July 1, 1958 A. W. COFFMAN ET AL 2,841,253

WALL PANEL

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Fig. 1

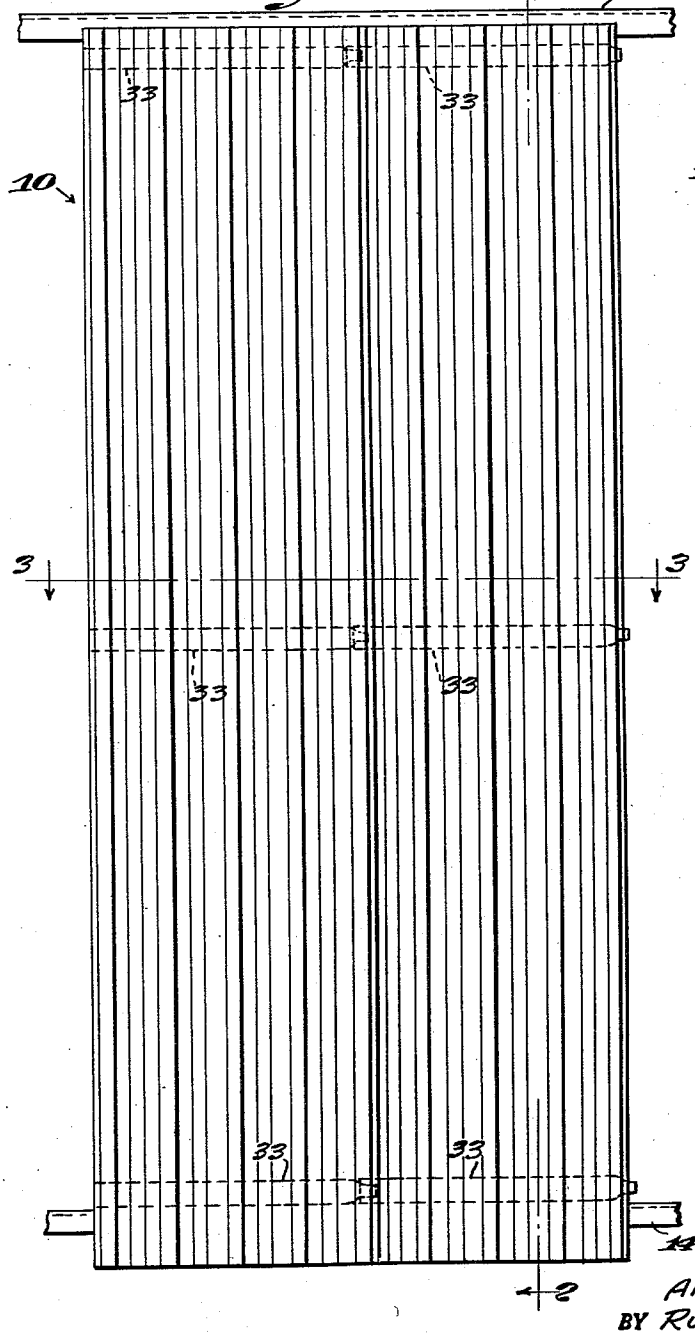
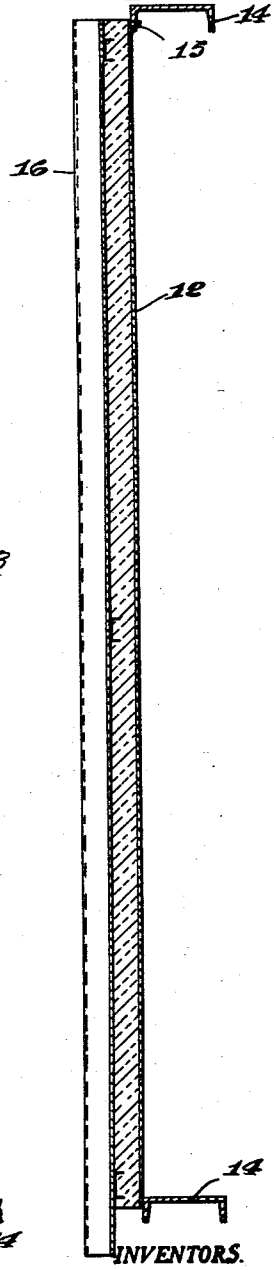


Fig. 2



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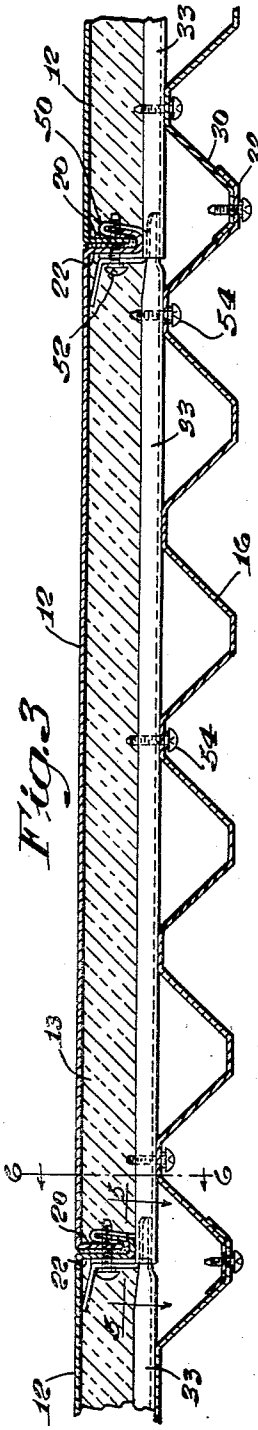


Fig. 3

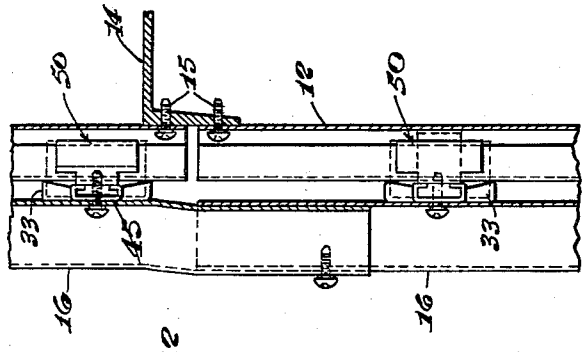


Fig. 7

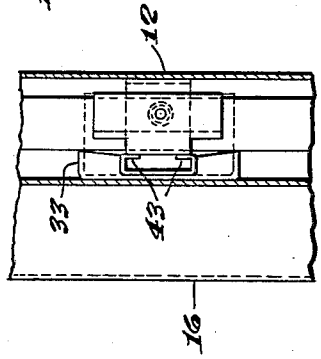


Fig. 6

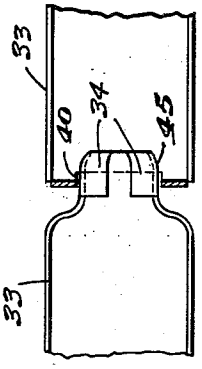


Fig. 5

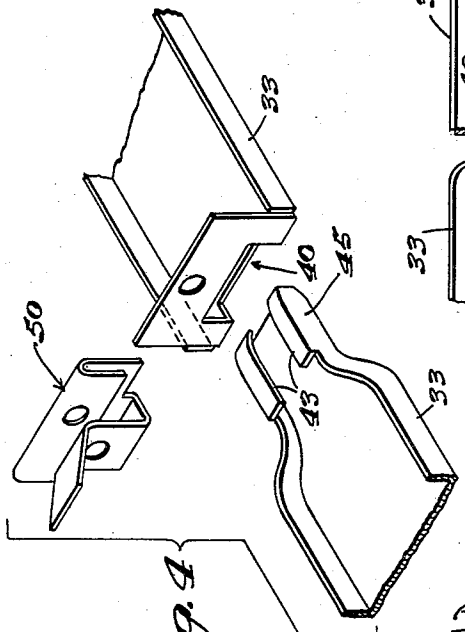


Fig. 4

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WALL PANEL

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4 Claims. (Cl. 189—34)

This invention relates to a wall panel.

In general the object of the invention is to provide a novel insulated sheet metal wall panel which may be erected and dismantled in a minimum of time and with minimum labor.

A further object of the invention is to provide a novel wall panel structure embodying a plurality of panel units and novel means of detachably securing together the panel units to enable the wall panel structure to be quickly and easily erected and taken down when it is desired to move the structure.

With these general objects in view and such others as may hereinafter appear, the invention consists in the wall panel units, in the wall panel structure and in the fastening means for the erection of the wall panel units, and the various structures and parts thereof hereinafter described and particularly claimed at the end of this specification.

In the drawings illustrating the preferred embodiment of the present invention:

Fig. 1 is a side elevation of two of the present wall panels assembled in side by side relation;

Fig. 2 is a longitudinal cross section on line 2—2 of Fig. 1;

Fig. 3 is a cross section on line 3—3 of Fig. 1;

Fig. 4 is a perspective view of the clip and the male and female ends of the channel bar locking member;

Fig. 5 is a cross-sectional detail on line 5—5 of Fig. 3;

Fig. 6 is a cross section taken on the line 6—6 of Fig. 3; and

Fig. 7 is a cross section of the end lap joint of two connected panels.

In general the present invention contemplates an insulated sheet metal wall panel structure comprising a plurality of panel units erected side by side and each unit comprising an inner sheet metal facing sheet adapted to be secured to the framework of the building. The inner sheet metal facing sheet of each unit is provided with outwardly extended lips on the two side edges thereof, one being a male lip and the other a female lip, and with the male lips of one panel unit projecting into the female lip of an adjacent unit. The insulated sheet metal wall panel further comprises a prefabricated outer sheet and sub-girt system, which is adapted to be erected as will be described and cooperate with the previously erected inner facing sheet to form the completed panel structure. Preferably, a plurality of sub-girts are affixed to and extend transversely across the previously erected inner facing sheets. Provision is made for securing the sub-girts to the inner facing sheets through connections to the outwardly extended lips of the inner facing sheets. The forward end portion of one or more of the sub-girts, and preferably of each sub-girt, is reduced in width and shape to form a locking tongue designed to be inserted in a slot in the upturned end of the sub-girt previously erected. In accordance with this preferred method of erection, successive adjacent inner facing units are secured to the framework of the building with the contiguous

male and female lips in interlocking engagement. After erecting the sub-girts, as above indicated, the outer facing sheets comprising corrugated sheets, either with or without male and female engaging lips, are applied over the sub-girts with suitable fasteners, preferably sheet metal self-tapping screws, starting at the marginal portion of the wall surface. The sub-girts having been located on the wall, this application of the corrugated sections then becomes more or less of a sheeting operation and the erection proceeds from one extreme edge of the wall to the other. The fastening of the sub-girts to the inner lining sheet is preferably accomplished by the provision of clips arranged to hook over the end of the female lip and to extend through the slot and upwardly engaging the rear face of the upturned end of the preceding sub-girt. When desired, these parts, namely, the clip, the male and female joints, and the upturned end of the sub-girt, may be fastened together by a self-tapping screw applied by field drilling and by field screwing with a self-tapping screw at this location. The interior of the inner facing unit within the two marginal lips is filled with insulating material 13 as the erection proceeds.

Referring now to the drawings illustrating the preferred embodiment of the invention, the present wall panel structure indicated generally at 10 comprises a series of panel units adapted to be erected upon the framework of a building and to be secured thereto. Each panel unit comprises an inner facing sheet 12 which is attached to the framework of a building, herein shown as horizontal steel girders 14, by means of bolts 15 or otherwise. Each inner facing sheet is provided along its opposite marginal edges with outwardly turned lips, one lip 20 comprising a male lip and the second lip comprising a female lip 22. As adjacent sheets 12 are erected upon the framework of a building, the male lip of one sheet is inserted into the female lip of the adjacent sheet. In erecting the panel units a convenient number of inner facing sheets 12 are secured to the framework preparatory to the erection of the outer facing sheets.

The outer section of each panel unit comprises an outer sheet metal facing sheet which may be of a standard corrugated shape, as illustrated, and having overlapped marginal edges 30, 32, or the corrugations may be of any other desired shape utilizing male and female lips along the edges of the sheet. In practice the sub-girts 33 are erected in the field, and as herein shown, each sub-girt 33 comprises a sheet metal member formed into channel shape and may be of a length slightly greater than the width of the inner facing sheet 12. One end of the sub-girt is bent upwardly at right angles to the bottom wall thereof and is provided with a slot 40 in the lower portion thereof. The other end of the sub-girt is provided with a tongue 45 formed as a reduced end portion of the channel shaped sub-girt, the tongue 45 of one sub-girt being adapted to be extended into the slot 40 of an adjacent sub-girt. The tongue 45 is provided with inwardly turned top flanges 43 designed to constitute bearings for the upper wall of the slot and to facilitate introduction of the tongue into and from the slot.

In the erection of a wall made up of the panel units the inner facing sheets are first secured to the framework of the building as described with the male and female lips thereof interlocking, the male and female lips being crimped or otherwise joined to produce a continuous strong inner surface. The first panel unit to be erected will be at one marginal edge of the row of panel units, and the sub-girt for such section will then be erected by introducing the tongue thereof into an opening in the end finishing member of the wall. The slotted end of the first sub-girt may then be secured to the female lip 22 of the sheet 12 by a bendable metal clip 50 which may be hooked over the female lip, extended through the slot

40, and then bent upwardly parallel to the lip 22, the parts being secured in assembled relation by a self-tapping screw 52 extended through the clip and the lips, as shown. A plurality of sub-girts 33 may be thus connected to the sheet 12 at spaced intervals transversely of the sheet. The corrugated outer facing sheet 16 for the first panel unit is then erected, preferably by being secured to the girts by the self-tapping screws 54, as shown. The next panel unit is erected by introducing the tongue 45 of the second girt into the slot 40 in the end of the previously erected girt to thereby secure the forward end of the second girt, and then the rear end of the girt is erected and secured to the inwardly extended male and female lips of the second and third inner facing sheets by the clip 50 and self-tapping screw 52, as indicated in Fig. 3. The corrugated outer sheet is then secured in place as indicated. This procedure continues across the entire face of the building. Vertical rows of panel units are erected with overlapping joints, as indicated in Fig. 7, and certain corrugations may be fastened together by a self-tapping screw, as shown.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. An insulated sheet metal wall panel comprising a plurality of panel units erected side by side, each unit comprising an inner sheet metal facing sheet adapted to be secured to the framework of a building, each of said sheets having outwardly extended lips on the two side edges thereof, one a male and the other a female lip having a U-shaped portion, and with the male lip of one panel unit projecting into the U-shaped portion of the female lip of an adjacent unit, a body of insulation filling the space between the lips and overlying the inner facing sheet, and a prefabricated outer sheet and sub-girt system comprising a corrugated metal facing sheet having secured thereto a plurality of spaced light-weight sheet metal channel shaped sub-girts extending transversely and secured to the bottom of the corrugations of the outer corrugated sheet, each girt having at one end an inwardly extended portion engaging the female lip of an adjacent unit within said adjacent unit, and a slot at the bottom of the extended portion, and at the second end having the width of the channel reduced and provided with bent top portions having a rounded tongue inserted into said slot of the sub-girt of an adjacent unit, and a clip member hooked over the female lip of one unit, extended through the slot in the sub-girt, and having an inwardly extended portion engaging the inwardly extended portion of the sub-girt, and a fastener projecting through said inwardly extended portion of the clip and girt and through the cooperating male and female lips.

2. An insulated sheet metal wall panel as defined in claim 1, wherein each sub-girt is of a length greater than the width of the inner facing sheet of its panel section.

3. An insulated sheet metal wall panel comprising a plurality of panel units erected side by side, each unit comprising an inner sheet metal facing sheet adapted to be secured to the framework of a building, each of said sheets having outwardly extended lips on the two side edges thereof, one a male and the other a female lip having a U-shaped portion, and with the male lip of one panel unit projecting into the U-shaped portion of the female lip of an adjacent unit, a body of insulation filling the space between the lips and overlying the inner facing sheet, and a prefabricated outer sheet and sub-girt system comprising a corrugated metal facing sheet having secured thereto a plurality of spaced light-weight sheet metal channel shaped sub-girts extending transversely and secured to the bottom of the corrugations of the outer corrugated sheet, each girt having at one end an inwardly extended portion engaging the female lip of an adjacent unit within said adjacent unit, and a slot at the bottom of the extended portion, and at the second end having the width of the channel reduced and provided with bent top portions having a rounded tongue inserted into said slot of the sub-girt of an adjacent unit, and a fastener projecting through said inwardly extended portion of the girt and through the cooperating male and female lips for securing together the inner and outer corrugated facing sheets.

4. An insulated sheet metal wall panel comprising a plurality of panel units erected side by side, each unit comprising an inner sheet metal facing sheet adapted to be secured to the framework of a building, each of said sheets having outwardly extended lips on the two side edges thereof, one a male and the other a female lip having a U-shaped portion, and with the male lip of one panel unit projecting into the U-shaped portion of the female lip of an adjacent unit, a body of insulation filling the space between the lips and overlying the inner facing sheet, and a prefabricated outer sheet and sub-girt system comprising a corrugated metal facing sheet having bolted thereto a plurality of spaced light-weight sheet metal channel shaped sub-girts extending transversely and secured to the bottom of the corrugations of the outer corrugated sheet each girt having at one end an inwardly extended portion engaging the female lip of an adjacent unit within said adjacent unit, and a slot at the bottom of the extended portion, and at the second end having the width of the channel reduced and provided with bent top portions having a rounded tongue inserted into said slot of the sub-girt of an adjacent unit, and a clip member hooked over the female lip of one unit, extended through the slot in the sub-girt, and having an inwardly extended portion engaging the inwardly extended portion of the sub-girt, and a fastener projecting through said inwardly extended portion of the clip and girt and through the cooperating male and female lips.

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