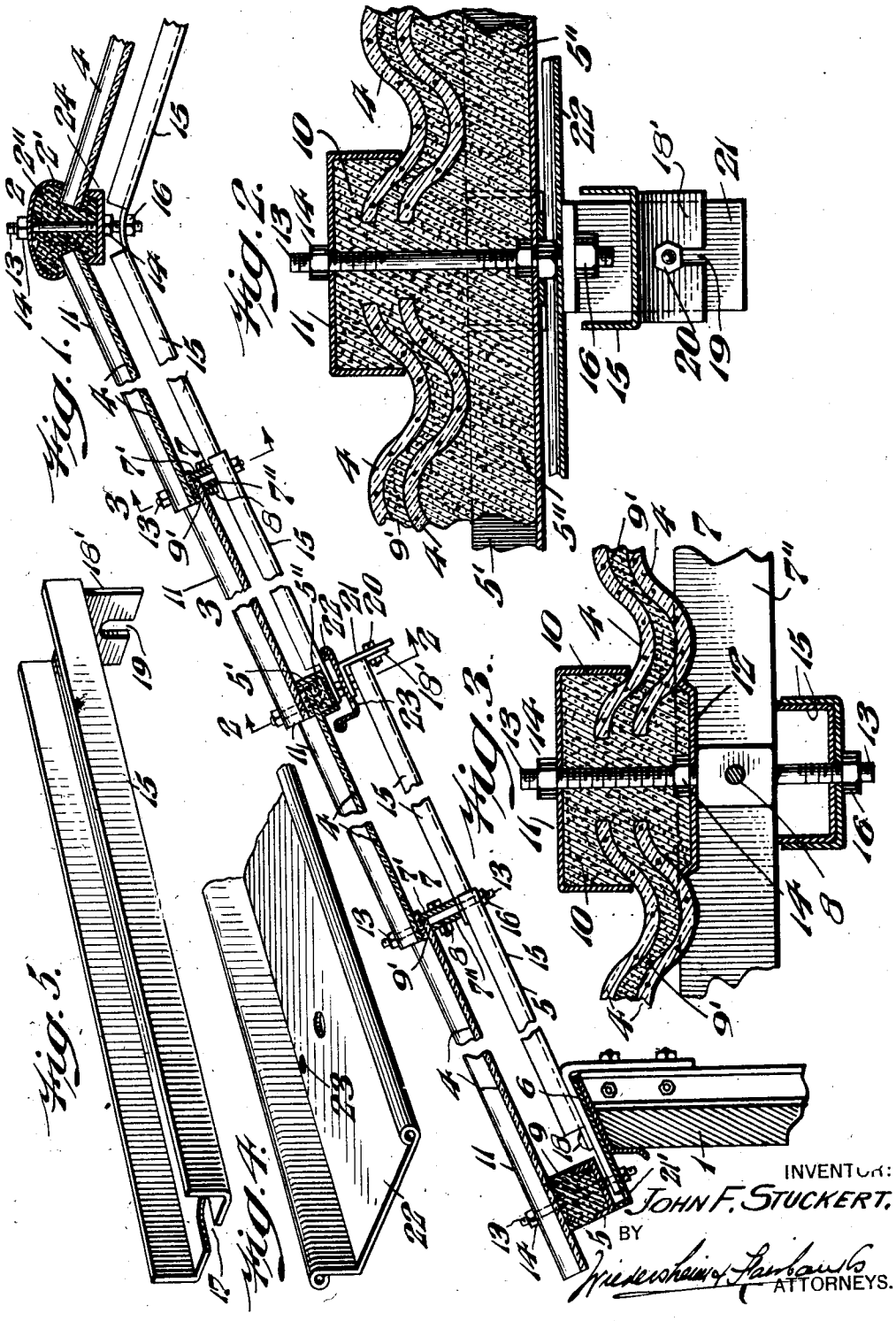
June 5, 1928. 1,672,629

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ROOFING STRUCTURE

Filed July 25, 1927 3 Sheets-Sheet 1



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Filed July 25, 1927 3 Sheets-Sheet 2

Fig. 6.

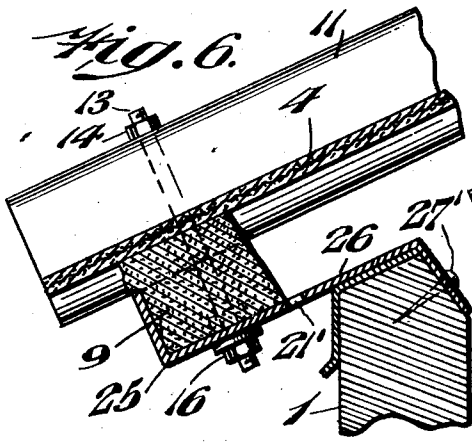


Fig. 7.

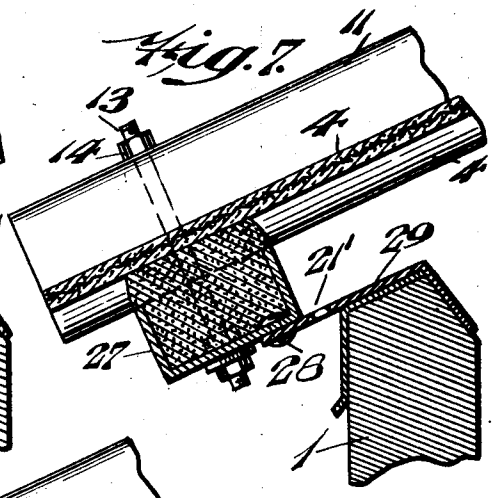


Fig. 8.

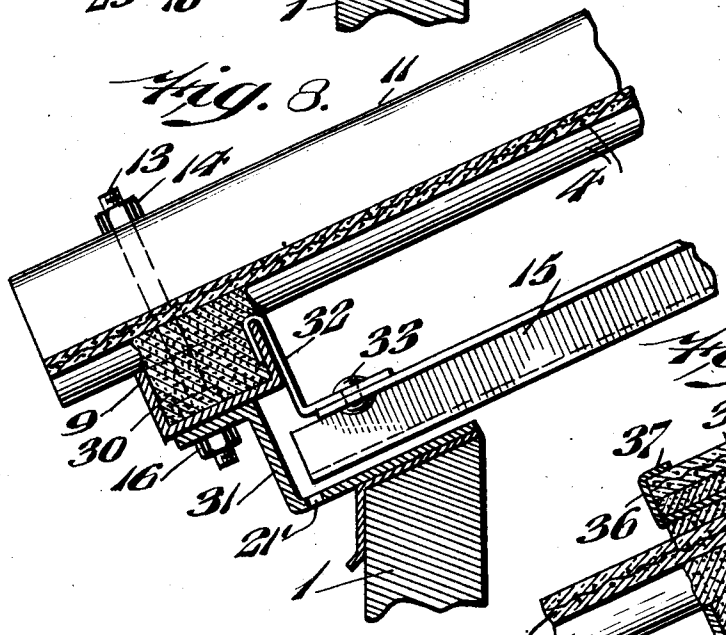


Fig. 9.

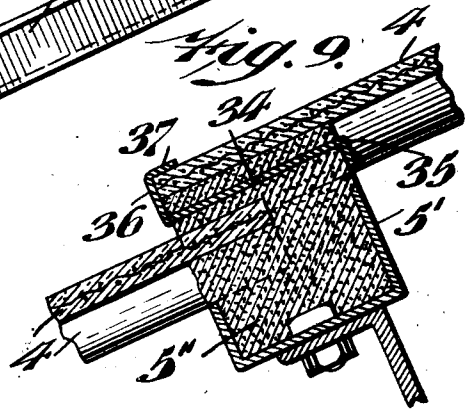
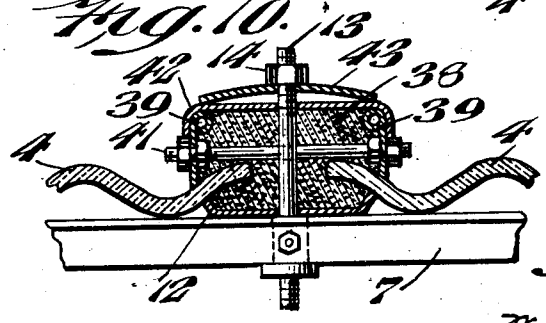


Fig. 10.



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Fig. 11.

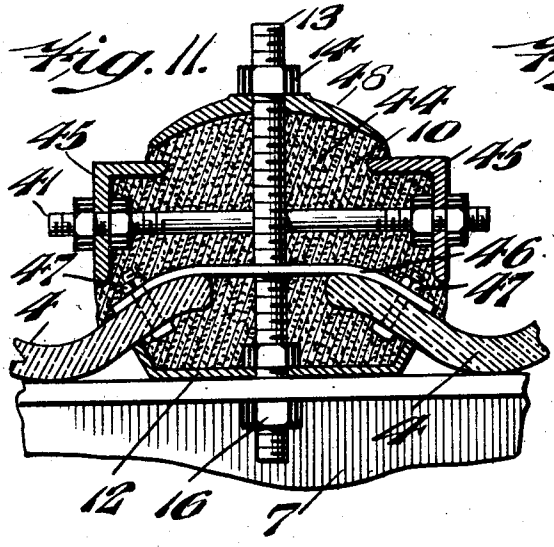


Fig. 12.

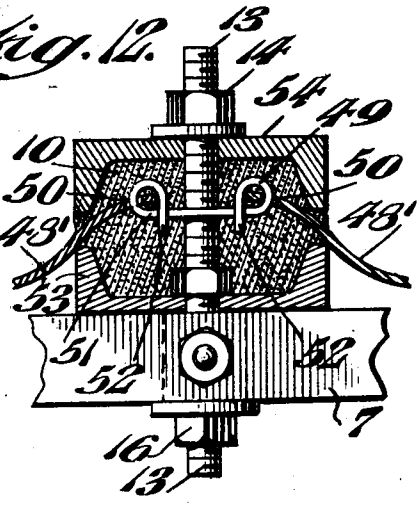


Fig. 13.

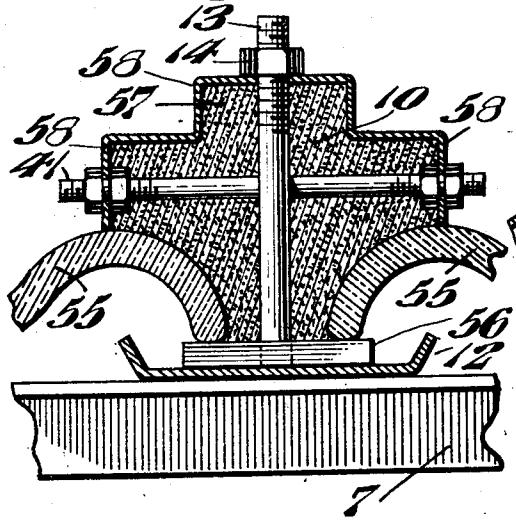
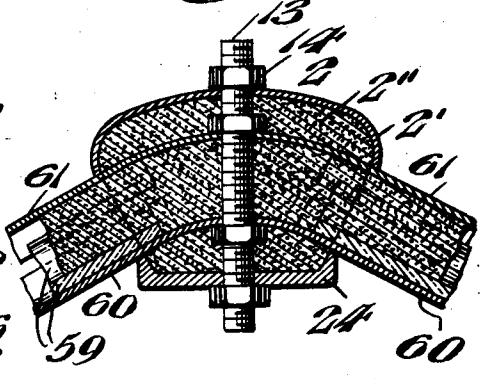


Fig. 14.



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ROOFING STRUCTURE.

Application filed July 25, 1927. Serial No. 208,164.

In the supporting of corrugated slabs, forming a roof structure, considerable difficulty has in the past been experienced along the eaves of a building. Corrugated slabs, whether of glass or other material, are not uniform in character, so that it has been the practice to employ concrete along the eaves, in which concrete, while soft, the unevenness of the slabs may be taken care of by embedding the slabs therein. It has been the general practice to support the concrete upon flat wooden strips. In time the wooden strips rot or the concrete breaks away from the wooden strips, thus permitting rain, snow, sleet, or the like to penetrate beneath the corrugated slabs and gain access to the building interior. A further disadvantage is that wind penetrates the cracks formed and causes damage to the roof itself from beneath. Further, it is very difficult to make repairs.

The leading object of the present invention may be said to reside in the provision of a novel structure for overcoming the above described disadvantageous features.

A further object resides in the provision of a metallic gutter supported by the walls of a building and forming the eaves of a building, which gutter is so arranged and constructed that the concrete fill employed is securely retained in place and forms a substantial support for corrugated roofing slabs.

A further object of the present invention may be said to reside in the provision of a gutter of channel iron forming the eaves of a building to receive concrete, the gutter being provided with integral side walls so that the concrete fill is retained against endwise movement, or in other words, in the direction of the slant of the roof.

Still another object of the present invention is to extend from my novel eaves construction to the ridge pole of a building a concrete rib to receive and have anchored therein the ends of adjacent roofing slabs.

A still further object of the present invention is to provide a ridge pole of concrete supported upon a gutter of channel iron.

Other and further objects of the present invention reside in the provision of general details of construction and in the arrangement, combination and connection of parts for attaining the results sought by the foregoing objects.

The nature, characteristic features and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which:

Fig. 1, is a fragmentary view of a roofing structure, principally in section.

Fig. 2, is a view in section taken upon the line 2—2 of Fig. 1.

Fig. 3, is a view in section taken upon the line 3—3 of Fig. 1.

Fig. 4, is a fragmentary view in perspective of a cross drain.

Fig. 5, is a view in perspective of one of the main drains.

Fig. 6, is a fragmentary view in section illustrating a modified form of my novel eaves as shown at the left hand side of Fig. 1.

Fig. 7, is a similar view of a further modified form.

Fig. 8, is a similar view of a still further modified form.

Fig. 9, is a fragmentary view in section illustrating a modified form of the cross-beam construction shown at the central part of the Fig. 1.

Fig. 10, is a fragmentary view in section illustrating a modified form of the concrete rib shown in Fig. 3.

Fig. 11, is a similar view illustrating a further modified form.

Fig. 12, is a fragmentary view in section illustrating a still further modified form.

Fig. 13, is a view illustrating a still further modified form.

Fig. 14, is a fragmentary view in section illustrating a modified form of concrete ridge pole parts.

For the purpose of illustrating my invention I have shown in the accompanying drawings several forms thereof which are at present preferred by me, since the same have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

Referring now to the drawings in detail, and with particular reference to Fig. 1, the reference numeral 1 designates the side wall of a building, 2 designates the ridge pole, and 3 designates the roof. The roof is made

up of a plurality of corrugated slabs which may be of glass, metal, asbestos, or other suitable material and which, for illustrative purposes, are shown in Fig. 1 as being made of glass, said slabs being designated 4. These slabs overlap at their meeting ends, the lower end of an upper slab overlapping the upper end of a lower slab. A description will now be given of means for supporting these slabs. Supported by the wall 1 is a metal gutter 5, preferably of channel iron, although sheet metal may be used, said gutter being carried by an angle plate 6. This gutter 5 forms the eaves of a building and in fact is a gutter-shaped metal eaves-piece. Spaced from eaves-piece 5 is a cross-beam 7. This cross-beam 7, however, is not of gutter-shape or channel iron formation but consists of spaced plates 7′ and 7″ bolted together at 8, plate 7′ being higher than the other plate. The lower of the slabs 4 rest at their upper ends upon plate 7″ of the cross beam 7 and the lower ends of said slabs 4 rest upon the concrete fill 9 in the eaves-piece 5. At suitable intervals, ribs 10 of concrete are formed which extend from the eaves-piece to the ridge pole or in other words along the pitch of the roof. The opposed inner ends of the slabs 4 are embedded in these concrete ribs, see Figs. 2 and 3. A cover plate 11 is provided for each rib 10. Immediately below and paralleling a rib 10 is a plate 12 which serves to support the opposed inner ends of the glass slabs 4 and also serves to receive the concrete as poured in the formation of the ribs 10. Extended through a cover 11, a rib 10, and a plate 12, is a bolt 13 provided with nuts 14 for clamping the cover plate 11, and plate 12 in place. The lower end of the bolt serves to support a main conduit or drain for draining water, the drain being designated 15. A nut 16 upon bolt 13 is employed for clamping the drain parts with respect to a cross-beam. These drains 15 overlap, as clearly shown in Fig. 1, and are adjustable endwise. A lowermost drain 15 is provided with a notch 17 for engaging a fixed stud 18, and the opposite end of the drain may be provided with a depending flange 18′ notched at 19, whereby the flanged part may be bolted, as at 20, to a support 21. The gutter forms no salient part of the present invention, and is shown for the purpose of illustrating a complete roof. The plate 6, previously described as supporting the eaves-piece 5, is provided with an opening 21′ to permit the passage of water from the lower end of the drain 15. At that part of the roof where the lower ends of the next series of slabs 4 overlap the upper ends of the first series of slabs, concrete 9′ is interposed between the overlapping edges of the slabs. Other bolts 13 pass down through the meeting slabs and between the plates forming the cross-beam 7 and support the drain 15. Since these bolts are similar to those previously referred to and to others to be referred to, the same reference characters refer to all. For supporting the upper ends of the second series of slabs 4 I employ a channel iron 5′ which I fill with concrete 5″. The overlapping edges of the second and third series of slabs 4 are secured by this concrete. At this point it may be desirable to arrange a cross drain 22, see Fig. 4. This drain 22 is useful in collecting water and directing the same to a main drain 15. The cross drain 22 is apertured at 23 to direct water to a drain 15. The cross drain forms a convenient place for the support of bracket 21 to which a drain part is secured. As many series of slabs 4 as desired may be employed, and they may be of any length and any width, according to the roof being constructed. A further description, therefore, of overlapping slab parts is thought to be unnecessary. The uppermost of the slabs 4 engage with the ridge-pole 2. The ridge-pole I make of concrete 2″ which is supported upon a cross-beam 24, which cross-beam is of channel-iron construction, see Fig. 1. Passing vertically through the concrete of the ridge pole are still other bolts 13 for supporting the drain parts 15. The upper ends of the uppermost slabs 4 are embedded in the concrete 2″ of the ridge pole, as clearly shown in Fig. 1. It is thus seen that the upper slabs of the roof are embedded in concrete 2″; that the overlapping parts of the roof abut against concrete 9′ and 5″; that the lowermost of the slabs are supported by concrete 9; and that viewed from another direction the opposed edges of the slabs are embedded in the concrete of ribs 10. Thus, tight joints may be provided in a lasting manner and at relatively small expense when the lasting qualities of the structure are considered. Bolts 13 are used to clamp the slabs 4 and eaves-piece to place.

Referring now to Figs. 6, 7, and 8, there are shown certain modified forms of eaves-pieces for the support of the lower of the slabs 4. In Fig. 6, the eaves piece 25 is formed integral with the plate 26, which plate 26 in turn is secured as at 27′ to the side wall 1. The concrete 9 is filled in upon this eaves-piece 25 and bolts 13 used as described in the foregoing arrangement of parts. In Fig. 7, the eaves-piece 27 is shown as being of channel iron formation and is secured as at 28 to plate 29 which latter is supported upon the side wall 1, otherwise the construction is the same as that seen in Fig. 6. Referring now to Fig. 8, the eaves-piece 30 is supported upon a Z-bracket 31 which latter is supported upon the side wall 1. Bolts 13 previously described are used to secure the eaves-piece 30 upon the uppermost arm of the Z-bracket 31. In this particular case I may support the water

drain 15 from the eaves-piece 30 by means of a strap 32 hooked at one end over one of the flanges of the channel iron and being riveted as at 33 at its other end to the drain 15.

Referring now to Fig. 9, a slightly modified form of roof construction adjacent the cross-beam 5′ is provided. Embedded in the concrete 5″ of the beam is a strap 34 the inner end of which is bent, as at 35, around the concrete fill, and the opposite end of which is bent upwardly at 36 and inwardly at 37 to engage around the lower end of a slab 4, and thus prevent said slab from shifting or sliding downwardly with respect to the cross-beam.

Referring now to Fig. 10, there is shown a modified form of rib construction. The concrete rib in this case is designated 38 and has embedded therein the opposed ends of the slabs 4, as in the previously described construction. The concrete is supported upon the plate 12 which in turn is supported upon the cross-beam 7, as previously described with respect to Fig. 1. The sides of the rib 38 are provided with plates 39. These plates 39 are secured firmly against the side walls of the rib 38 by means of a bolt 41, which bolt passes horizontally through the rib 38. A cover plate 42 is provided for rib 38 and is held in place by means of a spring plate 43 which impinges down upon the cover plate and is held in this position by means of bolts 13.

Referring now to Fig. 11, there is disclosed a further modified form of rib construction, the rib in this case being designated 44 and being formed of concrete as in the other cases. This rib is also provided with side plates, but these side plates are of right angle construction and are designated 45. These right angle plates are secured in abutting position against the side walls of the rib 44 by means of bolts 41, as referred to in Fig. 10. The opposed ends of slabs 4 are embedded in the concrete rib 44 and have their inner ends secured together by means of a strap 46, the ends of which strap are secured as at 47 to the inner ends of the slabs 4. Bolts 13 employed for securing the rib with respect to the cross-beam 7 are the same type of bolts as shown in Figs. 1 to 10. This rib 44 is provided with a cover plate 48, the bolt 13 being employed to secure the cover plate in position.

Taking up now Fig. 12, the slabs are designated 48′ and for illustrative purposes instead of being of glass are of metal. The concrete rib is designated 49 and the opposed ends of the metal slabs are embodied in the concrete forming the rib. The inner ends of the slabs are apertured as at 50. Connecting the inner ends of the embedded metal slabs is a strap 51 the ends of which penetrate the apertures of the slabs and are then bent downwardly as at 52 to interlock the slabs. Instead of employing plate 12 as used in the foregoing instances, I employ a piece of channel iron 53 which is arranged upon the cross-beam 7 for supporting the rib 49. I make use of a duplicate piece of channel iron for a cover plate 54. The two pieces of channel iron are secured in position by means of the bolts 13.

Referring to Fig. 13, the slabs 55 are of glass, but instead of being curved upwardly at their inner ends, as those previously shown and described, these slabs are curved downwardly at their inner ends and rest upon a plate 56, which in turn is supported upon the previously shown and described plate 12, the latter being supported upon the cross-beam 7. The rib is designated 57 and is concrete as in the previously described ribs, although the concrete does not extend below the inner ends of the slabs. The rib 57 is provided with a cover plate 58 which is of integral structure having depending parts 58 which cover the side walls of the rib. The depending parts 58 are clamped firmly against the side walls of the rib by means of bolts 41, previously referred to.

Referring now to Fig. 14, a modified form of ridge pole construction is shown and is designated 2, as in Fig. 1. This ridge pole is made of concrete 2″ and is provided with a cover plate 2′ as previously described. The member 24 of channel iron for supporting the concrete is also present, as are the bolts 13, previously described, for securing the cover plate with respect to the channel member 24, and also to anchor the parts about to be described. The reference numeral 59 designates roof slabs, for example of glass, supported upon members 60, usually of metal, which members may be continuous at the ridge pole and extend entirely through the ridge pole, as clearly seen in Fig. 14. A cover-plate 61, also of metal, is provided which like the member 60 is continuous and extends entirely through the ridge pole. The cover-plate and support 60 as well as the channel member 24 and the cover-plate 2′ are all secured by means of the bolts 13. The fill of concrete 2″ which goes to make up the ridge pole extends between the cover-plate and support 60 and serves to further anchor the slab ends in position. It is of course understood that when the glass or other slabs are positioned upon a roof the initial set of the concrete has not taken place, so that the slabs can be forced down into the concrete to take care of irregularity of slab parts.

From the above described arrangement, construction and combination of parts, it is apparent that many advantages reside, chief among which may be mentioned that wind, rain, sleet and the like cannot penetrate beneath the roof proper because the eaves-piece, being of metal with flanged sides and

containing a fill of concrete, forms a permanent structure, thus precluding the possibility of rotting away or otherwise providing leakage places. Another advantage is that by providing gutter-like eaves-pieces means is provided to prevent the concrete fill therein from moving endwise, or in other words, in the direction of the slant of the roof. Another advantage is that the ridge pole being of concrete and supported upon a channel iron gutter provides a very efficient arrangement in which the corrugated slabs may be secured. Still another advantage is the provision of the concrete rib in which may be embedded the opposed ends of the roof slabs.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have in the present instance shown and described the preferred embodiments thereof which have been found in practice to give satisfactory and reliable results, it is to be understood that the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a roofing structure, a supporting wall, a gutter-shaped metal eaves-piece carried by said wall, a fill of concrete within said eaves-piece, corrugated roof slabs the lower ends of which are positioned upon said eaves-piece before initial set of the concrete takes place and a water conduit supported beneath said slabs, and reaching to the eaves structure, the latter being provided with a water vent.

2. In a roofing structure, a supporting wall, a gutter-shaped metal eaves-piece carried by said wall, a fill of concrete within said eaves-piece, corrugated roof slabs the lower ends of which are positioned upon said eaves-piece before initial set of the concrete takes place, bolts passing through said slabs, concrete and eaves-piece for clamping said slabs to place and a water conduit supported beneath said slabs, and reaching to the eaves structure, the latter being provided with a water vent.

3. In a roofing structure, a supporting wall, a gutter-shaped metal eaves-piece carried by said wall, a fill of concrete within said eaves-piece, corrugated roof slabs the lower ends of which are positioned upon said eaves-piece before initial set of the concrete takes place ribs of concrete following the pitch of the roof in which ribs the opposed ends of said slabs are embedded and a water conduit supported beneath said slabs, and reaching to the eaves structure, the latter being provided with a water vent.

4. In a roofing structure, a supporting wall, an eaves-piece of channel iron carried by said wall, a fill of concrete within said channel iron, corrugated roof slabs positioned upon said channel iron before initial set of the concrete takes place, and a water conduit supported beneath said slabs and leading to the eaves structure, the latter being provided with a water vent.

5. In a roofing structure, cross-beams, a channel iron supported thereon and extending in the direction of the pitch of the roof, a fill of concrete for said channel iron to form a rib, and corrugated slabs supported by said cross-beams in overlapping position with the laterally extended edges thereof embedded in said rib and a water conduit supported beneath said slabs, and reaching to the eaves structure, the latter being provided with a water vent.

6. In a roofing structure, cross-beams, a channel iron supported thereon and extending in the direction of the pitch of the roof, a fill of concrete for said channel iron to form a rib, corrugated slabs supported by said cross-beams in overlapping position with the laterally extended edges thereof embedded in said rib, a cover plate for said rib, and a bolt passing through said rib for clamping the top of the cover plate and channel iron to said rib and a water conduit supported beneath said slabs, and reaching to the eaves structure, the latter being provided with a water vent.

7. In a roofing structure, cross-beams, a channel iron supported thereon and extending in the direction of the pitch of the roof, a fill of concrete for said channel iron to form a rib, corrugated slabs supported by said cross-beams in overlapping position with the laterally extended edges thereof embedded in said rib, a cover plate for said rib, a bolt passing through said rib for clamping the top of the cover plate and channel iron to said rib, and other bolts passing through said rib for holding the cover plate sides in abutting position with the side walls of the rib and a water conduit supported beneath said slabs, and reaching to the eaves structure, the latter being provided with a water vent.

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