

April 9, 1963

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3,084,929

ROOF TRUSS ASSEMBLING APPARATUS

Filed March 11, 1960

4 Sheets-Sheet 1

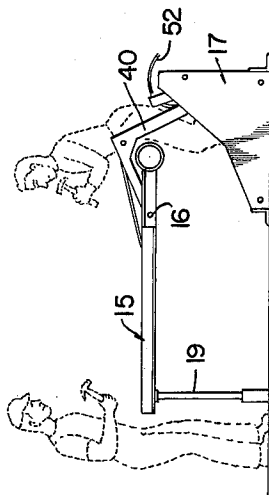


FIG. 1.

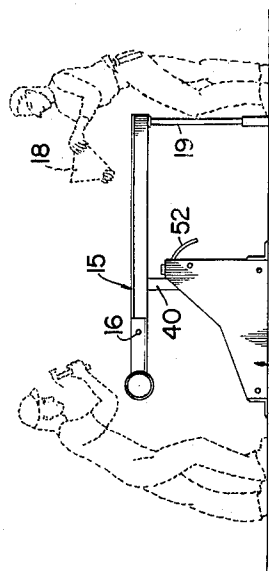


FIG. 2.

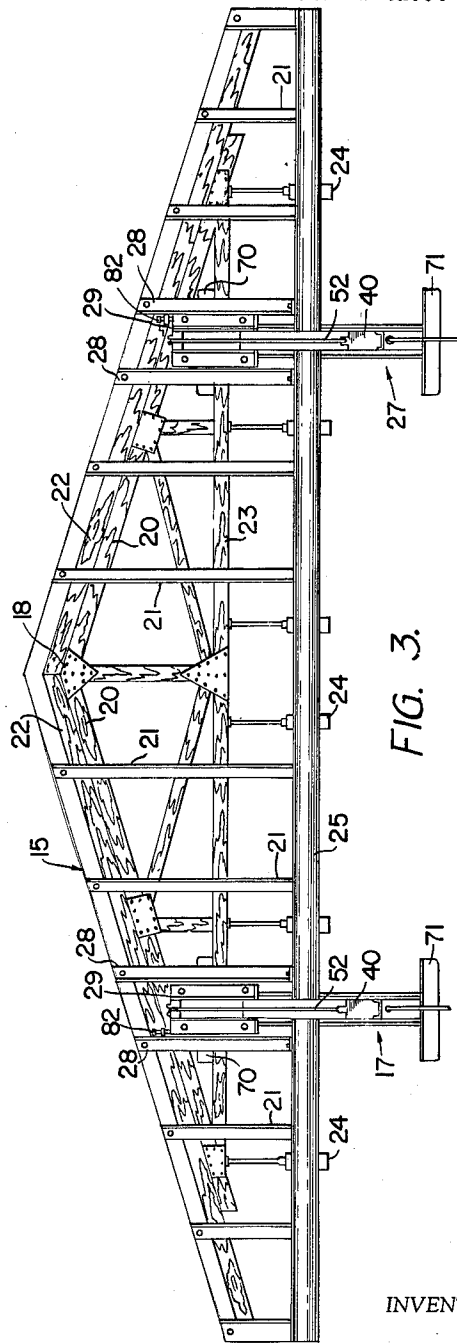


FIG. 3.

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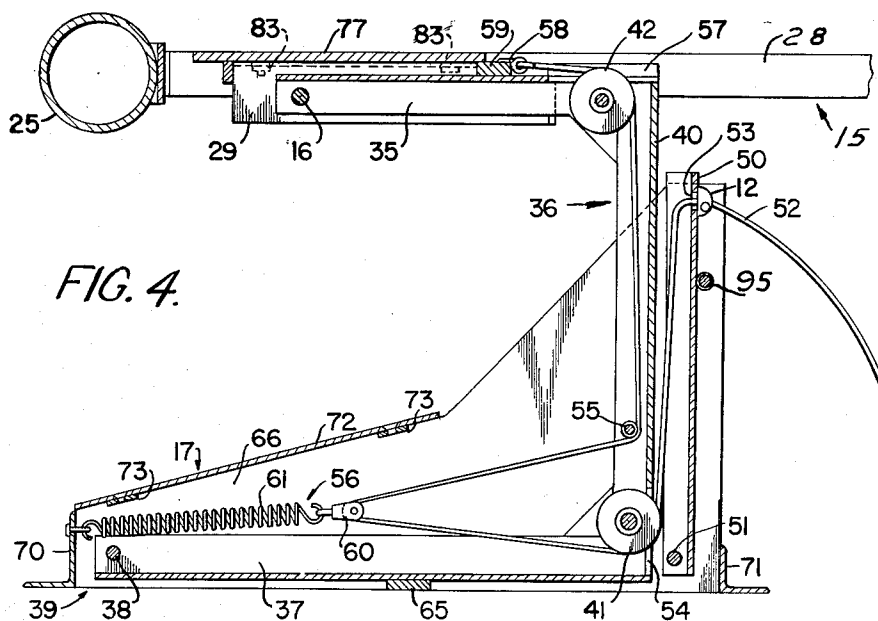
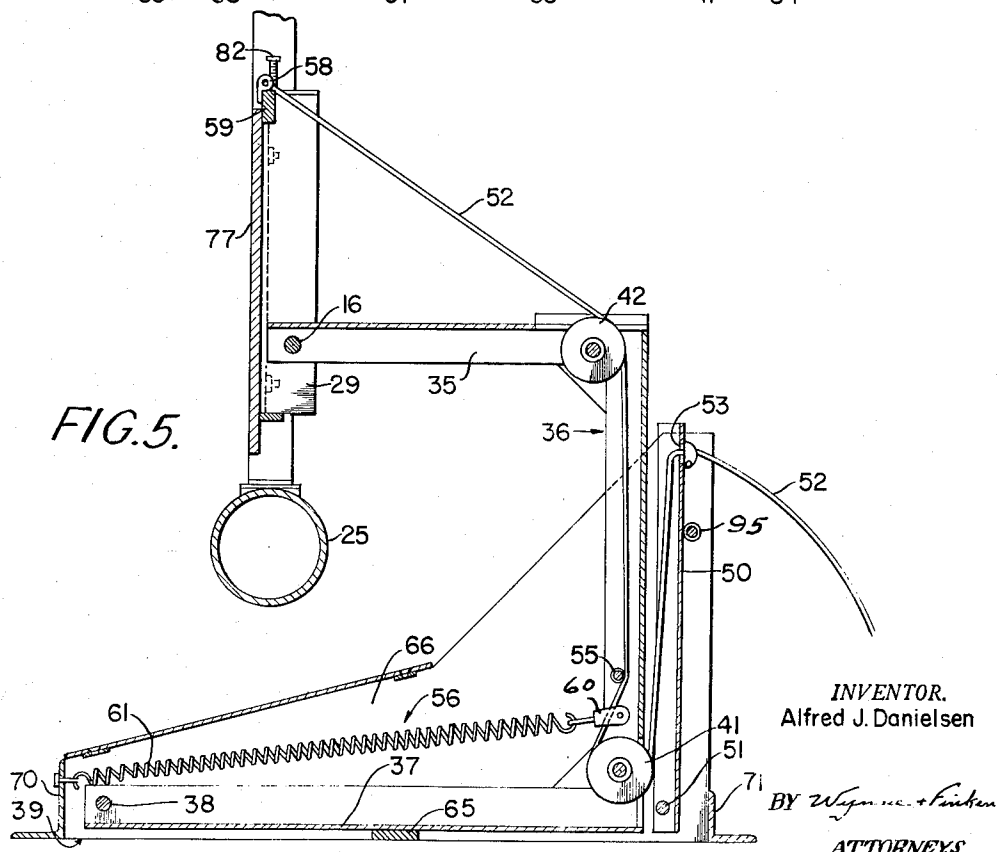
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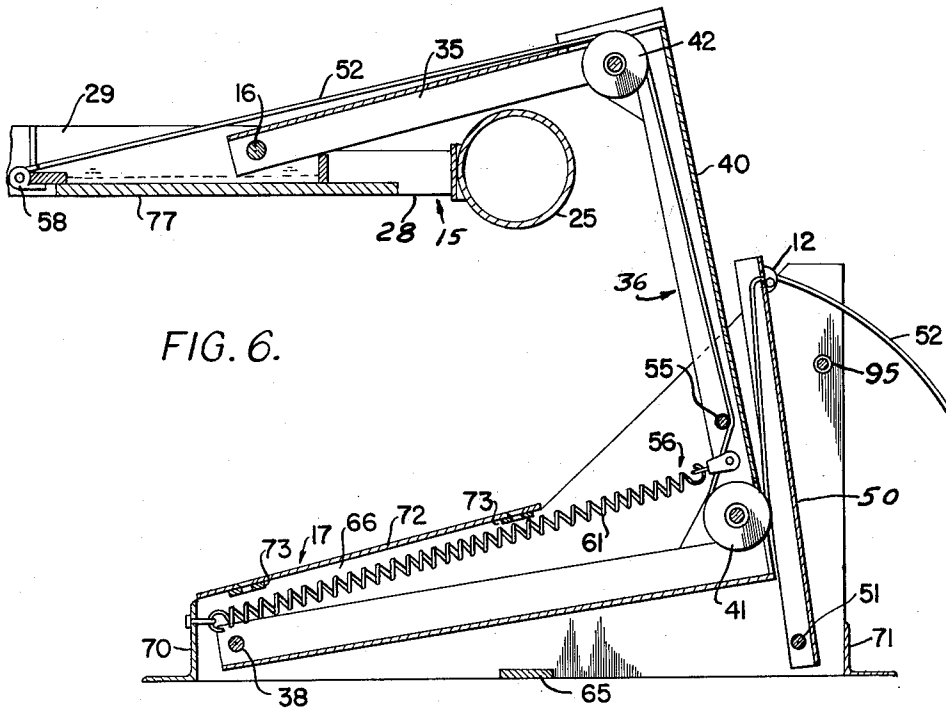


FIG. 6.

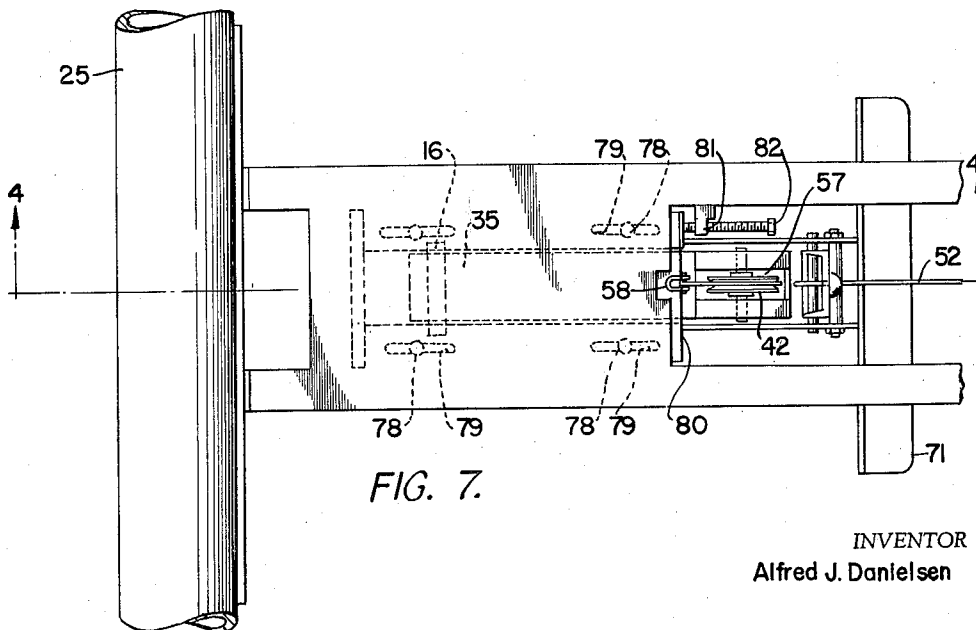


FIG. 7.

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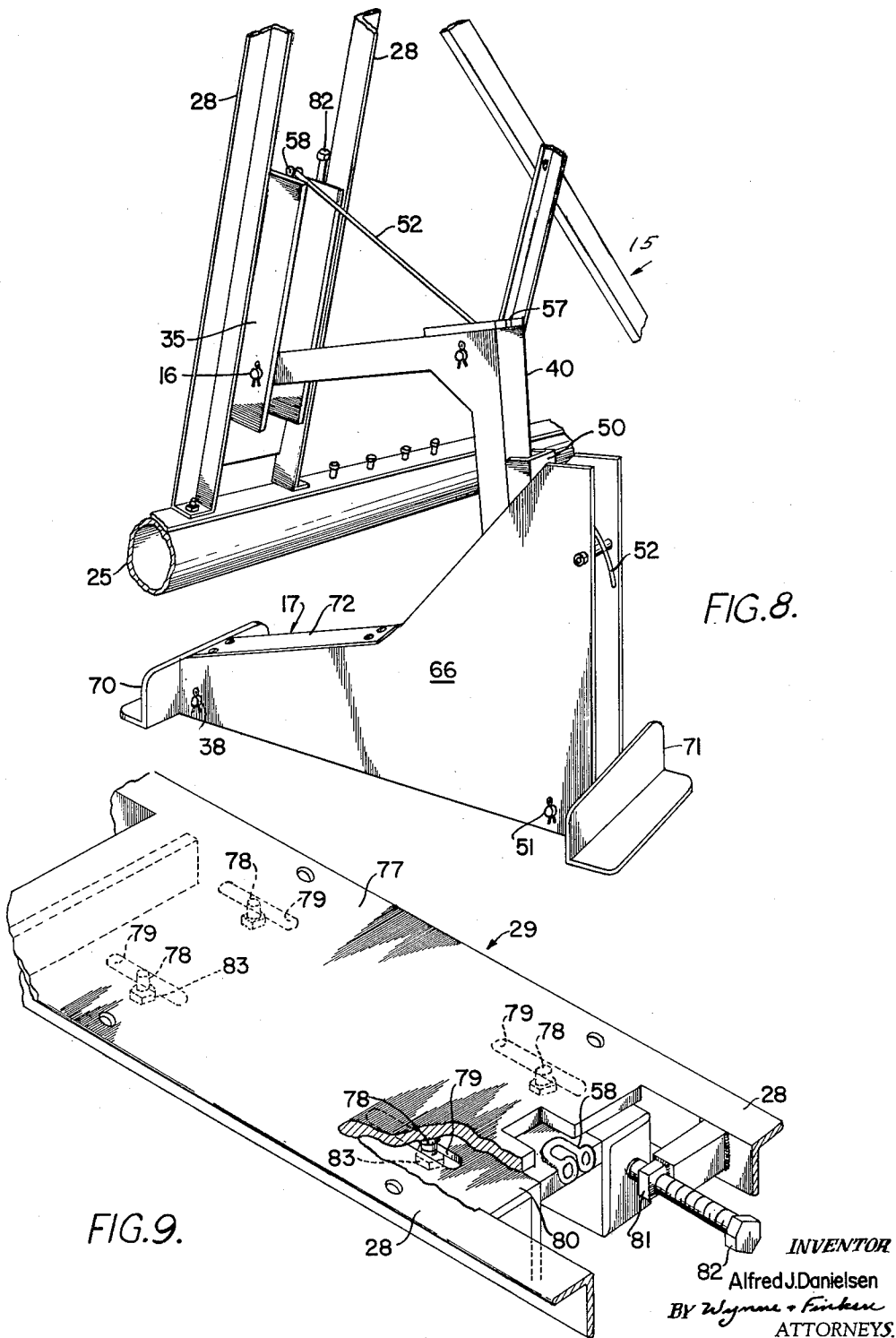
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ROOF TRUSS ASSEMBLING APPARATUS

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3,084,929
ROOF TRUSS ASSEMBLING APPARATUS
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 Filed Mar. 11, 1960, Ser. No. 14,246
 6 Claims. (Cl. 269—58)

This invention relates to an apparatus for enabling the assembly of a roof truss in a first horizontal position and then in an inverted horizontal position. In this manner, metal connecting plates may be easily attached (as by nailing) to the elements or members of the roof truss by workmen operating on the structure supported in a first horizontal position and then in an inverted horizontal position. The elements of the truss are clamped in position on a jig table which in turn is mounted for pivoting substantially 180 degrees between its two operating horizontal positions.

My invention provides a supporting system for a roof truss jig table which maintains an even balance of the supported weight during the pivoting operation and further which enables the pivoting of the unit through a full 180 degrees. It has been found through extended tests and production runs that workmen using this invention are able under normal conditions to increase their production 15 to 20 percent over other known techniques which require the workmen to connect truss elements held in a vertical or substantially vertical position. It has been found that the workmen are less fatigued at the end of a working day in operating the system of this invention and that the quality of work produced is improved.

It is believed well established that roof trusses prefabricated in the manner intended by this invention are, on the average, superior in strength characteristics and more uniform in dimension. This invention enables economic advantages in the prefabrication of the trusses.

It will be understood that the jig table which supports the truss components is of open construction to enable easy access to the juncture points of the components from opposite sides. Also, the jig table will include the usual fillers, accessories and the like for enabling adaptation of a standard jig table to trusses of varying dimensions and designs. The jig table has a longitudinally extending base element or pipe of substantial diameter which, in most cases, forms the base of an isosceles triangle. The longitudinal balance axis of the jig table extends parallel to the base element between the base element and the apex of the triangle. Means are provided for compensating for shifts in the balance axis when trusses of varying weight distributions are clamped in the table.

This invention provides an adjustable adapter means which is fixedly attached to the jig table, the adapter means being pivotally mounted along the balance axis at the outer end of a C-frame with the C-frame having the outer end of its lower leg pivotally mounted to a fixed structure such as a base. The legs of the C-frame in the first horizontal position are substantially horizontal and means are provided for tipping the C-frame when the table is pivoted 180 degrees to provide clearance for the base pipe and thereby allow the table to assume a horizontal inverted position. A bar is pivotally mounted adjacent the bight of the C-frame, this bar providing an anchor for a flexible non-stretchable connecting means which extends from the upper portion of the bar downwardly through the bottom end of the bight and from there upwardly through the inner end of the top leg at the top of the bight to the non-pivoted end of the adapter means. When the jig table is moving to its inverted horizontal position, the connecting means is fully extended and causes the C-frame to pivot and be lifted upwardly

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from the base thereby enabling the base pipe of the jig table to be pivoted upwardly a sufficient distance to enable the jig table to assume a horizontal attitude.

Other important objects and advantageous features of the invention will be apparent from the following description and accompanying drawings, wherein, for the purposes of illustration herein, a specific embodiment of this invention is set forth in detail, and wherein:

FIGURE 1 is a view showing the apparatus in a first horizontal position;

FIGURE 2 is a view showing the apparatus in an inverted horizontal position;

FIGURE 3 is a plan view of the structure shown in FIGURE 2 showing two support devices in use;

FIGURE 4 is a side view in section of a support device in first horizontal position, this view being taken on line 4—4 of FIGURE 7;

FIGURE 5 is a view similar to FIGURE 4 but with the adapter means and affixed jig table swung upwardly to the vertical position;

FIGURE 6 is a view similar to FIGURE 4 but with the adapter means and jig table swung fully to its inverted horizontal position;

FIGURE 7 is a top view of the support device in first horizontal position;

FIGURE 8 is a perspective view showing the jig table being swung between its horizontal positions, and

FIGURE 9 is a perspective view partly cut away showing the adapter means.

Referring now to FIGURE 1, it will be seen that a jig table 15 and its clamped truss components are pivotally mounted at pivot pin 16 to a support device 17. Workmen have easy access to the base of the triangular form as well as the apex thereby facilitating the application of connecting metallic plates 18. The jig table has been swung through 180 degrees in FIGURE 2 with the workmen there applying metal plates to the opposite side of the truss elements or members. If the truss is of substantial size and/or greater rigidity is desired, a support leg 19 may be inserted beneath the apex of the jig table as seen in FIGURES 1 and 2.

FIGURE 3 shows a jig table 15 with truss components 20 clamped therein, the table being in inverted position and utilizing two support devices 17 and 27 for greater support. It will be noted that the jig table is made up of an open framework of metallic angle irons 21 which present coplanar support portions for receiving and supporting the truss components 20. Suitable filler means may be provided, such as fillers 22, for enabling use of the jig table for various size trusses. The base component 23 of the truss is preferably forced toward the apex of the table by fluid operated piston means 24 suitably spaced along the enlarged base element or base pipe 25 of the jig table. It has been found that sufficient clamping force can be applied to hold the truss elements in position for assembly in both the first horizontal position and the inverted position.

It will be noted in FIGURE 3 that the two support means 17 and 27 are connected through bolted bars 28 of adapter means 29 to the angle irons structure of the jig table 15. Metal plates 18 used for joining the truss components are shown in nailed positions in FIGURE 3.

FIGURES 4, 5, 6 and 8 show the support means 17 in the first horizontal position (FIGURE 4), during tilting (FIGURES 5 and 8) and in the inverted horizontal position (FIGURE 6). In the first horizontal position shown in FIGURE 4, the base pipe 25 of the jig table extends longitudinally of the support device 17 across the rear end thereof. Adapter means 29 is bolted to the jig table in the manner previously described; the adapter means is predeterminedly positioned along a longitudinal line of the jig table to place the center of gravity thereof

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substantially at the pivot pin 16 of the adapter means. The pivot pin 16 is journaled in the outer end of the top substantially horizontal transversely extending leg 35 of the C-frame 36. The outer end of the bottom substantially horizontal transversely extending leg 37 of the C-frame is pivotally mounted by pin 38 journaled in a base 39. A vertical bight 40 interconnects the top and bottom legs of C-frame 36.

Bottom pulley 41 is rotatably mounted at the bottom end of the bight 40 and top pulley 42 is rotatably mounted at the top end of the bight. Preferably, the C-frame 36 is constructed of inwardly directed U-channels (FIGURE 7) which provide a housing for the pulleys and pivot pins.

It will be recognized on viewing FIGURE 4, that the jig table 15 could not be pivoted a full 180 degrees unless the C-frame 36 were lifted a predetermined controlled amount. To accomplish controlled lifting of the C-frame, a vertical bar 50 is pivotally mounted to the base 39 for slight swinging movement about pivot pin 51 in substantially juxtaposed position to the bight 40 of the C-frame. Attached to the upper portion of this bar 50 by a removable clamp 12 is a flexible non-stretchable connecting means 52 which, in the preferred form, is a cable. The cable 52 is threaded through a keyhole slot 53 in the upper portion of the bar, then downwardly through the channel formed by the U-shaped channel of the bar 50, through an opening 54 of the lower end of the bight 40, around pulley 41, through slack take-up means 56, upwardly past guide pin 55, over pulley 42 and then through opening 57 to the clevis 58 where it is attached to the outer free end 59 of the adapter means 29.

The clamp 12 is adjustably mounted on the cable 52 to control the amount of pivoting movement of the jig table 15. As seen in FIGURE 6, the cable 52 is taut and the jig table 15 has assumed a full horizontal position. It will be noted also that in FIGURE 5, with the table passing through a vertical position, the cable is taut and the C-frame 36 is in condition for elevation as the jig table continues to swing to an inverted horizontal position. A take-up means 56 for taking up slack cable is provided in the form of a spring biased pulley 60, the spring 61 being anchored at one end to the rear of the base and carrying the sash pulley 60 at its forward end and through which the cable is preferably threaded. This arrangement prevents binding or jamming of the cable and facilitates cable movement.

When in first horizontal position, the lower leg of C-frame seats on the bottom cross bar 65 of the frame. It will be noted also that the bar 65 serves also as a spacer which aids in holding the side plates 66, 66 of the base 39 in spaced parallel relation.

When the jig table is in inverted horizontal position, the jig table 15 and C-frame 36 are resting on pivot pin 38 in leg 37 of C-frame and on the cable 52 which passes through the upper end of bar 50. It will be noted that there is clearance between the upper edge of the bottom leg and the frame 39 and that adjustment of the planar attitude of the jig table may be accomplished by taking up or releasing the cable by the clamping means 12.

The base 39 is made up of a pair of similar transversely disposed vertical plates 66, 66 held in parallelism by suitable means. The base 39 is rigidified by longitudinally extending angle bars 70 and 71 at its front end and rear end, the spacer 65, brace pin 95 and upper cover plate 72 and cross bars 73. The base provides a housing or cover for the outer end of the lower leg 37 and other mechanism by means of the cover plate 72 and its associated cross bars 73. It will be appreciated that the cover plate 72 and cross bars 73 also provide a limit means for upward pivotal movement of the lower leg. If the clamp should become inadvertently released and cable slide therethrough, the C-frame 36 would be prevented from tilting upwardly to any great degree by the cover

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plate 72. Such a situation might arise if a workman should apply a large force at the apex of the jig table.

Referring now to FIGURE 9, it will be seen that the adapter means 29 includes an outer member 77 having side angle irons 28, 28 which are attached to the jig table as in FIGURE 3. Welded to these angle irons 28, 28 is a central plate having threaded studs 78 depending therefrom which, in turn, extend through elongated slots 79 in the inner member 80. Welded to the inner face of one angle iron 28 is a threaded nut 81 which receives an adjusting bolt 82 which, in turn, abuts against a face of the inner member 80 for varying the position of the outer member 77 with respect to the inner member 80. Clamp nuts 83 fixedly connect the inner member 80 and outer member 77 when the correct alignment of the two members has been attained. Through these means, the balance axis of the jig table 15 and its truss elements may be established with a great degree of accuracy.

Preferably, as disclosed in the drawing, two support devices are employed although it will be recognized that truss members of small dimensions may be accommodated by the use of a single support means.

As previously mentioned, various adapters and clamping members may be utilized with the angle irons 21 of the jig table to adapt the table for various sizes and designs of roof trusses. Trusses are usually fabricated of two-by-fours and two-by-sixes in accordance with the requirements. The base pipe 25 may be of a substantial diameter such as up to six inches and of a substantial weight to provide an important or substantial counterweight for the jig table when it carries the truss elements. It will be noted in FIG. 4 that the pivot pin 16 in the top leg 35 is spaced forwardly of the pin 38 in the bottom leg 37. This structural arrangement aids in the stable location of the center of gravity within the longitudinal confines of the base 39 at all positions of the jig table.

In practice, it has been found that the base 39 may have a transverse dimension from front to rear that is from bar 70 to bar 71 of about 4 feet with the bottom leg 37 having a length of about 2 feet, 10 inches, the bight about 2 feet, 8 inches, and the top leg about 2 feet. This dimensional arrangement places the bottom pivot pin 38 about 10 inches rearwardly of the top pivot pin 16.

It will be recognized, therefore, that my invention provides a device for enabling the pivoting of a substantially isosceles triangular jib table having a longitudinally extending base pipe about a longitudinal balance axis through the center of gravity of the table from a horizontal first position to a horizontal inverted position. This device includes a vertical C-frame which has a bottom leg pivotally mounted on a fixed axis to which, through an adapter means, is connected the jig table. Control means which include the bar 50, cable 52, pulleys 41 and 42 interconnect the adapter means and the C-frame and cause the C-frame to be tilted less than 1 foot upwardly about its pivot pin 38 in response to movement of the adapter means to inverted horizontal position. The C-frame assumes an angle of about 25° from the horizontal. The cable 52 provides a force transmitting means which is threaded through the pulleys and preferably through the take-up means 56 and around the forward face of guide pin 55. The brace pin 95 strengthens the side plates 66, 66 and also provides a safety limit for forward tilting of bar 50.

Various modifications of this invention will be apparent to those skilled in the art and, for that reason, I wish to limit myself only within the scope of the appended claims.

I claim:

1. A device for enabling a roof truss jig table having a longitudinally extending base element to be pivoted substantially 180 degrees between a horizontal first position and a horizontal inverted position to facilitate access to opposite faces of roof truss members held therein, comprising a base, a C-frame having substantially horizontal

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transversely extending bottom and top legs and a substantially vertical bight, the outer end of the bottom leg being pivotally mounted to said base on a longitudinal axis, an adapter means having one end pivotally mounted to the outer end of said top leg on a longitudinal axis, said adapter means being adapted to be fixedly connected to said jig table, means for causing predetermined upward pivoting of said C-frame when said adapter means is pivoted to inverted position to enable said table to move to a substantially horizontal inverted position including a bar pivotally mounted to said base on a longitudinal axis, said bar extending upwardly and substantially juxtaposed to said bight, a flexible non-stretchable connecting means connected to the upper portion of said bar and threaded downwardly in sliding engagement with and through the bottom end of said bight upwardly in sliding engagement with and through the inner end of said top leg into connection with the free other end of said adapter means.

2. A device for enabling a roof truss jig table to be pivoted about a longitudinal balance axis of the table substantially 180 degrees between a horizontal first position and a horizontal inverted position to facilitate access to roof truss members from opposite sides, comprising a base, a C-frame having substantially horizontal transversely extending bottom and top legs and a substantially vertical bight, the outer end of the bottom leg being pivotally mounted to said base on an axis parallel to said balance axis, an adapter means pivotally mounted at one end to the outer end of said top leg on an axis parallel to said balance axis of said table, said adapter means being adapted to be adjustably connected to said table to enable coincident alignment of said balance axis with the axis of said adapter means, means for causing predetermined upward pivoting of said C-frame when said adapter means is pivoted to inverted position to enable said adapter means to move to a substantially horizontal position when said table is mounted thereon including a bar pivotally mounted to said base on an axis parallel to said balance axis, said bar extending upwardly and substantially juxtaposed to said bight, a cable connected to the upper portion of said bar and threaded downwardly through the bottom end of said bight upwardly through the inner end of said top leg into connection with the free other end of said adapter means.

3. Apparatus for assembling a roof truss, comprising a jig table of substantially planar and open construction for receiving roof truss members in a predetermined pattern with the portions of the members to be joined being positioned at openings in the jig table to enable easy access and joining, means for holding said truss members in fixed position on said table, support means for enabling movement of the table about an internal longitudinal

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balance axis thereof from a horizontally extending first position through 180 degrees to a horizontally extending inverted position, said support means including a base means, a C-frame extending transversely of said balance axis and having a bottom leg pivotally connected to said base means on an axis parallel to said balance axis, a vertical bight and a top leg, adapter means fixedly connected to said table and pivotally connected to said top leg on an axis substantially coincident with said balance axis, a bar pivotally mounted on said base means on an axis parallel to said balance axis and extending in substantial juxtaposed position to said bight, a cable adjustably affixed to the top of said bar and threaded downwardly to the bottom of said bight upwardly to the top of said bight and then to said adapter means in a connected fashion at a point removed from said balance axis, and spring means connected to said cable for taking up slack when in the first position.

4. A device for enabling the pivoting of a substantially isosceles triangular roof truss jig table having a longitudinally extending base pipe about a longitudinal balance axis thereof from a horizontal first position to a horizontal inverted position to facilitate access to opposite faces of roof truss members held therein comprising a vertical C-frame having a bottom leg pivotally mounted on a fixed longitudinal axis, a bight and a top leg, an adapter means adapted to be connected to said table and having one end pivotally mounted on said top leg at said balance axis, and control means interconnecting said adapter means and said C-frame responsive to movement of said adapter means to inverted position to tilt said C-frame upwardly about said fixed axis to accommodate said pipe, said control means including a vertical bar pivotally mounted on a fixed longitudinal axis in substantially the same horizontal plane as said C-frame and extending upwardly in substantially juxtaposed condition to said bight, and force transmitting means interconnecting the upper end of said bar with said adapter means and said C-frame.

5. A device in accordance with claim 4 wherein said control means further includes a pulley mounted at the bottom of said bight and a pulley mounted at the top of said bight, and wherein said force transmitting means is a flexible non-stretchable cable threaded through the pulleys.

6. A device in accordance with claim 5 and including take-up means engaging the cable between the pulleys to take up slack in the cable when said adapter means is in first horizontal position and wherein said top leg is shorter than said bottom leg.

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