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Austin

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[54] **FASTENINGS FOR ROOF AND WALL SHEETING**

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[52] **U.S. Cl.** **24/73**

[51] **Int. Cl.** **A44b 21/00**

[58] **Field of Search** ..... 24/73 RM, 74

[56] **References Cited**

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[57] **ABSTRACT**

According to one aspect of the invention there is provided a fastening member for mounting on a roof purlin, wall stud or other support (hereinafter referred to by the term 'purlin') so as to have limited pivotal movement relative thereto and a spring for biasing the fastening member into an operative position for engaging with and securely holding in position a ribbed portion of the sheeting when said sheeting is pressed against the purlin, the fastening member having at least one shaped portion for engagement by an internal ledge of the sheeting and operable by pressure applied by that ledge when the sheeting is being put into position to pivot to a position such as will permit the sheeting to be pressed against the purlin.

5 Claims, 7 Drawing Figures

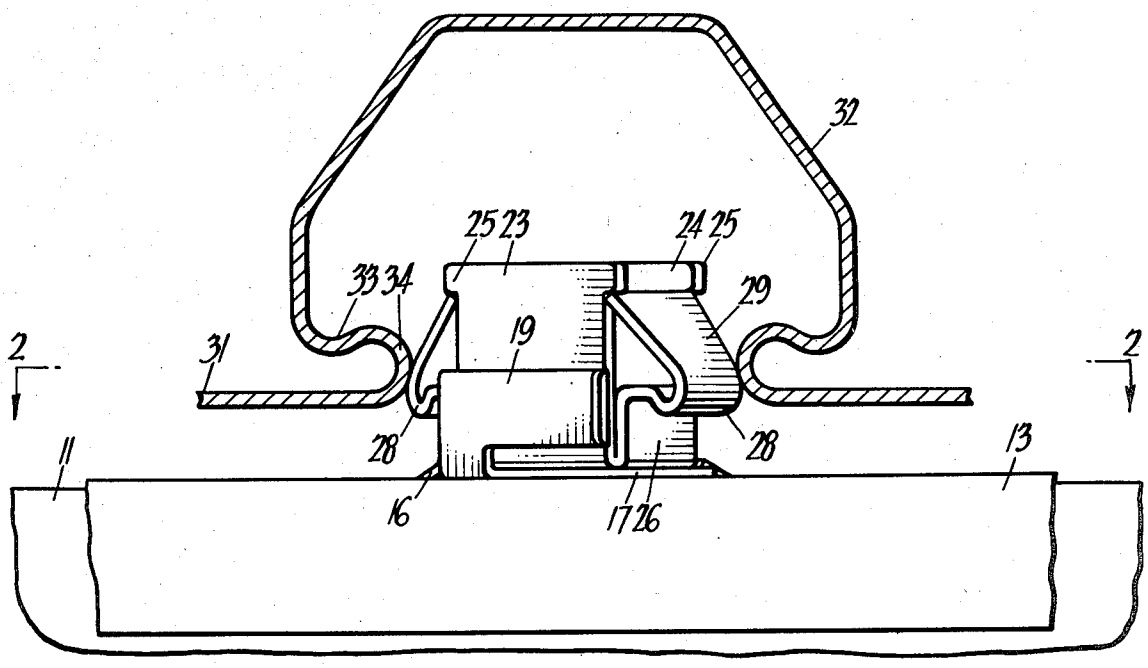
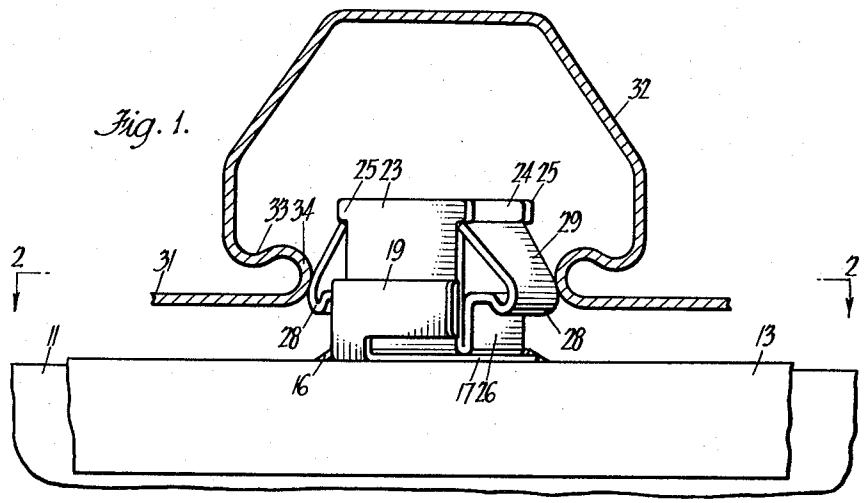


Fig. 1.



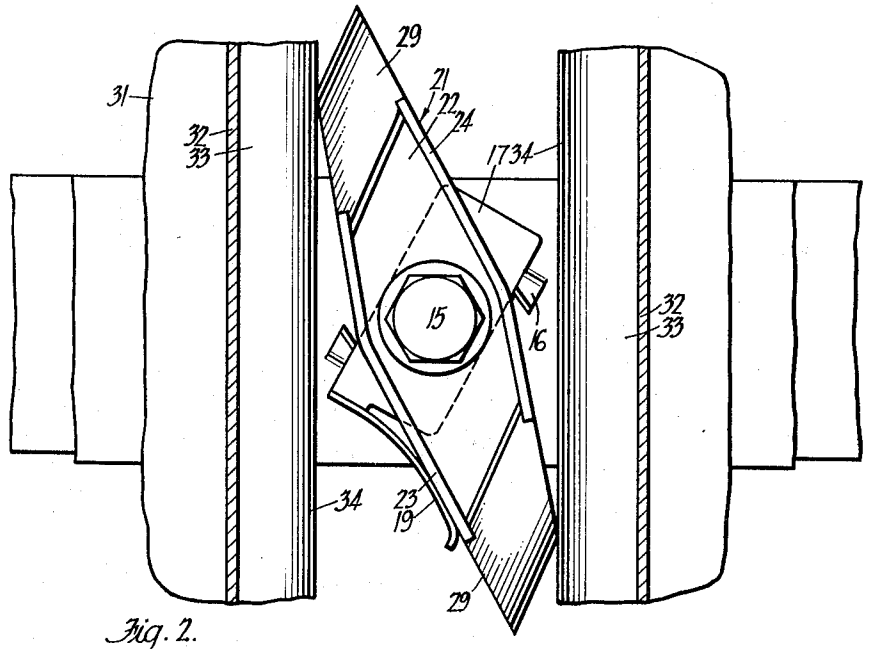


Fig. 2.

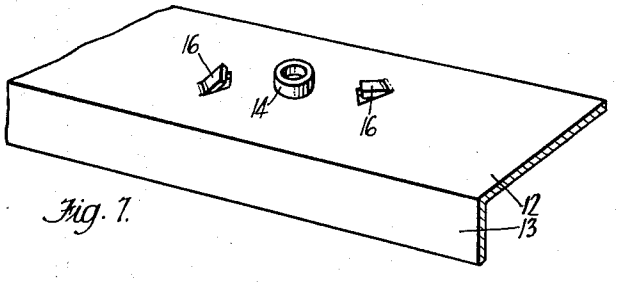
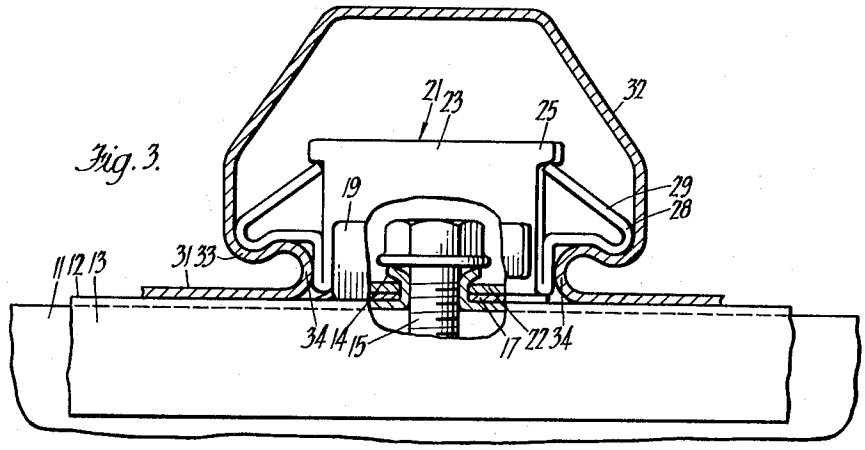


Fig. 7.

Fig. 3.



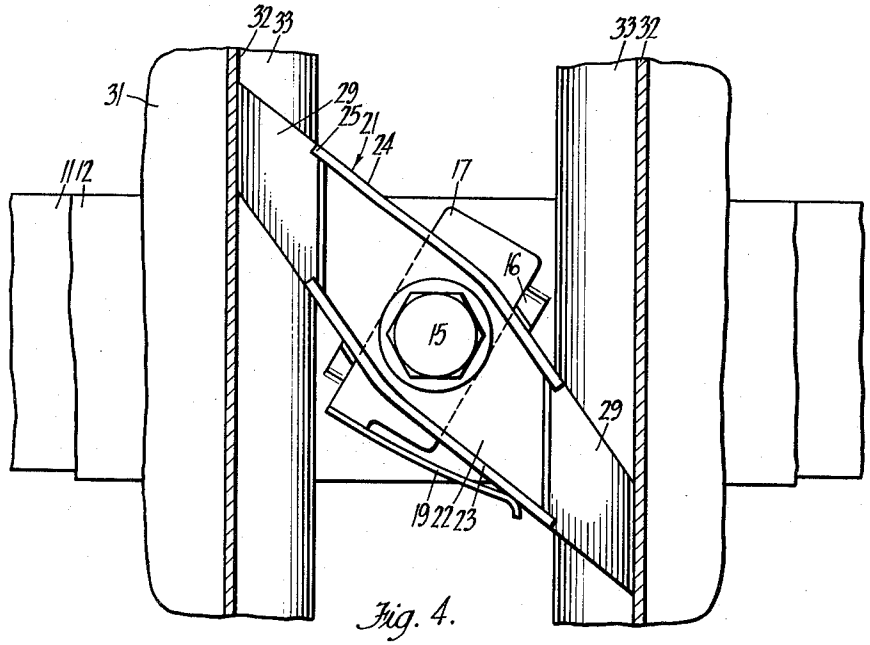


Fig. 4.

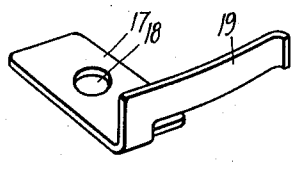


Fig. 5.

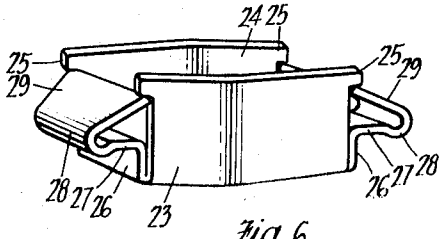


Fig. 6.

FASTENINGS FOR ROOF AND WALL SHEETING

This invention relates to fastenings for roof and wall sheeting and it refers particularly to so-called hidden fastenings for screwing in position roof sheeting and/or wall cladding (hereinafter referred to as sheeting) of the type having parallel ribs at spaced distances apart.

Such sheeting is well known, a large proportion of the thus-formed sheeting being made of an aluminium alloy, and it is desirable in the mounting or fastening of such sheeting in position that holes be not formed in the sheeting. It is also a requirement that the sheeting, once mounted in position, be able to withstand high stresses — such as those caused by strong winds — tending to detach the sheeting. Additionally, the fastening means should be such that the sheeting may be readily secured in position and that the fastening be somewhat flexible to permit of expansion and contraction of the sheeting with changes of temperature. Further, it is desirable that the fastening means be of such design and construction as is conducive to production in the factory rather than on-site assembly.

This invention has been devised with the object of providing fastening means which will comply with these and other requirements.

In another aspect there is provided a fastening member, for mounting povitally on a support member and for securing ribbed sheeting on the support member, in combination with a spring for biasing the fastening member into engagement with a ribbed portion of the sheeting, characterised in that the fastening member has at least one shaped part for engagement by the sheeting and operable under pressure applied thereto by the sheeting to turn against the pressure of the spring from an operative position to an inoperative position whereat the sheeting may be moved into its mounted position, the spring being operable to move the fastening member to its operative position in holding engagement with the ribbed portion of the sheeting.

In a further aspect the invention provides means for fastening ribbed sheeting on a support member comprising an anchor strap for mounting on the support member, several fastening members mounted pivotally on the anchor strap in linearly spaced relationship, and for each of the fastening members a spring mounted on the anchor strap in operable engagement with the associated fastening member, each of the fastening members having at least one shaped part for engagement by the sheeting and operable under pressure applied thereto by the sheeting to turn against the pressure of the spring from an operative position to an inoperative position whereat the sheeting may be moved into its mounted position, the spring being operable to move the fastening member to its operative position in holding engagement with the ribbed portion of the sheeting.

Preferably, the fastening member has two such shaped portions, at its opposite ends, for engagement by opposite ledges extending inwardly of a ribbed portion of the sheeting whereby the sheeting will be engaged by the fastening member at opposite sides of the rib.

Also, it is preferred that a metal strap be made for attachment to a purlin and that such strap have mounted on it a number of such fastening members spaced apart distances substantially the same as the spacing of the ribs on the sheeting.

In order that the invention may be clearly understood and readily put into practical form there will now be

described a preferred construction of hidden-fastening means for securing roof and wall sheeting in position, this construction being illustrated in the accompanying drawings, wherein:

FIG. **1** is a view in a direction at right angles to a support member having fitted to it the fastening means according to this invention and showing in transverse cross-section portion of a ribbed sheeting;

FIG. **2** shows a cross-section on the line and in the direction of the arrows in FIG. **1**;

FIG. **3** is a view similar to FIG. **1** but showing the ribbed sheeting secured in position by the fastening means and also showing the central mounting of the fastening in a cut-away sectional view;

FIG. **4** is a cross-section similar to FIG. **2** but showing the ribbed sheeting secured in position by the fastening means;

FIG. **5** shows the spring, in perspective;

FIG. **6** is a perspective view of the fastening clip; and

FIG. **7** shows part of the anchor strap, in perspective.

As shown in these drawings a roof purlin **11** has fastened to it a metal anchor strap **12** formed with a down-turned ledge **13** which bears against a side of the purlin to locate the strap in correct position. At predetermined spaced locations in the length of the strap **12**, conforming to the spacing of longitudinal centre lines of the ribs of the sheeting, are a number of expressed pintles **14** having through them openings for the reception of suitable screws **15** by which the fastening means are held in assembled relationship and mounted on the purlin. Two tongues **16** are pressed out of the strap **12** at positions on diametrally opposite sides of the pintles **14**, for the primary purpose of holding against turning in one direction a spring base plate **17**. Said plate **17** has a hole **18** of a size to receive the pintle **14** so that the plate **17** may be mounted on the strap **12** with its opposite side edges engaging the tongues **16**, and at one end there is a spring arm **19** adapted to bear upon and bias the fastening member **21**.

The fastening member has a base **22** provided with a hole of the same size as that in the spring base plate **17** for engagement with the pintle **14**, upstanding side walls **23, 24** which are shaped so as to form tongues **25** at the upper extremities of the opposite ends, and at the opposite ends there are composite catch and ramp means. Said catch and ramp means are formed from the same material as the base and side walls and each of these constitutes a short upstanding wall **26**, an outwardly extending ledge portion **27** having a somewhat bulbous outer end **28** and an inwardly and upwardly extending ramp member **29**, the extremity of which is engaged below the tongues **25** at the relative end of the side walls. The ramp members **29** are so shaped that when firm downward pressure is applied to them, as by pressing the opposite in-turned sides of a rib of the sheeting on them, the fastening member will be caused to turn, in the manner as indicated in FIGS. **1** and **2**.

In the assembly of the parts the spring base plate **17** is first engaged on the pintle **14** so as to rest upon the strap **12** with its opposite edges engaging the tongues **16** and then the fastening member **21** is engaged with the pintle so as to be pivotal thereon and with its side wall **23** engaged by the spring arm **19**. The outer ends of the pintle are then swaged an amount sufficient to retain the fastening member **21** in position whilst permitting it to have free pivotal movement under the pressure of the spring arm **19**. The strap **12** having a

number of fastening members **21** mounted thereon thus constitutes an assembly which may be readily mounted in desired position on a purlin **11** by fitting screws **15** through the pintles **14** and screwing them into the purlin **11** so as to secure the assembly thereon.

The fastening means are adapted to co-operate with sheeting having ribs such as illustrated in the drawings. Said sheeting **31** has ribs **32** at spaced locations corresponding to the spacing of the fastening means on the strap **12** and in the form of rib illustrated in the drawings there are two inwardly directed ledges **33** each having a somewhat bulbous inner edge portion **34.**

The ends **28** of the fastening member are shaped to interengage the ledges **33** outwardly of the edge portions **34** so that there is a resistance to the disengagement of the ends of the fastening member **21** from the two ledges **33** of the rib **32.** Thus, there is a partial locking of the fastening member in the position to hold the sheeting against the purlin. It is also noted that the extreme ends of the member **21** are shaped to press upon the sides of the rib **32** when so engaged in position.

The tongues **16** which operate to hold the spring base plate **17** against rotation in one direction also act as stops to limit the turning movement of the fastening member **21.** When the strap **12** has been secured to the purlin and before sheets **31** have been placed in position each of the fastening members **21** will be held in a position very close to that shown in FIG. **4,** anticlockwise rotation being limited by the two tongues **16.** They are thus in a correct position for the ramps **29** to be engaged by the undersides of the ledges **33.**

The anchor strap **12** conveniently may be made of an aluminium alloy, as may be the fastening member **21,** and the spring member **17, 19** may be made of spring steel. These material may, of course, be varied to suit particular requirements.

In practice, a required number of the anchor straps **12** is fastened to a number of purlins for carrying the sheeting **31** in such manner that a number of the fastening members **21** of the several anchor straps will be in line, in the direction of the ribs of the sheeting, so that each said rib will be held by a number of the fastening members **21.**

Preferably, the edges of the fastening member which bear upon the internal ledges of the sheeting **31** are rounded so as to reduce noise if there is relative movement between the fastening member and the sheeting after the sheeting has been mounted in position, as occurs when there is thermal expansion and contraction.

Also, the spring base plate **17** may be bowed a little so as to exert a spring pressure as between the fastening member **21** and the strap **12** and purlin **11** and thereby reduce likelihood of rattling.

It will be found that the fastening means provided by this invention may be made as sets on the strap **12** ready for mounting on site and that the metal sheeting having ribs for engagement by the fastening member **21** may be readily fitted in position and engaged by the fastening members **21.** Due to the configuration and symmetry of the clip high pull-off forces will be readily opposed.

Minor modifications in details of design and/or construction may be made without departing from the ambit of the invention as defined by the appended claims.

What I claim is:

1. Means for fastening ribbed sheeting on a support member comprising an anchor strap for mounting on the support member, several fastening members mounted pivotally on the anchor strap in linearly spaced relationship, and for each of the fastening members a spring mounted on the anchor strap in operable rotative engagement with the associated fastening member, each of the fastening members having at least one cam shaped part for engagement by the sheeting and operable under axial pressure applied to the cam shaped part by the sheeting to turn the fastening member against the pressure of the spring from an operative position to an inoperative position whereat the sheeting may be moved into its mounted position, the spring being operable to rotatively move the fastening member to its operative position in holding engagement with the ribbed portion of the sheeting.

2. Means for fastening ribbed sheeting on a support member as claimed in claim **1** wherein said cam shaped part consists of a ramp which is so inclined that axial pressure applied thereto by the underside of the sheeting will induce a rotational movement about the pivot of the fastening member, and said ramp including an outer end portion shaped to engage with an internal ledge of the ribbed sheeting so as to hold the sheeting against the support.

3. Means for fastening ribbed sheeting on a support member as claimed in claim **1** wherein each spring consists of a base plate to fit between the anchor strap and the associated fastening member and an integral spring arm adapted to bear against the fastening member and bias it into operative position.

4. Means for fastening ribbed sheeting on a support member as claimed in claim **1** wherein the anchor strap has at the location of each fastening member a pair of tongues operative to hold the spring against rotation in one direction and operative to limit the pivotal movement of the fastening member in the opposite direction.

5. Means for fastening corrugated ribbed sheeting to a support member comprising anchor means for mounting on the support member said anchor means including at least one hollow pintle extending upwardly therefrom in a direction opposite said support member, a fastening member rotatably mounted on said pintle and movable within limits defined by protuberance means on said anchor member, spring means mounted on said pintle and adapted to cooperate with said protuberance means and said fastening member to positively locate, in spring relationship, said fastening means relative to said anchor member, each said fastening member including a base and a pair of upstanding walls along opposite edges of said base, each of said walls including shoulders extending laterally adjacent their free extremities, at least one integral wing member extending outwardly from an end of said base of the fastening member and thence bent reversely toward and in engagement with the shoulders on said walls to form a ramp shaped cam for engagement by the sheeting when axially telescoped with one of the corrugations of the sheeting to rotatably turn the fastening member against the pressure of the spring from an operative position to an inoperative position whereby the sheeting may be moved into its mounted position adjacent said support member, the spring being capable of rotatively moving the fastener back to its operative position whereby an outer end of said arm is brought into holding engagement with the ribbed portion of the sheeting.

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