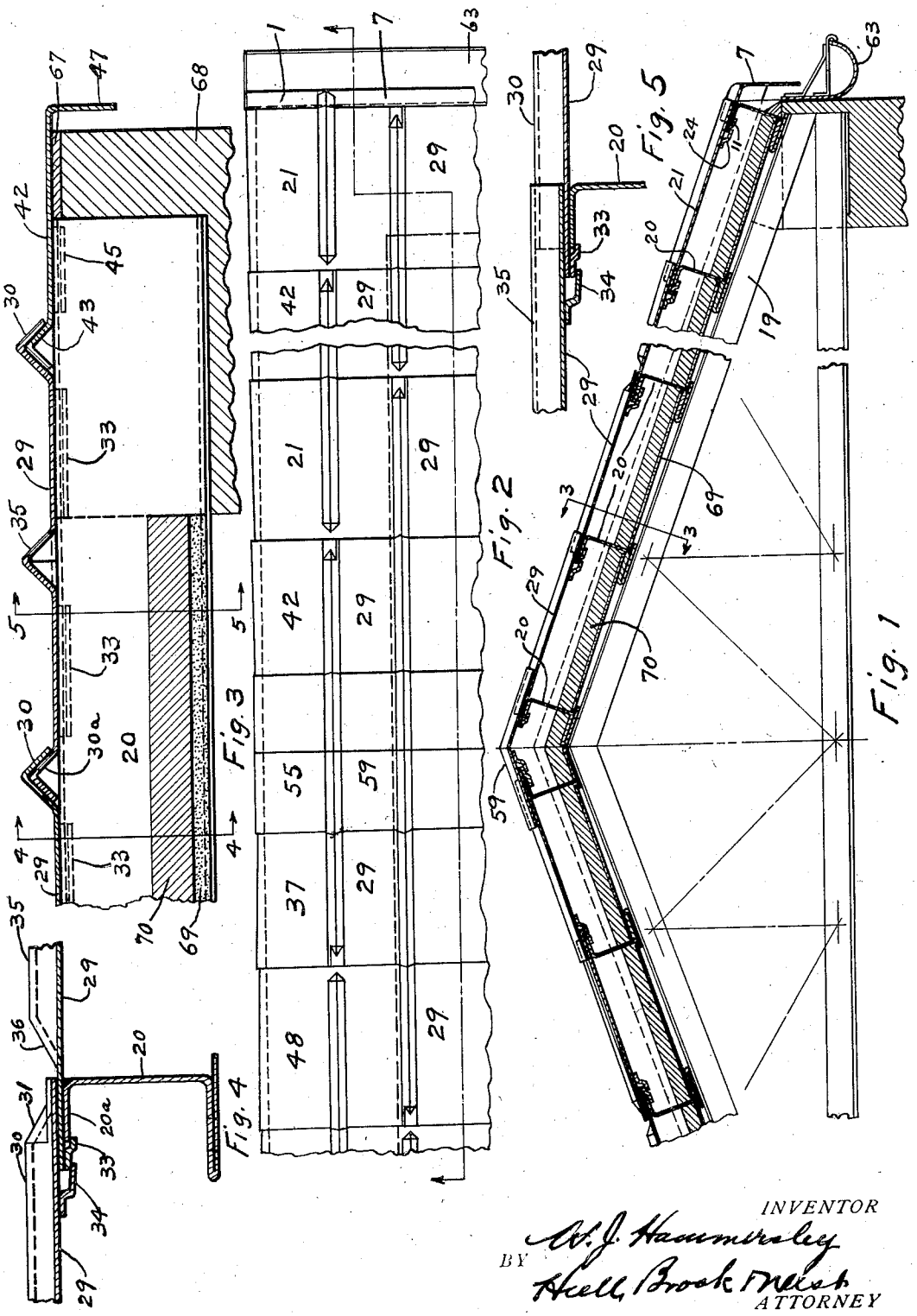


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

INVENTOR

W. J. Hammersley

BY

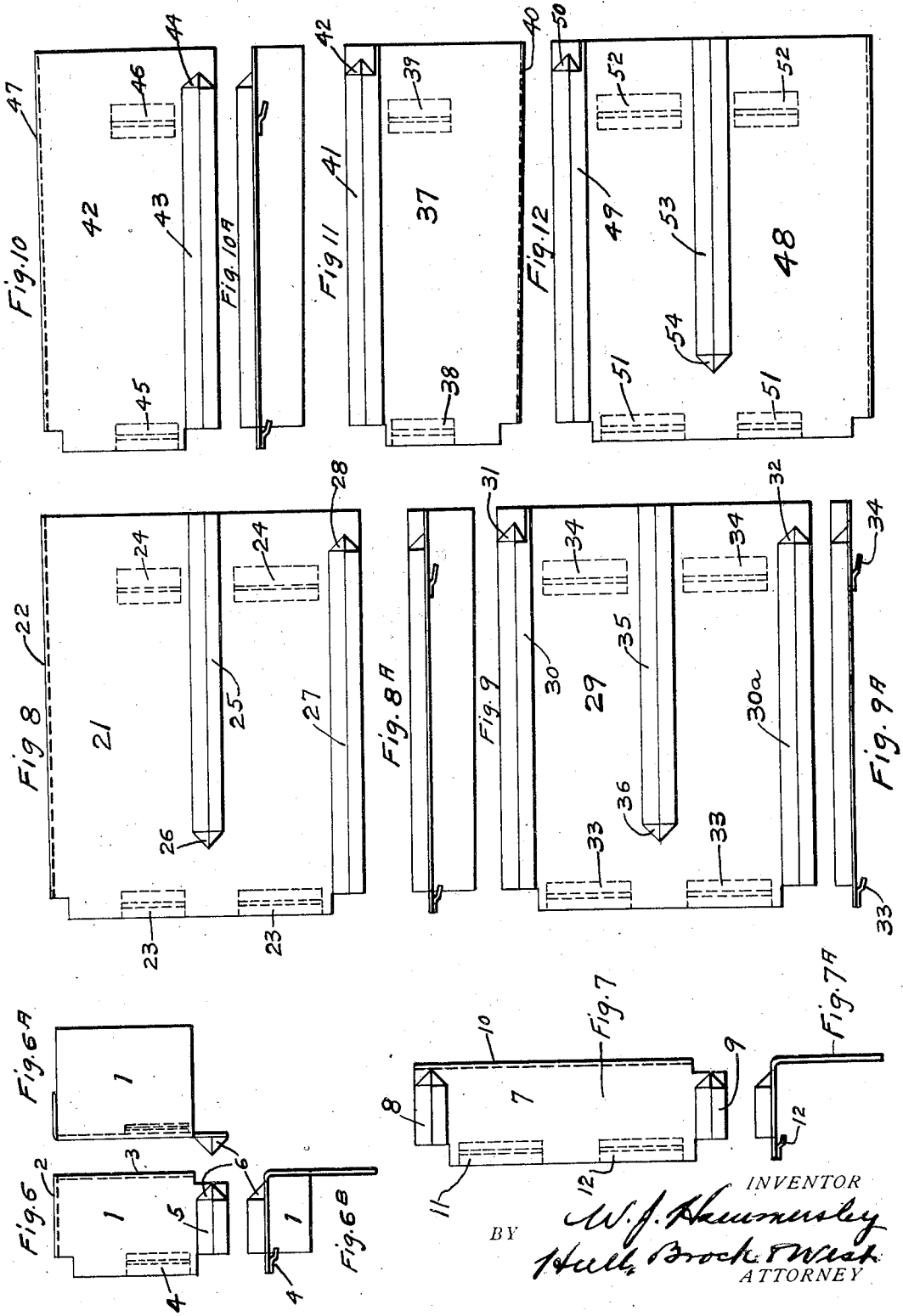
Hall, Brook & Welch

ATTORNEY

June 30, 1936. W. J. HAMMERSLEY 2,045,707

ROOFING CONSTRUCTION

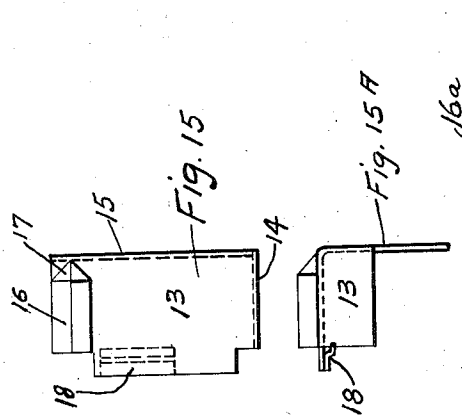
Filed Jan. 21, 1932 4 Sheets-Sheet 2

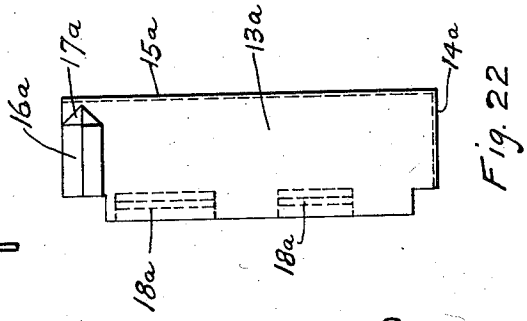


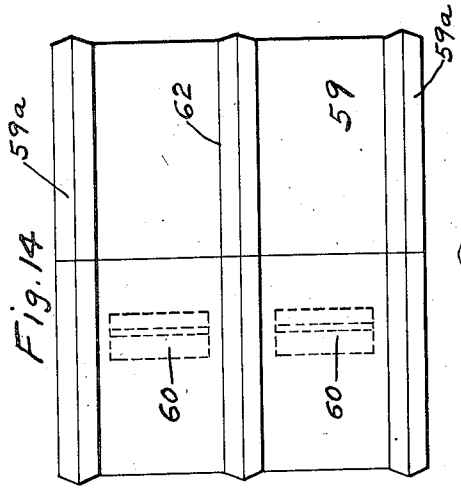
June 30, 1936. W. J. HAMMERSLEY 2,045,707

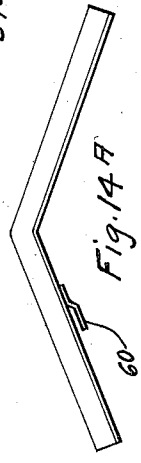
ROOFING CONSTRUCTION

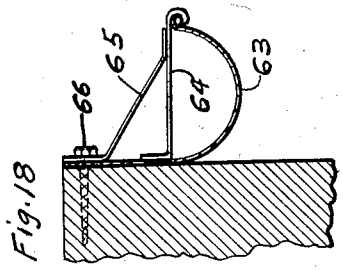
Filed Jan. 21, 1932 4 Sheets-Sheet 3

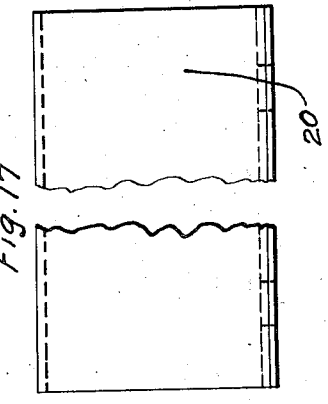


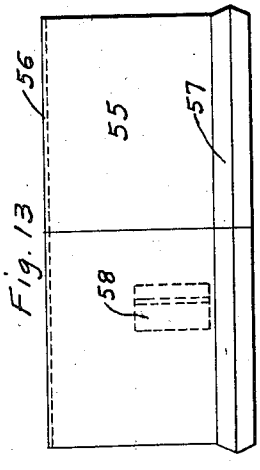


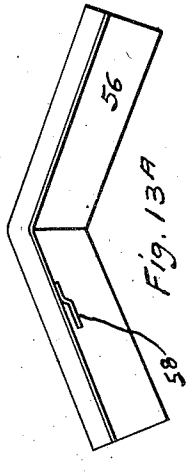


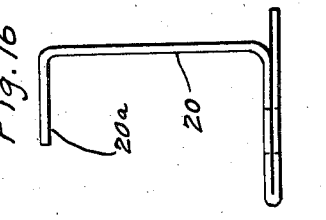












INVENTOR

BY W. J. Hammersley

Hull, Brock & West

ATTORNEY

June 30, 1936. W. J. HAMMERSLEY 2,045,707

ROOFING CONSTRUCTION

Filed Jan. 21, 1932 4 Sheets-Sheet 4

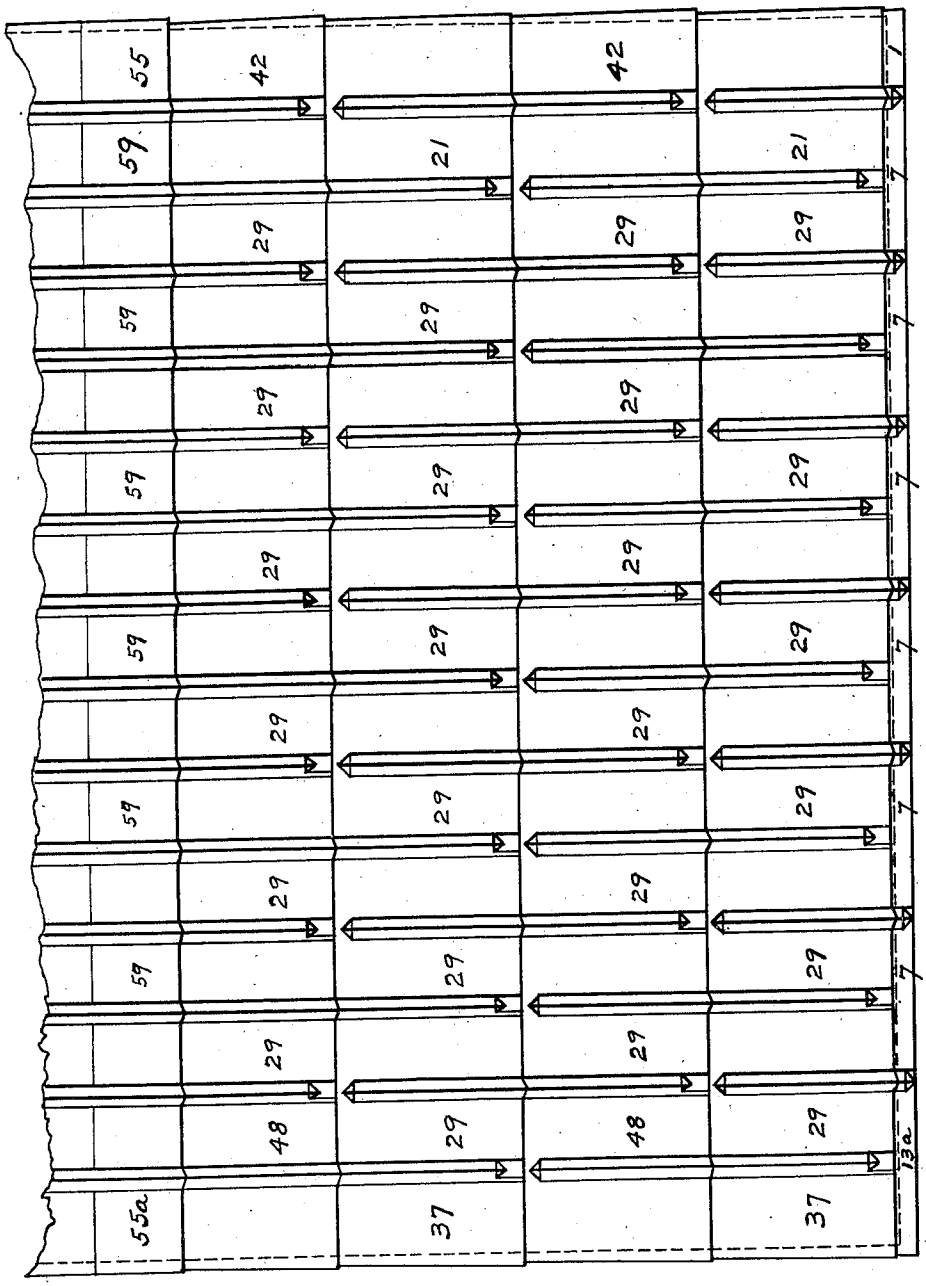


Fig. 19

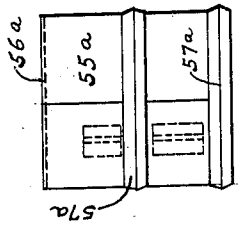


Fig. 20



Fig. 21

INVENTOR

BY W. J. Hammersley

Hull, Brock & West

ATTORNEY

Patented June 30, 1936

2,045,707

UNITED STATES PATENT OFFICE

2,045,707

ROOFING CONSTRUCTION

Wilbur J. Hammersley, Cleveland, Ohio

Application January 21, 1932, Serial No. 587,946

3 Claims. (Cl. 108—17)

This invention relates generally to a roofing construction for buildings and the main object of the invention is to provide a roof which can be applied or secured in place without the use of nails, screws, lumber or any combustible material.

A further object of the invention is to provide a roof construction which is made up of a plurality of metal shingles all of which are secured together in interlocking relation in such a manner that any one or all of the shingles may be removed and/or replaced as desired.

Another object of the invention is to provide a roof of the character described which is fireproof and of light weight and well adapted to be installed at a low cost.

A still further object of the invention is to provide a roof of the character described which can be manufactured from any sheet metal of suitable gauge, such as copper, aluminum, steel, toncon, amco, coperloy or wrought iron and which is so constructed and arranged that it wholly encloses or caps the building which it covers.

A further object of the invention is to provide a roof that will eliminate or minimize waste of material and which can be applied or erected without making very much noise, as all material used in making up the entire building cover can be delivered on the property cut to size and in the correct quantity to complete the entire job.

Another object of the invention is to provide a roofing of the character described which is made up of a plurality of metal units or shingles secured together in interlocking relation and in which the eaves and ends of the building are enclosed or covered by a drop flash in such a manner as to prevent water, snow and the like from beating or seeping in about the edges thereof.

A still further object of the invention is to provide a roof construction which consists essentially of a plurality of metal shingles having cleats or clamping members thereon by means of which the several shingles are detachably secured together in interlocking relation and secured to the building structure by means of purlins which are adapted to receive the cleats thereover, said cleats and purlins constituting the sole means for securing the shingles.

Another object of the invention is to provide a roof construction made up of a plurality of metal shingles which are interlocked with each other and secured to the rafters of the building by means of purlins so spaced and arranged as to receive insulating material therebetween in such a manner as to prevent undue conduction of heat from the roof to the interior of the building.

Further and more limited objects of the invention will appear as the description proceeds and by reference to the accompanying drawings in which Fig. 1 is a fragmentary vertical sectional view disclosing my improved form of roof secured on a building; Fig. 2 is a fragmentary top plan view of the roof construction disclosed in Fig. 1; Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 1 looking in the direction of the arrows; Fig. 4 is a fragmentary vertical sectional view on the line 4—4 of Fig. 3; Fig. 5 is a fragmentary sectional view on the line 5—5 of Fig. 3; Fig. 6 is a top plan view of the shingle which fits the upper right hand ridge cover; Figs. 6^A and 6^B are side elevations and an end elevation respectively of the shingle shown in Fig. 6; Fig. 7 is a top plan view of the shingle which will be referred to as the regular eaves; Fig. 7^A is an end elevation of a shingle shown in Fig. 7; Fig. 8 is a top plan view of the shingle which will be referred to as the right hand full end flash and Fig. 8^A is an end view of the shingle shown in Fig. 8; Fig. 9 is a top plan view of a shingle which will be referred to as the regular shingle; Fig. 9^A is an end view of the shingle shown in Fig. 9; Fig. 10 is a top plan view of a shingle which will be referred to as the right hand half end flash; Fig. 10^A is an end view of the shingle shown in Fig. 10; Fig. 11 is a top plan view of a shingle which will be referred to as the left hand half end flash; Fig. 12 is a top plan view of the shingle which will be referred to as the left end full end flash; Fig. 13 is a top plan view of a shingle which will be referred to as the end ridge; Fig. 13^A is an end view of the ridge shown in Fig. 13; Fig. 14 is a plan view of a ridge which will be referred to as the regular ridge; Fig. 14^A is an end view of a ridge shown in Fig. 14; Fig. 15 is a top plan view of the shingle which will be referred to as the lower left hand eaves corner; Fig. 15^A is an end view of a shingle shown in Fig. 15; Fig. 16 is an end view of one of the purlins secured in the roofing place; Fig. 17 is a fragmentary side elevation of the purlin disclosed in Fig. 16; Fig. 18 is a fragmentary sectional view disclosing one manner of securing the eaves trough in place; Fig. 19 is a top plan view of one half of the roof; Figs. 20 and 21 are a top plan view and an end view respectively of the full end ridge shingle; and Fig. 22 is a top plan view of the full left hand eaves shingle.

Referring now to the drawings, I will now describe each of the shingles which go to make

up the complete roof. In applying the roof, the first shingle to be secured in place is the lower right hand eaves corner, which is shown in Figs. 6, 6A and 6B and designated by reference character 1. The shingle 1 is provided with downturned portions or flashes 2 and 3 which extend over the corner of the building. This shingle is also provided with a cleat 4 and an angularly disposed rib 5 which terminates a short distance from the edge of the shingle and is beveled at its end as shown at 6.

Disposed adjacent the right hand eaves corner shingle is a shingle 7 which will be designated the regular eaves shingle and which is shaped as shown most clearly in Fig. 7A and provided at opposite sides thereof with upstanding angular ribs 8 and 9 which terminate a short distance from the lower edge of the shingle. The lower edge of the shingle is provided with a flash 10 which is turned downwardly and extends along the lower edge of the building. The angular rib 8 fits over the angular rib 5 of the shingle 1 and interlocks therewith. The shingle 7 is also provided with cleats 11 and 12, the purpose of which will hereinafter appear. Another shingle 7 is disposed adjacent the shingle just described and interlocks therewith and additional shingles like the shingles 7 are provided in a similar manner until the lower left hand corner of the roof is reached.

In Figs. 15 and 15A there is disclosed a shingle 13 which will be referred to as the left hand eaves corner shingle. This shingle is provided with downturned portions or flashes 14 and 15 which fit over the corner of the building. This shingle is also provided with an angular rib portion 16 terminating a short distance from the lower edge thereof and beveled as shown at 17. This angular rib portion 16 fits over the rib portion 9 of the adjacent shingle 7. The shingle 13 is provided with a cleat 18. Disposed along the lower edge of the roof and secured to the rafters or trusses 19 are purlins 20 which are shaped as shown most clearly in Figs. 16 and 17. These purlins are specially designed and shaped to carry the roof and are spaced one foot apart regardless of the angle or pitch of the roof. The purlins 20 are preferably made of #11 gauge rolled and bent plate. The metal is bent back upon itself as shown most clearly in Figs. 16 and 17 and provided with openings adapted to receive rivets or bolts therethrough. The cleats on the shingles engage over the angular ends 20a of the pulins, as shown most clearly in Fig. 1.

The next shingle to be secured in place is shown in Figs. 8 and 8A and will be referred to as the full end flash shingle and is designated by the reference character 21. Each of the full end flashes has an overhanging or downwardly directed portion 22 which extends along the inclined edge of the roof. The full end flash shingle 21 is also provided with cleats 23 and 24. The cleats 24 fit over and engage beneath the cleats on the right hand eaves corner shingle 1. The full end flash shingle 21 is also provided with a longitudinally extending angular rib portion 25 which terminates a short distance from the upper edge of the shingle and is beveled as shown at 26. The shingle 21 is also provided adjacent one edge with a longitudinally extending angular rib portion 27 which extends from the upper edge of the shingle toward the lower edge and terminates a slight distance therefrom and is beveled as shown at 28. The angular rib portion 25 fits over the angular rib portion 5 of the right hand eaves corner shingle 1.

The next shingle to be secured in place is shown in Figs. 9 and 9A and will be referred to as the regular shingle and is designated by the reference character 29. Each of the regular shingles 29 has extending along the opposite edges thereof angular rib portions 30 and 30a which terminate a short distance below the lower edge thereof and are beveled as shown at 31 and 32. Each shingle 29 is also provided with pairs of cleats 33 and 34. Each shingle 29 is also provided with a centrally disposed longitudinally extending angular rib 35 extending from the lower edge thereof and terminating a short distance from the upper edge of the shingle and provided with a beveled portion as shown at 36. The angular rib portion 30 engages over the angular rib portion 27 of the shingle 21. The cleats 34 of the shingle 29 engage over the cleats 11 and 12 on the lower shingle 7. A plurality of shingles 29 are secured in place in the manner just described until the left hand edge of the roof is reached.

The next shingle to be secured in place is shown in Fig. 11 and will be referred to as the left hand half end flash shingle and is designated by the reference character 37. This shingle is provided with cleats 38 and 39 and the edge thereof is provided with a downturned portion 40 which extends along the inclined edge of the roof. The cleat 39 engages the cleat 18 on the left hand eave corner shingle 13. This shingle is also provided with a longitudinally extending rib portion 41 extending along one edge thereof and terminating in a beveled portion 42.

The next shingle to be applied in the next row up is disclosed in Figs. 10 and 10A and will be referred to as the right hand end flash and is designated by the reference character 42. This shingle is only half as wide as the shingle 21 and is provided along one edge thereof with a longitudinally extending angular rib 43 terminating in a beveled portion 44. This shingle is provided with cleats 45 and 46. Cleat 46 engages one of the cleats 23 on the shingle 21. The shingle 42 is also provided with a downturned portion or flash 47 which extends along the inclined edge of the roof.

The next shingle to be secured in place is shingle 29 and the cleats thereon engage over the cleats on the shingles 21 and 29 of the next course below. A plurality of shingles 29 are laid in this course in the manner hereinbefore described until the left hand edge of the roof is reached.

The next shingle to be secured in place is shown in Fig. 12 and will be referred to as the left hand full end flash and is designated by the reference character 48. This shingle is like shingle 21 except that it is of the opposite hand and is provided along one edge with a longitudinally extending angular rib portion 49 terminating in a beveled portion 50. This shingle is also provided with cleats 51 and 52 and a centrally disposed longitudinally extending angular rib portion 53 terminating in a beveled portion 54. The cleat 52 of the shingle 48 engages with the cleats 33 of the shingle 29 and cleat 38 of the shingle 37 respectively.

Alternate courses of shingles are laid in the manner hereinbefore described so that the rib portions of the shingles are positioned, as shown most clearly in Fig. 19 until the ridge of the roof is reached.

The next shingle to be laid is shown most clearly in Figs. 13 and 13A and will be referred to as the end ridge shingle and is designated by the reference character 55. This shingle is somewhat V-shaped in section and is provided with a downturned flash portion 56 which extends along the end wall of the building. This shingle is also provided along its inner edge with the longitudinally extending angular rib portion 57 as shown most clearly in Fig. 13. The end ridge shingle is also provided with a cleat 58 by means of which it is secured in place. In Fig. 22 there is disclosed a shingle 13a which is used instead of the shingle 13 when the length of the roof necessitates its employment.

The next shingle to be secured in place is shown most clearly in Figs. 14 and 14A and will be referred to as the regular ridge shingle and is designated by the reference character 59. This shingle is provided along each edge thereof with oppositely disposed angular rib portions 59a, the ends of which are beveled as shown most clearly in Fig. 14. This shingle is also provided with cleats 60 by means of which the shingle is secured in place. The shingle 59 is also provided with a centrally disposed longitudinally extending angular rib portion 62, the opposite ends of which are beveled as shown. A plurality of shingles 59 are laid in succession adjacent each other until the opposite end of the roof is reached whereupon another shingle 55a similar to the shingle 55 is secured in place. The shingle 55a is shown in Figs. 20 and 21 and is like the shingle 55 except that it has two ribs 57a and is twice the width of the shingle 55.

It should here be pointed out that the purlins 20 are secured in place across the roof in abutting relation to each other and in rows as shown most clearly in Fig. 1. The rows of purlins are spaced one foot apart up the roof and in such a manner that the two rows of purlins are disposed adjacent the crown of the roof and adapted to receive the end ridge shingles and the regular ridge shingles thereover. Should the roof be of such dimension that the standard size shingles do not close in at the ridge, any variation is taken care of by the use of a variable length ridge shingle. Any variation in the length of the building is taken care of by varying the width of the regular shingle 29 and the regular eaves shingle 7.

Secured along the eaves of the building and preferably secured to the wall thereof are eaves troughs which are shown in Fig. 18 and designated by the reference character 63. The eaves trough 63 is formed of a strip of metal shaped as shown most clearly in Fig. 18 and secured in place by means of straps 64 and 65. The straps 64 and 65 are so positioned as to strengthen and reinforce the eaves troughs and are provided with openings adapted to receive bolts 66 therethrough for securing the same in place. It is to be understood that eaves troughs may be secured to the regular eaves shingles in buildings of the California bungalow type having a long overhanging eave.

The opposite edge of the roof is secured in place in the manner hereinbefore described and a detailed description of this operation is not believed necessary. A strip of suitable material, such as plaster, asphalt or the like is applied to the wall of the building on which the roof rests. Such a strip of material is disclosed in Fig. 3 and designated by the reference character 67. The reference character 68 designates one wall of the building to which the roof is applied.

It is also contemplated to insulate the roof so as to prevent undue conduction of heat from the roof toward the interior of the building and to prevent loss of heat from the interior of the building by radiation. In order to prevent this passage of heat, I provide two layers of insulating material. The first layer of insulating material consists of strips or squares of wall board, such as gypsum rock lath, which are placed between and supported by the purlins 20. This first layer of insulating material is made up of a plurality of squares or strips 69 which rest loosely between the purlins 20. In order to better insulate the roof, I provide a second layer of insulating material 70 which is made of a material such as thermofill or rockwool or other suitable fireproof material. The second layer of insulating material consists of loose, light or powdered material disposed between the purlins and resting loosely therebetween. The nature and thickness of the insulating material as well as the number of layers of insulating material may be varied as desired without departing from the spirit of my invention.

A roof constructed in the manner herein described has no cracks or crevices and there will be no distortion caused by unequal expansion between the shingles themselves or between the shingles and the supporting structure.

No wood or other combustible material is used in the roof construction and all of the material used has a close range of expansion coefficient. Due to the nature and the amount of insulating material used, a sudden change of temperature will not cause condensation of moisture on the inner side of the roof. The cleats on the shingles are beveled so as to cause the shingles to fit tightly together as they are pulled downward against the purlins resulting in a very good weather seal. The construction enables any shingle or the entire roof to be removed or replaced without damage. The insulating material is fireproof and of light weight and of non-warping material, such as wall board, gypsum or the like, upon which is laid or packed light fire-proof material such as asbestos or gypsum powder or other like material. The eaves flashes make it possible to hang the eaves troughs directly thereon when used on a roof with long overhanging or projecting eaves or the eaves troughs may be secured on the wall of the building as shown in Fig. 18.

The manner in which the shingles may be removed will be readily understood by reference to Fig. 4, wherein it will be seen that the length of the space between the downwardly extending leg of a lower cleat and the under surface of its shingle and between the top edge and the upper cleat of a shingle of a course beneath is equal to or greater than the length of the overlap of the upper cleat of such lower course shingle upon the purlin which it engages. By pushing two or more shingles in a course upwardly, one or more shingles in the next lower course may be freed from their purlin, enabling them to be removed without distortion.

It will now be clear that I have provided a roof construction which will accomplish the objects of the invention as hereinbefore stated. Various changes may be made in the shape, size and nature of the materials used as well as in the manner of securing the several units in place.

It is therefore to be understood that the form of the invention herein disclosed is merely illustrative and is not to be considered in a limiting sense as the invention is limited only in accordance with the scope of the appended claims.

Having thus described my invention, what I claim is:

1. In a roof construction, the combination, with vertically spaced purlins each having an upper flange, of a series of shingles each having an upper and a lower cleat, each of said cleats having a downwardly extending leg spaced from the under surface of its shingle, each upper cleat being arranged adjacent to the upper end of the shingle to which it is attached and the leg thereof being adapted to engage beneath a purlin flange, and each lower cleat being spaced from the lower edge of the shingle to which it is attached, the lower end of the leg of each lower cleat being adapted and arranged to receive the upper edge of a shingle in the next lower course between itself and the under surface of the shingle to which said lower cleat is attached, and each lower leg of each lower cleat being of sufficient length to enable the upper edge of a shingle in the next lower course to be projected into the space between said lower leg and the under surface of its shingle a sufficient distance to disengage the leg of the upper cleat of the said shingle in the said lower course from its purlin flange.

2. A metallic shingle comprising a body having a cleat adjacent to its upper end and a cleat spaced from its lower end, each cleat having a downwardly extending leg spaced from the lower surface of the said body, the leg of the upper cleat being adapted to engage beneath a retaining seat and the leg of the lower cleat being adapted to receive the upper end of a like shingle in the course below, the leg of the lower cleat being of sufficient length and spaced from the under surface of the body a sufficient distance to enable the upper end of the shingle in the lower course to be moved into such space a sufficient distance to disengage the leg of the upper cleat on such lower shingle from its seat.

3. A metallic shingle comprising a body, a Z-shaped cleat secured by its upper flange to the under surface of said body adjacent to the upper edge thereof, a Z-shaped cleat secured to the lower surface of said body by its upper flange at a point spaced from the lower edge of said body, the lower flange of the lower cleat being spaced a sufficient distance from the lower surface of said body to receive in such space the upper edge and the upper flange of the upper cleat on a shingle in the course next below, the length of the space being sufficient to permit the movement thereinto of the upper edge and upper flange of the said lower-course shingle for a distance sufficient to disengage the lower flange of its upper cleat from a seat received between itself and the under surface of its shingle.

WILBUR J. HAMMERSLEY.