United States Patent [19]

Jureit et al.

[11] **3,877,091**

[45] **Apr. 15, 1975**

[54] **BED FRAME CONSTRUCTION**

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[73] Assignee: **Automated Building Components, Inc.,** Miami, Fla.

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[52] **U.S. Cl.** ..... **5/200 R;** 5/200 C; 5/236; 5/264 B; 5/282 R; 403/231; 403/405

[51] **Int. Cl.** **A47c 19/00**

[58] **Field of Search** .... 5/200 R, 200 C, 192, 236 B, 5/238, 239, 244–246, 263, 264 R, 264 B, 282 R, 351; 403/230, 231, 405, 406

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Primary Examiner—James C. Mitchell
Attorney, Agent, or Firm—LeBlanc & Shur

[57] **ABSTRACT**

The bed frame includes a pair of side rails, end rails and intermediate slats in coplanar relation. The slats and end rails are secured at opposite ends to the side rails by plates of the type having a plurality of teeth struck to project to one side thereof. Particularly, the plates are embedded on opposite sides of the joints formed between the ends of the slats and end rails on the one hand and the side rails on the other hand. A central support strip of sheet metal underlies the intermediate slats and its ends overlie the end rails. The central support is secured by plates of the foregoing type wherein the teeth pass through the strap and are embedded into the underlying wooden end rails. In one form hereof a corner plate is provided for joining the ends of the end rails to the ends of the side rails. The corner plate includes a sheet metal plate formed to provide channel shaped portions at opposite ends which extend at right angles to one another with inside and outside radii therebetween. Each channel portion has a plurality of teeth struck from its base for embedment into the end or side rail receivable within the channel-shaped end portions. The corner plate has a plurality of upstanding tabs for gripping the lower end of a spring forming a part of the boxspring.

29 Claims, 18 Drawing Figures

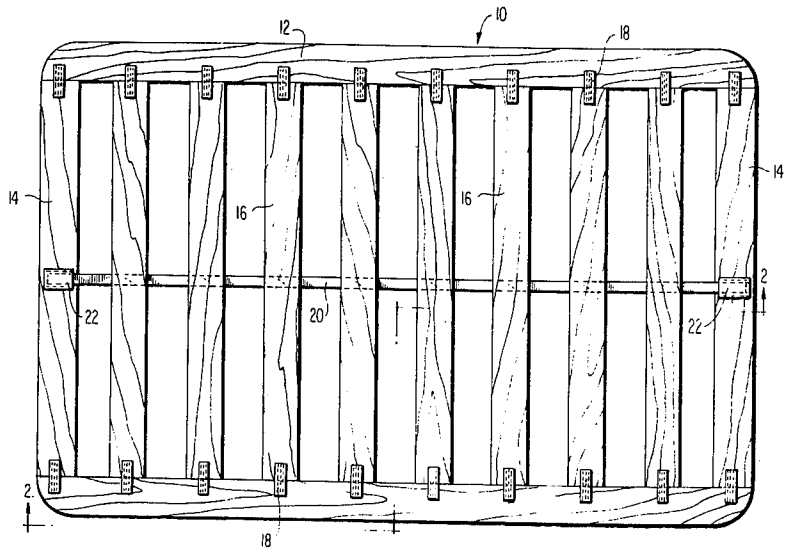


FIG. 1

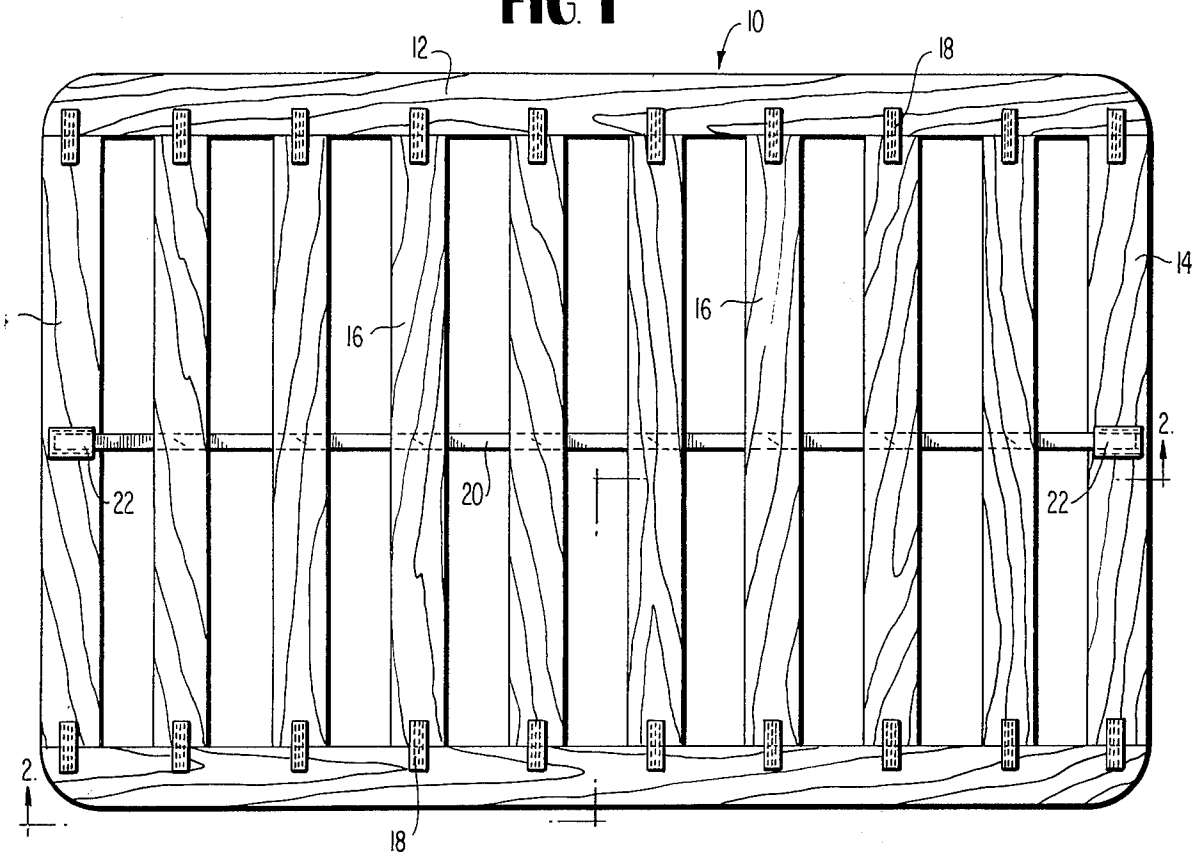
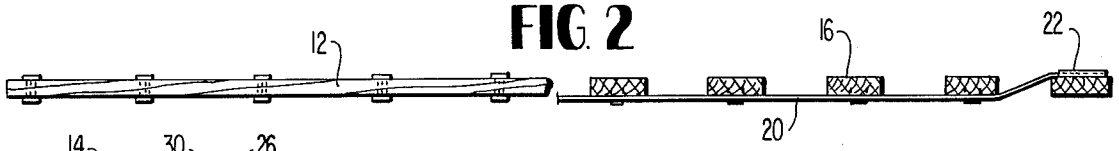


FIG. 2



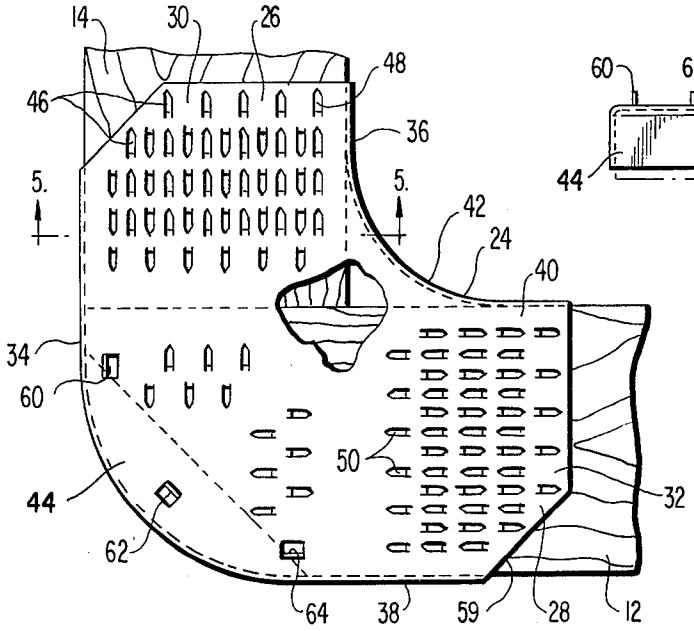


FIG. 3

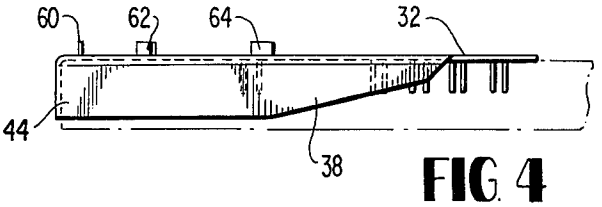


FIG. 4

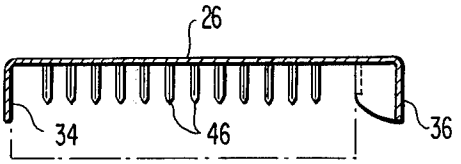


FIG. 5

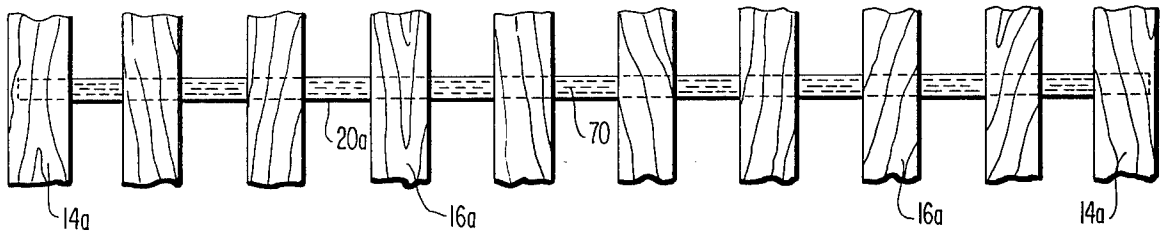


FIG. 6

FIG. 7

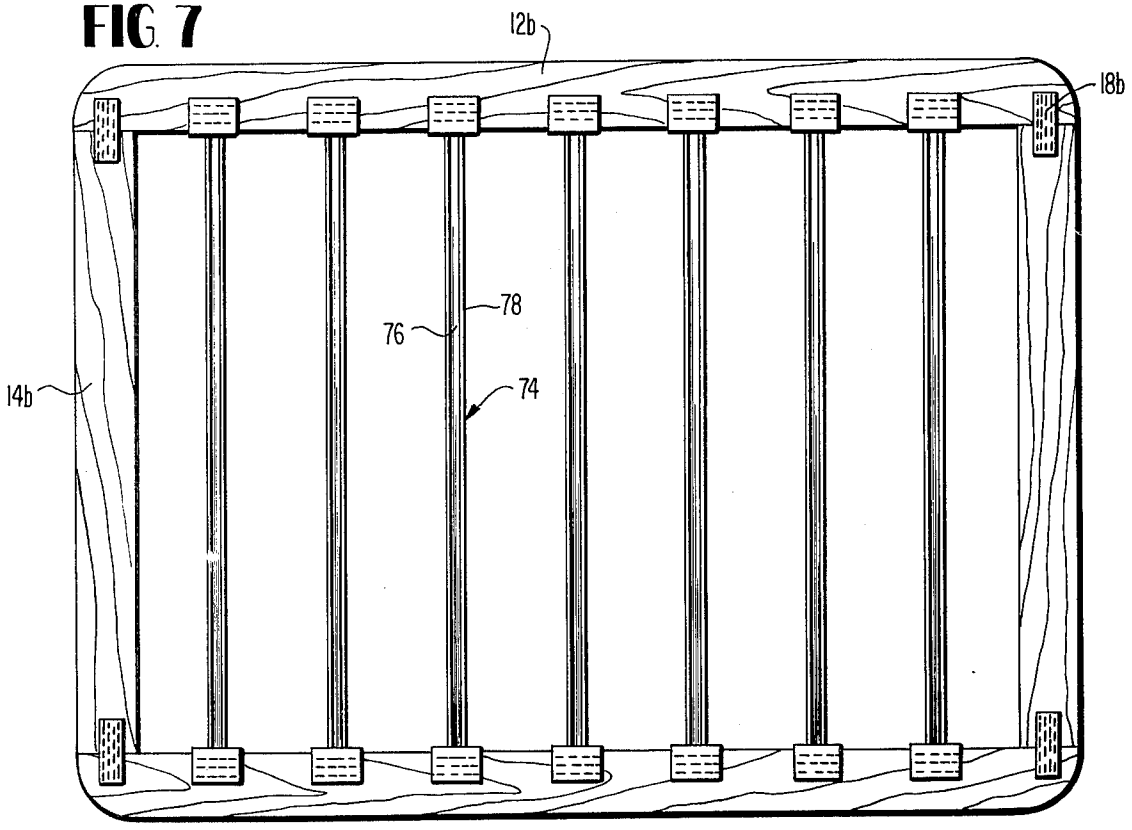


FIG. 8

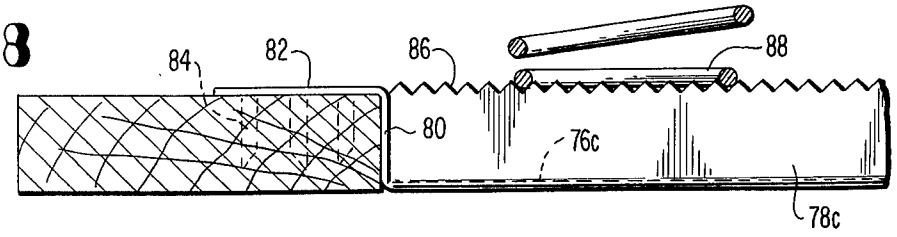


FIG. 9

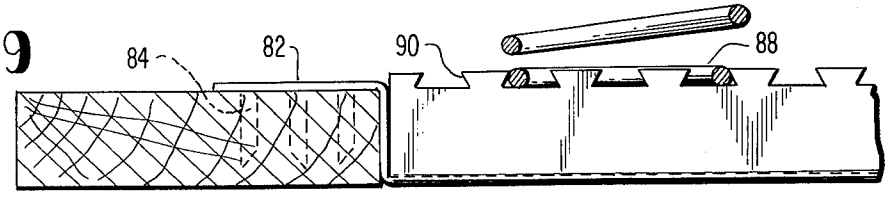
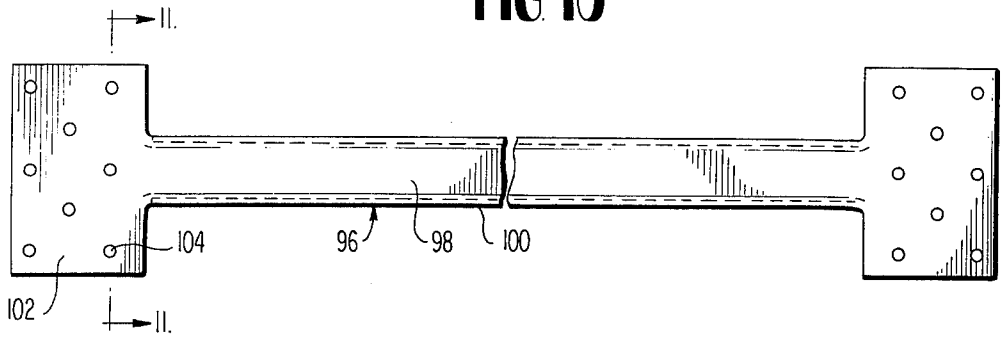


FIG. 10



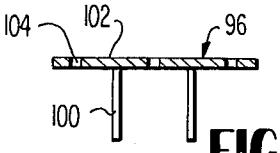


FIG. 11

FIG. 12

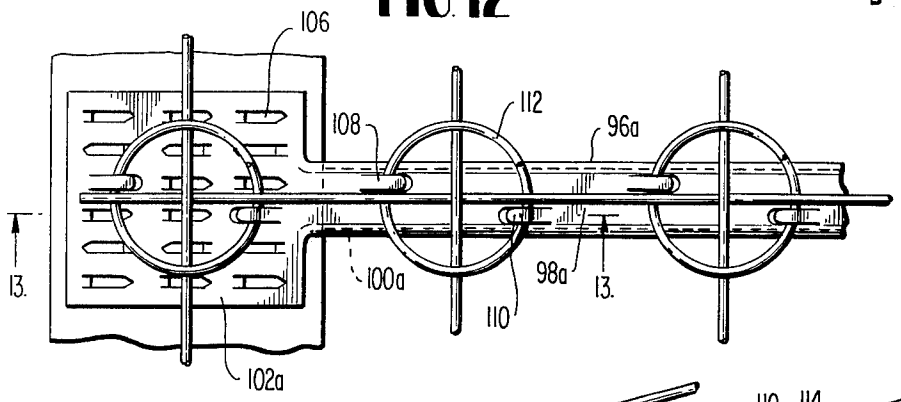


FIG. 13

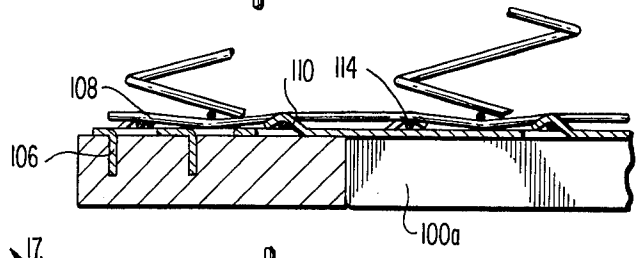
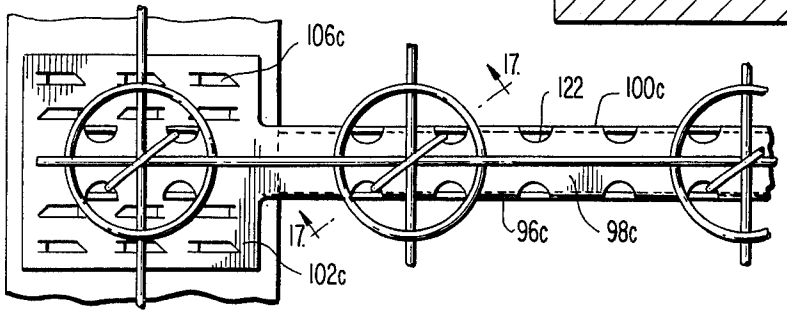


FIG. 15



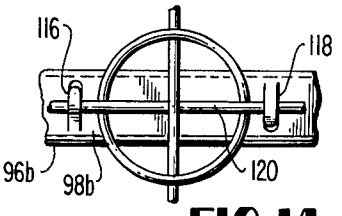


FIG. 14

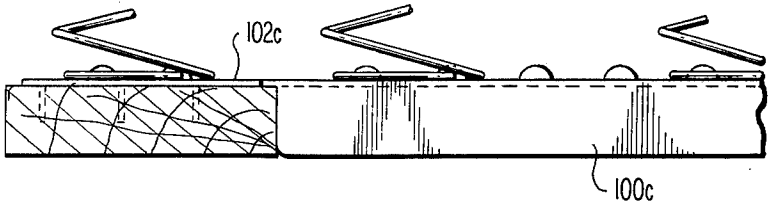


FIG. 16

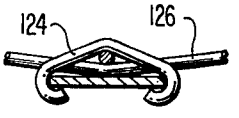


FIG. 17

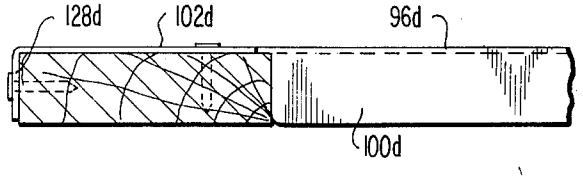


FIG. 18

BED FRAME CONSTRUCTION

The present invention relates to a bed frame construction and particularly relates to a novel boxspring frame construction and corner connector plate utilized therewith.

Various types of boxspring frames have been proposed and constructed in the past. Most such frames are comprised of side and end rails forming a rectangular frame with intermediate rails or slats spaced longitudinally along the frame between the side rails. Certain conventional constructions require that the slats rest on the side rails for proper support. Furthermore, the juncture of the end and side rails has heretofore been somewhat difficult to form and has required substantial quantities of wood as well as the performance of various cutting operations to achieve the desired corner configuration. Automated construction of bed frames has thus, prior to the present invention, been difficult to achieve.

The present invention provides a bed frame construction which minimizes or eliminates the foregoing and other problems associated with prior bed frame constructions and provides a novel and improved bed frame construction having various advantages in construction, and use in comparison with such prior bed frame construction. Particularly, the present invention provides a bed frame construction comprised of a pair of side rails, a pair of end rails disposed between the side rails in a manner to form a generally rectangular frame and a plurality of intermediate rails or slats which extend between the side rails at longitudinally spaced positions along the bed frame. The end rails and intermediate slats are secured to the side rails, in one form of the present invention, by connector plates of the type having a plurality of teeth struck therefrom to project to one side of the plate. The plates are applied on opposite sides of each joint with the teeth being embedded into both the side rail and intermediate slat or end rail as applicable. Preferably, a plate is applied on each of the opposite sides of the juncture between the end rails and the side rails as well as on each side of the joint between the intermediate slats and the side rails. A steel strap extends longitudinally along the underside of the intermediate slats and has its opposite ends overlying the end rails at locations medially between the side rails. A connector plate of the foregoing type is applied to the ends of the strap and its teeth are punched through the strap ends and embedded into the end rails to secure the strap to the frame. In this manner, the intermediate slats are supported centrally of the frame by the strap. Alternately, the strap may constitute an elongated strip of sheet metal having a plurality of teeth struck therefrom and distributed continuously throughout its length. The teeth are embedded into the undersides of the slats and end rails whereby the slats are supported.

In a further form hereof, the foregoing described connector plates at the juncture of the end and side rails are replaced by one or two corner plates. Particularly, each corner plate is comprised of a sheet metal plate formed to provide generally right-angularly related channels at its opposite ends with inside and outside radii interconnecting between the respective inner and outer flanges of the end portions of the plate. Each channel-shaped end portion has a plurality of teeth struck from its base to project into the channel for embedment into the side or end rail received within such channel-shaped end as applicable. Thus, the corner plate is applied to the bed frame with channel-shaped ends overlying the ends of the side and end rails, respectively, the teeth of the channel-shaped ends being embedded into the respective rails. The ends of the side rails are preferably cut linearly along an angle whereby the corner of the bed frame is formed by the outer flange or radius interconnecting the channel-shaped end portions of the corner plate. This channel-shaped construction particularly strengthens the joint thus formed. Furthermore, to facilitate securement of the boxsprings to the corner of the bed frame, the corner plates are provided with a plurality of upstanding tabs for locating the corner spring of the boxspring on the plate. The lower end of the spring is passed along respective inner and outer surfaces of the tabs whereby respective displacement of the spring relative to the bed frame is precluded and securing anchoring therefor provided. The corner plates, of course, may be applied to opposite sides of the joints.

From the foregoing, it will be appreciated that the bed frame construction utilizing connector plates as the means for forming the joints between the end and intermediate rails on the one hand and the side rails on the other hand, lends its construction to automated processes. Particularly, the bed frame may be laid out on a jig table similarly as described and illustrated in U.S. Pat. No. 3,328,867 of common assignee herewith and passed through a press whereby the teeth of the connector plates spotted on the jig table in respective overlying and underlying relation to the joints are embedded into the respective rails and slats. Thus, a bed frame may be completed simply by spotting the wooden members and the connectors therefor on the jig and passing the jigged bed frame through a press. Moreover, the slat support strap likewise can be secured to the bed frame in a similar manner. With respect to the corner plates, the press may be specifically configured such that the upstanding tabs are not deformed upon pressing action. Alternatively, the corner plates can be pressed by portable presses such as described and illustrated in U.S. Pat. No. 3,207,406 of common assignee herewith.

In a still further form of bed frame construction hereof, channel-shaped metal members having integrally formed plates at opposite ends are utilized in lieu of conventional wooden slats. The channels are preferably inverted and the end plates carried thereby lie in a plane containing the upper edges of the member to overlie the side rails. The plates have teeth struck integrally therefrom for embedment into the rails whereby the plates support the members from the side rails. Also, the upper edges of the flanges of the channel-shaped members may be serrated or provided with transversely spaced grooves for receiving the lower end portions of the box springs. Thus lateral movement of the box springs is prevented.

In a still further form of bed frame construction hereof, the channel-shaped members with integrally formed plates at the opposite ends are also utilized in lieu of slats but with the channel-shaped members inverted in comparison with those described previously. Hold down tabs are struck from the base of the channel members to project upwardly to secure the ends of the springs to the bed frame. The hold down tabs comprise teeth which can be struck either parallel to or trans-

verse to the long axis of the channel-shaped slats to project upwardly and for subsequent forming over the lower coils of bed spring. A variation of this embodiment provides for oppositely opening tabs whereby the bed springs are snapped into place by a twisting motion. A further variation provides for cut-outs formed along the base of the channel for receiving clinch ring anchors or locking clinch type staples for holding the lower ends of the bed spring.

Accordingly, it is a primary object of the present invention to provide a novel and improved bed frame construction requiring for its formation a minimum quantity of wood and a frame of increased strength.

It is still another object of the present invention to provide a novel and improved bed frame construction which is particularly capable of being formed by automated processes.

It is a further object of the present invention to provide a novel and improved bed frame construction having a uniquely configured corner plate for joining the side and end rails of the bed frame one to another.

It is still a further object of the present invention to provide a novel and improved bed frame construction wherein the corner plate is further configured to provide support for and to accurately locate the corner springs in the box spring construction.

These and further objects and advantages of the present invention will become more apparent upon reference to the following specification, claims and appended drawings wherein:

FIG. **1** is a plan view of a bed frame constructed in accordance with the present invention;

FIG. **2** is a cross-sectional view thereof taken about on lines **2—2** in FIG. **1**;

FIG. **3** is a fragmentary enlarged view of the joint between a side and end rail and illustrating the novel and improved corner plate hereof;

FIG. **4** is a side elevational view of the joint and plate illustrated in FIG. **3**;

FIG. **5** is a cross-sectional view thereof taken about on line **5—5** in FIG. **3.**

FIG. **6** is a fragmentary plan view illustrating another form of the central tension strap for the frame;

FIG. **7** is a view similar to FIG. **1** of another form of bed frame constructed in accordance with the present invention;

FIGS. **8** and **9** are enlarged fragmentary cross-sectional views of the joints between the side rails and the intermediate members with respective different forms of the intermediate members;

FIG. **10** is a plan view of a further form of a metal slat for use in a bed frame constructed in accordance with the present invention;

FIG. **11** is a cross-sectional view thereof taken generally about on line **11—11** in FIG. **10**;

FIG. **12** is a fragmentary plan view of a still further form of metal slat construction and illustrating coil spring hold down tabs;

FIG. **13** is a cross-sectional view thereof taken about on line **13—13** in FIG. **12**;

FIG. **14** is a view similar to FIG. **12** illustrating a variation of a coil spring hold down tab;

FIG. **15** is a view similar to FIG. **12** and illustrating a further form of metal slat construction;

FIG. **16** is a cross-sectional view thereof;

FIG. **17** is an enlarged cross-sectional view thereof taken generally about on line **17—17** in FIG. **15**;

FIG. **18** is a view similar to FIG. **16** and illustrating a further variation of a channel-shaped slat.

Referring now to the drawings, particularly to FIG. **1**, there is illustrated a bed frame generally designated **10** and comprised of a pair of side rails **12**, a pair of end rails **14**, and a plurality of intermediate slats **16**. It will be appreciated that when finally assembled, the end rails are secured between the side rails at opposite ends of the frame with the slats **16** secured at longitudinally spaced positions therealong and between the side rails **12**. The ends of the intermediate slats **16** and rails **14** are secured to the side rails **10** by discrete elongated connector plates applied to each of the opposite sides of each joint thereof. Particularly, the plates **18** comprise elongated sheet metal plates having a plurality of elongated, nail-like teeth struck or formed therefrom to project to one side for embedment into the wooden rails or slats as applicable. Such plates **18** may be of the type described and illustrated in U.S. Pat. No. 2,877,520 of common assignee herewith. In brief, the teeth are struck to form a plurality of longitudinally extending rows thereof leaving a plurality of elongated slots in the plate. As illustrated in FIG. **2**, the plates are applied to the opposite sides of the joints formed by the side rails and slates on the one hand and the side rails and the end rails on the other hand. In order to form a secure joint between the end rails and side rails, a plate of a similar type is provided on each of the opposite sides of the joint thus formed. A larger connector plate, however, or one of like size securing the slats and side rails could be utilized. It will be appreciated that with the plate thus applied, the end rails, side rails, and intermediate slats are maintained in coplanar relation one with the other with the connector plates forming secure joints therebetween to rigidize the frame.

Also illustrated in FIG. **1**, there is provided a longitudinally extending strap **20** formed of sheet metal and which strap underlies slat **16** to provide support. Particularly, the strap **20** underlies each slat **16** and has opposite ends in overlying relation to the end rails **14** as best illustrated in FIG. **2**. The strap **20** lies centrally or medially along the frame and is secured at opposite ends to the end rails **14** by plates **22** of the type previously described. Particularly, the plates **22** have teeth which extend through the end portions of strap **20** and into the wooden end rails **14**. In applying the plates **22**, the teeth preferably are driven through the end portions of the strap although it will be appreciated that performed holes in the end portion of the strap could be provided if desired. Similar plates can be provided to secure the strap to each slat or selected slats and in a like manner as described above.

The foregoing bed frame manufacture can be readily fabricated in an automated manner. For example, the side and end rails and intermediate slats can be disposed on a jig with the connector plates **18** disposed on the jig on opposite sides of the joints, similarly as trusses are formed as disclosed in U.S. Pat. No. 3,238,867. Likewise, strap **20** can be located under the slats **16** and connector plates **22** disposed in overlying relation relative to the end portions of the straps on the end rails **14**. The jigged bed frame can then be indexed through a press as disclosed in that U.S. Pat. No. 3,602,237 whereby the teeth of the connector plates **18** and **22** are sequentially driven into the portions of the wooden frame members adjacent the joints. Alternatively, the bed frame members and plates therefor can

be jigged and the press indexed to move along the jig table as disclosed in U.S. Pat. No. 3,603,244. As a still further and preferable method of fabrication, the machine disclosed in copending application Ser. No. 317,095 filed Dec. 20, 1972 may be utilized to both form the plates utilized in the construction of the bed frame as illustrated in FIG. **1** as well as apply them to the joints. It will thus be appreciated that the foregoing bed frame construction can be readily and easily fabricated and in a manner utilizing a minimum quantity of wood.

Referring now to FIGS. **3–5,** there is disclosed a joint between end rail **14** and side rail **12** which may be utilized in lieu of the joint illustrated in FIG. **1.** Particularly, the joint illustrated in FIGS. **3–5** utilizes a corner bracket **24** which has a generally channel shape and opposite end channel portions **26** and **28** arranged at right angles one to the other. Each channel-shaped end portion **26** and **28** is comprised of a base **30** and **32,** respectively. Base **30** has depending flanges **34** and **36** along its opposite sides while base **32** has depending flanges **38** and **40** along its opposite sides which depend in a like direction as flanges **34** and **36** depend from base **30.** Flanges **36** and **40** form right angle continuations of one another with the connecting flange **42** therebetween defining an internal arcuate radius. Likewise, flanges **38** and **34** form right angle continuations of one another with the connecting flange **44** therebetween defining an outer radius. Each base portions **30** and **32** is provided with a plurality of teeth struck or formed therefrom to project to one side thereof. The teeth **46** struck from base portion **30** are disposed in longitudinally extending rows and have slots **48** left in base portion **30** thereof extending parallel to the direction of rail **14.** The teeth **50** are struck from base portion **32** to lie in longitudinally extending rows thereof with the slots left in base portion **32** extending parallel to rail **12.** The teeth struck from the end portions **26** and **28** are struck throughout their surface and terminate along a diagonal extending between the inner and outer radii **42** and **44,** respectively. The direction in which the teeth are struck is at right angles one to the other in order to obtain maximum strength in tension in each of the rail members.

To form the corner joint, between the end and side rails, the corner plates are disposed over the end portions of the end and side rails and the teeth of the end sections **26** and **28** are embedded into such rails. It will be appreciated that the channel-shaped end portions receive the ends of the rails and provide lateral support therefor. Also, as illustrated in FIG. **3,** the end of the side rail is cut along a diagonal indicated **59** in order to insure that the side rails are receivable within the corner brackets. The corner brackets may be applied by the press described in the foregoing U.S. Pat. No. 3,602,237 or may be applied individually by a C-clamp press, for example, the type disclosed in U.S. Pat. No. 3,207,406 of common assignee herewith. Also, it will be appreciated that the corner plate can be applied to one or both of the opposite sides of the corner joint as desired depending upon the strength required.

To facilitate connection of the corner box springs to the corner of the bed frame and particularly to the corner plate, the plate is formed to provide a plurality of upstanding tabs **60, 62** and **64.** These tabs are arranged along the arc of a circle corresponding to the arc of the lower end of the corner box spring.

Accordingly, the spring can be disposed about the tabs as illustrated in FIG. **3** with tab **62** lying on the inside of the spring and end tabs **60** and **64** lying outside of the spring. The tabs can be peened over to secure the spring to the corner bracket.

Referring now to FIG. **6,** there is illustrated a plurality of wooden slats **16***a* disposed between end rails **14***a.* In this form, however, the central band or strap **20***a* or two or more of such bands for frames of substantial width are provided substantially continuously throughout its length with a plurality of elongated nail-like teeth struck to project to one side. Strap **20***a* is tensioned along the underside of the frame and the nails **70** are embedded into the undersides of the slats **16***a* as well as into the undersides of the end rails **14***a.* In this manner, the intermediate slats **16***a* are mutually supported one from the other and from the end rails **14***a.*

FIG. **7** illustrates a form of bed frame construction in accordance with the present invention. In this form the side and end rails **12***b* and **14** *b,* respectively, are secured one to the other by connector plates **18***b,* of the type previously described, or may be secured one to the other by the corner plates previously described. In this form, however, the wooden slats are replaced by elongated generally channel-shaped sheet metal members **74,** each member having a base **76** and a pair of side flanges **78.** As illustrated, at each of the opposite ends of the channel members **74,** the base **76** is extended at **80** and bent substantially normal to the base and between the flanges **78.** This extension is then reversely bent to provide an endwise extending plate **82** in a plane common to the edges of flanges **78.** Each of plates **82** is provided with a plurality of slender elongated nail-like teeth **84** for embedment into the side rail. Thus, the intermediate channel-shaped member **74** can be spotted along the length of the bed frame at the appropriate positions and the teeth of the end plates **82** are embedded into the end rails by suitable presses. Note that the channel lies substantially in coplanar relation with the side and end rails **12***b* and **14***b,* respectively.

Referring to FIG. **8,** the upper edges of the flanges **78***c* may be serrated as indicated at **86.** The lower coils of the box springs may thus be received along the serrated edge and thus prevented from lateral movement. In FIG. **9,** the upper edge of flanges **78***c* are provided with a plurality of grooves **90,** in this case dove-tail shaped grooves. The lower coils of the coil springs likewise may be received within the dove-tail shaped grooves **90** and similarly prevented from lateral movement.

FIG. **10** illustrates a further form of metal slat construction comprised of a generally elongated channel-shaped sheet metal slat **96** having a base **98** and downwardly extending side flanges **100.** As illustrated, each of the opposite ends of slat **96** is provided with a flat plate **102** which extends beyond the ends of flanges **100** and has a plurality of openings **104** formed therein. To form a bed frame utilizing slat **96,** these slats are spotted along the length of the frame at selected positions with the plates **102** overlying the side walls. Nails are thereafter inserted through the openings **104** in each of the opposite end plates **102** whereby the slat is nailed to the side rails.

In FIGS. **12** and **13** there is illustrated a variation of the slat illustrated in FIG. **10.** The slat **96***a* in FIG. **12** comprises an elongated channel-shaped member hav-

ing a base **98***a*, depending flanges **100***a* and flat plates **102***a* formed at its opposite ends. However, in this form, plates **102***a* are provided with integrally struck teeth **106** for embedment into underlying side rails by appropriate pressing apparatus once the slats are located at selected positions along the bed frame. Also, and in this form of slat, pairs of longitudinally extending tabs **108** and **110** are formed to project upwardly from the base **98***a* of the slat at transversely spaced positions therealong. Tabs **108** and **110** are struck such that the slots in the base **98***a* extend from the tabs in opposite directions and toward the opposed tab. In this manner, the lower portion **112** of the bed spring coil can be inserted below tabs **108** and **110** with the tabs being subsequently deformed over the lower coil spring portion **112** as indicated at **114** in FIG. **13.** Thus, tabs **108** and **110** provide for ready securement of the box spring to the slats and hold down of the spring. The hold down tabs are also provided in the end plates **102***a*. Thus, in lieu of forming a pair of teeth downwardly, such pair can be formed in the opposite direction to comprise hold down tabs whereby the bed spring coils along the sides of the frame can also be held down on top of and firmly secured to the side rails.

Referring to FIG. **14,** the base portion **98***b* of the channel-shaped slat **96***b* may be provided with hold down tabs **116** and **118** struck upwardly therefrom. These tabs extend normal to the longitudinal axis of slats **96***b* and in opposite directions whereby the spring rod **120** can be readily placed below the tabs, for example by a twist, snap-in, placement procedure. The tabs **116** and **118** may thereafter be deformed downwardly to lock the spring **120** in place.

Referring now to the embodiment illustrated in FIG. **15,** there is illustrated a further form of channel-shaped metal slat construction **96***c* having a base **98***c*, depending side flanges **100***c* and end plates **102***c*. The plates **102***c* are provided with integrally struck teeth **106***c* for embedment thereof into the side rails of the bed frame. The teeth **106***c* are different in configuration in comparison with the teeth **106** of FIG. **12** and therefore illustrative of a further configuration and arrangement of teeth in the plates at the opposite ends of the slats. In this form, the channel-shaped slats **96***c* are provided with semi-circular cut-outs **122** formed in the base **98***c* thereof. The cut-outs **122** are spaced longitudinally along opposite sides of the base of the slat. Referring to FIGS. **16** and **17,** the cut-outs **122** cooperate with clinch ring anchors **124** for securing the spring **126** to the slats. Each clinch ring anchor comprises a generally V-shaped rod or wire formed to provide hooks at opposite ends. The hooks are received within selected cut-outs **122** with the lower spring coils between the slats and the anchors **124** whereby the bed springs are held down onto the slats and bed frame.

In FIG. **18,** there is illustrated a generally similar channel-shaped slat **96***d* having depending flanges **100***d* and an end plate **102***d*. In this form, end plate **102***d* is extended in a longitudinal direction and turned downwardly to form a flange **128***d*. The flange **128***d*, as well as plate **102***d*, may be provided with performed openings whereby nails are receivable through the openings for embedment into the top and outer sides of the side rail. Alternately, the plate **102***d* may be provided with teeth, for example the teeth illustrated at **106** in FIG. **12** or **106***c* in FIG. **15** with holes provided in flange **128** for driving the nails.

Accordingly, it will be appreciated that the foregoing described bed frame fully accomplishes the objects of the present invention in that there is provided a bed frame which is sturdy in construction, utilizes a minimum quantity of wood, and which can be readily fabricated utilizing automated processes. Furthermore, the bed frame hereof provides a novel and unique corner bracket whereby the corner of the bed frame is substantially strengthened.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A bed frame comprising a pair of elongated wooden members for forming the substantially rigid side members of the frame, a pair of wooden end members disposed between said side members adjacent respective opposite ends thereof, a plurality of longitudinally spaced wooden members extending transversely between said side frame members intermediate said end members, said end, side, and intermediate members lying in substantial coplanar relation each with the other with the opposite ends of the intermediate and end members in substantial butting relation with the inner edges of the side rails respectively, each of said end, side and intermediate members having a width greater than its depth with the wide sides of said members lying in planes generally parallel to the plane containing said bed frame, and means for joining the opposite ends of said end and intermediate members to the respective side frame members including a plurality of sheet metal planes, each of said plates having a plurality of elongated nail-like teeth formed to project to one side of said plate, said plates being applied to at least one side of the respective joints formed between said side members and said end members and between said side members and said intermediate members with the plates spanning said joints and the teeth thereof embedded into the wooden members forming the respective joints, said plates constituting the sole means of connection between the joint members on said one side of the joint.

2. A bed frame according to claim **1** wherein said plates are applied on opposite sides of the respective joints formed between said side members and said intermediate members with said plates forming the sole connection between the members of said joints.

3. A bed frame according to claim **2** including an elongated metal strap extending along one side of said intermediate members with its opposite ends extending along one side of said end members, and means for securing the opposite ends of said strap to the respective end members including a pair of sheet metal plates each having a plurality of elongated nail-like teeth formed to project to one side thereof, said latter plates being applied to said end members, respectively with the teeth thereof extending through the corresponding end of said strap and embedded into such end member.

4. The bed frame according to claim 3 including means for securing said strap to said intermediate members.

5. A bed frame according to claim 2 including an elongated metal strap having a plurality of elongated nail-like teeth struck to project to one side thereof and distributed in said strap substantially throughout its entire length, said strap extending longitudinally along said frame between said side members and having the teeth thereof embedded into said intermediate and end members.

6. A bed frame comprising a pair of elongated wooden members for forming the substantially rigid side members of the frame, a pair of wooden members disposed between said side members adjacent respective opposite ends of said side members, said side and end members lying in substantially coplanar substantially butting relation one to the other and means for joining the opposite ends of said end members and said side members including a plurality of sheet metal plates, the opposite ends of each of said plates being formed to provide generally channel-shaped portions extending generally at right angles one to the other for receiving the respective adjacent end portions of said side and end members, each of said plates having a plurality of elongated nail-like teeth struck to project to one side thereof and into said channel-shaped portions for embedment into the adjacent ends of said side and end members.

7. The bed frame according to claim 6 wherein said teeth are struck from each said plate to leave a plurality of elongated slots left in the plate, the slots in one channel-shaped plate portion extending from the teeth in a direction substantially normal to the direction the slots extend from the teeth in the other channel-shaped plate portion.

8. A bed frame according to claim 6 wherein one of said side and end members at each said joint thereof has an end in butting relation with the side of the other of said side and end members.

9. A bed frame according to claim 6 wherein the poprtion of said plate intermediate said channel-shaped end portions includes a pair of arcuately extending flange portions forming respective continuations of the flanges on opposite sides of the plate of each channel-shaped end portion.

10. A bed frame according to claim 6 including a plurality of tabs upstanding from each of said plates at locations between said channel-shaped end portions for receiving a portion of the corner spring of a box spring carried by said bed frame.

11. A bed frame according to claim 6 including a plurality of longitudinally spaced transversely extending wooden members disposed between said side frame members intermediate said end members and in substantial coplanar relation with said side and end members the opposite ends of the intermediate members lying in substantial butting relation to the inner edges of said side members, each of said side, end and intermediate members having a width greater than its depth with the wide sides of said members lying in planes generally parallel to the plane containing said frame, means for joining the opposite ends of said intermediate members to the respective side frame members including a plurality of sheet metal plates, each of the latter plates having a plurality of elongated nail-like teeth formed to project to one side thereof, said latter plates being applied to at least one side of the joints formed between said side and intermediate members with the plates spanning said joints and the teeth thereof embedded into the wooden members forming the respective joints, said plates constituting the sole means of connection between the joint members on said one side thereof.

12. A bed frame according to claim 11 including an elongated metal strap underlying said intermediate members, the opposite ends of said strap overlying said end members, and means for securing the opposite ends of said strap to the respective end members including a pair of sheet metal plates each having a plurality of elongated nail-like teeth formed to project to one side thereof, said latter plates being applied to said end members respectively with the teeth thereof extending through the corresponding end of said strap and embedded into such end member whereby said strap provides support for said intermediate members from said end members.

13. A bed frame according to claim 11 including an elongated metal strap having a plurality of elongated nail-like teeth struck to project to one side thereof and distributed in said strap substantially throughout its entire length, said strap extending longitudinally along said frame between said side members and having the teeth thereof embedded into said intermediate and end members.

14. A bed frame according to claim 6 including a plurality of longitudinally spaced transversely extending sheet metal members disposed between said side frame members intermediate said end members and in substantial coplanar relation with said side and end members, means for joining the opposite ends of each of said intermediate members to the respective side frame members including a plate integrally formed with said intermediate member at each of its opposite ends, said end plates having a plurality of teeth struck to project to one side and embedded into the corresponding side member for supporting said intermediate member from said side members.

15. A bed frame according to claim 12 wherein each of said intermediate members is channel-shaped with the end plates being formed from endwise continuations of the base portion of the channel.

16. A bed frame comprising a pair of elongated wooden members for forming the substantially rigid side members of the frame, a pair of wooden end members disposed between said side members adjacent opposite ends thereof, a plurality of longitudinally spaced sheet metal members extending transversely between said side frame members intermediate of said end members and in substantial coplanar relation with said side and end members, means for joining the opposite ends of each said intermediate member to the respective side members including a plate integrally formed with said intermediate member at each of its opposite ends, each of said end plates having a plurality of teeth struck to project to one side and embedded into the corresponding side member for supporting said intermediate member from said side members, and means for connecting the ends of said end members to the respective side members.

17. A bed frame according to claim 16 wherein each of said intermediate members is channel-shaped with the end plates being formed from endwise continuations of the base portion of the channel.

18. A bed frame according to claim 16 wherein the edges of the flanges of the channel-shaped intermediate members are notched to receive lower coil portions of a box spring coil.

19. A bed frame according to claim 18 wherein said flange edges are serrated to form said notches.

20. A bed frame according to claim 18 wherein said flange edges are provided with a plurality of dove-tailed grooves to form said notches.

21. A bed frame according to claim 16 wherein said connecting means include a plurality of sheet metal plates, each of said plates having a plurality of elongated nail-like teeth formed to project to one side thereof, said plates being applied to at least one side of the joint between each said end member and said side member with the plates spanning the joints and the teeth thereof embedded into the wooden members forming the respective joints.

22. A bed frame according to claim 16 including tabs carried by said intermediate members for securing one or more of the lower coils of a box spring to the bed frame.

23. A bed frame according to claim 22 wherein said tabs are formed from said intermediate members and project upwardly from said bed frame, said tabs being formed over one or more lower coils of the box spring to secure the latter to the intermediate members.

24. A bed frame according to claim 16 wherein each of said intermediate members has a plurality of slots formed therein at spaced locations therealong, and means cooperable with said slots for securing one or more of the lower coils of a box spring to said bed frame.

25. A bed frame according to claim 16 wherein each of said plates has an end flange projecting generally normal thereto for overlapping the outer lateral edge of the side rails, and means securing each of said flanges to the corresponding side rail.

26. A bed frame comprising a pair of elongated wooden members for forming the substantially rigid side members of the frame, a pair of wooden end members disposed between said side members adjacent opposite ends thereof, a plurality of longitudinally spaced sheet metal channel-shaped members extending transversely between said side frame members intermediate of said end members and in substantial coplanar relation with said side and end members, means for joining the opposite ends of each said intermediate member to the respective side members including a plate integrally formed with said intermediate member at each of its opposite ends and comprised of an endwise continuation of the base portion of said channel-shaped intermediate members, each of said end plates having a plurality of openings formed therein for receiving nails to secure said intermediate member to a corresponding side rail.

27. A bed frame according to claim 26 wherein each of said plates has an end flange projecting generally normal thereto for overlapping the outer lateral edge of the side rails, and means securing each of said flanges to the corresponding side rail.

28. A bed frame comprising a pair of elongated wooden members for forming the substantially rigid side members of said bed frame, a plurality of members disposed between said side members and longitudinally spaced one from the other, said side and longitudinally spaced members lying in substantial coplanar relation each with the other, each of said side members having a width greater than its depth with the wide sides of said members lying in planes generally parallel to the plane containing said bed frame, means for joining the opposite ends of said longitudinally spaced members to the respective side frame members including a plurality of sheet metal plates, each of said plates having a plurality of elongated nail-like teeth formed to project to one side of said plate, said plates being applied to each side members at least along one side thereof and at longitudinally spaced locations therealong corresponding in longitudinal location with the longitudinal location of said longitudinal members along said side frames, the teeth of each said plate being embedded into the wooden members forming the respective side members, said plates constituting the sole means of connection between the longitudinally spaced members and the side members on said one side thereof.

29. A bed frame according to claim 3 wherein said elongated strap underlies said intermediate members and its opposite ends overlie said end members whereby said strap provides support for said intermediate members from said end members.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,877,091 Dated April 15, 1975

Inventor(s) John Calvin Jureit and Andrew G. Seipos

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 4, line 38, "underlies slat" should read --underlies the intermediate slat--.
Claim 1, line 40, "planes" should read --plates--.
Claim 28, line 30, "each side" should read --each said side--.

Signed and Sealed this

ninth Day of *September 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks