

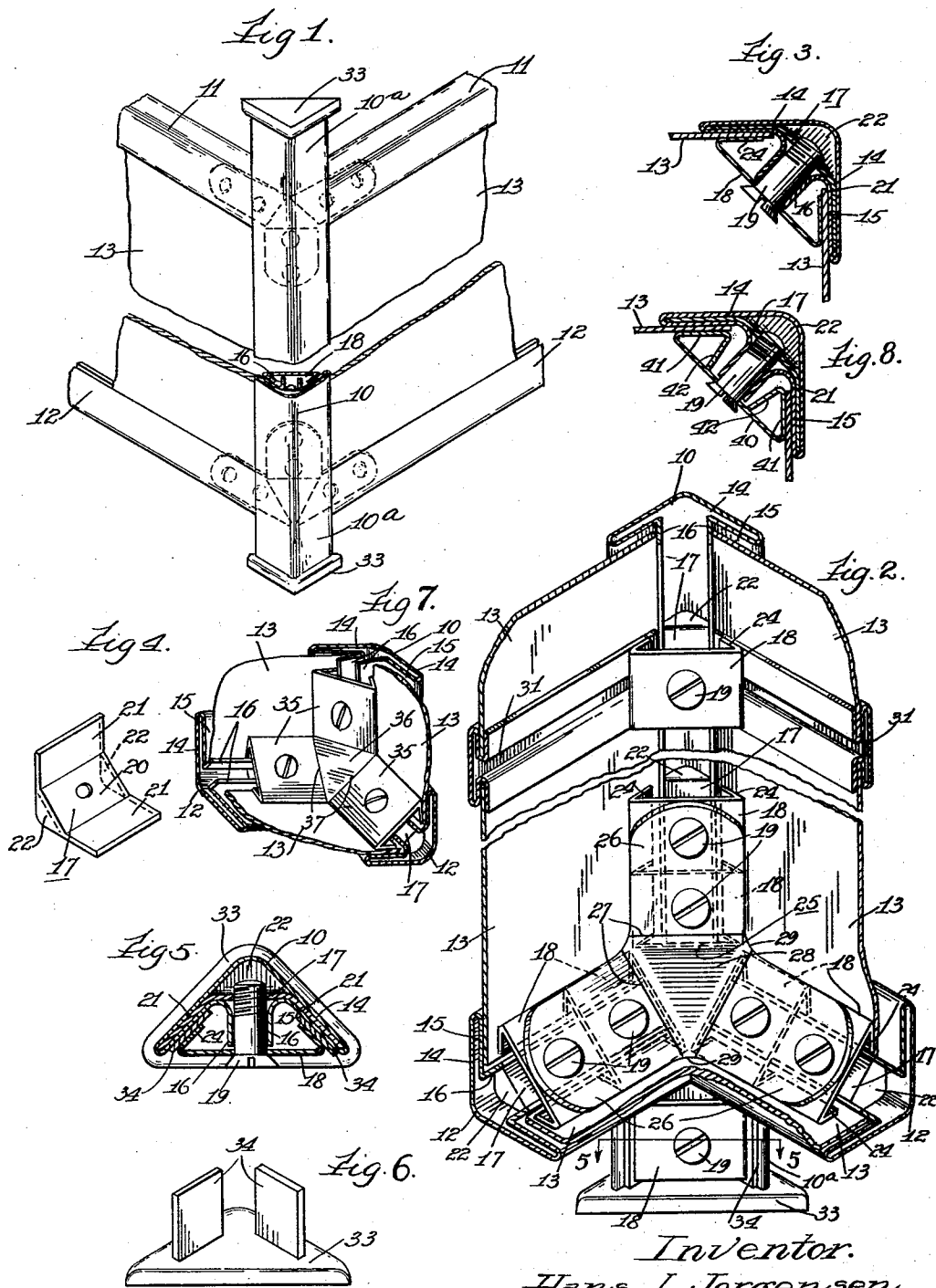
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CASING CONSTRUCTION

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CASING CONSTRUCTION

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This invention relates to casing construction such as for radiators, show cases or the like, and has for an object to provide an improved method of securing panels of sheet material to a metal frame. Another object is to provide an improved construction in which the ordinary fastening means, such as screws, rivets, bolts, etc., are totally hidden from the outside view of the casing. A further object of this invention is to provide means employed in corners of the casing for securing the frame members together and also for securing the panels of sheet material to the frame members. It consists in certain features and elements of construction, as herein shown and described, and as indicated by the claims.

In the drawings:

Figure 1 is a fragmentary perspective view of a corner of a radiator casing embodying the present invention.

Figure 2 is an enlarged detail perspective view of an interior corner of the casing showing a corner member for fastening the frame members together and securing the panels to the frame; the upper portion of the view being illustrative of a method of securing several panels in a frame in either horizontal or vertical relation.

Figure 3 is a transverse section through a frame member indicating the manner by which improved fasteners secure panels to the frame member.

Figure 4 is a perspective view of a retaining clamp plate which serves as the nut for the fastening members.

Figure 5 is a section taken as indicated at line 5-5 on Figure 2.

Figure 6 is a perspective view of a cap member which may be used as a foot or as a top for the end of the upright frame member.

Figure 7 is a perspective of an interior corner of the casing illustrating a modified form of corner member for securing the frame members together and the panels to the frame.

Figure 8 is a transverse sectional view through a frame member, showing a clamping member of modified form.

In the drawings, the present invention is shown for purposes of illustration, in connection with a casing of the type adapted for enclosing steam or hot water radiators of various forms. The casing includes a frame comprising upright corner members, 10, and substantially horizontally extending top and bottom framing members, 11 and 12, respectively, secured to said uprights to form a skeleton in which are mounted panels, 13, of sheet material such as metal plates, wire mesh, glass, etc. Preferably, the panels for radiator casings are of perforated plate or wire mesh to permit proper heat radiation. The framing members are preferably of sheet metal, bent along their longitudinal center lines, forming angle members with legs, 14, at an angle substantially equal to the angle at which the adjacent panels are to be mounted relative to each other. Each of the legs, 14, is folded upon itself, bringing the part, 15, of the leg back opposite the inner side of the outer part in spaced relation thereto, with the extreme edge portion, curved inwardly in a stiffening rib, 16, extending parallel to and offset from a plane bisecting the angle between said legs, 14.

As illustrated in Figure 3, the panels, 13, are positioned against the inner leg portions, 15, of the frame members and clamped in place by fastening devices, each consisting of a retaining clamp plate, 17, and a clamping member, 18, secured to the retaining clamp plate by a screw, 19, extending between the stiffening ribs, 16. This retaining clamp plate consists of a middle portion, 20, and two oppositely inclined legs, 21, disposed at an angle corresponding to the angle formed between the legs, 14, of said frame member, so that the retaining clamp plate may be positioned in the frame member with its legs, 21, inserted between the leg portions, 14 and 15, of said frame and with the middle portion positioned perpendicular to the plane bisecting the angle, to reinforce and stiffen the legs of these frame members and also serve as the nut for the screw, 19. A pair of outwardly projecting lugs, 22, are formed at the ends of the middle por-

tion, 20, and are adapted to fit snugly into the corner of the frame member against the inner surfaces of the legs, 14. These lugs serve to position the retaining clamp plate in the frame member for engagement by the screw, 19, and also act as reinforcing ribs for the legs, 21. The body of the clamping member when operatively positioned is substantially parallel to the middle portion, 20, of the retaining clamp plate, 17, and has its outer ends, 24, bent inwardly parallel to the legs, 14, of the frame and engaging the inner surfaces of the panels, 13, for holding the same in position with a wedge-like grip. These fastening devices may be spaced at suitable intervals along the frame members, or if preferred the retaining clamp plate and clamping member may be approximately the same length as the frame members for clamping the entire marginal edge of the panels to said frame members. This construction is especially adaptable for use in show-case construction, to close the interior portion of the frame members neatly, so as to present a more finished appearance through the glass panels. Also, this construction is suitable for use in securing together the plate glass panels of store fronts, or as a complete frame for a plate glass window.

At the corners at which three framing members meet, I provide the usual panel fastening devices and connect them together in such a manner that they also serve to attach and hold the framing members rigidly together. On each frame member adjacent the corner are positioned two complete clamping devices (as shown in Figure 2), to which I secure a truss plate, 25, having three outwardly extending arms, 26, bent along lines, 27, which define a triangular central area, 28. The truss plate is secured to the respective clamping devices by the usual screws, 19, extending through the clamping members, 18, between the stiffening ribs, 16, and engaging the retaining clamp plates, 17, in the frame members. Of course, in place of using two clamping devices on each of the frame members adjacent the corner, a single and longer set may be employed, but to simplify and standardize I prefer using two clamping devices, as it materially reduces manufacturing costs. It will be noted that the lines of bend, 27, are farther from the corner of the assembly than the innermost ends of the inside clamping members, so that a maximum trussing effect will be obtained. These arms, 26, may also be reinforced by providing fillets, 29, connecting the adjacent edges of the respective arms, as shown.

In some instances it is desirable or necessary to use two or more panel sections in one panel opening of the frame and for this purpose I provide a sheet metal connecting

member, 31, having its longitudinal edges folded upon itself and reversed to form pockets for the edges of the panels as shown in Figure 2. These members may be used in either direction of the panel opening and are secured to the frame members by one of my improved fastening devices in the same manner as the panels are clamped to the framing members.

The upright frame members, 10, may be extended above or below or in both directions with respect to the top and bottom frame members, 11 and 12, as indicated at 10^a, to serve as supporting legs or uprights for a cover, etc. The casings usually are so positioned as to permit viewing the inner side of the extension and to give it a better ornamental and substantial appearance, I fill up the extension, 10^a, of the upright with the clamping devices, which serves to stiffen and strengthen the extension. At the open ends of said extensions I use a cap plate, 33, having transversely extending lugs, 34, arranged so as to be positioned against the leg portion of the framing member, 15, so that the prongs, 24, of the clamping member will be wedged thereagainst to hold the cap plate in position. This cap plate, which may be a die casting, serves either as a foot for the supporting leg, or as an ornamental top, as the case may be, and is preferably of triangular shape of slightly greater size than the triangular cross sectional area defined by the upright.

Figure 7 illustrates a corner fastening device of modified construction, in which three oppositely extending integrally connected clamping members, 35, are positioned on the respective framing members and connected to usual retaining clamp plates, 17, by screws, 19, for securing the panels in place. These clamping legs are joined to a common triangular portion, 36, defined by the lines, 37, along which said clamping members are bent. This construction also serves as the means for attaching the three oppositely extending framing members together to form a corner as clearly shown in Figure 7 of the drawing.

Figure 8 illustrates a clamping member, 40, of modified form, in which the outer portions are bent toward each other to form an angle substantially the same as that formed by the panels to be secured to the frame. The extreme outer end portions, 42, are bent back so that the ends proper abut against the inside of the body portion of the clamping member, leaving an intermediate portion, 41, parallel to said panels; forming a triangular truss member as shown in the drawing. The portion, 42, serves as a brace for reinforcing the portion, 41, with respect to the body portion of said clamping member to transmit the pressure to the en-

tire area of the portion, 41, to secure the panels rigidly to the frame member.

I claim:

1. In a casing of the character described, the combination of a frame comprising a plurality of upright and transversely extending sheet metal frame members meeting to form corners of the casing, a plurality of sheet panels extending in a direction transverse to each other, each of said frame members including a body portion bent to conform to the angle formed by two adjacent panels and having its longitudinal edges folded back upon said body portion in spaced relation and continuing in transversely extending reinforcing ribs; the adjacent marginal portions of each panel bearing against the adjacent surfaces of the respective folded portions of said frame members, a unitary fastening member positioned inside a corner, and retaining clamp members cooperating therewith and engaged with the respective frame members which meet at the corner for engaging a pair of adjacent marginal portions of each adjacent panel for securing the same to said frame members.

2. In a casing of the character described, the combination of a frame comprising a plurality of upright and transversely extending sheet metal frame members meeting to form corners of the casing, a plurality of sheet panels extending in a direction transverse to each other, each of said frame members including a body portion bent to conform to the angle formed by two adjacent panels and having its longitudinal edges folded back upon said body portion in spaced relation and continuing in transversely extending reinforcing ribs; the adjacent marginal portions of each panel bearing against the adjacent surfaces of the respective folded portions of said frame members, and means positioned inside a corner cooperating with the respective frame members which meet at the corner for engaging a pair of adjacent marginal portions of each adjacent panel for securing the same to said frame members, said means including a clamping plate on each frame member adjacent the corner engaging the inner surfaces of said adjacent panels and operatively connected to a retaining clamp member on each frame member interposed between the folded portions and the body portions thereof, and a reinforcing plate comprising arms extending parallel to the respective frame members forming the corner and secured to said clamping plates.

3. In a casing of the character described, the combination of a frame comprising a plurality of upright and transversely extending sheet metal frame members meeting to form corners of the casing, a plurality of sheet panels extending in a direction

transverse to each other, each of said frame members including a body portion bent to conform to the angle formed by two adjacent panels and having its longitudinal edges folded back upon said body portion in spaced relation and continuing in transversely extending reinforcing ribs; the adjacent marginal portions of each panel bearing against the adjacent surfaces of the respective folded portions of said frame members, and means positioned inside a corner cooperating with the respective frame members which meet at the corner for engaging a pair of adjacent marginal portions of each adjacent panel for securing the same to said frame members, said means comprising a clamping plate for each frame member positioned adjacent the corner and engaging the inner surfaces of the marginal edges of the adjacent panels, a retaining clamp plate positioned between the folded portions and body portions of each member operatively connected to and aligned with said clamping plates, and a reinforcing plate connecting the clamping plates together comprising three radiated arms, extending parallel to the frame members at said corner and connected by a triangular portion with lines of bend between said arms and the triangular part positioned opposite a point intermediate the ends of said clamping plates when secured thereto.

4. In a casing of the character described, the combination of a frame comprising a plurality of upright and transverse sheet metal frame members secured together forming corners of the casing, a plurality of sheet panels extending transversely of each other, each of said frame members being provided with a body portion shaped to conform to the angle between the two adjacent panels and having its longitudinal edges folded back upon the body portion in spaced relation and continuing in transverse reinforcing ribs extending on opposite sides of and substantially parallel to a plane bisecting the angle formed by said adjacent panels, the adjacent marginal edges of each panel bearing against the surfaces of the folded portions of two frame members, and clamping means positioned at each corner comprising divergent arms respectively parallel to and cooperating with the upright and the pair of oppositely extending transverse frame members, together with separate retaining clamp members respectively positioned intermediate the folded portions and the body portions of each frame member adjacent the corners and connected by clamping screws to the aligned arms of the clamping means for gripping the marginal portions of said panels.

5. In the combination set forth in claim 4, each of said arms of the clamping means

extending perpendicular to the plane bisecting the angle formed between the adjacent panels and the longitudinal edges thereof being bent inwardly for engaging the inner surfaces of said adjacent panels for securing the same to the frame member.

6. In the combination defined in claim 4, said upright frame members extending beyond the transverse members, each of said extensions having a retaining clamp plate interposed between the folded portions and body portions, secured to a clamping member disposed perpendicular to the plane bisecting the angle formed by the adjacent panels of said upright, the clamping member having inclined end portions positioned for engaging the inner surfaces of said folded portions, encasing said ribs and substantially closing said upright extension.

7. In the combination defined in claim 4, said upright frame members extending beyond the transverse members, each of said extensions having a retaining clamp plate interposed between the folded portions and body portions, secured to a clamping member disposed perpendicular to the plane bisecting the angle formed by the adjacent panels of said upright, the clamping member having inclined end portions positioned for engaging the inner surfaces of said folded portions, encasing said ribs, and a cap member for closing the end of such extension, comprising a plate abutting against the end of said extension, having a pair of transversely projecting lugs adapted to be positioned against the inner surface of said folded portion and secured thereat by the end portions of said clamping member for substantially closing said extension.

8. In a structure of the character described, a pair of sheet panels disposed in angular relation to each other, a frame member for said panels having oppositely extending leg portions conforming to the angle of said panels, a clamping member comprising a body portion extending transverse to a plane bisecting the angle formed by the panels, and end portions bent inwardly, parallel to and adapted to be positioned against the panels, with bracing means interposed between said end portions and the body portion of said clamping member, and means for connecting said clamping member to the frame member, whereby to exert pressure through said bracing means and said end portions against said panels for rigidly securing the same to the frame member.

9. In the structure defined in claim 8, said bracing means being continuations of the end portions, having their ends proper abutting the inner side of the body portion to form a truss.

10. In a structure of the character described, a pair of sheet panels disposed in

angular relation to each other, a sheet metal framing member having a body portion bent to conform to the angle of said panels, the longitudinal edges of said member being folded back upon the body portion in spaced relation and continuing in transversely projecting reinforcing ribs which extend the entire length of the frame member, said ribs being spaced on opposite sides of the plane bisecting the angle formed by said panels and clamping means for securing said panels to the framing member comprising a short retaining clamp member interposed between said body portion and folded-back portions, a short clamping plate positioned opposite the retaining clamp member and formed to engage the inner faces of said panels, and a bolt for drawing said clamping and retaining members together to grip the panels, said retaining clamp member having a central portion perpendicular to said bisecting plane and continuing in oppositely extending arms engaged between the folded-back portions and the body portion, together with a reinforcing rib extending transversely of said central portion and integral therewith fitted into the angle of the body portion intermediate said arms.

11. In a structure of the character described, a pair of sheet panels disposed in angular relation to each other, a sheet metal framing member having a body portion bent to conform to the angle of said panels, the longitudinal edges of said member being folded back upon the body portion in spaced relation and continuing in transversely projecting reinforcing ribs which extend the entire length of the frame member, said ribs being spaced on opposite sides of the plane bisecting the angle formed by said panels and clamping means for securing said panels to the framing member comprising a short retaining clamp member interposed between said body portion and folded-back portions, a short clamping plate positioned opposite the retaining clamp member and formed to engage the inner faces of said panels, and a bolt for drawing said clamping and retaining members together to grip the panels said retaining clamp member having a central portion perpendicular to the said bisecting plane with oppositely extending arms engaged between said folded-back portions and the body portion of the frame member, together with reinforcing ribs projecting from said central portion transversely at its ends and shaped to seat in the angle of the body portion.

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