

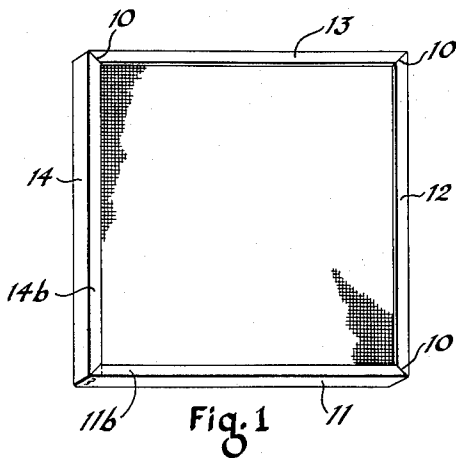
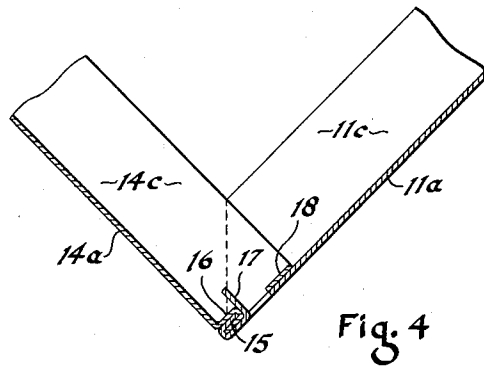
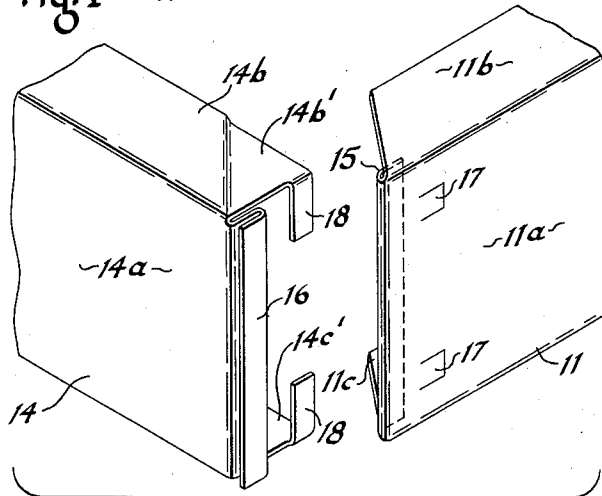
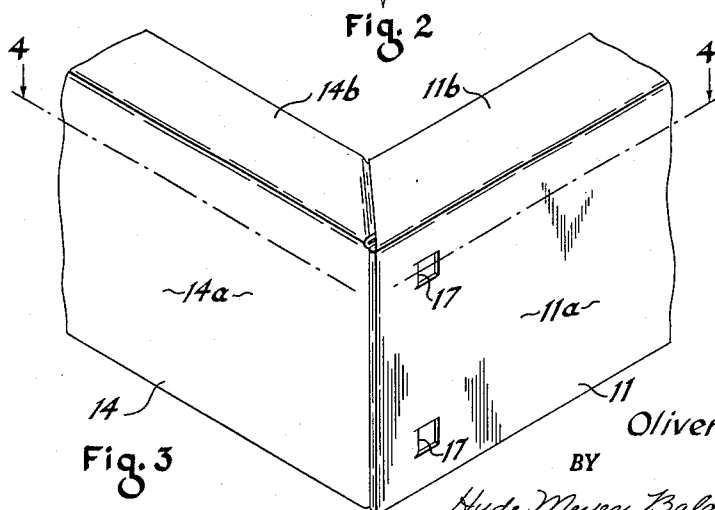
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FILTER PANEL CORNER CONSTRUCTION

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FILTER PANEL CORNER CONSTRUCTION

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2 Claims. (Cl. 189—36)

This invention relates to improvement in frame structure and more particularly to easily assembled frame structure.

One of the objects of the present invention is to provide in a multiple sided frame of the type described means for locking said sides together into a rigid frame formation and for permitting easy assembly of the frame.

Other features of this invention reside in the arrangement and design of the parts for carrying out their appropriate functions.

Other objects and advantages of this invention will be apparent from the accompanying drawings and description and the essential features will be set forth in the appended claims.

In the drawings,

Fig. 1 is a perspective view of the novel frame structure described in this application and containing foraminous filter material;

Fig. 2 is a perspective view in disassembled condition of the corner at the lower left of Fig. 1 which forms the easily assembled connection between the adjacent sides;

Fig. 3 is a perspective view of the sides shown in Fig. 2 but shows them in their assembled position; while

Fig. 4 is a horizontal sectional view taken along the line 4—4 of Fig. 3.

Those familiar with the frame construction art will recognize that this invention may be applied in many ways. For example, the frame may be used to hold a picture or sign for display, to form a partition, or to support a plate or any other type of flat object. I have chosen to illustrate the novel frame set forth herein as supporting filter material for filtering a fluid stream. The filter material may be of any known type and forms no part of this invention. The novelty exists in the frame structure.

The closed frame in Fig. 1 may have any number of sides desired but for purposes of illustration it is shown as being rectangular or square. This frame is formed from a continuous length member, preferably sheet metal, channel-shaped in section, and having three pairs of spaced ninety degree notches cut in the channel flanges along its length. The continuous length is bent at each of these pairs of notches to form a corner of the frame shown in Fig. 1. This 90 degree notch helps maintain a 90 degree angle between the adjacent sides of the frame. The continuous length of channel section, in its bent form shown in Fig. 1, provides a multiple sided frame having sides 11, 12, 13, and 14.

A connection is provided for joining the free ends of sides 11 and 14, as seen in the lower left hand corner in Fig. 1. One of these adjacent sides, side 11, has a tongue 15 at the corner lying within the channel form of side 11. The distal end of the tongue extends away from the corner and extends parallel to the channel web 11a of the side 11. This tongue is an integral extension of the web which is formed by bending it inwardly back upon the web so that the tongue lies in a plane substan-

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tially parallel to the web. The second adjacent side 14 has a U-shape projection 16 for embracing the tongue 15 when the sides are connected together. The channel web 14a of side 14 at the corner is provided with a bend inwardly at right angles to the web and then a return bend extending outwardly at right angles to the web. When the free ends of the continuous channel length are joined, the tongue 15 lies within the U-shape projection 16, as shown in Fig. 4.

The connection joining the free ends also includes coacting means on adjacent sides 11 and 14 for preventing removal of tongue 15 from the U-shape projection 16 after the corner is assembled. A pair of tongues or lugs 17 are struck up from the web 11a of side 11. These tongues or lugs 17 are bent inwardly substantially at right angles to web 11a and into engagement with the bottom of the U-shape projection 16, as shown in Fig. 4, to lock the tongue 15 in the U-shape projection 16. These tongues or lugs 17 are attached to the web 11a a distance from the corner or free end of side 11 substantially equal to the spacing of the bottom of the U-shape projection 16 from the outer surface of web 14a. Then, the corner of the frame has a flush outer surface, as seen in Figs. 3 and 4.

This coacting means for locking the corner together also includes means to prevent endwise movement of the tongue 15 out of the U-shape projection 16. Sides 11 and 14 being channel shape in section have, in addition to their respective webs 11a and 14a, inwardly directed flanges 11b, 11c and 14b, 14c respectively. These inwardly directed parallel flanges serve a dual purpose. First, they retain the filter material within the frame. Second, by overlying the ends of parts 15 and 16 (see Fig. 3) they prevent endwise removal of tongue 15 from the U-shape 16 after the corner is assembled. The end of flanges 11b and 11c adjacent the corner are beveled at a 45 degree angle with respect to the web 11a and resemble one half of one of the notches 10. Flanges 14b and 14c have offset portions or flanges 14b' and 14c', respectively, which are spaced somewhat closer together than the flanges 14b and 14c. The offset bend in each flange is at approximately a 45 degree angle to the web 14a. When the free ends are joined at the corner, the flange 11b lies over the offset portion or flange 14b' while the flange 11c lies below the portion 14c', and the offset bends in the flanges 14b and 14c butt against the inclined ends of flanges 11b and 11c respectively in a manner similar to the edge of each flange in one of the notches 10 previously described. Hence, the flanges 11b and 11c resiliently snap into place and bear against the outer surfaces of flanges 14b' and 14c' to prevent endwise separation of tongue 15 from U-shape projection 16. Of course, it is apparent that the corner construction on the flanges of side 11 could be interchanged with that on side 14, if desired, so that flanges 14b and 14c lie outside of flanges 11b and 11c.

The connection may also include coacting means on adjacent sides for maintaining a predetermined angle between these adjacent sides. In a rectangular or square frame, this angle would be 90 degrees. Inwardly directed projections 18, at right angles to portions 14b' and 14c', are carried by flanges 14b and 14c. These projections are spaced from the corner and engage the inner surface of the channel web 11a in Fig. 4 just to the right of the apertures formed by struck up lugs or tongues 17 as viewed in Figs. 2, 3 and 4. The projections 18 along with the three notches 10 and the offset bends between flanges 14b and 14b' and between 14c and 14c' maintain a 90 degree angle between each pair of the adjacent sides 11, 12, 13, and 14.

It should now be apparent that the frame may be as-

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sembled into finished form by bending the continuous lengths of channel shape material into a rectangular or square structure, as shown in Fig. 1, inserting tongue 15 into U-shape projection 16 while flanges 11b and 11c pass around the offset flanges 14b' and 14c', and then bending tongues or lugs 17 to the position shown in Fig. 4 to lock the corner connections together. This frame is especially suitable for use as a retaining or holding means for foraminous filter material.

Various changes in details and arrangements of parts can be made by one skilled in the art without departing from the spirit of this invention or the scope of the appended claims.

What I claim is:

1. A frame for supporting filter material, said frame having a plurality of sides connected together and forming a closed frame formation, each side being channel-shape in section with the web of the channel forming a portion of the outer periphery of the frame and with the two flanges of the channel inwardly directed for retaining the filter material in said frame, a connection on at least one corner of said frame joining first and second adjacent sides of said frame, said connection comprising a tongue carried by said first side adjacent the corner within the channel of said first side and having its distal end spaced from and extending away from said corner, a U-shape projection on said second side at said corner having a first leg connected with said second side and extending inwardly at right angles to the web of said second side and having a second leg spaced from and parallel to said first leg and connected thereto by a reverse bend, said two legs embracing said tongue, a member carried by at least one of said channel flanges of one of said sides and spaced from said corner engaging the inner surface of the channel web of the other of said sides for maintaining a predetermined angle between said sides at said

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corner, and coacting means on said adjacent sides for preventing the removal of said tongue from said U-shape projection, said means including the flanges of the channel of one of said sides lying within and contiguous to the flanges of the channel of the other of said sides, and means carried by said first side engaging the bottom of said U-shape projection, said last mentioned means comprising at least one tongue struck up from said first frame and bent into engagement with the bottom of said U-shape projection.

2. A rectangular frame comprising a continuous length of channel section bent to provide four sides and having the free ends joined at one corner, the channel web of one side at said corner extending beyond its associated flanges and bent inwardly at right angles to said web and then having a return bend outwardly providing a U-shape projection, the web of the other side at said corner extending beyond its associated flanges and being bent back inwardly upon itself to provide a tongue fitting into said U-shape projection, and at least one tongue struck up from the web of said other side and attached to said other side at a distance from said corner substantially equal to the spacing of the bottom of said U-shape projection from said corner, said struck up tongue lying contiguous to the bottom of said U-shape projection and locking said first mentioned tongue into said U-shape projection.

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