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FASTENING MEANS FOR BUILDING CONSTRUCTION

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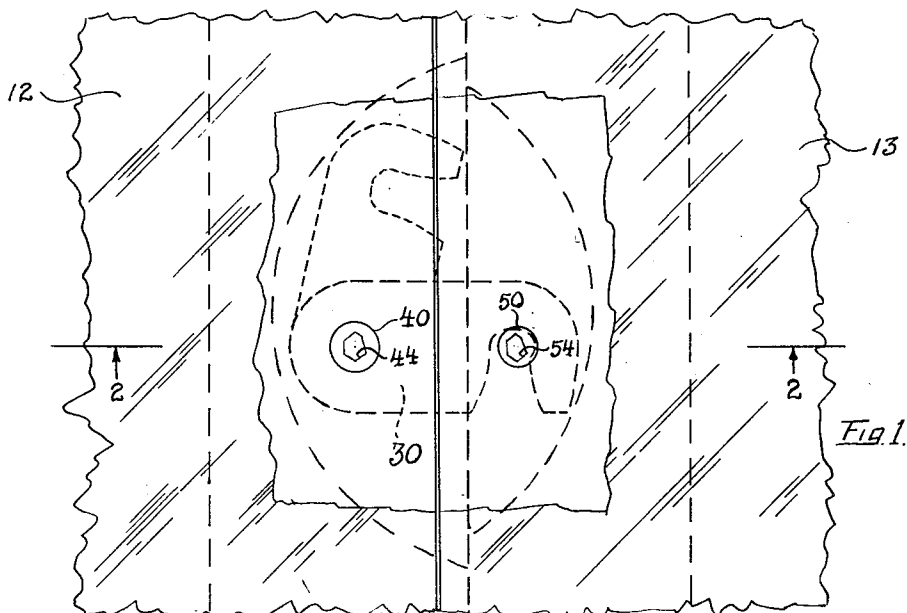


Fig. 1.

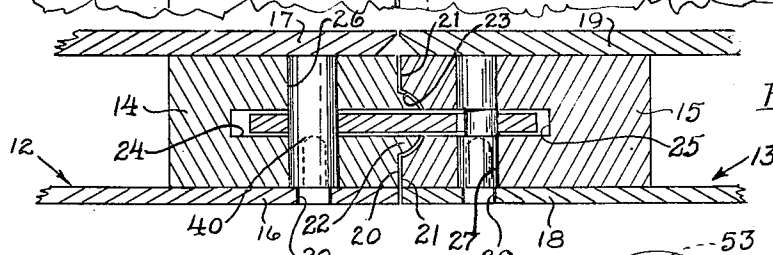


Fig. 2.

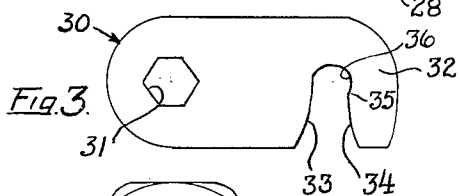
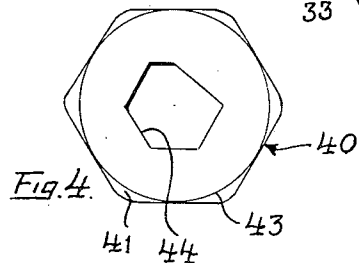
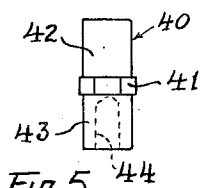


Fig. 5.

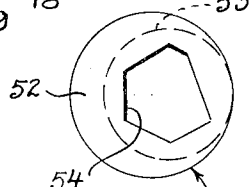


Fig. 6.

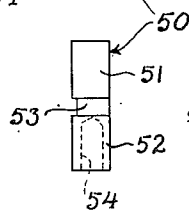


Fig. 7.

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FASTENING MEANS FOR BUILDING
CONSTRUCTION

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8 Claims. (Cl. 20—92)

This invention relates to fastening means for building construction, and more particularly to fastening means for securing together adjacent wall panels, partition or floor sections, or other portions of a building construction, for example a prefabricated house or a boat, pontoon, trailer, etc. In the following description of an illustrative embodiment of my invention, the words "building construction" are used in the generic sense to indicate any type of structure comprising a number of parts adapted to be secured together to form the whole.

Objects of this invention are to provide fastening means which may be built into the portions of a structure before assembly, which will not protrude from the structural units in transportation, which will be securely and positively held against being lost out of the structure, and which may be actuated—either for fastening or unfastening—from without the structural member wherein contained, with only a small circular surface opening or openings required for access.

Further objects are to provide installation for the fastening elements which shall be well adapted to simple machine fabrication, which shall allow of the ready emplacement of the fastening elements, which shall provide a snug fit and at the same time allow free movement of the elements from unfastened relation to fastened relation and vice-versa.

Other objects are to provide positive locking of the fastening means, and to provide means whereby additional tightening means may be employed to draw the assemblies tightly together, with increased leverage, after initial fastening.

Still another object is to provide means whereby the position of the fastening elements may be readily observed in the joined structure.

Still further objects will appear in the course of the detailed description.

In the drawing an illustrative embodiment of my invention is shown, wherein:

Fig. 1 is a front elevation, with parts broken away, of a pair of adjacent panels joined together by my fastening device, which appears in dotted lines in locked position and in retracted position.

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a side elevation of the lock bar;

Fig. 4 is a front view of the bushing or pivot pin, on an enlarged scale;

Fig. 5 is a top view of the same;

Fig. 6 is a front view of the locking pin, on an enlarged scale; and

Fig. 7 is a top view of the same.

In a preferred embodiment as illustrated, adjacent members, as wall sections 12, 13, are made up with framing members 14, 15 such as 2 x 4's along the adjacent edges, with narrow faces opposed, and plywood, wood fiber sheets, or other facing material 16, 17, 18, 19 secured on both the front and back surfaces of both the framing members. The adjacent edges of the framing members are tongue-and-groove shaped, the facing material terminating substantially flush with the shoulders 20, 21 of the tongue 22 and groove 23 respectively.

In a central lengthwise plane the framing members are arcuately cut out forming recesses 24, 25, as by kerfing with a circular saw.

A lock bar 30 has a loose fit within the space formed by these two adjacent kerfs. A pivot pin or bushing 40 is driven into a hole 26 bored through the framing member and through a hole 31 in the pivot end of the lock bar. A locking pin 50 is inserted into a hole 27 bored through the framing member of the other section. Both holes are bored in parallel to each other and perpendicular to the flat faces of the two panel members. In each case the pins are inserted before the facing is applied, and their ends are completely covered on one side, and partially covered on the other side, by the facing material, whereby they cannot come out or have any substantial endwise movement.

Describing the locking members in more detail, as best seen in Figs. 3—7, the lock bar 30 consists of a flat steel bar, generally of the order of $\frac{1}{4}$ inch thick, and being rounded at each end as seen in the front elevation of the assembly. Near the left end (as seen in the drawing) a non-circular hole 31 is provided, running through from front to back face. In one preferred form this hole is hexagonal. The pivot pin 40 may be turned down from hexagonal bar stock of a size to fit nicely in this hole, the center portion 41 of the pivot pin which comes at the saw kerf being of non-circular form, as by being left in original hexagonal form when the pin is formed from hexagonal bar stock, and the ends 42, 43 being turned down to form cylinders fitting nicely in the hole 26 bored through the framing member. The cylindrical portions are tangent with the centers of the hexagonal faces which remain in the center portion. Preferably the points of the hexagonal portion 41 are slightly rounded. After the lock bar is inserted, the pivot pin 40 is started into the hole at the front face. The cylindrical end 42 enters without difficulty, and the pin is then driven in the rest of the way, the hexagonal

points somewhat deforming the surrounding wood of the framing member but its essential shape being left intact and in close fit with the outer cylindrical end 43 of the pivot pin because of the hexagonal portion's sides being tangent with the cylindrical portion. Thus the non-circular portion 41 of the pivot pin 40 engages the non-circular hole 31 in the lock bar, so that the two can only turn together, while the ends of the pivot pin have a snug fit in the hole through the framing member. By turning the pivot pin, as will be later described, the lock bar is thus swung about the axis of the pivot pin.

At the other end of the lock bar a hook 32 is formed by making a cut up from the bottom of the lock bar, the edge 33 of this cut nearer the pivot pin being on a radius substantially centered at the lock pin axis, and its right edge 34 being reversely curved. The top of the cut has its far edge spaced farther from the pivot pin axis than is this curve below that location, leaving a projection 35, and above it a cut-back 36. The cut-back 36 thus formed is preferably formed with the same radius as the central portion of the locking pin, and extends farther back from the pivot pin axis than the adjacent portion below, of the curved edge 34.

The locking pin 50 is generally cylindrical, as seen at end portions 51, 52, of a size to fit snugly in the hole 27 provided for it in the framing member, but its central part 53 which comes at the saw kerf is shaped as a cylinder eccentric to the main body, conveniently by turning down this portion eccentrically.

Provision is made for rotating the pivot pin, and thereby the lock bar, and also for rotating the locking pin. This is by providing a non-circular aperture 44 within one end of the pivot pin, and likewise a non-circular aperture 54 within one end of the locking pin. At the face where these apertures are provided the facing material has holes 28, 29 bored in it of a size large enough to expose the apertures yet small enough to partially overlie the ends of the pins. A key can then be inserted in the apertures to rotate the members.

This construction is particularly well adapted for prefabricated houses, boats, pontoons, canoes, trailers or other structures, capable of being shipped in knockdown condition and assembled on the site. Later disassembly, reshipment, and reassembly on another site are particularly facilitated by this invention. With this construction there is practically no disturbing of the parts of the structure, trim, and decoration, other than the separation at the intended joints.

In shipment the lock bar would normally be retracted into its saw kerf space, by rotating it upwardly as seen in Fig. 1. When the two panels have been placed edge to edge, the tongue and groove shapes helping to position the members and also serving as a weather seal thereafter, a key having a leverage handle extending to the side is inserted in the aperture 44 of the pivot pin 40. This aperture is non-symmetrical about its axis whereby the key must be inserted in one particular position. Thus it is readily possible to tell the position of the lock bar from that of the key, even though the lock bar is hidden. The key is rotated to bring the hook portion of the lock bar down over the locking pin.

The locking pin would be at that time set to have its center eccentric portion 41 closest to the pivot pin axis. After the lock bar projection 35 has snapped past the locking pin and the locking

pin is engaged in the cut-back 36 of the lock bar, then the key is inserted into the aperture at the end of the locking pin. Again, this aperture is non-symmetrical about its axis, and the position of the locking pin may be seen from the position of the external key. The key is now turned to rotate the locking pin, whereby its eccentric tightens up the pull on the lock bar with great leverage, giving a very tight joint. It will be observed that the curved portion 34 of the lock bar exerted a pull with moderate leverage to draw the sections together when the lock bar was first swung down over the locking pin, and then the subsequent rotating of the locking pin exerted a final powerful force to bring the sections very tightly together.

It will be appreciated that I have shown and described a preferred embodiment and application of my invention, but its advantages may be realized in full or in part by many different forms, and in many different applications besides the edge joining of two flat built-up panels. Hence the invention should be understood as limited only by the scope of the appended claims.

I claims:

1. Fastening means to secure together two members in building construction comprising a lock bar fitting within opposed apertures in the adjacent edge faces of the members to be joined, a pivot pin rotatably mounted in one of the members and having a non-rotatable engagement with the lock bar, a keyway in said pivot pin, key means to rotate the pivot pin and with it the lock bar, a lock pin in the other member engaging with the hook portion of the lock bar, a keyway in said lock pin, and key means to rotate the lock pin after engagement with the hook to tighten the engagement.

2. Device of claim 1 in which the holding pin is rotatable on an axis eccentric to its portion engaging the hook whereby tightening may be effected by rotating the holding pin.

3. Device of claim 1 in which the apertures are each enclosed at all sides except for an opening in each of the faces to permit the key means to engage the pivot pin and the lock pin, and except at their respective meeting edges whereby complete enclosure is effected when joined.

4. Fastening means for securing together two members in building construction comprising a lock bar fitting within opposed apertures in the adjacent edge faces of the members to be joined, a pivot pin rotatably mounted in one of the members and having non-rotatable engagement with the lock bar, and a holding or locking pin in the other member engaging with the hook portion of the lock bar, each structural member comprising a framing member at the edge to be joined and facing material over the faces of said framing member, the pivot pin and the locking pin each extending through the framing member and being overlaid and held therein by the facing material while permitting access to the pin from without the facing.

5. Device of claim 4 in which keyways are provided at the end of the pivot pin and the locking pin for the reception of a key, and the holes are cut in the facing material to expose said keyways while still overlying part of the ends of the pins.

6. A locking means comprising a hidden hook member, a rotatable actuating element for same, a rotatable locking and tightening member having a hidden camming portion, and non-symmetrical non-circular exposed keyways in the

front ends of said two last named parts for the insertion of a key, whereby those parts may be rotated, and their rotative position may be known, by a removable key extending exteriorly of the assembly.

7. A locking element for two members comprising a hidden hook in one member, a rotatable actuating element for the same, a rotatable locking and tightening pin in the other member having a hidden camming portion engageable by the hook, and non-symmetrical non-circular exposed keyways in the front ends of the hook rotator and pin for the insertion of a key whereby they may be rotated, and upon engagement of the pin by the hook the pin may be rotated to tighten the engagement.

8. Fastening means for securing together two members in building construction, comprising a lock bar fitting within the edge of one member, a pivot pin rotatably mounted in said member and having a non-rotatable engagement with the lock bar, said pivot pin having a non-symmetrical and non-circular keyway therein, a lock pin in an opposing edge of the other member engageable by the hook portion of the lock bar, said lock pin also having a non-symmetrical and non-circular keyway therein, and removable key means extending exteriorly of the members to rotate both the lock pin and the pivot pin, whereby their rotative position may be known.

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