May 21, 1957 A. J. OLSEN 2,792,918

KNOCK-DOWN METAL FRAME CONSTRUCTION

Filed July 5, 1955 2 Sheets-Sheet 1

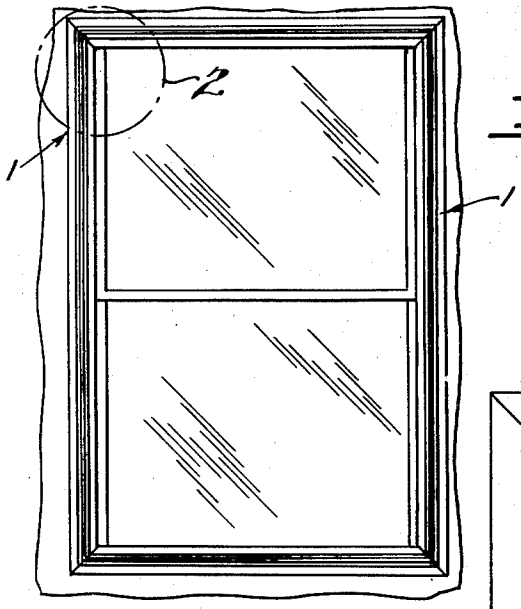


FIG. 1.

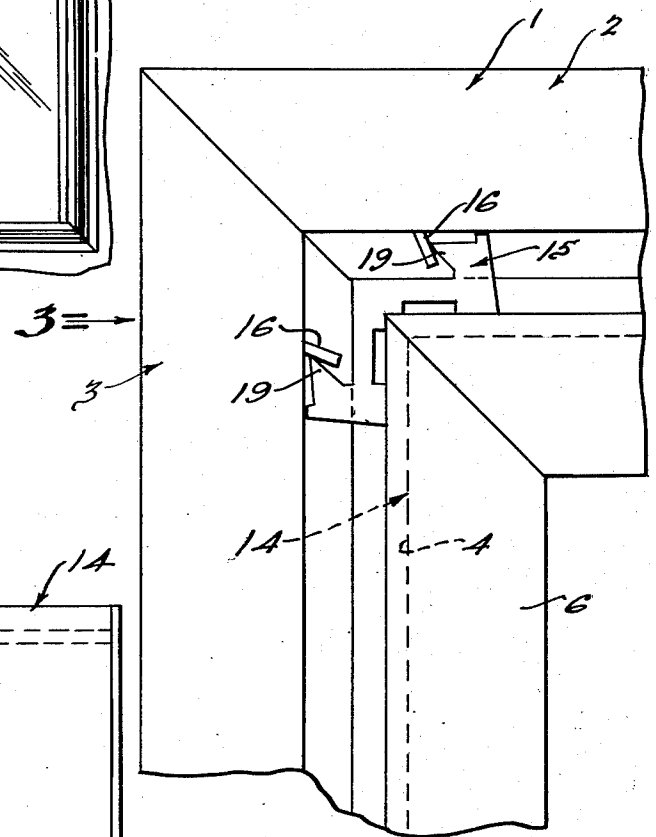


FIG. 2.

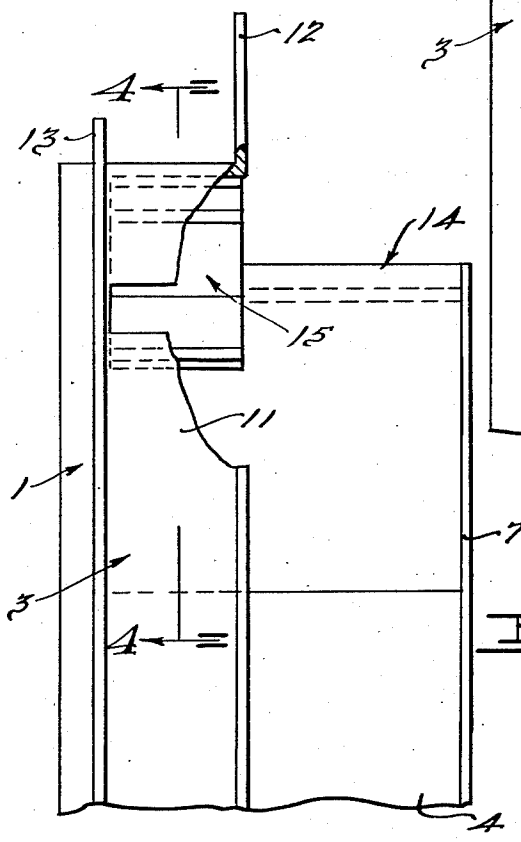


FIG. 3.

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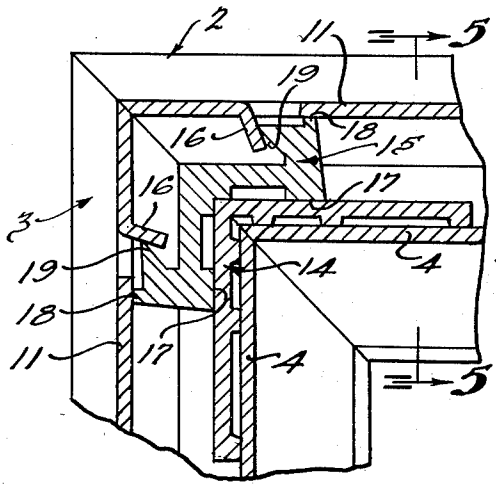


FIG. 4.

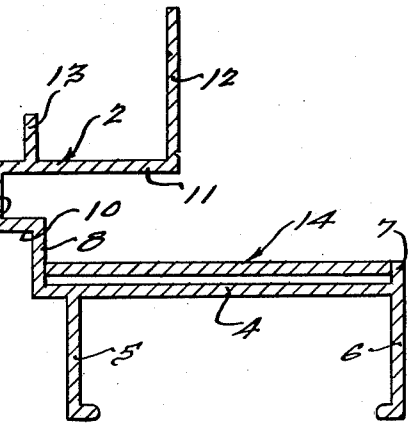


FIG. 5.

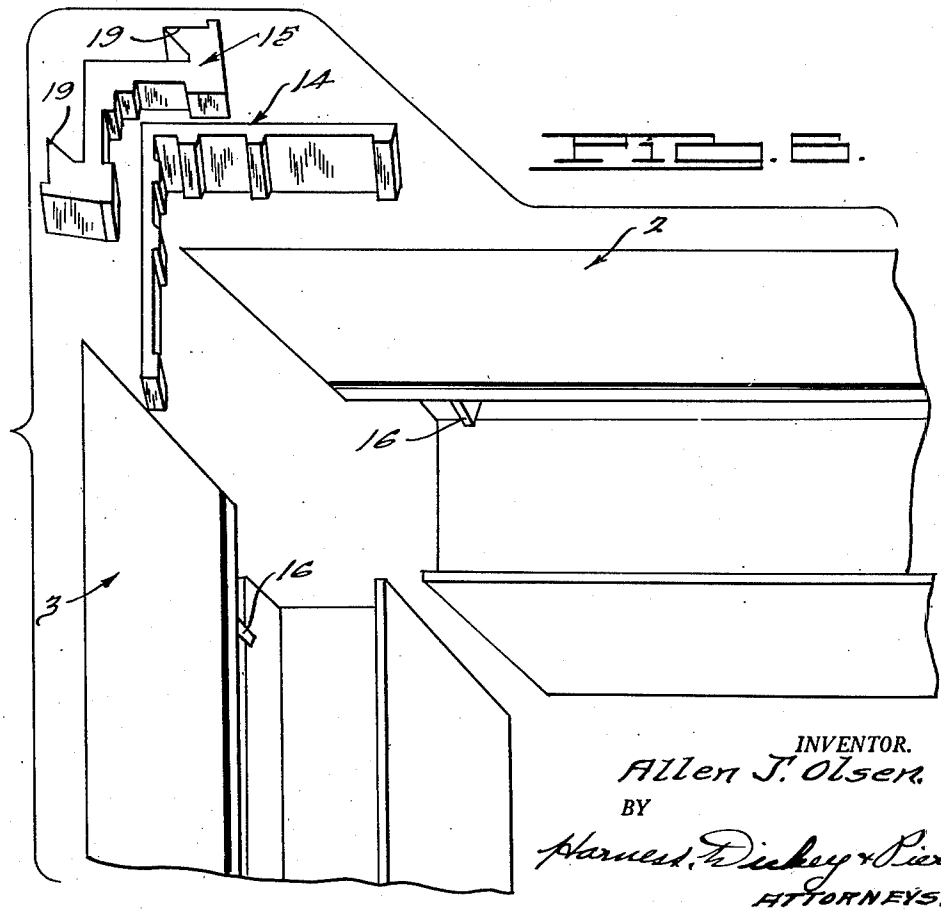


FIG. 6.

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United States Patent Office 2,792,918 Patented May 21, 1957

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KNOCK-DOWN METAL FRAME CONSTRUCTION

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Application July 5, 1955, Serial No. 519,784

6 Claims. (Cl. 189—36)

The present invention relates to metal window frame constructions, and particularly relates to a knock-down corner frame assembly.

In the construction of metal window frames, it is desirable for economies in merchandising over wide geographical areas that the elements forming the frame be shipped knocked down. Such knocked-down elements are then assembled in the localities in which they are sold and used, usually in comparatively small shops. Heretofore the assembly of such elements has been rather complex, in that special and complicated tools are required to effect the assembly.

One of the primary objects of the present invention is to provide a knock-down corner assembly so that the frame elements may be shipped knocked down, and readily assembled with the use of the most elementary tools available in any shop, such as a hammer.

A further object of the invention is to provide a knock-down corner assembly of the type mentioned above which, when assembled, provides an exceptionally rugged and strong corner joint.

Other objects of the invention will become apparent from the present specification, the drawings relating thereto and from the claims hereinafter set forth.

In the drawings in which like numerals are used to designate like parts in the several views throughout:

Figure 1 is an elevational view of an assembled window frame construction which embodies features of the present invention;

Fig. 2 is an enlarged, fragmentary elevational view from the rear and within the circle 2 of Fig. 1, showing one of the corners, it being understood that all of the corners are substantially identical;

Fig. 3 is a side elevational view with parts broken away taken substantially in the direction of the arrow 3 of Fig. 2;

Fig. 4 is a cross-sectional view taken substantially along the line 4—4 of Fig. 3;

Fig. 5 is a cross-sectional view taken susbtantially along the line 5—5 of Fig. 4;

Fig. 6 is an exploded and separated perspective view of the corner elements before assembly.

Referring to the drawings, a metal window frame assembly is generally indicated at 1, and such assembly comprises frame elements having mitered corners forming the sides, tops and bottoms of the frame, and shown in Fig. 1 in their assembled relationship.

The frame elements of the present invention are illustrated as being aluminum extrusions, but it is to be understood that the inventive concept is applicable to other corner assemblies.

In the embodiment illustrated, the frame assembly comprises for each corner a pair of frame elements 2 and 3 having mitered corner portions which are adapted to be secured together in right-angular relationship. The frame elements 2 and 3 are, in the emobdiment illustrated, aluminum extrusions, and are of the desired cross-sectional configuration, one of such configurations being best shown in Fig. 5.

The cross-sectional configuration of elements 2 and 3 are the same and, in the embodiment illustrated, each element has a first wall or web portion 4 having laterally projecting flanges 5 and 6 which form a channel to carry sliding window tracks (not shown). The wall portion 4 has oppositely directed flanges 7 and 8 at opposite ends to provide a channel therebetween for a purpose that will be described hereinafter. The flange 8 terminates in an offset portion 9 which forms therewith a storm or screen reveal 10. Each section has a second wall portion 11, which is integral with the end of the offset portion 9, and which is parallel to the first wall portion 4, but of less height. The second wall portion 11 has a laterally projecting flange 12, which serves to attach the window frame to the adjacent building sections and, in the embodiment illustrated, also has a laterally projecting plaster mold flange 13.

It will be understood that the particular configuration of the sections may be varied, the one shown being merely illustrative and, so far as the present invention is concerned, the significant portions thereof being the parallel first and second walls 4 and 11 with the flanges 7 and 8 integral with the wall 4 to provide a channel therebetween.

As stated above, the frame elements 2 and 3 are shipped knocked down and are assembled by means of securing angle members generally indicated at 14 and 15.

The member 14 is a right-angle metal member having a height substantially the same as the height of the wall 4, as best seen in Figs. 3 and 5. The member 14 may have portions of the metal removed to form ribs on the inside surface for weight saving purposes, as shown in Figs. 4 and 6, so that the inner surfaces of such ribs are adapted to engage the adjacent faces of the wall portions 4 of frame elements 2 and 3 adjacent the corners. In assembly, one of the legs of the angle member 14 is slid into the channel of member 2, lengthwise thereof, so that it bears against the adjacent face of member 2, and the edges thereof abut against the adjacent surfaces of flanges 7 and 8. The opposite leg of the angle member is likewise slid into the corresponding channel in frame element 3. The mitered corners are then brought closely together, and the elements 2 and 3 are held by the angle member 14 against displacement relative to each other in a direction substantially parallel to the web or wall 4.

The member 15, when positioned, serves to lock the elements 2 and 3 against angular displacement or separation. In order to accomplish this, the wall 11 of each of the elements 2 and 3 is preformed with an instruck or offset tab 16, which provides cam elements in relation to each other.

The member 15 is a right-angular member having portions of the inner surface removed to save weight, and provided with inner surface portions 17, which form a corner adapted to bear against the adjacent faces of the member 14 when positioned. A member 15 has a width substantially equal to the space between the angle member 14 and the adjacent wall 11, so that it has outer surfaces 18, which bear against the adjacent walls 11 when in position. The member 15 is also formed with integral cam surfaces or projections 19, which are adapted to bear against and wedge against the elements 16 when assembled, as best shown in Fig. 4.

When the frame sections 2 and 3 and the angle element 14 are assembled as described above, the element 15, which has substantially the same height as the wall 11, is disposed around the mitered corner in the position shown in Fig. 4, and is then slid down or driven down by a hammer, if necessary, in a direction substantially parallel to the walls 4. The cam surfaces 19 are then in such a position that they wedge against the cam element 16, as shown in Fig. 4, and the surfaces 17 and 18 are bearing against the adjacent surfaces, as shown in Fig. 4,

so that a secure interlock is provided which would prevent separation or angular movement of the frame elements 2 and 3.

It is pointed out that, in some installations, the interlock may be effected without the angle member 14, although such element is used to give best results. In such a case, the element 15 would then have a width such that the inner surface 17 would bear against the adjacent surface of wall 4.

Formal changes may be made in the specific embodiments of the invention described without departing from the spirit of the invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. A knock-down corner frame assembly comprising a pair of mitered corner elements secured together in angular relationship, each of said elements having a first wall portion provided with overhanging flanges forming adjacent channels when assembled, each of said elements having a second wall portion substantially parallel to said first wall portion, a preformed cam element formed in each of said second wall portions, an angle corner member received within said channels in engagement with said first wall portions and their overhanging flanges, an interlocking angle element having cam surfaces engaging said cam elements and bearing against said angle corner member to thereby secure said corner elements in said angular relationship.

2. A knock-down corner frame assembly comprising a pair of mitered corner elements secured together in angular relationship, each of said elements having a first wall portion provided with overhanging flanges forming adjacent channels when assembled, each of said elements having a second wall portion substantially parallel to said first wall portion, a preformed offset tab formed in each of said second wall portions forming camming elements, an angle corner member received within said channels in engagement with said first wall portions and their overhanging flanges, an interlocking angle element having cam surfaces engaging said cam elements in wedging relationship and bearing against said angle corner member to thereby secure said corner elements in said angular relationship.

3. A knock-down corner frame assembly comprising a pair of mitered corner elements secured together in angular relationship, each of said elements having a first wall portion provided with overhanging flanges forming adjacent channels when assembled, each of said elements having a second wall portion substantially parallel to said first wall portion, a cam element formed in each of said second wall portions, an angle corner member slidably received endwise within said channels in engagement with said first wall portions and their overhanging flanges, an interlocking angle element having cam surfaces slidably positioned in a direction substantially parallel to said wall portions and engaging said cam elements in wedging relationship and bearing against said angle corner member to thereby secure said corner elements in said angular relationship.

4. A knock-down corner frame assembly comprising a pair of mitered corner elements secured together in angular relationship, each of said elements having a first wall portion provided with overhanging flanges forming adjacent channels when assembled, each of said elements

having a second wall portion substantially parallel to said first wall portion, a cam element formed in each of said second wall portions, an angle corner member received within said channels in engagement with said first wall portions and their overhanging flanges, an interlocking angle element having cam surfaces engaging said cam elements in wedging relationship and bearing against said second wall portion and angle corner member to thereby secure said corner elements in said angular relationship.

5. A knock-down corner frame assembly comprising a pair of frame elements having mitered corner portions secured together in angular relationship, each of said elements having a first wall portion provided with overhanging flanges forming adjacent channels when assembled, each of said elements having a second wall portion substantially parallel to said first wall portion and of less height, a preformed and offset cam element formed in each of said second wall portions, an angle corner member having a height substantially the same as said first wall portion and slidably received endwise within said channels in engagement with said first wall portions and their overhanging flanges, an interlocking angle element having a height substantially the same as said second wall portion and having cam surfaces slidably positioned in a direction substantially parallel to said wall portions and engaging said cam elements in wedging relationship and bearing against said angle corner member to thereby secure said frame elements in said angular relationship.

6. A knock-down corner frame assembly comprising a pair of frame elements having mitered corner portions secured together in angular relationship, each of said elements having a first wall portion provided with overhanging flanges forming adjacent channels when assembled, each of said elements having a second wall portion substantially parallel to said first wall portion and of less height, a preformed and offset cam element formed in each of said second wall portions adjacent said mitered corners, an angle corner member having a height substantially the same as said first wall portion and slidably received endwise within said channels in engagement with said first wall portions and their overhanging flanges to hold said elements against displacement in a direction transverse to the lengths thereof, an interlocking angle element having a height substantially the same as said second wall portion and having cam surfaces slidably positioned in a direction substantially parallel to said wall portions and engaging said cam elements in wedging relationship and bearing against said second wall portion and said angle corner member to thereby secure said frame elements in said angular relationship against angular separation.

References Cited in the file of this patent

UNITED STATES PATENTS

2,092,552	Larrick	Sept. 7, 1937
2,101,349	Sharp	Dec. 7, 1937

FOREIGN PATENTS

245,035	Great Britain	Dec. 31, 1925
1,084,079	France	June 30, 1954