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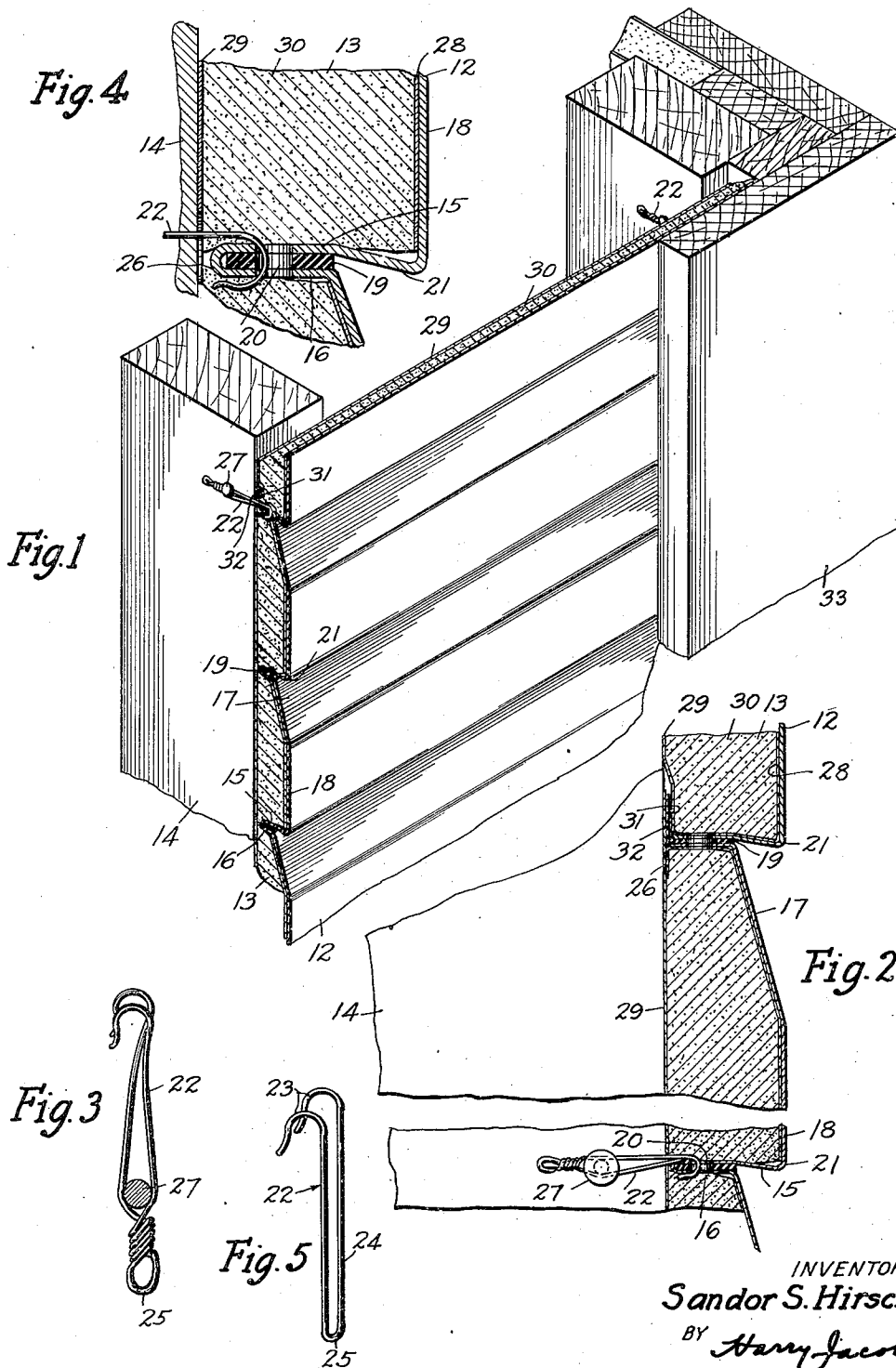
S. S. HIRSCH

2,442,977

PREFABRICATED COVERING

Filed Oct. 24, 1945

2 Sheets-Sheet 1



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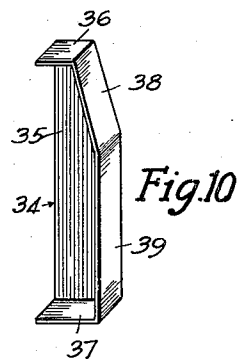
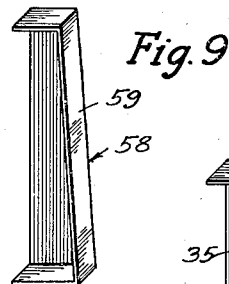
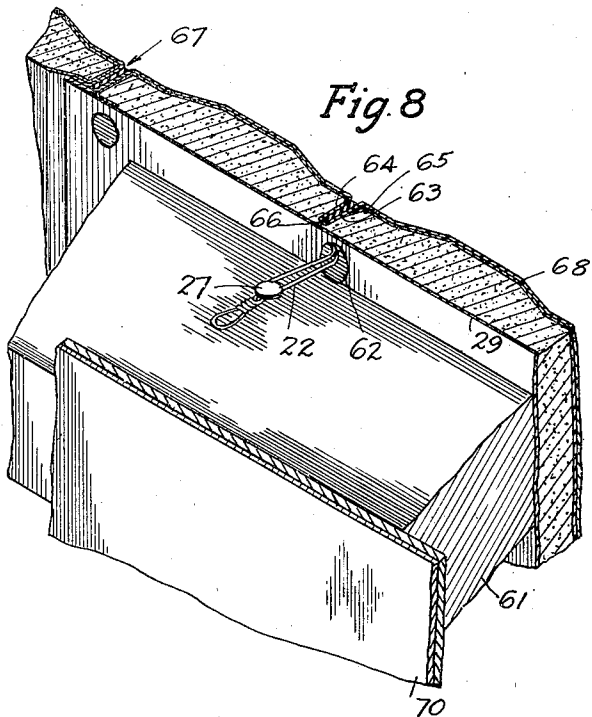
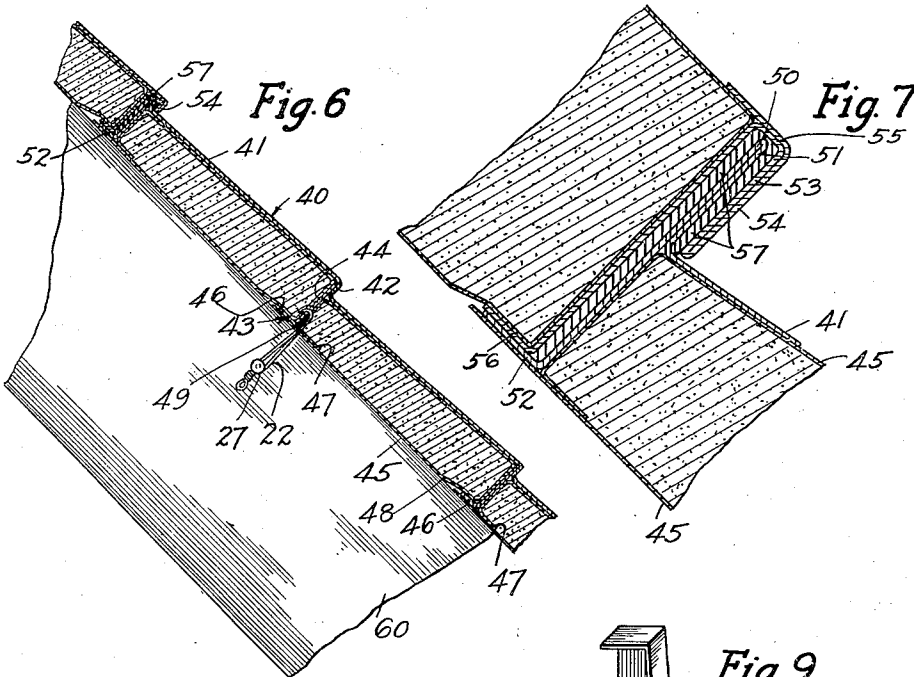
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PREFABRICATED COVERING

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5 Claims. (Cl. 108-13)

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This invention relates to building construction and particularly to the outer covering, such as sheathing, siding and roofing of the outside walls or roofs of dwellings and other building structures.

Such sheathing, siding and shingles have generally been made of wood, and consequently require considerable handling and labor including the cutting of each individual to length, fitting the piece in place and securing each piece to the wall studs or rafters. In spite of the time and effort required for the construction of such covering, it is nevertheless ineffective without additional insulation, to insulate the interior of the structure against heat and cold, and if such insulation is desired, additional labor and material must be expended to provide it. The above construction methods apply to much of the wooden sheathing, siding, clapboard and shingles now in general use.

This invention therefore contemplates the elimination of the greater part of the time and labor required to install such wooden covering and insulation by the provision of imperforate and waterproof metallic self stiffened sheets shaped to simulate the usual outer wall or roof covering and preassembled with suitable heat insulation to form a sectional unit quickly and easily secured in place, the units being adapted for speedy and efficient interlocking, and preferably being supplied in standard widths and suitable lengths but being adapted to be cut to length and fitted in the field if necessary or desirable.

The invention further contemplates the provision of means whereby the prefabricated sheets and insulation may be quickly and effectively secured to the wall or roof members, said means taking the form of wire pins or clips if desired.

The invention further contemplates the provision of efficient leak-proof joints between the adjacent sheets and the sections thereof to bar out rain, air and moisture and to prevent corrosion, thereby insuring durability and long life to the covering and the wall, the sheets being adapted to assume any suitable shape whereby they may be made to simulate any suitable type of wooden or the like siding or roof covering, the sheets being further shaped for quick and easy connection to each other, and the metal thereof being maintained out of contact with the wall structure to avoid heat transfer while being adequately secured thereto.

The various objects of the invention will be clear from the description which follows and from the drawing, in which

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Fig. 1 is a fragmentary perspective view of the corner portion of a typical outside wall to which my invention has been applied.

Fig. 2 is an enlarged fragmentary and fore-shortened vertical section of the wall showing the joint between adjacent sheets and typical means securing the sheets to the wall members.

Fig. 3 is a perspective view of a preferred form of the securing wire clip or pin when operative, being twisted about a headed pin in the form of a nail or the like carried by the stud or wall member.

Fig. 4 is an enlarged fragmentary vertical section of an intermediate part of the sheet of Figs. 1 and 2 showing the secured insulation which forms part of the covering, and showing also the optional corrosion preventing gasket or seal and part of the fastening member.

Fig. 5 is a perspective view of the pin of Fig. 3 before it has been twisted about the holding pin therefor.

Fig. 6 is a fragmentary vertical section of my improved covering as it appears when applied to a roof to simulate wooden or slate or the like shingles, tile or other generally employed roof covering.

Fig. 7 is a fragmentary enlarged view of the joint between the adjacent sheets of Fig. 6.

Fig. 8 is a fragmentary perspective view of an outside wall showing the sheets arranged vertically and shaped to simulate vertical siding.

Fig. 9 is a perspective view of the protecting and finishing cap adapted to be used at the end of the sheet of Fig. 6 to finish the edge of the roof when edging of the usual type is not employed.

Fig. 10 is a similar view of the end finishing cap used for the sheets shown in Figs. 1 and 2.

Fig. 11 is a top plan view of the cap shaped to finish the upper or lower ends of the sheets of Fig. 8.

In that practical embodiment of the invention shown in Figs. 1 to 5, the wall covering consisting of the sheets 12 and the insulation 13 is applied to the wall supports which are shown in the form of the usual studs 14, though it will be understood that such supports may be of any shape or material generally employed in outer walls. Each of the sheets 12 is preferably made of comparatively thin metal, aluminum being preferred for lightness and resistance to corrosion though any suitable metal may be employed. To simulate clapboards, each sheet is provided with a plurality of longitudinally extending depressions and with a number of intermediate and suitable spaced apart reentrant flanges, each

flange extending throughout the length of the sheet and consisting preferably of a portion of the sheet doubled on itself to form two thicknesses 15 and 16 preferably though not necessarily slightly spaced apart (Figs. 2 and 4). The inwardly and upwardly inclined portion 17 forming one side of a depression, extends from the outer end of the lower and narrower thickness 16 while the upright portion 18 extends upwardly from the outer end of the upper and wider thickness 15 to the lowermost end of the portion 17, said portions 17 and 18 being integrally joined by a bend at the inner ends thereof and together forming one section of any desired number of similar sections comprising the sheet 12, each section being of the desired shape, in this case simulating a typical clapboard member. To seal the space, if any, between the thicknesses 15 and 16, a suitable elongated waterproof sealing member or gasket of rubber or the like material as 19 is preferably arranged in said space, thereby preventing the accumulation of moisture or water which might otherwise cause corrosion of the sheet, or which might work its way into the interior of the wall through the pin-receiving holes or slots 20 made in the flange and in the sealing member. It will be understood that the thicknesses 15 and 16 may be pressed into sufficiently intimate contact to prevent the seepage of moisture therebetween, in which case the sealing member 19 may be omitted.

It will be noted that the upper thickness 15 while having an inner portion parallel to the thickness 16, has an outer portion tapering downwardly and outwardly to provide a lowermost part 21 on each section overhanging the portion 17 of the adjacent lower section thereby to cause rain to drip off the overhanging part and to resist entrance of moisture between the thicknesses.

As has been hereinbefore indicated, suitable slots or openings of any suitable shape as 20 are made at suitable spaced intervals in each of the reentrant flanges for the reception of a fastening member. As shown, said fastening member takes the form of a wire clip or pin 22 (Fig. 5) having two hooks 23 at the free ends thereof, and having a double shank 24 joined at the ends remote from the hooks by the integral bends 25. The hooks 23 are passed through suitable openings, slits, slots or the like 26 in the insulation 13 as will be more fully explained hereinafter, and through the openings 20 (Fig. 4). A suitable headed projecting member such as the nail, screw or pin 27 is fastened into the stud 14 at the proper place to engage the respective shanks 24 of the clip, which shanks are arranged on opposite sides of the pin 27 to project therebeyond. The bend 25 is then twisted by rotating it to interlock the shanks and to draw them tightly against the member 27 (Fig. 3), such twisting also being effective to shorten and to tension the clip, thereby drawing the sheet toward the studs and securing it thereto. It will be understood that the clips shown are merely illustrative of a simple and quickly installed fastener and that any suitable form of fastener may be used to secure the covering in place as may be found convenient or desirable.

Since the insulation 13 permits the passage of the fastener into the interior thereof while serving the functions not only of preventing contact of the metallic covering sheet or the reentrant flange thereof with the wall support members, but also as heat insulation, it is desirable that any slits or cuts in the insulation be so made that the

contact-preventing function thereof be not destroyed. Consequently, the insulation is preferably of the type comprising a pair of spaced apart sheets as 28, 29 of paper or the like inexpensive but non-conductive flexible material, between which sheets is adhesively sandwiched suitable heat-insulating material 30 such as cotton or other fibrous or mineral insulation to fill the space between the paper sheets. The outer paper sheet 28 is adhesively secured to the inner face of the metallic sheet 12 to form a unitary covering therewith, the insulation 13 extending transversely across the entire width of the sheet 12 and across all of the sections thereof and along the entire length thereof. At each of the reentrant flanges, the sheet 28 only is slit to permit the flange to pass into the interior of the insulation and thereby to arrange the opening 20 of the flange in a position wherein it is accessible to the hooks 23. Since the filling material 30 is comparatively soft and yieldable, said material need not necessarily be slit at the place where the sheet 28 is slit, the reentrant flange in that case merely compressing the insulation 30 when forced thereinto through the slit in the paper. However, the insulation may also be slit if desired to permit easy passage of the reentrant flange thereinto as shown in Fig. 4. The backing paper sheet 29 however, is continuous and is not slit, but as has been hereinbefore indicated, suitable slots or other openings 26 are made therein at intervals adjacent the reentrant flange and the perforations 20 for the passage therethrough of the hooks 23. In any case, the major part of the backing sheet 29 being imperforate, the innermost edge of the reentrant flange cannot come into contact with the stud 14 and is adequately insulated therefrom.

While my improved covering may be made in any suitable widths and lengths to cover larger or smaller wall areas as desired, it usually can be conveniently supplied in lengths sufficient to extend the length of the wall but not usually to cover the entire width of the wall. Hence it is usually advisable to join several sheets together along their edges when an entire wall is to be covered. For this reason, the upper and lower end edges of the sheets 12 are formed with L-shaped flanges extending in the same direction to permit the flanges to be nested. As best shown in Fig. 2, the lowermost edge of the sheet 12 consists of the single thickness 15 similar to that of the reentrant flange, and the uppermost edge of the sheet comprises the single thickness 16, each of said thicknesses forming one leg of an L-shaped flange. The inner peripheral portion of each of the single thicknesses terminates in an upwardly extending leg such as 31 and 32 respectively. Said legs 31 and 32 are preferably nested and in contact, and to permit such contact, the insulation at the joint between adjacent sheets 12 is somewhat modified. That is, at the bottom of the sheet, the outer paper sheet 28 is carried laterally under and across the filling insulation 30 and against the thickness 15 and is then turned upwardly against the outer face of the leg 31 preferably to connect to the backing sheet 29. The paper sheet 28 at the top of the metallic sheet 12 is continued laterally across the insulation and under the thickness 16 and therepast, and is bent downwardly at its inner end against the backing sheet 29, the latter being continued past the legs 31 and 32 thereby to interpose the paper backing sheet between the leg 32 and the stud.

The complete covering, consisting of the metallic sheet and the insulation, if not of the desired length, may readily be cut to size in the field, and at the ends thereof, forming the corner of the wall, may be covered by the usual upright corner board as 33 (Fig. 2). However, should no corner board be used, the ends of the sections of the sheet 12 between the reentrant flanges may be finished and protected by a suitable cap 34 shown in Fig. 10, fitted into the section. The end wall 35 of the cap forms the finishing or closing wall of the section, the top 36 and the bottom 37 being inserted between the upper and lower reentrant flanges of the various sections, while the tapered part 38 of the cap is fitted closely to the tapered portion 17 of the section, and the upright part 39 engages the inner face of the part 18 of the section, the cap being thereby frictionally held in place.

In the application of my improved outer covering to sloping roofs as shown in Fig. 6, the major part of the sheet 40 is formed without any reentrant flanges, each section of the sheet being shaped by suitable projections and depressions, as desired to simulate slate, shingles, tile or the like, or formed into any other desired shape. As shown in Figs. 6 and 7, each section comprises a longitudinally extending and upwardly and inwardly depressed part 41 having its upper end arranged inwardly of the lower end of the next adjacent section and joined integrally thereto by the outstanding flange 42 overhanging the upper end of the depressed part 41. The sheet is therefore free of reentrant flanges and being continuous and imperforate, no leakage of rain therethrough is possible. To provide the attaching flange for each section, an L-shaped or angle member 43 has the outer part of one leg 44 spotwelded or otherwise secured to the inside face of the flange 42, the other leg 46 of the member 43 being adapted to be pressed toward and against the rafter or similar structural member 60 of the roof with a paper sheet interposed therebetween.

In this form of the invention, the insulation is fitted between the pairs of members 43 and secured to and of the same width as each section, instead of being continuous across all of the sections. A single sheet of paper or the like 45 is here preferably employed. Said sheet is adhesively secured to the inner face of the part 41 of the section and is continued laterally across the top and bottom in adhesive contact with the legs 44 of the respective angle members at the top and bottom of the section.

At the top of the section and inner end of the leg 46, the sheet is turned downwardly as at 47. At the inner end of the bottom of the section, the sheet is turned upwardly to cover the outer face of the leg 46 and is continued therepast as at 48 and past the top of the section to overlap and to be secured to the downwardly turned part 47 and to cover the inner face of the leg 46. The leg 44 and the paper sheets adjacent thereto are punched out as at 49 to provide openings for the passage of the pin hooks 23 as already explained in connection with Figs. 1 to 5. The inner part of the paper sheet adjacent the roof member 60 may also be punched out or slotted at the proper places to permit the passage of the clip 22 into operative holding engagement with the angle member 43.

At the upper and lower ends of the covering sheet 40, suitable L-shaped flanges are provided to permit a leak-proof nested connection to the similar adjacent sheet. As best seen in Fig. 7, 75

the upper portion of the part 41 of the sheet is bent outwardly and doubled on itself to form two contacting thicknesses 50 and 51, the upper thickness 50 being continued laterally or inwardly and then flanged upwardly to provide the upstanding leg 52 adapted to be pressed toward the roof member 60 when the clip 22 is tightened by twisting. Similarly, the lower portion of the part 41 is doubled on itself to form the two thicknesses 53, 54 in downward spaced relation to the thicknesses 50 and 51 when a pair of adjacent covering sheets are assembled in a wall. The upper thickness 53 is bent for a short distance as at 55 into contact with the lower portion of the part 41 and then bent inwardly parallel to and in slight spaced relation to the thickness 50 and finally flanged upwardly at its inner end to form the leg 56 nesting in contact with the leg 52 when the sheets are joined. The slight spaces between the thicknesses 53 and 54 of the bottom parts of one sheet and the top parts 50, 51 of the adjacent sheet existing when the sheets are assembled, are preferably made leak-proof as by filling the same or coating said parts with a layer of suitable calking compound or mastic 57. Should it be desired to finish the end of the sections, a cap as 58 (Fig. 9) is frictionally fitted, preferably inside of and between the respective legs 44 of the attaching flanges to close off the end of each section, the part 59 of the cap being pressed against the inner face of the section part 41.

As shown in Fig. 8, my invention is also adapted for use as vertical siding and may be given the desired shape for such purpose, as is illustrated for the purpose of exemplification. In that case, the covering is secured to the horizontally arranged wall members as 61 carrying the inner wall surfaces 70, by the clips 22 and the headed pins 27 passing through the holes 62 of the inner or backing paper sheet 29. The reentrant flanges 63 are similar to those shown and described in connection with Figs. 1, 2, and 4 excepting that both thicknesses 64 and 65 thereof are preferably of the same width, the rubber sealing member 66 being optionally arranged therebetween in vertical positions and the flanges 63 being upright. The joint 67 between sheets being substantially identical with the joint shown in Fig. 2 except for its vertical position, no detailed description thereof is deemed necessary. The insulation 68 is continuous between the longitudinal side edges of the covering and is slitted similarly to the insulation 13 previously described for the reception of the reentrant flanges. In Fig. 11 is shown the frictionally fitted end cap 69 for this form of the covering.

In all cases, the sections of the metallic sheets may have reinforcing beads impressed therein or stamped out in any desired pattern for stiffening and ornamental effects in a manner well understood in the sheet metal art.

It will be seen that I have provided a covering adapted for economical prefabrication and for assembly in the field, effective to prevent leakage and economically and efficiently combined with heat or other insulation, and hence well adapted to meet the severe requirements of practical use.

Various changes in part above indicated, and in part obvious may be made in the specific forms of the invention shown and described and falling within the spirit of the invention and the scope of the appended claims.

I claim:

1. In an outer wall or roof covering, a metallic

sheet shaped to form a plurality of similar longitudinally extending and continuous sections, a perforated bracing member extending laterally from and substantially perpendicularly to the general plane of the sheet at the jointure of the sections, and insulation carried by the metallic sheet and comprising a first flexible insulating sheet adhesively secured at the inner face of the metallic sheet, a second similar flexible sheet in spaced relation and parallel substantially to the first sheet, and heat-insulating material between the sheets and adhesively secured thereto, said member and the second flexible sheet being perforated to permit the passage of a securing member therethrough, and the first flexible sheet being slitted for the passage of the bracing member therethrough, said second sheet continuing past the bracing members and being substantially coextensive with the metallic sheet.

2. An outer wall or roof covering according to claim 1 wherein each of the end portions of the metallic sheet is provided with an integral angle flange having two legs, one leg of each of the flanges extending laterally and substantially perpendicularly to the general plane of the sheet and the other leg extending perpendicularly to the said one leg, said other leg of both flanges extending in the same direction.

3. An outer building structure according to claim 1 wherein the securing member comprises a wire clip having a pair of hooked ends each having a shank projecting therefrom, a bend integrally joining the shanks, and a pin projecting from a wall member between the shanks, said shanks being adapted to be twisted together beyond the pin to carry the shanks into pressed contact with the pin and to tension the clip thereby to draw the sheet and the insulation toward the wall members.

4. In a structural outer wall or roof covering, a continuous metallic sheet shaped to form a plurality of longitudinally arranged continuous sections, a reentrant flange integral with the sheet and of two thicknesses and having a per-

foration therein, insulation adhesively secured to the sheet and comprising a pair of spaced apart paper sheets cemented to heat-insulating material arranged between the paper sheets, one of said paper sheets being slitted for the passage of the reentrant flanges therethrough, the other of the paper sheets being perforated adjacent each reentrant flange and continuing past the flange, and means passing through the perforations of the flange and the paper sheet securing the sheets and insulation as a unit to a wall member.

5. In an outer covering for buildings, a metallic sheet divided into longitudinally extending sections simulating wooden clapboards, each section having an inwardly tapering depressed part joined at its upper end edge to the lower end edge of the adjacent section by an integral flange extending inwardly and substantially perpendicularly to the general plane of the sheet, said flange comprising two thicknesses of said sheet, one of said thicknesses being wider than the other to extend therepast, heat-insulating material adhesively secured to the inner face of the sheet, and L-shaped flanges extending in the same direction from the respective ends of the sheet and each having one leg thereof extending substantially perpendicularly to the general plane of the sheet and having the other leg thereof substantially parallel to the general plane of the sheet and in inward spaced relation thereto.

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