July 11, 1939. D. M. MUIRHEAD 2,165,500

SHIELDING STRUCTURE AGAINST INSECTS

Filed July 22, 1938

Fig. 1.

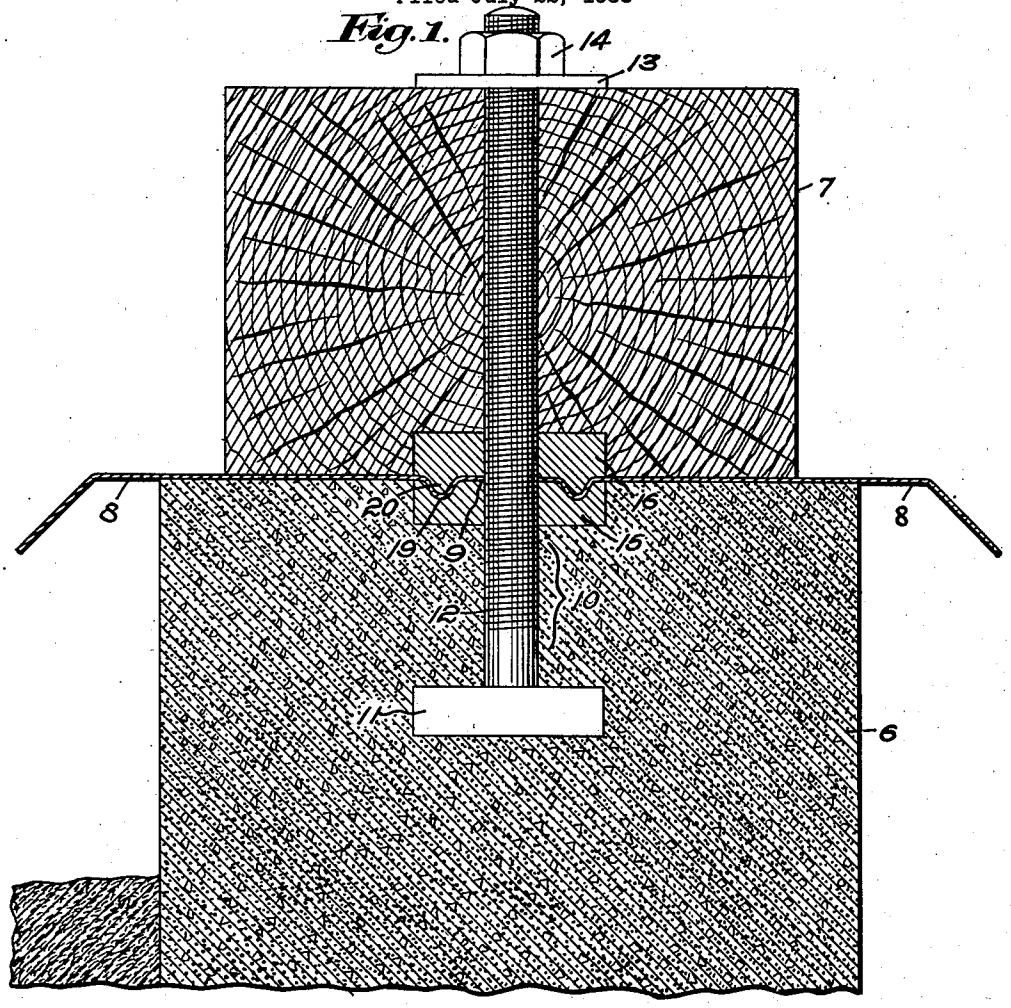


Fig. 4.

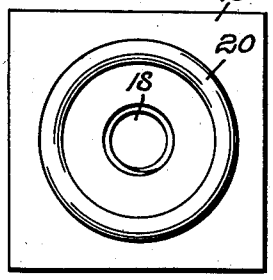


Fig. 2.

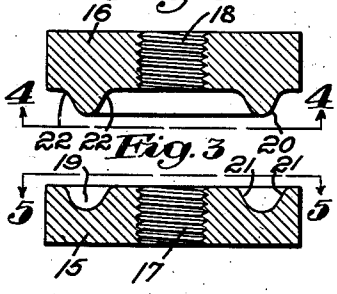
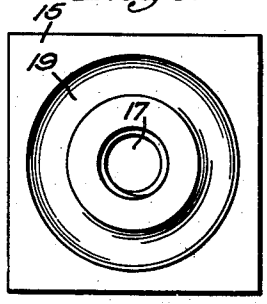


Fig. 3

Fig. 5.



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SHIELDING STRUCTURE AGAINST INSECTS

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Application July 22, 1938, Serial No. 220,694

3 Claims. (Cl. 72—0.5)

My present invention relates to the construction of foundations and walls receiving timbers, sills and the like which are to be protected against invasion by termites or other insects, and to builders' hardware for use in such construction. A common plan and perhaps the best plan for protection against termites and the like is a shield of sheet material, generally metallic, inserted between the foundation or wall and the associated wood element, the latter being anchored by bolts or threaded anchors projecting from the wall and passing through apertures in the shield. The bolt or anchor apertures in this shield generally do not fit the bolts snugly, and have heretofore afforded space through which insects such as termites can pass to the wood element from below. Termite infestation—which may be a terrible thing—has as its essential element a place of abode in the ground outside the house connected with the place of damage in the house by a tube or avenue of approach which the termites have a genius for getting across.

In accordance with the invention a simple, inexpensive and efficient method and means are provided for sealing these bolt-receiving apertures in insulating sheets or shields of foundation and like wall structures such as referred to and thus crowning with success human efforts to outwit and outdo the termite or other insect.

In the drawing illustrating by way of example one form of means embodying the invention and whereby the method thereof may be practiced;

Fig. 1 is a vertical section of the upper portion of a foundation wall and associated sill anchored and insulated in accordance with the invention;

Figs. 2 and 3 are enlarged sectional views of two opposed crimping or sealing elements for the shield, said elements being seen in operative position in Fig. 1; and

Figs. 4 and 5 are plan views of said elements, looking at them as indicated by the arrows on Figs. 2 and 3 respectively.

Referring to the drawing in more detail, and first to Fig. 1, I have there represented at 6 the upper portion of a foundation wall or the like. On this wall is to be fastened a wood sill or other timber 7, shown in position, and which is to be insulated by a sheet element or shield 8 disposed flatwise between it and the wall. Such shield is provided essentially for the purpose of blocking access to the sill by termites or like insects traveling along a surface of the underlying wall or through cracks and crevices in it. Sheet metal, preferably non-corrosive, such as copper or Monel metal, is generally employed for this purpose, being provided in strips of a width to extend completely across the top surface of the wall and to project at one or both sides of the latter substantially as illustrated. The outer edges of such projecting portions of the shield are downturned at an obtuse angle, or otherwise shaped with the ambition of blocking termites and other insects.

Such metallic shielding element is ordinarily supplied in strips of substantial length, say 6 to 8 feet, so that the number of joints or seams between adjoining strips is kept to the minimum. These shielding strips are pierced at appropriate points to receive the sill anchor bolts, one only of which is seen in Fig. 1, indicated as a whole by the numeral 10.

The apertures for the passage of these anchor bolts generally are formed on the job, as the strip is installed. It is impracticable or substantially impossible to locate and fashion the apertures with such accuracy that their edges will fit snugly around the corresponding bolts. This is due to substantially unavoidable irregularities in the distribution of the anchor bolts along the wall, and to the difficulty of matching the apertures to conform to the bolts. Thus heretofore in structures such as referred to there have existed substantial gaps of more or less irregular size and shape between the shield and the bolts passing through it, as indicated by way of example at 9 in Fig. 1. I have found that such open spaces or gaps operate substantially to destroy the efficiency of the shield. They offer ready entrance points for insects such as termites, which are able somehow to find their way to them, traveling across or through cracks in the wall at some point below the metal shield until they reach and move past the barrier by going upwardly along the bolts. As above stated, it is a main object of my present invention to provide for effectively sealing these bolt apertures.

The bolts 10 such as seen by way of example in Fig. 1 may be of standard construction in all respects not otherwise mentioned. Each anchor bolt has a head or other projection 11 at its end portion which is to be embedded in the concrete or masonry of the wall or other structure, the head being of rectangular, hexagonal, round or other shape as preferred. The thread 12 of the anchor bolt is extended continuously from the non-headed end for a considerably greater distance than usual, well down onto the headed end of the bolt. For example, if the bolt is to be set into the wall for a distance of 3 inches, including the thickness of the head, the thread is termi-

nated at a point not more than about 1½ inches from the head. The bolt is of the usual or preferred length to extend through the timber or sill which it is to secure, and to project sufficiently beyond the latter for the reception of a washer 13 and securing nut 14. For a 4 x 6 inch sill, for example, set with its wide face horizontal an 8 or 9 inch bolt usually will be adequate.

The sealing means proper as employed in accordance with my invention, and adapted for cooperation with the metal shield and the anchor bolts such as described, comprises, for each bolt, a pair of cooperating elements 15, 16 in the nature of nuts, having through apertures 17 and 18 threaded for reception on the corresponding bolts. These elements may be of any preferred shape, round, hexagonal or otherwise, being represented as square in Figs. 4 and 5.

Each such pair of sealing or crimping elements includes an inner or bottom element 15 below or at the wall side of the metal shield and an outer or upper element 16 at the timber side. In the construction of the foundation wall the anchor bolts are set in place in the usual manner before the upper section is completed. Also before the pouring or building, the lower nuts 15 are positioned on the bolts, at such height that their upper faces will come flush with the top of the finished wall. Desirably also the outer nuts 16 are temporarily threaded on to the bolts and into contact or substantial contact with the inner nuts, to assist in holding the latter in place and to protect their upper faces from being covered or dirtied by the concrete mix or mortar.

The two sealing elements or nuts 15 and 16 for each bolt have formed at their opposed apertured faces annular concentric cooperable crimping formations 19 and 20. In the illustrated example these comprise a female formation or groove 19 on one of the elements, herein the one shown in the lower position, and a correspondingly shaped and similarly disposed male formation or rib 20 on the other element. Said formations 19, 20 have a cross sectional form substantially as illustrated, of arcuate or approximately semi-circular sectional outline. Their opposite side walls accordingly are somewhat tapering, those of the rib or bead 20 being divergent toward the base of said formation, and those of the groove or channel 19 similarly diverging away from the base of the latter. Thus when the two sealing elements or nuts are brought into proximity on the bolts, by turning one or the other or both of them, usually only the upper one, the described annular formations on their adjacent faces come into mating relation. They may be formed to provide some small clearance between them in the completely contacting position of the nuts. Thus the latter are adapted to engage and crimp a sheet element such as the shield 8, between them.

In operation, the concrete or masonry top of the wall, foundation or the like is poured or built, with the anchor bolts set in place, the lower elements or nuts 15 of the sealing device being set at the desired level, namely, such that their top surfaces will come flush with the top of the wall, and the outer or upper nuts desirably being temporarily installed in holding and protecting position. In preparation for installing the timber or sill 7 the upper nuts, if in position, are removed and the metal shield 8 is placed flatwise onto the top of the wall, the anchor bolts 10 being received through the apertures provided in the shield for the purpose. By reason of my invention it is unnecessary to take great care to arrange the bolts and the shield apertures in exact conformity or so that the edges of the bolt holes fit snugly against the bolts. Hence the shield may be pierced and set onto the bolts more rapidly and with less expert workmanship than heretofore required.

The upper or outer sealing elements or nuts 16 are then placed on and screwed down upon the several bolts, being turned down tightly onto the top face of the shield 8. In so doing, the male sealing formation 20 represented in this instance as on the upper element, forces and crimps the metal of the shield 8 into the female formation 19 on the other element. The opposite side edges of these two formations cooperate to provide in effect a double, concentric crimp line completely surrounding and spaced from the bolt, laterally beyond the aperture in the shield.

Thus there is provided a tight metal-to-metal seal which is impervious to the passage of termites or other insects. It will be noted that the corners or side edges of the two sealing formations are rounded off, to avoid cutting of the sheet metal as the sealing elements are screwed together. With the shield and bolts thus sealed the wall is ready to receive the timber or sill 7, the latter having the bolt apertures therein countersunk or recessed at their inner ends to accommodate the sealing nuts 16. By reason of the pair of sealing nuts engaging the opposite faces of the shield the nuts 14 at the outer ends of the bolts may be turned down onto the timber as forcibly as desired, without danger of rupturing the shield, the stress being taken by the sealing nuts and transferred by them directly to the wall itself.

In the described manner, access to any space between the shield and the bolt is completely blocked, in part by the threaded engagement of the nuts or sealing elements themselves with the bolt, and further, in the plane of the top of the wall 6, by the described double crimping formation effected by the interaction of the sealing formation of said elements. It will be understood that either the male or the female nuts 15 and 16 may be employed in either the upper or the lower position, the particular arrangement illustrated in the drawing being selected merely for the purposes of illustration. Obviously also the crimp-effecting formations may be provided at both apertured faces of any or all the nuts, those on any given nut being both male, or both female, or one of each type.

It will be evident from the foregoing that the method of my invention contemplates installing anchor bolts in the formation of the timber-receiving portion of a wall and simultaneously providing bolt-surrounding crimp-effecting formations metallically connected to the bolts, protecting said formations during the completion of said wall portion, aperturing a metallic or other sheet insulating element in but approximate conformity to the spacing of the bolts, positioning the insulating element on the wall and bolts, and thereafter crimping the insulating element concentrically about and along lines spaced from each bolt.

It will be understood that my invention, either as to means or method, is not limited to the exemplary embodiment or steps herein illustrated or described, and I set forth its scope in my following claims.

I claim:

1. An insect-insulated foundation structure for buildings, comprising, in combination, a founda-

tion wall, anchor bolts set in and projecting from a timber-receiving face of the wall, a metallic shield strip extending across and in contact with said wall face, said strip having apertures for the bolts, and means for sealing the strip peripherally of said apertures, said means comprising, for each bolt, a laterally projecting element positioned thereon so as to set flush with the face of the foundation wall at which the bolt projects, a cooperating element threaded onto the bolt at the opposite face of the shield strip, and cooperating annular male and female formations on the adjacent faces of said elements serving to crimp the shield strip between them and concentrically of the bolt.

2. Means for sealing the bolt holes of shielding strips between a foundation and a timber, comprising, in combination with an anchor bolt to be set in the foundation so as to project through the timber, a pair of nut-like elements having threaded apertures for receiving the bolt, one of said elements having in one of its apertured faces an annular channel formed concentrically of its bolt-aperture, and the other element having a correspondingly disposed annular rib adapted to enter said channel sufficiently to crimp and seal a shielding strip to be received between them.

3. The method of insulating timbers of foundation structures against invasion by insects which comprises installing anchor bolts in the formation of the timber-receiving portion of a foundation and simultaneously providing bolt-surrounding crimp-effecting formations metallically connected to the bolts, protecting said formations during the completion of said foundation portion, aperturing a metallic or other sheet insulating element in but approximate conformity to the spacing of the bolts, positioning the insulating element on the wall and bolts, and thereafter crimping the insulating element concentrically about and along lines spaced from each bolt.

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