April 24, 1962 V. H. WILLIAMS 3,031,047

FILTER FRAME

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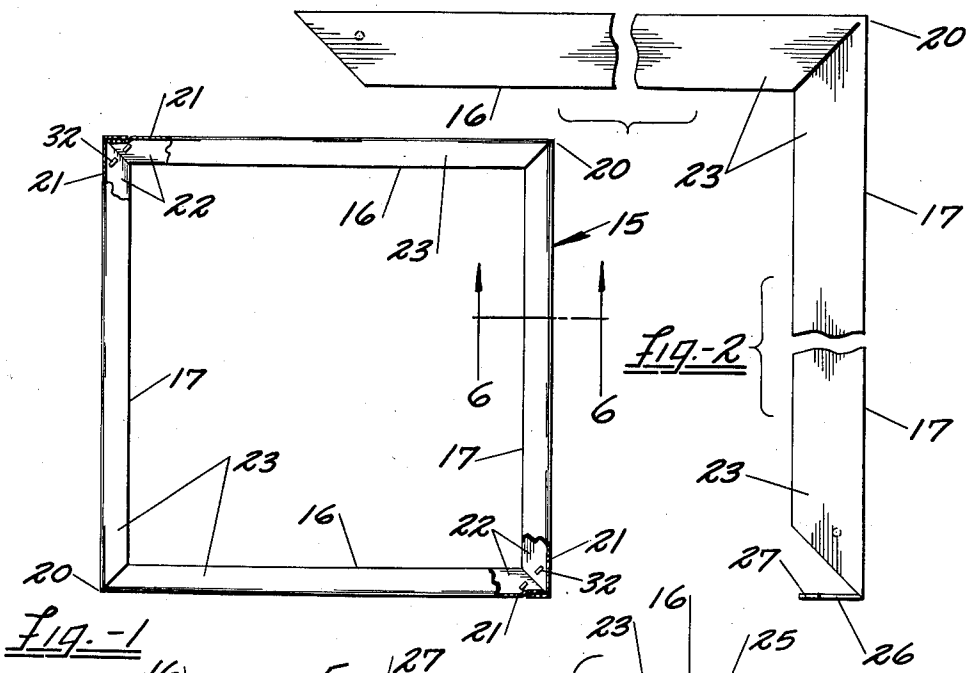


Fig.-1

Fig.-2

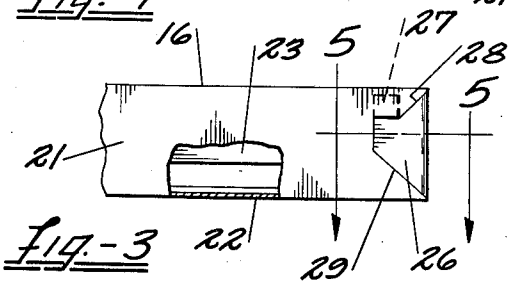


Fig.-3

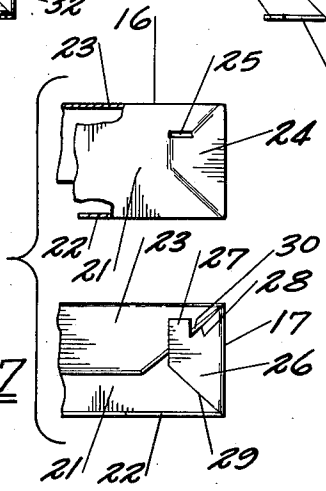


Fig.-7

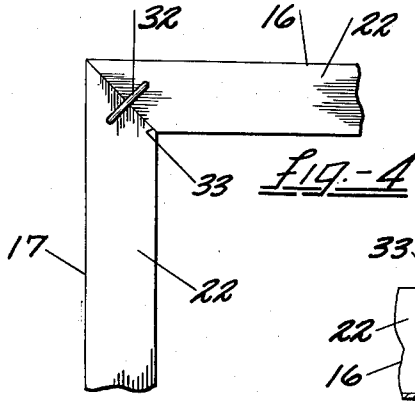


Fig.-4

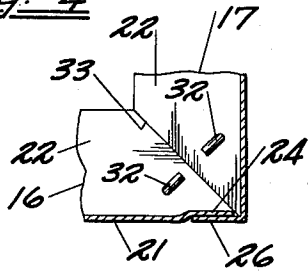


Fig.-5

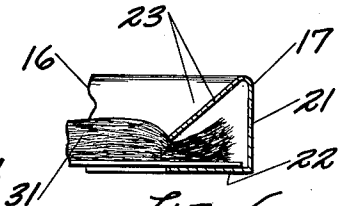


Fig.-6

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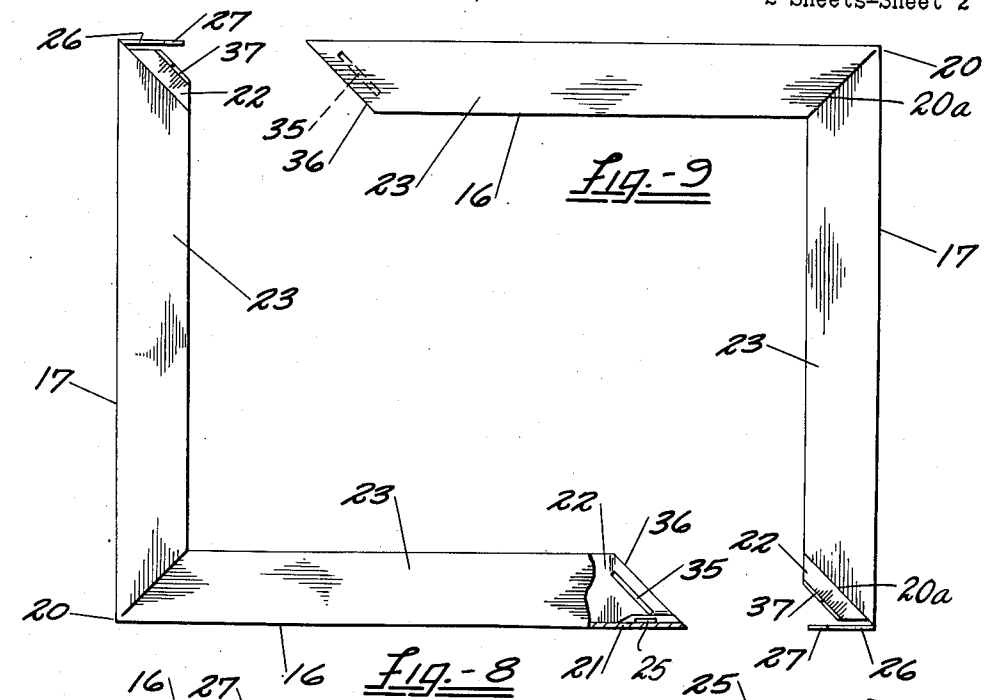


Fig.-9

Fig.-8

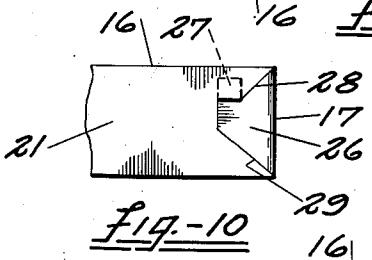


Fig.-10

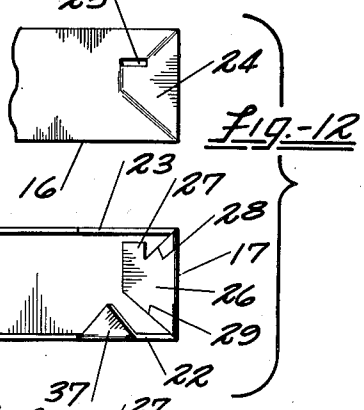


Fig.-12

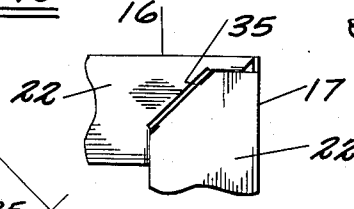


Fig.-11

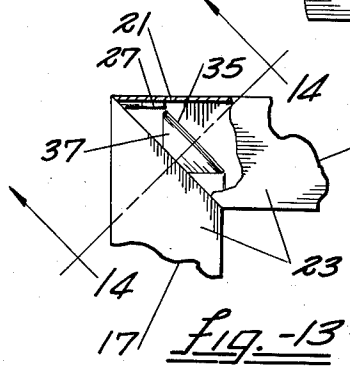


Fig.-13

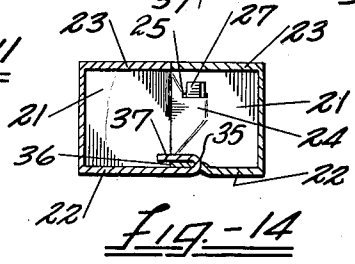


Fig.-14

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FILTER FRAME

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1 Claim. (Cl. 189—36)

This invention relates to a frame such as would be employed for holding a filter body, and relates primarily to the corner construction between opposing ends of frame members.

The frame is composed essentially of rigid channel members and a primary purpose of the invention is to retain those opposing members in rigid interconnection by interengagement of tongues through slots wherein those members are interlocked in such manner as to prevent separation and at the same time reinforce the corner against deformation.

A further important object of the invention resides in a construction wherein no bolts or welds are required to interengage the frame members and to retain them throughout the life of the frame, and wherein relatively simple tools are employed without having to go to excessive die cost in preparing the tools and in forming the frame members.

These and other objects and advantages of the invention will become apparent to those versed in the art in the following description of particular forms of the invention as illustrated in the accompanying drawings, in which

FIG. 1 is a view in top plan with parts in section of a frame embodying the invention;

FIG. 2 is a view in top plan on an enlarged scale of a pair of interconnected legs of the frame;

FIG. 3 is a view in elevation of the corner construction embodying the invention, and in partial section;

FIG. 4 is a view in bottom plan of the corner construction;

FIG. 5 is a view in detail in section on the line 5—5 in FIG. 3;

FIG. 6 is a view in section on the line 6—6 in FIG. 1 with a fragmentary portion of the filter body engaged with the frame;

FIG. 7 is an exploded view in elevation of the ends of two frame members prior to interconnection;

FIG. 8 is a view of a slightly modified form of a pair of frame legs in plan and partial section;

FIG. 9 is a view in top plan of a complementary pair of frame legs;

FIG. 10 is a view of an assembled corner embodying the invention;

FIG. 11 is a view in bottom plan of the assembled corner;

FIG. 12 is an exploded view of the adjacent corner parts in disassembled relation;

FIG. 13 is a view in top plan and partial section of the corner construction; and

FIG. 14 is a view in section on the line 14—14 in FIG. 13.

The frame generally indicated by the numeral 15 is polygonal in shape, and for the sake of simplicity and clarity in the present showing, is illustrated and described as being rectangular in shape. The frame 15 is made up of a plurality of pairs of sides or legs 16 and 17, integrally interconnected at a corner 20, and extending therefrom in diagonal abutment one with the other on the line 20*a* between the sides dependent upon the shape of the polygon, herein shown for the rectangular shape as being 90 degrees.

Each pair of legs 16 and 17, FIG. 1, has a boundary or intermediate plate 21 from the under edge of which

extends a flange 22, and from along the upper edge of which extends a flange 23.

The leg 16 at its free end, FIGS. 5 and 7, has an indented or recessed area 24, through an upper portion of which there is a slot 25. The free end of the leg 17 is provided with an arm 26 turned from the boundary plate 21 at right angles thereto for the rectangular shape frame, and carries an upwardly directed tongue 27, toward which the arm slopes by the upper line 28 and by the lower line 29. The combination of the tongue 27 and the line 28 defines a V notch 30 therebetween. The arm 26 exclusive of the tongue 27 fits over the recessed area 24 to have its outer side substantially in the plane of the outer side of the plate 21 of the leg 16 when the arm 26 is laid thereover and has the tongue 27 inserted through the slot 25 to extend upwardly on the inner side of the plate 21 of the leg 16. By this interconnection of the two end portions of the legs 16 and 17, the corner is maintained by holding the legs 16 and 17 in a fixed relationship.

When the frame 15 is employed as a filtering medium frame, the filtering body 31 is laid by its marginal edge portions over the lower flange 22, and then the upper flange 23 on each of the separate legs is pressed downwardly into the angular disposition as indicated in FIG. 6 so as to compress the marginal portions of the body 31 and retain that body in a fixed position within the frame 15. As means insuring that the interconnection be maintained between the respective legs, a staple 32 may be passed through adjacent ends of the lower flange 22 in each instance across the diagonal dividing line 33, FIG. 4, one staple being used at each of the corners. The staple 32 prevents the vertical separation of the two free ends one from the other by sliding of the tongue 27 out of the slot 25.

Referring to FIGS. 8–14, the staple 32 may be omitted by employing the structure shown in these views. In this modified form, the top flange 23 is slightly shorter than the lower flange 22 in side member 17, so that end portions of the flange 22 extend slightly beyond the diagonal line 20*a* of the flange 23, FIGS. 8 and 9. The flange 22 at the free end portion of each leg 16 is provided with a diagonally disposed slot 35, spaced from the edge 36, FIGS. 8 and 9. The free corner of the flange 22 at the free end of the leg 17 is turned upwardly from the flange 22, defining a tongue 37 triangular in shape.

As the tongue 27 of arm 26 is inserted through the slot 25 in the boundary plate 21, the triangular tongue 37 is inserted upwardly through the flange slot 35, and then, preferably, the tongue 37 is bent over the end of the flange 22 extending from that slot to the edge 36, FIG. 14. By use of this structure, the corner is thus made to be non-releasable since the bent over tongue 37 prevents withdrawal of both the tongues 27 and 37 from their respective slots 25 and 35.

Therefore it is to be seen that I have presented a simple corner structure for a channel member wherein two of the channel members are brought together, and while I have described the invention in the specific forms, it is obvious that structural variations may be had in that construction without departing from the spirit of the invention, and I therefore do not desire to be limited to those precise forms beyond the limitations which may be imposed by the following claim.

I claim:

A metal frame corner construction comprising one side member generally U-shaped and having a pair of vertically spaced apart, substantially parallel flanges extending approximately at right angles from opposite edges of an intermediate plate as upper and lower flanges; the upper flange having an end disposed at approximately forty-five degrees to said plate, the lower flange of said one side

member being longer than the upper flange and having an end with major portion thereof terminating on a line at forty-five degrees to said plate, parallel to the top flange end; a generally triangularly shaped plate portion extending approximately at a right angle from an end of the plate adjacent said flange ends; a generally rectangular tongue extending upwardly from said plate portion; a second U-shaped side member comprising an intermediate plate and from opposite edge portions thereof extend respectively parallel, spaced apart upper and lower flanges, common ends of which terminate in lines each approximately forty-five degrees to the second member plate, the top flange end abutting the forty-five degree end of the first member top flange end; the triangular plate portion of said first member extending along the outerside of the plate of the second member; said second plate member having a slot therethrough the margins of which are approximately parallel to said flanges and through which slot said rectangular tongue extends upwardly; the lower flange of said second member having a slot therethrough adjacent to and aligned with the flange forty-five degree

line; and a tongue extending upwardly from the forty-five degree line of the lower flange of the first side member through said second member slot and thence around and over against a portion of the inner side of said lower flange beyond said last slot; the end portion of the lower flange of the first side member overlapping in part the end portion of the lower flange of the second side member.

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