June 1, 1954 W. W. KENNEDY 2,679,912

SHEET METAL FRAME CONSTRUCTION

Filed Aug. 10, 1948

Fig. 1.

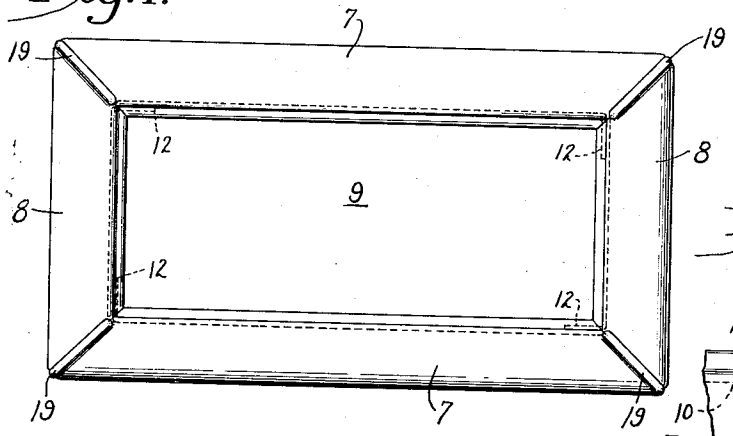


Fig. 3.

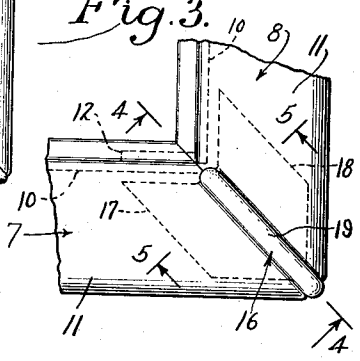


Fig. 2.

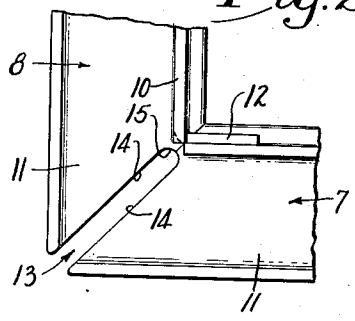


Fig. 4.

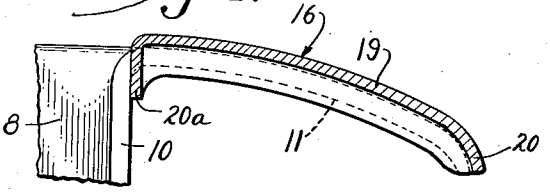


Fig. 5.

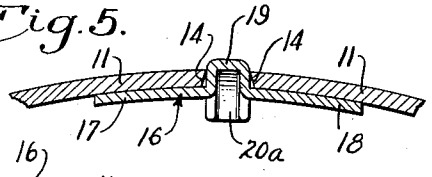
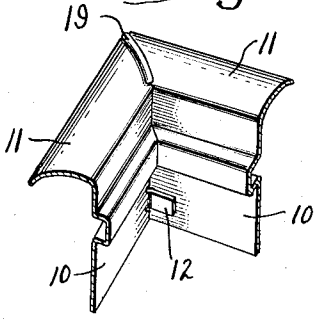


Fig. 8.



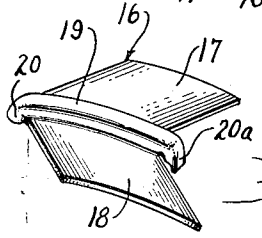
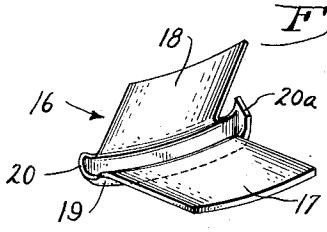


Fig. 6.

Fig. 7.



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SHEET METAL FRAME CONSTRUCTION

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2 Claims. (Cl. 189—36)

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The invention pertains to frames formed of sheet metal and usually made in rectangular form with mitered corners, and it has especial reference to an improved frame construction for grilles adapted to be secured in wall openings to provide air outlets in air conditioning systems.

Considerable difficulty has been experienced in producing sheet metal frames for grilles and the like, possessing ample strength and rigidity while presenting a neat and attractive appearance. Such frames are commonly made of angle bars so as to provide an inner portion or flange defining the opening which is to receive the grille core and provide means of attaching the same to a duct and a moulding portion or flange disposed generaly at right angles to the inner flange so as to overlap the wall adjacent the opening and thereby conceal the rough edges of the latter. In forming the corners of the frame, the adjoining ends of the moulding flanges are mitered and brought together to form a mitered joint. However, in the shearing or stamping operation the metal is compressed and broken out leaving rough edges that cannot be pieced together in mitering. Unless such edge cracks are filled as by welding and the excess metal removed by an expensive grinding operation, an unsightly joint is formed. Even when the edges are ground, the result is not entirely satisfactory, particularly in the case of plated or polished frames, since the ground areas present an appearance after plating different from the unground areas. Other attempts to solve the problem while avoiding expensive machining operations have included the use of specially formed caps to cover and conceal the joints, but such caps are difficult to apply and in general have proven unsatisfactory.

With the foregoing in view, the object of the present invention is to provide a new and advantageous corner construction for sheet metal frames presenting an appearance which is uniform and pleasing to the eye and which is strong and rugged in character, easy to paint or otherwise finish and capable of economical manufacture.

The object of the invention thus generally stated together with other and ancillary advantages are attained by the construction and arrangement shown by way of illustration in the accompanying drawing, in which:

Figure 1 is a front elevational view of a grille frame embodying my invention.

Fig. 2 is a fragmentary underside view of one side of the frame in process of construction.

Fig. 3 is a fragmentary elevational view of a

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corner of the frame as the same is finally constructed.

Fig. 4 is a fragmentary sectional view taken approximately in the plane of line 4—4 of Fig. 3, but on a larger scale.

Fig. 5 is a fragmentary sectional view taken in the plane of line 5—5 of Fig. 3, but on a larger scale.

Figs. 6 and 7 are perspective views showing respectively the top and undersides of a corner plate employed in the construction of the frame.

Fig. 8 is a fragmentary perspective view of an inside corner of the completed frame.

While the present invention is not confined to grille frames, such a frame is herein shown for purposes of illustration. It comprises in general, four frame members including top and bottom members 7 and end members 8 arranged in rectangular form (Fig. 1) so as to define an opening 9 for the reception of the grille core (not shown). In the illustrative embodiment the frame members are made from separate angle bars secured together at the corners of the frame and each comprising a side flange 10 of substantial depth in a front-to-rear direction and an outer moulding flange 11 of appropriate form. The side flanges are adapted to project into the wall opening for attachment to a duct or the like, with the moulding flanges overlapping the wall adjacent the opening so as to conceal the rough edges of the latter.

In carrying out my invention, the adjoining ends of the moulding flanges are mitered as heretofore except that I deliberately provide a gap or slot between the ends of the flanges for the reception of an outwardly projecting rib on a corner plate secured to the undersides of the moulding flanges and providing a rigid connection therebetween.

In Fig. 2 I have shown the underside of one corner portion of a grille frame with two adjacent frame members 7 and 8 brought together with the inner or anchoring flanges 10 thereof in abutting relation, the flange 10 of one of the members (herein the member 8) being preferably made with an end flange 12 spot-welded to the flange member 10 of the adjoining member 7. The moulding flanges 11 of the two members are cut away adjacent their ends so as to form a slot 13 diagonally disposed and having parallel edges 14. The inner ends of the edges 14 are curved toward each other, as indicated at 15, so as to close the slot at its inner end, while the outer end of the slot is open.

To complete the construction, I employ a corner fastening plate 16 (Figs. 6 and 7) which may

be made of relatively thin sheet metal. The plate is shaped to conform to the shape of the adjacent moulding flanges 11 and has wing portions 17, 18 disposed at right angles to each other and respectively secured (Figs. 3 and 5) to the undersides of the flanges as by spot-welding. Between these two wing portions the corner plate is formed with a diagonal rib 19 projecting outwardly from the wing portions into the slot 13. Preferably the rib 19 is in the form of a channel having an outer depending tip end 20 serving to close the outer end of the channel, and an inner depending end flange 20a engaging in the inner end of the slot 13. Preferably the rib 19 is preformed in the corner plate before assembly of the latter with the frame members.

As shown, the rib 19 is made of a depth somewhat greater than the thickness of the moulding flange so as to protrude sufficiently to form in effect an embossed bead. Also, the longitudinal corners of the rib as well as the ends thereof are gently rounded to avoid sharp edges. The width of the rib corresponds as closely to that of the slot as commensurate with necessary fabrication tolerances. To facilitate the reception of the rib 19 the edges of the slot may be bevelled slightly as shown in Fig. 5.

The projection of the rib beyond the outer face of the frame proper to form an outwardly protruding bead is advantageous for the reason that it increases the prominence of the bead to a degree such that any gaps or crevices between the bead and the edges 14 of the slot due to the presence of burrs or roughness are relatively unnoticeable.

It will be seen that by the construction provided, not only are the frame members 7 and 8 effectually secured together by the corner fastening plates but the latter provide material for the formation of diagonal ribs presenting such a pleasing and attractive appearance as to render negligible the formation of small gaps at the sides thereof. Moreover, the cost of construction is low in that the use of carefully machine mitered joints is eliminated.

I claim as my invention:

1. A frame comprising side and end sheet metal members disposed at right angles to each other and presenting front faces of similar convexly curved cross-section, the adjacent ends of said members being spaced apart and cooperating to form a narrow parallel sided slot extending diagonally of the corners of the frame, and a piece of sheet metal having opposite end portions lying against and secured to the undersides of said members and an intermediate portion struck upwardly to form a hollow rib upstanding through and closely filling said slot and curved longitudinally to match the convexity of the faces of said members, said rib comprising laterally spaced parallel side walls at least as deep as the thickness of said members and joined by a connecting bead having outer edge surfaces of arcuate cross section rounded into mergence with the outer surfaces of said walls and disposed above said convex faces to mask the exposed lines of abutment between said walls and said member ends.

2. A frame comprising side and end sheet metal members disposed at right angles to each other and presenting front faces of similar convexly curved cross-section, the adjacent ends of said members being spaced apart and cooperating to form a narrow parallel sided slot extending diagonally of the corners of the frame, and a piece of sheet metal having opposite end portions lying against and secured to the undersides of said members and a hollow rib upstanding through and completely filling said slot and comprising laterally spaced parallel side walls deeper than the thickness of said members and joined by a connecting bead having rounded outer corner surfaces disposed above said convex faces, said bead being curved longitudinally to match the convexity of the faces of said members and the opposite ends of the bead and walls being bent downwardly more sharply than the curvature of the frame members to eliminate sharp edges at the ends of the bead and fill the ends of said slot.

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