Sept. 23, 1952 A. B. HAMMITT ET AL 2,611,458

FASTENING MEANS FOR ROOFING AND SIDING MATERIAL

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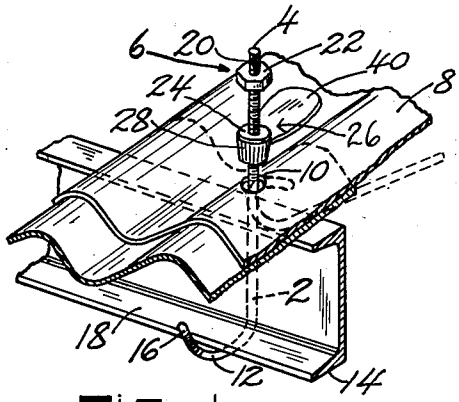


Fig. 1.

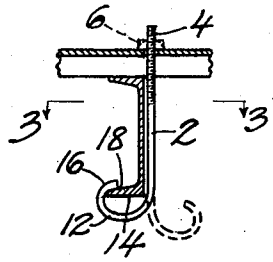


Fig. 2.

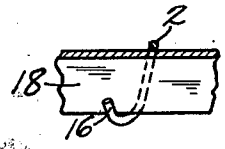


Fig. 3.

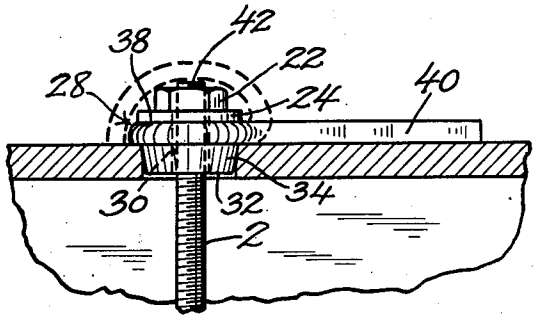


Fig. 4.

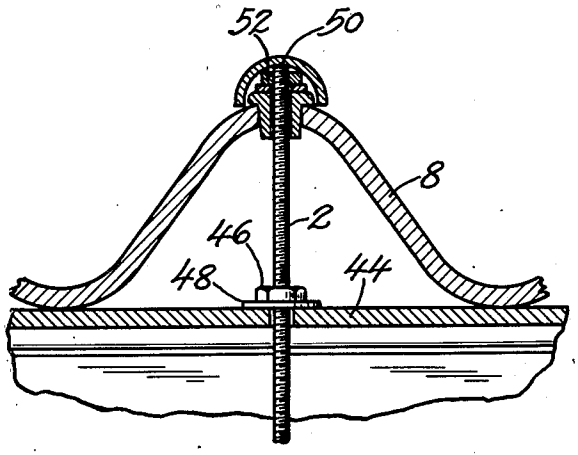


Fig. 5.

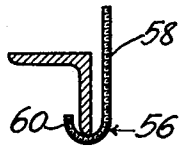


Fig. 6.

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FASTENING MEANS FOR ROOFING AND SIDING MATERIAL

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1 Claim. (Cl. 189—35)

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Our invention relates to fasteners for securing sheet material to a support and more particularly to fasteners which may be employed in securing siding and roofing material to steel girts and purlins of the framework of a building.

Heretofore when sheet material has been applied to the roof or exterior walls of a building it has been necessary to erect scaffolding on the inside of the building in order for the workmen to apply nuts, toe clips or other securing means to bolts passed through the sheet material from the exterior and to the structural elements of the building framework to which the sheet material is secured. This has been necessary because of the fact that the sizes of the sheets and their arrangement in an overlapping manner have made it impossible for the workmen on the exterior of the structure to reach over or around the sheets to fasten the toe clips and nuts or other devices used to secure the sheet material to the purlins or girts of the building framework. Moreover, when working adjacent the eaves of a roof or when boilers, pipes or other installations are located near a roof or side walls of a building it is not always possible or convenient to erect or support a scaffold in position to be accessible in the interior of the structure so as to secure the sheet material to the structural elements of the building framework. Furthermore, the cost of erecting such scaffolds and the time required to move them from place to place as the roof or siding is constructed frequently increases the total cost of the installation by from one fourth to a third and often exceeds the cost of the sheet material being used.

In an effort to overcome these objections fasteners have been devised which can be drawn up or tightened in place from the exterior of a building. However, those devices heretofore provided have not been capable of being inserted through the sheet material from the exterior and into position to be secured firmly to the structural elements of the framework. Moreover, if the ends of the bolts or fastening means are snipped off the danger of corrosion is substantially increased and staining of the outer surface of the sheet material is often encountered due to the stripping away of the galvanized protection on the end of the bolt and rusting thereof. This difficulty is not always overcome even when an extremely tight caulking job is provided since frequent inspection and pointing up of the caulking is necessary due to movement of the bolts and cracking of the caulking upon expansion or yielding of the framework and sheet material on hot days or in high winds.

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Our invention overcomes these objections to constructions of the prior art and renders it possible to apply and secure sheet material to building structures without employing any scaffolding on the interior of the building. At the same time all danger of corrosion of the fastening means exposed on the exterior of the building is eliminated.

These advantages are preferably attained by employing fastening means having a shank provided on one end with an arcuate or hook shaped portion for engaging and embracing a structural element. The fastening means also may be formed with an extremity which is offset laterally to engage the structural element more securely and to simplify insertion of the fastening means through an opening in the sheet material which is of limited cross sectional area. The securing means further may be tightened entirely from the outside by means of an ordinary nut or fastening element and the excess protrusion of the shank may be snipped off upon the completion of the work. Thereafter the space between the shank and the sheet material may be sealed and all danger of corrosion due to the exposure of ungalvanized portions of the bolt may be precluded by employing a deformable sealing element or washer which serves to hold the shank in place and also serves to protect the end of the bolt from corrosion due to the exposure to the weather of the ungalvanized cut portion of the shank.

One of the objects of our invention is to provide a fastener for roofing or siding material which may be inserted and drawn up entirely from the exterior of a structure.

Another object of our invention is to provide a novel method of inserting and tightening said bolt without recourse to interior scaffolding.

A further object of our invention is to provide novel means for the sealing of the exposed portion of a fastener for sheet material so as to protect it against the weather.

A still further object of our invention is to provide a novel type of washer which will give an adequate seal against the weather.

These and other objects and features of our invention will readily appear from the following description thereof in which reference is made to the figures of the accompanying drawing.

In the drawings:

Fig. 1 is a perspective of a preferred form of our invention as applied in use with parts of the building broken away.

Fig. 2 is a side elevation of the construction shown in Fig. 1 with parts shown in section.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged view of a portion of the construction shown in Fig. 1 with parts in section.

Fig. 5 is a sectional view through a portion of a building illustrating an alternative application of the construction shown in Fig. 1.

Fig. 6 is a sectional view of a construction using an alternative form of our invention.

In that form of our invention illustrated in Figs. 1 to 5 of the drawings the fastening means is adapted for use in securing sheet material to any one of a variety of types and sizes of girts or purlins constituting structural elements in the framework of a building. As shown, a single type and size of fastening means may be used even though the structural elements vary and are in the form of channel beams, I-beams, angle iron or conventional wooden timbers. At the same time the fastening means may be applied and secured in place by workers located only on the exterior of the building.

These advantages are attained by forming the fastening means of a rod or bar of material which preferably is circular in cross-section and is generally J-shaped in appearance with a straight shank 2 threaded at 4 to receive retaining means 6 located on the exterior of the sheet material 8. The shank 2 extends through an opening 10 in the sheet material which preferably is circular in form and somewhat larger than the shank 2. The opposite end of the fastening means is provided with an arcuate portion 12 which is shaped to extend about and embrace the edge 14 of the structural element opposite to that upon which the sheet material is located. The size and radius of curvature of the portion 12 therefore should be such as to exceed the width of the edge 14 so that the extremity 16 of the arcuate portion will extend upward on the side of the structural element opposite to the shank 2.

The extremity 16 of the arcuate portion also may extend laterally from the arcuate portion so that it may overlie the flange 18 of a channel beam or I-beam with which it is used as illustrated in Figs. 2 and 3. When the structural element is a conventional wooden timber the extremity 16 also tends to bite into or become embedded in the timber so as to aid in securing the fastening means in place when it is drawn up by the retaining means for securing the sheet material to the structural elements. When the extremity 16 projects to the right or in a clockwise direction from the arcuate portion 12 as shown in the drawings, the use of conventional right hand or clockwise threads on the shank serves to cause the extremity 16 to be urged into engagement with the structural element during the operation of threading a nut onto the shank in securing the fastening means and sheet material in place.

The offset position of the extremity 16 of the arcuate portion of the fastening means also renders it easier to insert the fastening means through an opening 10 in the sheet material which is of limited diameter and in fact the whole arcuate portion of the fastening means may be curved somewhat so as to have a general helical shape to permit the fastening means to be threaded through the opening 10 most readily.

In applying the fastening means to a sheet and structural element it is positioned as shown in dotted lines in Fig. 1 with the shank 2 lying nearly parallel to the sheet material or in the valley between adjacent corrugations and with the extremity 16 of the arcuate portion 12 inserted into opening 10 located adjacent to one edge of the structural element. The arcuate portion is then threaded through the opening, turning the arcuate portion away from the structural element by holding the shank 2 and turning the fastening means about. A mark 20 on the shank, which may be paint or a longitudinally extending groove in the shank, is provided for indicating the location of the arcuate portion when it is hidden from view by the sheet material. The fastening means is then inserted through the opening far enough to permit the arcuate portion to be turned to pass beneath the edge 14 of the structural element. When thus positioned the workman pulls the shank upward to move the arcuate portion upward into position to embrace the edge 14 of the structural element. At the same time the fastening means may be turned to cause the extremity 16 to overlie the flange 18 of the structural element, if it is in the form of a channel beam or an I-beam, or to bite into the wood of a conventional timber. Furthermore, if the structural element is in the form of an angle iron the arcuate portion may be turned to insure positioning of the edge of the angle iron at the lowermost point in the arcuate portion of the fastening means. It will thus be apparent that the arcuate portion is adapted to engage and embrace structural elements which differ greatly in width and form without sacrificing or decreasing its effectiveness.

After positioning the arcuate portion and offset extremity of the fastening means as described the sheet material is secured thereto and to the structural elements by suitable retaining means engaging the shank. As shown, the shank is threaded at 4 and the retaining means 6 includes a nut 22 and a washer 24 which may be drawn up by means of a conventional wrench to bear against the outer surface of the sheet material so as to urge it forcibly toward the structural elements and secure it firmly in place thereon.

In order to afford further protection against the weather and to eliminate lateral play or looseness between the shank of the fastening means and the sheet material, a member 26 is provided which is formed of lead, babbitt or other deformable material and has a tapered body 28 for sealing the space between the shank and edges of the opening 10. The body 28 has a central passage 30 therethrough so that it may be slipped over the shank 2 into a position in which the lower end 32 of the body extends into the opening 10 in the sheet material and the side walls 34 of the body bear against the edges of the opening. A steel or other hard washer 24 bears against the outer face 38 of the body and preferably is of greater diameter than the opening 10 so that when the nut 22 is turned downward on the shank and against the washer the body 28 of the sealing means will be deformed to seal the space between the shank and the sheet material and fixedly position and retain the shank in place with respect to the sheet material.

It will be apparent from the foregoing description that the shank 2 of the fastening means should be of sufficient length to manipulate the arcuate portion thereof from the exterior of the building and to permit the fastening means to be drawn up to clamp the sheet material securely in place. Thereafter the protruding end of the

shank is cut off and since the fastening means is generally formed of galvanized iron rod it is desirable to protect the cut end thereof from corrosion. For this purpose protecting means are provided and as shown they may be carried by and formed integral with the body 28 of the sealing means so as to form a unitary element. In this construction the body 28 is provided with a laterally extending wing or flange 40 which is of such length or shape that it may be folded over the cut end 42 of the shank and may be hammered down or pressed into place over the end 42 to seal the end against exposure and corrosion. A neat, finished and attractive construction is thus provided on the exterior of the sheet material and the shank is held securely in place and protected against the weather.

With this construction all operations necessary for applying the fastening means to the structural framework and sheet material and for securing the fastening means in place can be performed by operators located on the exterior of the building. The usual scaffold on the interior of the building and the time and expense for constructing and moving the scaffold are thus entirely eliminated and the cost of applying the sheet material is greatly reduced. Furthermore, corrosion of the fastening means is prevented so that staining of the sheet material does not occur and caulking of the openings through which the fastening means extend is not required.

The sheet material secured to the structural elements may be of any type, but our invention has particular advantages when employed for applying corrugated sheets of cement-asbestos compositions. With such sheets the openings through which the fastening means extend are generally formed in the crown of the corrugations and the shank of the fastening means may be placed in the valley when inserting the offset end of the arcuate portion through the opening. It is also possible when using our invention to employ a single fastening means for securing both insulation and corrugated sheet material to the structural framework of a building. Thus as shown in Fig. 5 the fastening means may be applied to the insulating sheet 44 and secured in place by nuts 46 and washers 48 which if desired may be applied only loosely to prevent injury to soft insulating material. The corrugated sheets may then be drilled to provide openings positioned to receive the projecting ends 50 of the shanks of the retaining means and other retaining means 52 such as those described above may be applied to the outer ends of the shank on the exterior of the corrugated sheet. The nuts 46 are then located in the space beneath the crowns of the corrugations and when the outer retaining means 52 are drawn up tightly the nuts 46 may be drawn away from the insulation somewhat but the pressure of the corrugated sheet against the insulation will hold both sheets securely in place.

In order to apply the nuts 46 to the shanks of the fastening means it is necessary for the shank to be threaded for the greater part of its length. In fact, as shown in Fig. 6 the fastening means may be formed from stock consisting of lengths of rod which are threaded continuously throughout the length thereof and in that event the

threads on the arcuate and offset portions of the fastening means bite into the structural elements or present a frictional surface which aids in holding the fastening means securely in place.

Many other modifications in the form and construction of devices embodying our invention may be made and for this reason it should be understood that the embodiments of our invention herein shown and described are intended to be illustrative only and are not intended to limit the scope of our invention.

We claim:

In a building structure embodying sheet material applied to a structural framework element having an inner laterally extending flange and having an opening in the sheet material located adjacent the structural framework element, the combination of means securing said sheet material to said element including a rod having one end which is threaded and projects through said opening, the opposite end of said rod having a laterally extending portion being angularly disposed with respect to the edges of said flange provided at its end with an inwardly turned extremity which is spaced from said rod a distance exceeding the width of said flange and embracing and overlying the edge of said flange, said extremity being off-set so as to project to one side from a plane containing said rod and laterally extending portion so as to permit insertion of the extremity into said opening and subsequent lengthwise threading of the fastening means through the opening from the exterior of the sheet and into retaining engagement with the framework element, deformable sealing means surrounding the threaded end of said rod, and retaining means engaging the threads on said rod and cooperating with said sealing means for filling the space between said rod and the sides of the opening to seal the opening and hold said fastening means and sheet material in place on said structural element.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
277,528	Wright	May 15, 1883
980,567	Schneider	Jan. 3, 1911
1,266,836	Lyon	May 21, 1918
1,529,697	Hall	Mar. 17, 1925
1,540,339	Jones	June 2, 1925
1,576,727	Deniston, Jr.	Mar. 16, 1926
1,713,903	Hinkson	May 21, 1929
1,909,559	Wagner	May 16, 1933
1,971,047	Moritz	Aug. 21, 1934
2,014,451	Pfeifer, Jr.	Sept. 17, 1935

FOREIGN PATENTS

Number	Country	Date
118,776	Great Britain	1918
823,539	France	1937
554,058	Great Britain	1943