

July 2, 1968

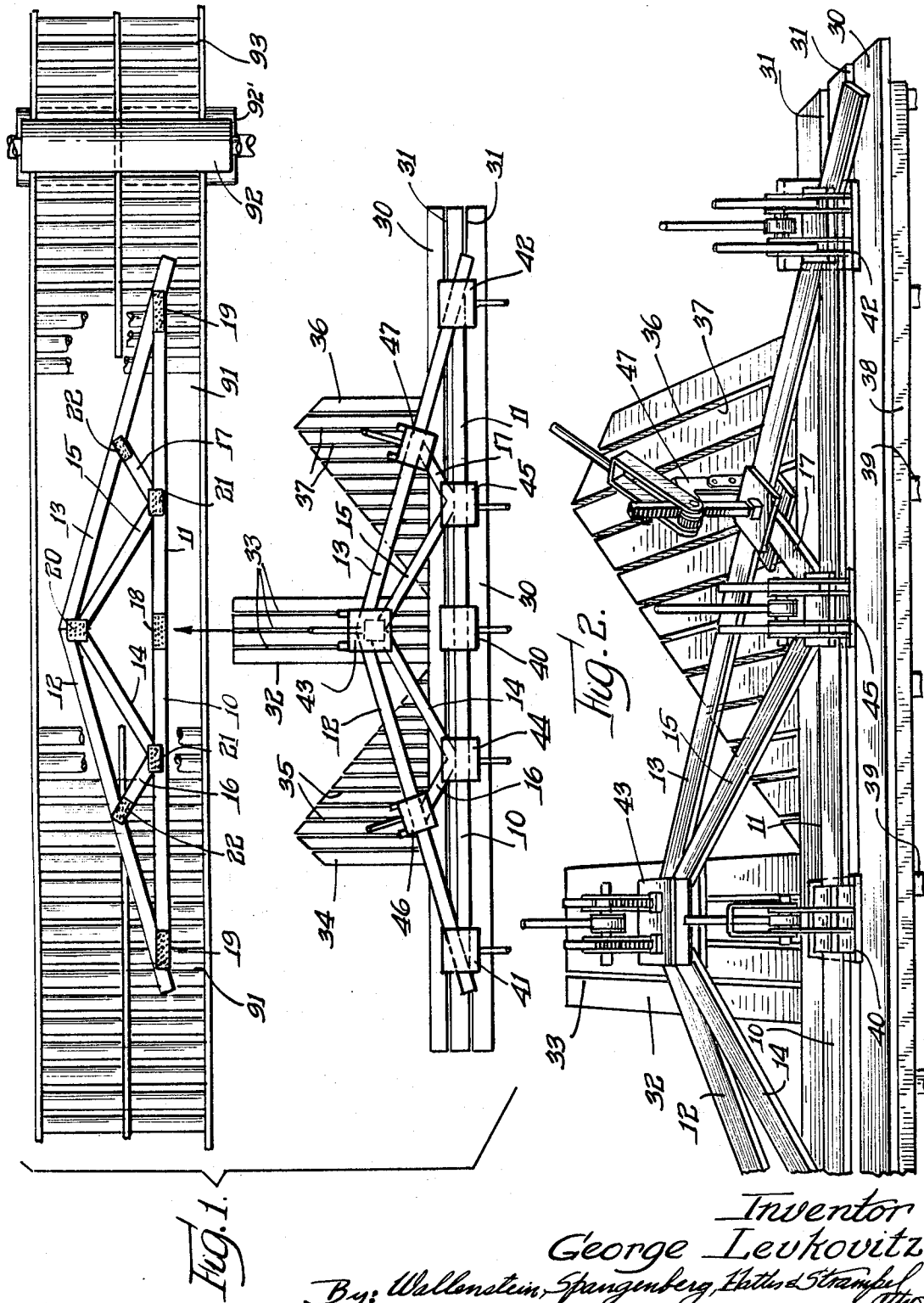
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METHOD AND APPARATUS FOR FORMING WOOD ROOF TRUSSES OR THE LIKE

Filed April 13, 1966

3 Sheets-Sheet 1



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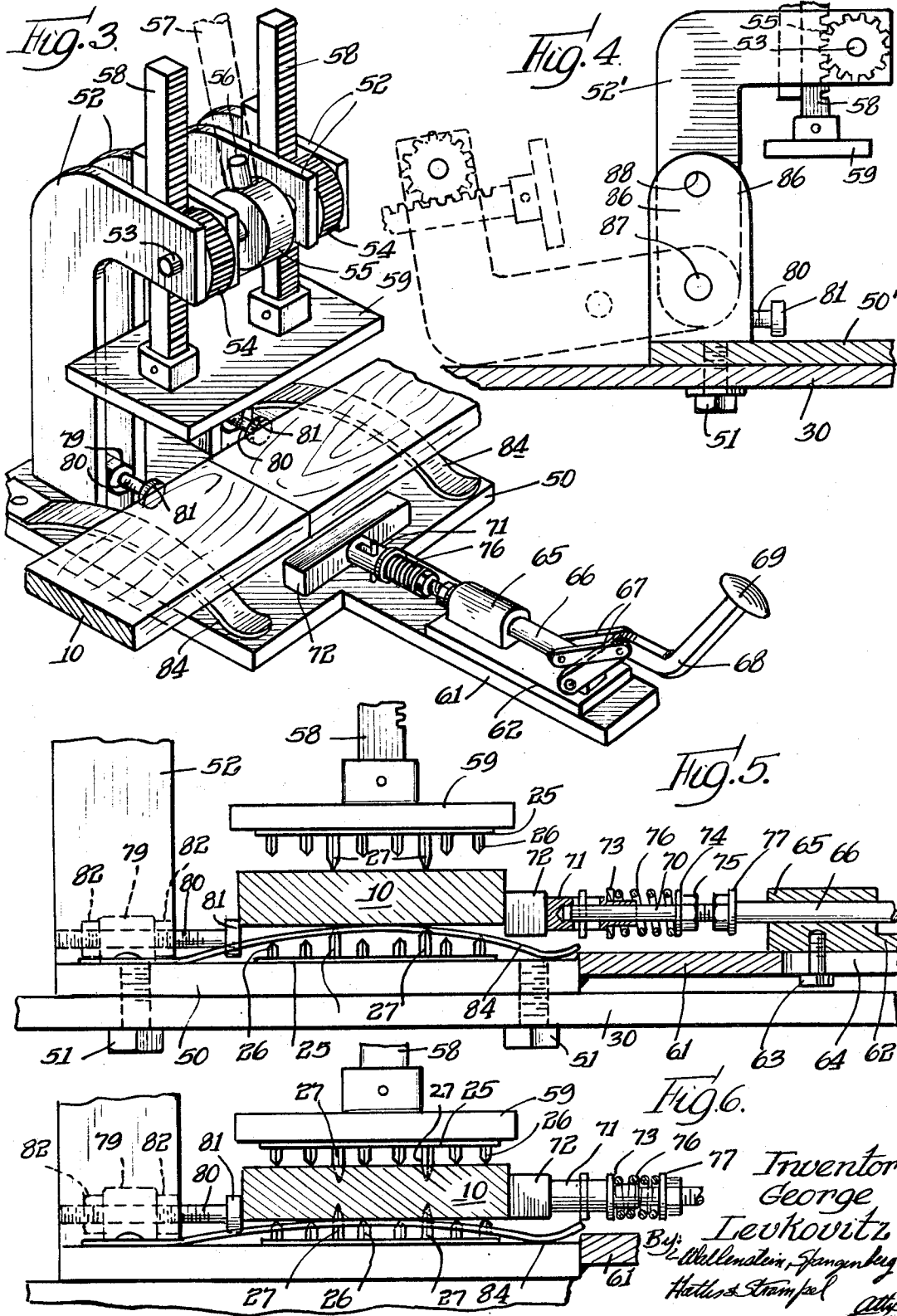
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METHOD AND APPARATUS FOR FORMING WOOD ROOF TRUSSES OR THE LIKE

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3 Sheets-Sheet 2



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METHOD AND APPARATUS FOR FORMING WOOD ROOF TRUSSES OR THE LIKE

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Fig. 7.

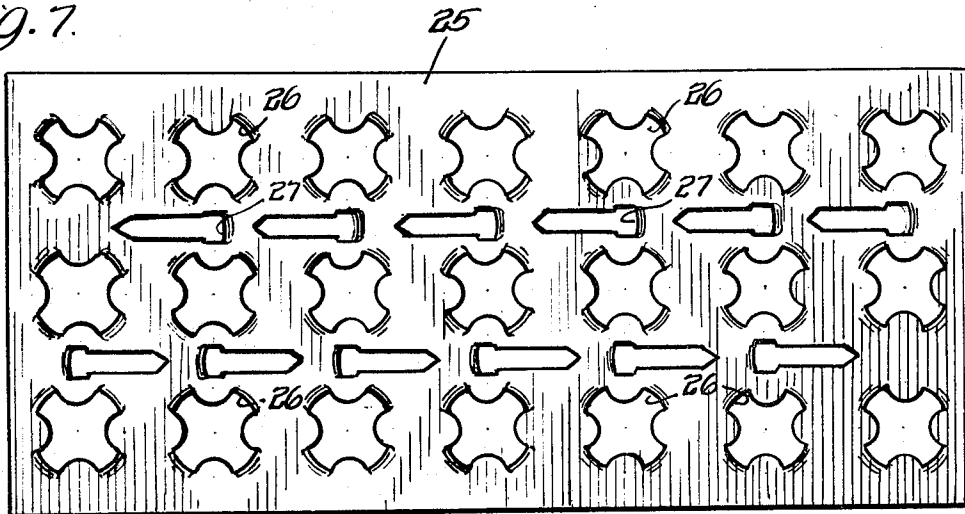


Fig. 8.

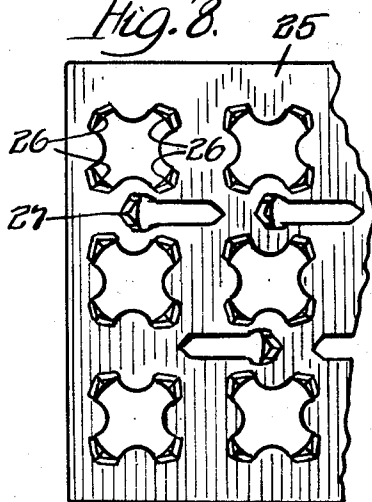


Fig. 9.

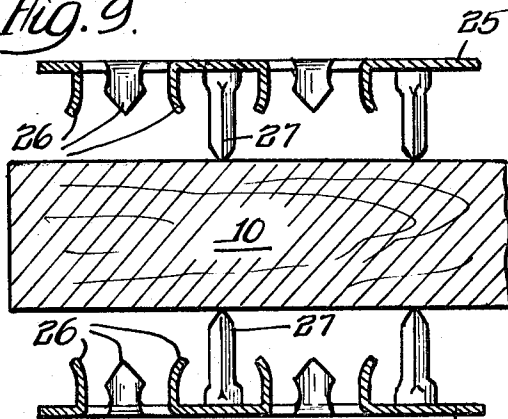


Fig. 10.

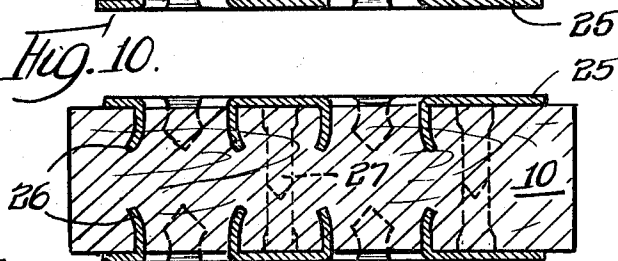
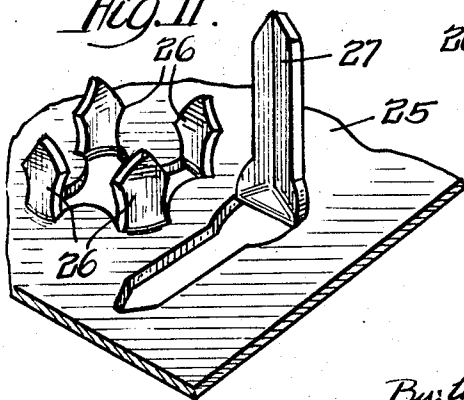


Fig. 11.



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METHOD AND APPARATUS FOR FORMING WOOD ROOF TRUSSES OR THE LIKE

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ABSTRACT OF THE DISCLOSURE

Method and apparatus for forming wood roof trusses or the like. The wood members are substantially horizontally arranged on a jig table in positions corresponding to the ultimate positions of the wood members in the wood truss or the like. The joints, at least, between the wood members are resiliently supported in an elevated position on the jig table. Nail plates having relatively long positioning nails and relatively short clinch nails struck therefrom are positioned above and below the joints between the wood members. The nail plates are substantially simultaneously pressed into the wood members at each of the joints to secure a portion of the relatively long positioning nails in the wood members. The thusly preformed truss is then shifted onto a conveyor and passed between horizontal rolls thereby to press both the partly secured relatively long positioning nails and the clinch nails completely into the wood members and form the finished roof truss or the like.

This invention is directed to an improved method and apparatus for forming wood roof trusses or the like utilizing a roller press or the like for pressing nail plates into the wood members forming the roof truss or the like at the joints between the wood members.

In the past in roller press forming apparatus, the wood members were positioned on a jig table in proper position for the roof truss or the like and nail plates having clinch nails struck therefrom were placed over the joints of the wood members forming the roof truss or the like. These nail plates were provided with holes for receiving stitching nails which were individually hammered into the wood members for positioning the nail plates on one side of the wood roof truss or the like at the joints formed by the wood members. The roof truss or the like was then turned over on that jig table or onto another jig table and then further nail plates having clinch nails struck therefrom were placed over the joints of the wood members of the roof truss and were held in place by individually driving stitching nails through holes in the nail plates as on the other side of the roof truss or the like. Thereafter, the roof truss or the like was transferred onto a horizontal conveyor and then fed through a roller press having horizontal rollers for pressing the struck clinch nails and the individual stitching nails completely into the wood members for completely forming the roof truss or the like.

That prior method of forming roof trusses or the like by a roller press required individually hammering stitching nails through nail plates on one side of roof truss or the like and then turning over the roof truss or the like and repeating this operation before feeding the roof truss or the like to the roller press for pressing the clinch nails of the nail plates into the wood members of the roof truss or the like. Considerable man hours in so doing were required and weakening and distortion of the joints between

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the wood members of the roof truss or the like were occasioned by the turning over of the roof truss from one side to the other.

Those deficiencies in the manufacture of wood roof trusses by roller presses are eliminated by this invention. Briefly, in accordance with this invention, the wood members of the roof truss or the like are properly positioned on a horizontal jig table and nail plates having relatively long positioning nails and relatively short clinch nails struck therefrom are simultaneously secured to both sides of the joints between the wood members forming the roof truss or the like by simultaneously pressing the relatively long struck positioning nails of the nail plates into both sides of the wood members. In this way, hammering of individual stitching nails and turning over the roof truss or the like for a repetitive stitching nail operation before feeding the roof truss or the like to the roller press are entirely eliminated. As a result, many man hours of time are saved and more accurately formed wood roof trusses are made possible. This invention has particular utility in modernizing and improving the many aforementioned existing roller press installations currently in use.

The principal object of this invention is to provide an improved method and apparatus for preforming and completely forming wood roof trusses or the like in accordance with the foregoing.

Further objects of this invention reside in the improved steps of the method for forming wood roof trusses or the like and in the details of the apparatus and the cooperative relationships between the component parts of such apparatus for forming wood roof trusses or the like.

Other objects and advantages of this invention will become apparent to those skilled in the art upon reference to the accompanying specifications, claims and drawings in which:

FIG. 1 is a top plan view of the apparatus of this invention for forming wood roof trusses or the like;

FIG. 2 is a perspective view of the portion of the apparatus illustrated in the lower right hand portion of FIG. 1;

FIG. 3 is an enlarged perspective view of one of the presses utilized in the apparatus;

FIG. 4 is a partial side elevational view of another form of the press utilized in the apparatus;

FIG. 5 is a vertical sectional view of the lower portion of the apparatus illustrated in FIG. 3 and illustrating the upper platen in an elevated position;

FIG. 6 is a sectional view similar to FIG. 5 but illustrating the upper platen in a lowered position;

FIG. 7 is a top plan view of a nail plate which is useful in the formation of roof trusses or the like by the apparatus illustrated in FIGS. 1 to 6;

FIG. 8 is a partial bottom plan view of the nail plate illustrated in FIG. 7;

FIG. 9 is a vertical sectional view through upper and lower nail plates prior to pressing the same into a wood member;

FIG. 10 is a view similar to FIG. 9 but illustrating the upper and lower nail plates completely pressed into the wood member; and

FIG. 11 is a perspective view of a portion of the nail plate illustrating in more detail the nails struck therefrom.

As an example of wood roof truss or the like which may be formed in accordance with this invention, refer-

ence is made to FIGS. 1 and 2 wherein the wood roof truss is shown to be made up of a plurality of wood members, such as members 10 and 11 forming the bottom chord of the roof truss, members 12 and 13 forming the top chords thereof, members 14 and 15 and members 16 and 17 forming struts between the bottom chord and the top chords. The wood members 10 and 11 are spliced together by nail plates 18, the members 12 and 13 are secured adjacent their ends to the members 10 and 11 by nail plates 19, the members 12 and 13 and the members 14 and 15 are secured together by nail plates 20, the members 14 and 15 and the members 16 and 17 are secured to the members 10 and 11 by nail plates 21, and the members 16 and 17 are secured to the members 12 and 13 by nail plates 22.

The nail plates which are particularly useful in accordance with this invention are illustrated in more detail in FIGS. 7 to 11. Here, the nail plates are formed from a sheet metal plate 25 having any desired thickness gauge, such as 14, 16, 18 and 20 gauge. A plurality of relatively short clinch nails 26 are struck from the plate 25 and, as illustrated, these clinch nails 26 are struck radially from a central point so as to provide a plurality of groups of clinch nails including four clinch nails per group. A plurality of rows formed of a plurality of clinch nails is preferably utilized. In the forming of the clinch nails 26, the tips of such nails are preferably bent outwardly so that when they are driven into a wood member, they will bend outwardly so as to provide a clinching action. The nail plate 25 also includes a plurality of rows having a plurality of relatively long positioning nails 27 struck therefrom. By pressing the positioning nails 27 of upper and lower nail plates partially into the wood members the nail plates are positioned on the wood members and serve to secure the wood members in proper position with respect to each other. Thereafter, when the clinch nails 26 of the upper and lower nail plates and the positioning nails 27 are completely pressed into the wood members, a strong joint between the wood members is afforded.

Referring now to FIGS. 1 and 2, the apparatus for preforming the wood roof truss or the like includes a horizontal jig table having a chord portion 30 made of a plurality of boards having slots 31 therebetween. It also includes a central lateral extension 32 made of a plurality of boards having slots 33 therebetween. It further includes a pair of wing portions 34 and 36 on opposite sides of the central portion 32 which are made from a plurality of boards for providing slots 35 and 37. The entire jig table is supported in an elevated position by a base frame 38 having supporting legs 39.

A plurality of manually operated presses are adjustably mounted on the top of the jig table in the slots formed between the boards of the jig table. A first centrally located press 40 is centrally mounted on the bottom chord portion 30 for driving the nail plates 18. A pair of presses 41 and 42 are mounted on the chord portion 30 of the jig table for driving the nail plates 19. A press 43 is mounted on the central portion 32 for driving the nail plates 20. A pair of presses 44 and 45 are mounted on the chord portion 30 for driving the nail plates 21 and a pair of presses 46 and 47 are mounted on the wing portions 34 and 36 for driving the nail plates 22. These presses 40 to 47 have generally the same construction and are utilized for simultaneously pressing the positioning nails of the nail plates into the wood members so as to perform the wood roof truss or the like. The presses 41, 42, 43, 44 and 45 are larger than the presses 40, 46 and 47 since the nail plates driven thereby are larger than the nail plates driven by the other presses. All of the presses face inwardly towards the wood roof truss being preformed thereby so that they may be readily operated by personnel moving around the wood truss and jig table. In order to provide for horizontal movement of the preformed wood truss from the jig table onto a horizontal

conveyor the upper platens of the presses 43, 46 and 47 are movable away from above the bottom platens thereof so that the top chord portions 12 and 13 and the preformed wood roof truss may be first lifted and then the entire preformed wood roof truss horizontally moved onto the horizontal conveyor.

One form of the press is illustrated in FIGS. 3, 5 and 6. The press includes a bottom platen 50 which is adjustably secured to the boards of the jig table by screws 51 extending through the slots in the jig table. The press includes four L-shaped members 52 which are suitably secured, as by welding, to the bottom platen 50, the upper portions of the members 52 overhanging the bottom platen 50. The top portions of the L-shaped members 52 are provided with holes for receiving a shaft 53. The shaft 53 carries a pair of gears 54 and a collar 55 provided with a handle portion 56. A suitable operating handle 57 is secured to the handle portion 56 so that by manipulating the handle 57 the shaft 53 and the gears 54 carried thereby are suitably rotated. The gears 54 mesh with a pair of rack bars 58 which are secured at their bottoms to an upper platen 59. Thus, by manipulating the handle 57 the upper platen 59 may be raised and lowered with respect to the bottom platen 50.

A pair of bosses 79 carried by the L-shaped members 52 slidably receive screw threaded pins 80 having heads 81. The pins 80 and, hence, the heads 81 may be adjustably positioned in the bosses 79 by nuts 82 and act as a guide means for the wood members set between the lower and upper platens 50 and 59.

An extension 61 is suitably secured, as by welding, to the lower platen 50. Slidably mounted on the extension 61 is a plate 62, the plate 62 being slidably secured in place on the extension 61 by screws 63 operating in slots 64 in the extension 61. The plate 62 is provided with a boss 65 in which is slidably mounted a plunger 66. The outer end of the plunger 66 is secured by toggle links 67 to a lever 68 pivoted on the plate 62 and provided with an operating handle 69. By manually manipulating the handle 69 the plunger 66 may be slidably moved in the boss 65. The plunger 66 is provided with an extension 70 extending into a hole in a sleeve 71 carrying a guide and clamping member 72. Suitable means such as a pin and slot are provided for limiting the movement of the sleeve 71 with respect to the plunger extension 70. A spring seat 73 is carried by the sleeve 71 and a spring seat 74 is adjustably carried by the plunger extension 70, the position of the spring seat 74 being adjusted by a nut 75 screw threadedly carried by the plunger extension 70. A spring 76 is interposed between the spring seats 73 and 74 for the purpose of urging the sleeve and, hence, the guide and clamping means 72 inwardly with respect to the plunger 66. There is, therefore, formed between the plunger 66 and the guide and clamping means 72 a spring biased lost motion connection. A nut 77 adjustably mounted on the plunger extension 70 limits the extent of retracting movement of the plunger 66. When the plunger 66 is retracted by the handle 69, the guiding and clamping member 72 is retracted to allow positioning of wood members between the lower and upper platens 50 and 59 and when the handle 69 is manipulated to advance the plunger 66, the guide and clamping member 72 resiliently urges and clamps the wood members against the adjustable guide members 81. In this way, the wood members may be accurately positioned between the lower and upper platens 50 and 59.

The lower platen is provided with a pair of resilient leaf springs 84 so as to resiliently hold the wood members in elevated position when they are inserted between the lower and upper platens 50 and 59. Before inserting the wood members between the upper and lower platens 50 and 59 a nail plate 25 is placed in desired position on the lower platen 50 and thereafter the wood members are placed in position. The resilient springs 84 hold the wood members in elevated position above the lower nail

plate carried by the bottom platen 50. After the wood members are properly positioned by the guide means 81 and the guide and clamping means 72, an upper nail plate is placed over the wood members in proper position, all as illustrated in FIG. 5. The upper platen 59 is then lowered for pressing the relatively long struck positioning nails 27 into the wood members for accurately securing the wood members together and preforming the joint, as illustrated in FIG. 6. In so pressing the relatively long positioning nails 27 into the wood members the resilient spring means 84 gives way as the upper platen 59 is lowered so that the positioning nails 27 of the lower and upper nail plates are substantially simultaneously pressed into the wood members.

Referring now to FIG. 4 a modified press is illustrated, such modified press being the presses 43, 46 and 47 illustrated in FIG. 1. The modified press of FIG. 4 is the same as that of FIGS. 3, 5 and 6 with one exception and that is that the upper platen 59 may be swung away from above the lower platen 52'. Like reference characters have been utilized in FIGS. 3 and 4 where the parts are the same. In FIG. 4, however, the L-shaped members 52' are not fixedly secured to the lower platen 50'. Here, the lower platen 50' has a plurality of ears 86 suitably secured to the lower platen 52' by welding or the like. The ears 86 are provided with holes and the lower ends of the L-shaped members 52' are provided with holes for receiving a pin 87 for pivotally mounting the L-shaped members 52' on the ears 86. The ears 86 are also provided with holes 88 and the L-shaped members 52' are provided with holes 89 for receiving a pin for locking the L-shaped members 52' in the upright position as illustrated by solid lines in FIG. 4. The operation of the press of FIG. 4 is the same as that described above in connection with the press of FIGS. 3, 5 and 6. In FIG. 4 when the joint between the wood members has been preformed as described above, the locking pin is removed from the holes 88 and 89 in the ears 86 and L-shaped members 52' so that the latter may be swung from the position illustrated in solid lines to the position illustrated in broken lines in FIG. 4. Thus, the wood members which have been joined together may be vertically lifted from the press of FIG. 4, this being the case of the presses 43, 46 and 47 as illustrated in FIGS. 1 and 2. Located to one side of the jig table is a horizontal conveyor 91 and the preformed wood roof truss may be horizontally moved from the jig table onto the horizontal conveyor 91 in the direction indicated by the arrow in FIG. 1. No turning or flipping over of the preformed wood roof truss or the like is required in the preforming of the wood roof truss or the like and in the transferring of the same from the jig table to the conveyor. After the preformed wood roof truss or the like is placed on the conveyor 91, it is longitudinally fed through a roller press comprising an upper roller 92 and a lower roller 92' for completely pressing the struck clinch nails 26 and the struck positioning nails 27 of the upper and lower nail plates completely into the wood members for completely forming the wood truss. As the wood truss is advanced through the rollers 92 and 92', it is received by another horizontal conveyor 93 so as to be carried away from the roller press.

As shown more clearly in FIG. 2, the presses 40, 46 and 47 are of lighter construction than the other presses, they including only a single rack bar as distinguished from double rack bars in the other presses. This is occasioned by the fact that the nail plates 18 and 22 to be driven thereby are smaller than the other nail plates and as much energy to press partially the positioning nails of those nail plates into the wood is not required.

While for purposes of illustration one form of this invention has been disclosed, other forms thereof may become apparent to those skilled in the art upon reference to this disclosure and, therefore, this invention is to be limited only by the scope of the appended claims.

I claim:

1. A method of making a wood roof truss or the like, comprising the steps of substantially horizontally arranging on a jig table various wood members in positions corresponding to the ultimate positions of said wood members in said wood roof truss or the like, the joints at least between said wood members being resiliently supported in an elevated position on the jig table, positioning upper and lower nail plates having relatively long positioning nails and relatively short clinch nails struck therefrom above and below the resiliently supported elevated joints between said wood members with the struck nails extending toward the wood members, simultaneously pressing the upper and the lower nail plates at each resiliently supported elevated joint between the wood members toward the wood members of each such joint for simultaneously pressing the relatively long positioning nails of said nail plates partially into said wood members at each such joint for fixing and securing the positions of said wood members in their ultimate positions to preform the roof truss or the like, removing the pressure from the upper and lower nail plates thereby to permit the joints at least between said wood members to return to an elevated position, horizontally shifting said roof truss or the like onto a conveyor, and horizontally feeding said roof truss or the like from the conveyor between horizontal rolls of a roller press for simultaneously further pressing the upper and lower nail plates at each joint between the wood members toward the wood members of each such joint for simultaneously pressing the relatively long positioning nails and the relatively short clinch nails completely into said wood members for completely securing together the wood members and completely forming the roof truss or the like.

2. In an apparatus for preforming a wood roof truss or the like from wood members, a horizontal jig table, a plurality of presses adjustably mounted on said jig table at positions corresponding to the positions of the wood members in the ultimate roof truss to be formed therefrom, each of said presses including a stationary lower platen for carrying a lower nail plate having relatively long positioning nails and relatively short clinch nails struck therefrom with the struck nails extending upwardly, guide means for positioning the wood members in adjoining position above the lower platen, resilient means for resiliently holding the positioned wood members in elevated position above the lower platen and the nail plate carried thereby, a movable upper platen above the lower platen and normally spaced above an upper nail plate having relatively long positioning nails and relatively short clinch nails struck therefrom with the struck nails extending downwardly and resting on the positioned wood members, and means for moving said upper platen toward said lower platen for simultaneously pressing the struck positioning nails of the lower and upper nail plates partially into the positioned wood members between the platens for fixing and securing together the positioned wood members in their ultimate positions to preform the roof truss or the like, said resilient means permitting downward movement of the positioned wood members as the upper platen is moved downwardly.

3. In an apparatus as defined in claim 2, said presses on said jig table having supporting means for the upper platens thereof arranged outwardly from the roof truss or the like being preformed thereby, a horizontal conveyor adjacent to one side of the jig table, said presses on said jig table adjacent to said horizontal conveyor having means for moving the upper platens thereof away from above the lower platens thereof so that the portions of the preformed roof truss or the like thereat may be moved upwardly and the entire preformed roof truss or the like may be moved horizontally onto the horizontal conveyor, and a roller press having horizontally arranged pressing rolls adjacent the horizontal conveyor for horizontally receiving the preformed roof truss or the like for pressing the struck clinch nails and the struck positioning nails completely into the

preformed roof truss or the like for completely forming
said roof truss or the like.

References Cited

UNITED STATES PATENTS

1,384,498 7/1921 Thomas ----- 100/211
2,572,286 10/1951 Smith ----- 100—288 X

2,983,292 5/1961 McKinley.
3,068,483 12/1962 Moehlenpah et al. ---- 227—152
3,100,301 8/1963 Black ----- 227—152
3,172,125 3/1965 Sanford ----- 227—152
3,241,585 3/1966 Jureit ----- 144—288
3,244,091 4/1966 Anderson et al. ----- 100—214

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