The invention relates to panels of sheet metal or the like for use in the construction of walls and ceilings, and is particularly directed to the means for attaching the panels to a supporting surface, and this application is a continuation in part of my abandoned application, Ser. No. 446,859, filed July 30, 1954.

An object of the invention is to provide a panel that can be prefinished and attached with concealed fastenings through attaching ears at its marginal edges.

Another object is to provide such a panel in which an attaching ear is located at each of the corners of the panel so as to support the panel at all of its corners.

A further object is to provide a panel of this character in which the same number, arrangement and spacing of the attaching ears is provided on each of the marginal edges of the panel, whereby any edge of the panel may abut any edge of a similar panel.

A still further object is to provide such a panel in which the attaching ears are so spaced along each edge of the panel that the spaces between ears are equal to the length of an ear, whereby when the panels are attached to a wall or ceiling the overlapping ears on the opposed edges of adjacent panels will completely fill the spaces between the ears on each panel.

Another object of the invention is to provide a panel of the character referred to in which the attaching ears are formed at the edges of angular marginal flanges upon the panel, and the edges of these marginal flanges are slightly concaved between adjacent attaching ears, to facilitate the insertion of the attaching ears of an adjacent panel.

A further object is to provide a panel of this type in which the outwardly disposed projections or rib portions are formed at the junctures of the attaching ears with the marginal flanges, for engagement with the notched edges of the marginal flanges of adjacent panels, in order to prevent sagging of any edge portion of any of the panels and to line up the lower surfaces of all panels in the same horizontal plane.

A still further object is to provide spaced pairs of notches or apertures in the attaching ears of the panels, for receiving staples for attaching the panels to the supporting surfaces.

The above objects together with others which will be apparent from the drawing and following description, or which may be later referred to, may be attained by constructing the improved wall or ceiling panel in the manner hereinafter described in detail and illustrated in the accompanying drawing, in which:

Fig. 1 is a perspective view of a panel embodying the invention, showing the reverse side of the panel;

Fig. 2 is a plan view of the reverse sides of two adjacent panels, of a wall or ceiling, showing the manner in which the attaching ears of adjacent panels interlock and completely fill the spaces between the ears on the two abutting edges of the panels;

Fig. 3 an enlarged, fragmentary section, taken as on the line 3—3, Fig. 2, showing the manner in which the projections on the attaching ears draw each panel top tightly in place relative to the adjacent panel;

Fig. 4 an enlarged, fragmentary edge view of a panel, showing the concaved edge of the marginal flanges between adjacent attaching ears, and the projections or rib portions at the junctures of the attaching ears and the marginal flanges of the panel;

Fig. 5 a plan view of the reverse side of a modified form of panel, having a single attaching ear on each edge thereof, and,

Fig. 6 a fragmentary elevation of the edge portion of a panel and a modified form of attaching ear.

Referring first more particularly to the embodiment of the invention illustrated in Figs. 1 to 4, in which similar numerals refer to similar parts throughout, the improved panel is formed of a rectangular sheet of metal, preferably square as shown in Figs. 1 and 2.

The panel comprises the substantially flat, rectangular body portion 10, the edge portions of which are bent at right angles to form the integral marginal flanges 11 extending entirely around the four edges of the panel.

Outwardly disposed attaching ears 12 are formed at the edges of the marginal flanges 11, being bent outwardly therefrom at a 90 degree angle. The side edges of these flanges are preferably outwardly tapered, as indicated at 13, in order to facilitate the insertion thereof under the marginal flanges of contiguous panels.

Each attaching ear 12 is provided with a spaced pair of notches or apertures 14 for receiving staples 15 or equivalent attaching means for connection to a furring strip, stubbing, joist or other support, as indicated at 16 in Fig. 3.

As shown in the drawing, the number, arrangement and spacing of attaching ears 12 is the same on each of the four marginal edges of the panel. This is for the purpose of convenience in assembling the panels upon a wall or ceiling, as it permits any one of the four edges of a panel to be placed adjacent to any edge of a panel already attached to the wall or ceiling.

It will also be seen that the length of each attaching ear 12 is equal to the spaces 17 between adjacent ears.

Thus, as best shown in Fig. 2, when the panels are assembled together the attaching ears 12 of each panel will interlock with the attaching ears of contiguous panels thus entirely filling the spaces between the ears of all contiguous panels, obviating the possibility of dust or dirt passing therethrough.

It should be noted that in the arrangement and spacing of the attaching ears along the marginal edges of the panel, one ear is located at each corner of the panel, thus providing a support for the panel at all corners thereof.

The edges of the marginal flanges 11, between adjacent attaching ears 12, are notched as indicated at 17 in Figs. 3 and 4 in order to provide openings between said edges and the supporting surface 16 to receive the attaching ears 12 of the adjacent panels.

As best shown in Fig. 4, the edges of the marginal flanges 11 are preferably slightly concaved between adjacent attaching ears 12 as indicated at 18 in order to facilitate insertion of the tapered ends of the ears 12 of adjacent panels. This concavity is somewhat exaggerated in the drawing in order to more clearly show the same.

It should be understood, however, that this concavity is only sufficient to facilitate the insertion of the attaching ears of an adjacent panel between the edges 18 of the marginal flanges 11 and the supporting surfaces to which the panels are attached in constructing a wall or ceiling.

To install the improved panels on a wall or ceiling, the attaching ears 12 of the first panel installed are attached
to the supporting surface 16 by nails, staples, or the like located through the apertures 20 or 14 in said ears. The attaching ears 12 on adjacent edges of additional panels are then inserted between the notched edges 17 of the first panel and the supporting surface, and since these attaching ears are thus located behind the first panel and are not accessible for attachment to the supporting surface 16 by nails, staples, or the like, these adjacent edges of additional panels are secured only by the above described engagement with the first panel. It will be understood of course that the attaching ears 12 on the remaining edges of each additional panel may then be attached to the supporting surface by nails, staples or the like.

If the edges of the marginal flanges are notched as at 17, they may be deep enough so that the openings formed between said notched edges and the supporting surface 16 are just equal to the thickness of the attaching ears 12, the adjacent edges of additional panels, as above described, will be held tightly against the supporting surfaces 15, and none of the edges of any panel will sag relative to the adjacent edges of contiguous panels. However, with such a close fit it is extremely difficult to insert the attaching ears of additional panels, making this a very slow and tedious operation.

Therefore, in order to make the panels commercially practical, the notches 17' in the edges of the marginal flanges 11 are deeper than the thickness of the attaching ears 12, so that the ears may be quickly and easily inserted between said notched edges and the supporting surface 16.

This construction, however, permits the adjacent edges of additional panels to sag or drop away from the supporting surface 16 relative to adjacent secured edges of contiguous panels.

Means are provided for wedging the edges of each panel up tightly against the supporting surface, so that none of the edges of any of the panels will sag relative to the adjacent edges of contiguous panels, and the lower surface of all panels will be located in the same horizontal plane.

This means is in the form of downwardly disposed projections or rib portions upon the attaching ears 12, at the junctures with the marginal flanges 11 of the panels, and may be in the form of bosses or knobs 19 located at opposite ends of each attaching ear, wedging for contact with opposite ends of the notched edges 17' of adjacent panels.

While two equally spaced attaching ears are shown at each marginal edge of the panels in Figs. 1 and 2, it should be understood that any equal number of equally spaced and arranged attaching ears may be provided along each edge of the panel.

For instance, as shown in Fig. 5, a single attaching ear 12a may be provided upon the marginal flange 11a at each edge of the panel 10a. Each of these similar attaching ears 12a is one-half the length of the marginal flanges 11a, and the attaching ear at each edge of the panel is correspondingly positioned at one end of the corresponding marginal flange 11a, so that a support is provided at each of the four corners of the panel.

Panels such as shown in Fig. 5 may be otherwise the same as shown in Figs. 1 to 4. Each attaching ear 12a may be provided with a spaced pair of apertures or notches near each end thereof, so as to support each panel at each corner and at substantially the center of each edge. The spaces 17a between adjacent attaching ears are equal to the length of an attaching ear, and the edges of the marginal flanges 11a are notched and preferably slightly concaved between adjacent attaching ears in the manner shown at 17' and 18 in Figs. 1 to 4. Also, projections 19a are preferably formed on the attaching ears in the manner of the projections 19 above described.

In Fig. 6 is shown a slight modification in which the attaching ear 12b on the marginal flange 11b of the panel 10b, may be provided with a projection or rib portion in the form of a continuous rib 19 extending throughout the length of the attaching ear at the juncture thereof with the marginal flange 11b.

Instead of providing spaced pairs of notches in the edges of the attaching ears, as shown in Figs. 1 to 5, spaced pairs of apertures may be provided, as indicated at 14b in Fig. 6.

It will be noted that an aperture 20 is shown in each attaching ear in Figs. 1, 2 and 5. These apertures are for the purpose of suspending the panels upon hooks or the like for painting the panels with paint, enamel, or other protective or decorative coatings.

Panels constructed in the manner illustrated and above described may be easily and readily assembled in the construction of a wall or ceiling, as it is not necessary for the workman to turn each panel around to select the proper edge thereof to be butted against one edge of a panel already attached to the supporting surface.

All four edges of each panel having the same number, arrangement and spacing of attaching flanges therein permits any edge thereof to be butted against and interlocked with any edge of a similar panel.

The attaching ears 12 of a panel are inserted into the spaces 17 between the ears of an adjacent panel, the projections or rib portion 19 on said attaching ears will engage the notched edges 17' of the marginal flange of the adjacent panel, as shown in Fig. 3, so as to wedge the first-mentioned panel up tightly against the supporting surface 16, preventing sagging of this edge of said panel, so that the lower surface of all of the panels in a ceiling will be located in the same horizontal plane, and all panels will be held tightly in place.

Panels constructed as above described, if provided with an even number of attaching ears on each edge, may, if desired, be assembled with joints staggered in the manner of a masonry wall.

The improved panel construction is also adapted to the construction of acoustic walls and ceilings. Because of the diaphragm action of the panel, it has a certain amount of acoustic value, and this may be increased by perforating the body portion of the panel.

If desired, insulation or sound absorbing material may be located within the panel, before it is installed, in order to improve the insulation, and/or acoustic value of a wall or ceiling constructed of the improved panels.

In the foregoing description, certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such words are used for descriptive purposes herein and are intended to be broadly construed.

Moreover, the embodiments of the improved construction illustrated and described herein are by way of example, and the scope of the present invention is not limited to the exact details of construction.

Having now described the invention or discovery, the construction, the operation, and use of preferred embodiments thereof, and the advantages now and useful results obtained thereby; the new and useful construction, and reasonable mechanical equivalents thereof obvious to those skilled in the art, are set forth in the appended claims.

It is known that wall and ceiling panels have been made having rearwardly disposed marginal flanges and outwardly disposed attaching ears upon said marginal flanges, and no claim is made to such devices broadly.

However, applicant believes himself to be the first to provide such a panel in which the attaching ears are spaced apart a distance equal to the length of one attaching ear, and in which the number, arrangement and space-
ing of the attaching ears is the same on all edges of the panel, with one attaching ear located at each corner of the panel, whereby any edge of the panel may be abutted against any edge of a similar panel so that the attaching ears upon adjacent edges of contiguous panels will interfit and completely fill the spaces between ears, and whereby the panel may be secured at all of its corners, and applicant claims such panels as his invention.

I claim:

1. A sheet metal wall and ceiling panel comprising a substantially flat square body portion, rearwardly disposed marginal flanges at the edges of the body portion and outwardly disposed attaching ears at the edges of all of said marginal flanges for underlying similar contiguous panels, the number, arrangement and spacing of the attaching ears being the same on each of said marginal flanges, the attaching ears being all of the same length and being spaced apart a distance equal to the length of one attaching ear, one of said attaching ears being located at each corner of the panel, there being openings in said ears for receiving attaching means, the rear edges of the marginal flanges being notched between adjacent attaching ears, and rearwardly disposed rib portions located upon the attaching ears at the junctions thereof with the corresponding marginal flanges, whereby when a plurality of said panels are assembled together upon a supporting surface, all of the attaching ears of each panel will be received in the spaces between the supporting surface and the notched edges of the marginal flanges of contiguous panels and said forwardly disposed rib portions of the attaching ears will contact the notched edge of the marginal flanges of contiguous panels so as to wedge the edges of each panel tightly against the supporting surface.

2. A sheet metal wall and ceiling panel as defined in claim 1, in which the rib portions are in the form of knobs located at the opposite edge portions of the attaching ears.

3. A sheet metal wall and ceiling panel as defined in claim 1, in which the rib portions are coextensive in length with the attaching ears upon which they are located.

4. A sheet metal wall and ceiling panel as defined in claim 1, in which the attaching ears are outwardly tapered and the notched edges of the marginal flanges are slightly concaved.

5. A sheet metal wall and ceiling panel comprising a substantially flat rectangular body portion, rearwardly disposed marginal flanges at the edges of the body portion, outwardly disposed attaching ears at the edges of the marginal flanges at two opposite edges of the panel for underlying similar contiguous panels, the number, arrangement and spacing of the attaching ears being the same on each of said two marginal flanges, the attaching ears being all of the same length and being spaced apart a distance equal to the length of one attaching ear, there being openings in said ears for receiving attaching means, the rear edges of said two marginal flanges being notched between adjacent attaching ears, and forwardly disposed rib portions located upon the attaching ears at the junctions thereof with the corresponding marginal flanges, whereby when a plurality of said panels are assembled together upon a supporting surface, all of the attaching ears of each panel will be received in the spaces between the supporting surface and the notched edges of the marginal flanges of contiguous panels and said forwardly disposed rib portions of the attaching ears will contact the notched edges of the marginal flanges of contiguous panels so as to wedge the edges of each panel tightly against the supporting surface.

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