Oct. 11, 1960 K. R. M. KARLSTROM 2,955,688

LOCKING DEVICE

Filed June 4, 1958

FIG. 1

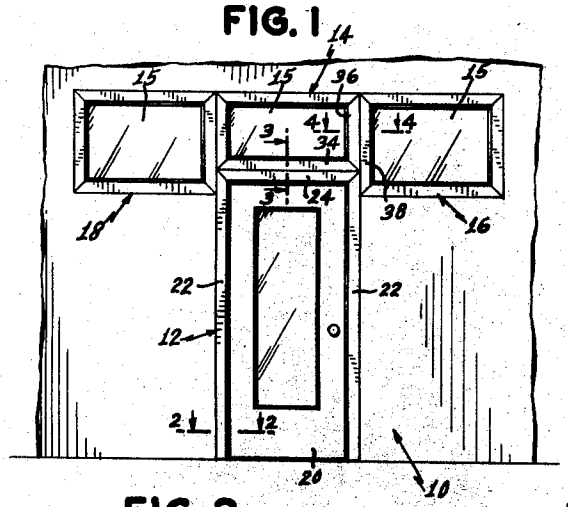


FIG. 3

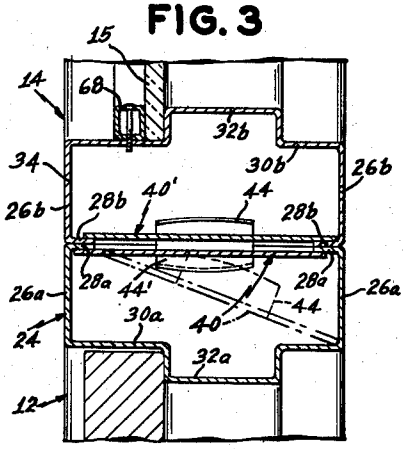


FIG. 2

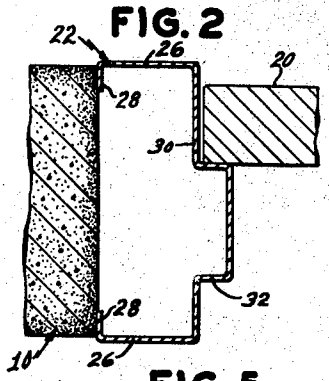


FIG. 4

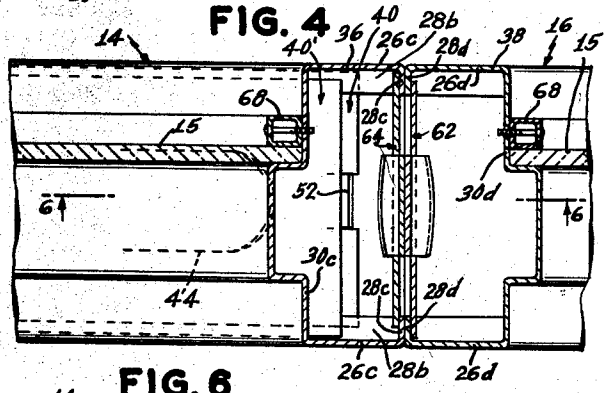


FIG. 5

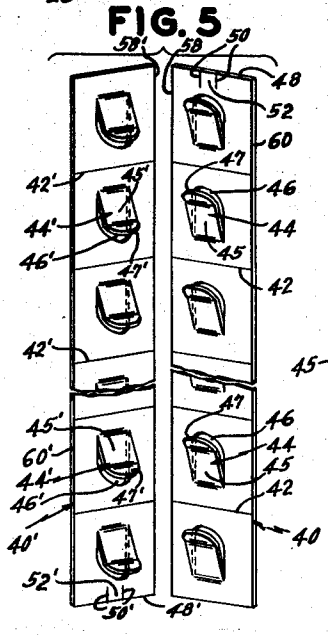
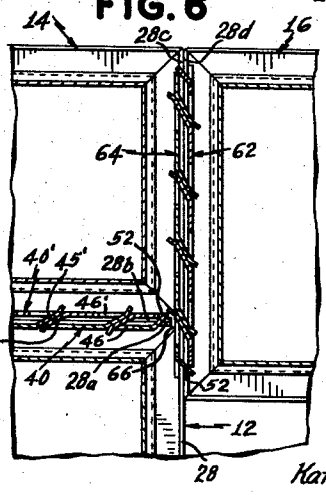


FIG. 6



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LOCKING DEVICE

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7 Claims. (Cl. 189—36)

This invention relates to building walls and more particularly to means for securing prefabricated wall parts to each other in the wall. The invention is also applicable more generally to structures comprising a plurality of units which are secured to each other in the structure.

One object of the present invention is the provision of generally improved means for interlocking a plurality of wall members.

Another object is the provision of locking means for a plurality of members which dispense with the necessity of auxiliary locking parts such as screws or bolts.

Another object of the present invention is the provision of locking means of generally improved construction and design and especially adapted for use in interlocking a plurality of framed panel units of a wall or other structure such as door jambs, window frames, transom panels, etc.

Another object is the provision of means for quickly and easily interconnecting a plurality of wall members in a building wall.

Another object is the provision of means for locking a plurality of structure members, which locking means are disposed internally of said structure members and concealed from view.

A further object is to provide a pair of locking strips having interengaging cooperating parts in fixed relation therewith, respectively, for securely interlocking said strips, without the use of auxiliary locking elements, for securing wall members to each other in a building wall.

The locking means of the present invention are adaptable for use in internal wall structures, such as partitions, as well as in external wall structures. Other structures, unrelated to walls or the like, such as metal frame furniture units, are equally adaptable to be interlocked in accordance with the locking means of the invention.

The above and other objects, features and advantages of the present invention will be more fully understood from the following description, considered in connection with the accompanying illustrative drawings:

In the drawings:

Fig. 1 is an elevation view of part of a wall provided with a plurality of panel assemblies interlocked in accordance with the invention;

Fig. 2 is a sectional view, on a larger scale, on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view, on a larger scale, on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view, on a larger scale, on the line 4—4 of Fig. 1;

Fig. 5 is a perspective view of a pair of locking strips according to the invention;

Fig. 6 is a sectional view on line 6—6 of Fig. 4.

Referring to Fig. 1 there is shown part of a wall 10 in which there are provided a plurality of panel assemblies 12, 14, 16 and 18 interlocked with each other by the locking means of the present invention. As here shown, panel assembly or wall member 12 comprises a metal door frame or jamb for a door 20; panel assembly

14 comprises a transom, and panel assemblies 16 and 18 may comprise, for example, additional windows.

Panel assembly 12 comprises a pair of opposite vertical frame sections 22—22 interconnected at their upper ends by horizontal frame section 24. Each of said frame sections is of similar construction and comprises, as best shown in Figure 2, opposite side walls 26—26 terminating at the outer ends in inturned flanges 28—28, and joined at the inner ends by inner wall 30, the latter having a laterally offset intermediate portion 32 which serves as a door stop for door 20. As shown in Figure 3, horizontal frame section 24 is similarly provided with opposite side walls 26*a*—26*a*, inturned flanges 28*a*—28*a* and inner wall 30*a* provided with portion 32*a*.

Each of panel assemblies 14, 16 and 18 comprises opposite vertical and horizontal frame sections of construction identical to frame sections 22 and 24 of panel assembly 12, except for the longitudinal extent thereof which is obviously governed by the size of the respective panels. As shown in Fig. 3 lower horizontal frame section 34 of panel 14 comprises sidewalls 26*b*—26*b*, inturned flanges 28*b*—28*b*, and inner wall 30*b* provided with portion 32*b* which acts as a stop for glass panel 15. Also as seen in Fig. 4, vertical frame section 36 of panel 14 comprises sidewalls 26*c*—26*c*, inturned flanges 28*c*—28*c*, inner wall 30*c*, and vertical frame section 38 of panel 16 comprises sidewalls 26*d*—26*d*, inturned flanges 28*d*—28*d*, and inner wall 30*d*.

Referring now to Figure 5, there is shown a pair of locking members 40, 40′ for interconnecting the wall panels or frame units to each other. Each of the locking members 40, 40′ comprises a longitudinally extending metal strip provided with equally spaced break-off indentations 42, 42′ so that the strips 40, 40′ may be broken off to the desired length. Each of strips 40, 40′ is provided with a struck out tongue 44, 44′ between each pair of adjacent indentations whereby to define in each of said strips a plurality of aligned equally spaced inclined tongues 44, 44′ associated respectively, with complementary aligned equally spaced slots 46, 46′. Each of tongues 44, 44′ comprises a main portion 45, 45′ inclined from the plane of the associated strip an equal amount, and an outer portion 47, 47′ inclined from the associated main portion 45, 45′, respectively. As shown in Figure 5, each of end edges 48, 48′ of strips 40, 40′ which confronts the free end of the adjacent tongue 44, 44′, respectively, is provided with a pair of hacksaw cuts 50—50, 50′—50′, respectively, defining portions 52—52′ therebetween the purpose of which will be hereinafter made clear. The tongues 44 and 44′ as shown are asymmetrically disposed between side edges 58—60 and 58′—60′ of strips 40 and 40′, respectively, tongue 44 being nearer side edge 58 than side edge 60 and tongue 44′ being nearer side edge 60′ than side edge 58′, the purpose for said asymmetrical arrangement to be hereinafter set forth.

In order to interlock two panels they are disposed with their inturned flanges 28 in abutting relation. As shown in Figure 3, which illustrates the method of interconnecting panels 12 and 14, frame section 34 is disposed on top of frame section 24 so that inturned flanges 28*b*—28*b* are in abutment with corresponding inturned flanges 28*a*—28*a*, respectively. One of the strips of the pair 40—40′ is inserted into each of the frames which are to be assembled. As seen in Figure 3, strip 40 is inserted into frame section 24 in an inclined position as shown by the dashed lines, and then moved to the position shown by the full lines so that the tongues 44 protrude through the space between inturned flanges 28*a*—28*a* and the side portions of strip 40 are in abutment with the inner surfaces of said flanges. Strip 40′ is similarly inserted in frame section 34, with tongues 44′ thereof opposed to tongues 44 of strip 40. Strips

40 and 40' are moved toward each other lengthwise thereof so that the tongues of each strip are fed into the slots of the opposing strip, in abutment with the tongues of said opposing strip, outer portions 47, 47' facilitating said feeding. The ends of the strips are rapped with a hammer and the binding angle of the tongue creates a clamping action on the back surfaces of the respective strips, thereby securely interlocking frame sections 24 and 34. Portions 52 and 52' are now bent between the respective hack-saw cuts 50—50 and 50'—50', toward the opposing strip, to thereby provide end locks and prevent relative longitudinal motion between the interlocked strips, as best shown in Figure 6. The width of the respective strips 40, 40' is greater than the distance between the inturned flanges of the associated frame section, and due to the asymmetrical disposition of the tongues 44 and 44' in the respective strips 40 and 40', the overall width of the interlocked strips is greater than the width of each strip, and almost equal to the spacing between the sidewalls 26*a*—26*a* or 26*b*—26*b* of the respective frame sections whereby to prevent lateral or twisting movement of said interlocked strips within said frame sections.

It will be understood that after the adjacent frame parts are secured to each other by the companion locking strips 40, 40', the glass or other panels 15 are inserted in the frames and held in position by metal retaining strips 68 fastened to the frame members by screws or in any other suitable way.

Referring to Figures 4 and 6, there is shown the interconnection and interlocking of panel unit 16 to panels 12 and 14 by means of locking strips 62 and 64 which are similar to locking strips 40 and 40', respectively, in all respects except the longitudinal extents thereof which are governed by the size of the respective panels. It is noted however that due to the relative heights of panels 14 and 16, locking strip 62 is in abutment with the inner surfaces of the inturned flanges 28*d* of panel 16 only, while locking strip 64 extends below panel 14 and is in abutment with the inner flanges 28*c* of panel 14 as well as with inner flanges 28 of panel 12, slots 66 being provided in inturned flanges 28*b* to allow passage therethrough of locking strip 64. It will be apparent that additional panels might be provided below panel 16 and be interlocked with panels 12 and 14 by merely providing locking strips of greater length.

Panel 18 is connected to panels 12 and 14 in exactly the same manner as described above in connection with the interlocking of panel 16 to panels 12 and 14.

Thus it is seen that the locking means of the present invention are well suited for interconnecting any number of structures whether they be disposed above one another, or in side by side relation. It is further seen that the locking means of the invention comprises only a pair of strips of simple construction and design, and that the interlocking thereof does not require the utilization of any additional locking elements. The locking strips are disposed internally of the frame sections and are thus concealed from view.

While the present invention has been described in connection with structures of the type that are provided in walls, it will be apparent that the locking means of the present invention are equally adaptable for use in connecting and interlocking structures of any type which are provided with peripheral frame sections having spaced outer parts so that one locking strip may be disposed in abutting relation with the inner surfaces of the outer parts of one of said panels and the tongues of said locking strip protrude between said spaced parts for engaging the slots of a complementary locking strip similarly disposed with respect to one or more of others of said panel units.

While I have shown and described the preferred embodiments of my invention, it will be understood that various changes may be made in the present invention without departing from the underlying idea or principles of the invention within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

1. In a structure of the type described, a pair of adjacent frame members disposed in abutting edge to edge relation, each of said frame members having a pair of flanges extending toward the adjacent member and terminating at their ends in coplanar inturned portions, the outer surfaces of said inturned portions of one frame member being in abutment with the outer surfaces of the inturned portions of the adjacent frame member, and means disposed inwardly of said inturned portions in abutting relation with the inner surfaces of said inturned portions connecting adjacent frame members together, said connecting means comprising a pair of separate members, each of said separate members having integral locking means engaging the locking means of the other separate member, thereby engaging said separate members together and connecting said adjacent frame members together.

2. In a structure as defined in claim 1, in which said locking means comprises interlocking elements engaging each other in overlapping relation to clamp said separate members together.

3. In a structure as defined in claim 1, in which said locking means comprises struck-out tongues and resulting openings formed in each of said separate members, said struck-out tongues of each of said members being interlocked with said resulting openings of the other of said members.

4. In a structure as defined in claim 1, in which each of said separate members is provided with second locking means engaging the other of said separate members to prevent longitudinal movement of said separate members relative to each other.

5. In a structure as defined in claim 1, in which one of said separate members is provided at one end thereof with a projecting portion engaging the corresponding end of the other of said separate members to prevent longitudinal movement of said separate members relative to each other.

6. In a structure as defined in claim 1, in which each of said separate members comprises an elongated strip, each of said strips having the same width and said locking means being unequally spaced from the respective side edges of the associated strip, whereby the over-all width of the interlocked strips is substantially equal to the space between the flanges of a frame member and is greater than the width of the individual strips.

7. In a structure as defined in claim 3, in which each of said separate members is an elongated strip and is provided with transversely extending break-off indentations between adjacent tongues, whereby said strips may be broken off to the desired length.

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