Dec. 8, 1942. J. WAELBROCK 2,304,614

TEMPLATE FOR FASHIONING ELEMENTS OF ROOF TRUSSES AND LIKE STRUCTURES

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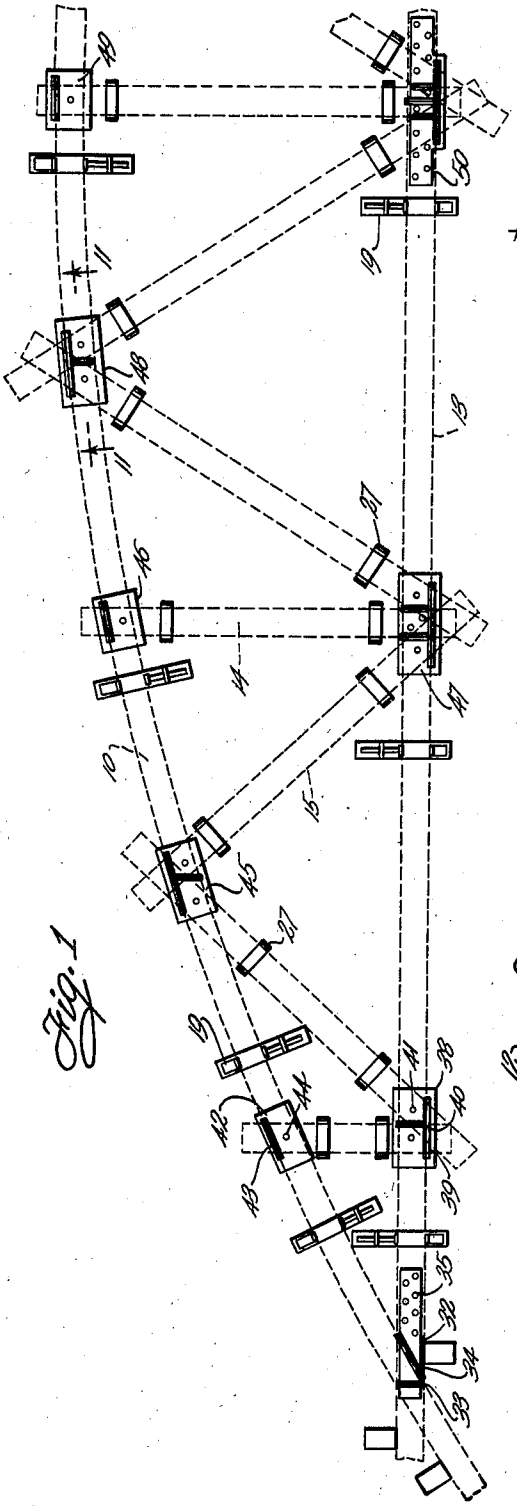

Fig. 1

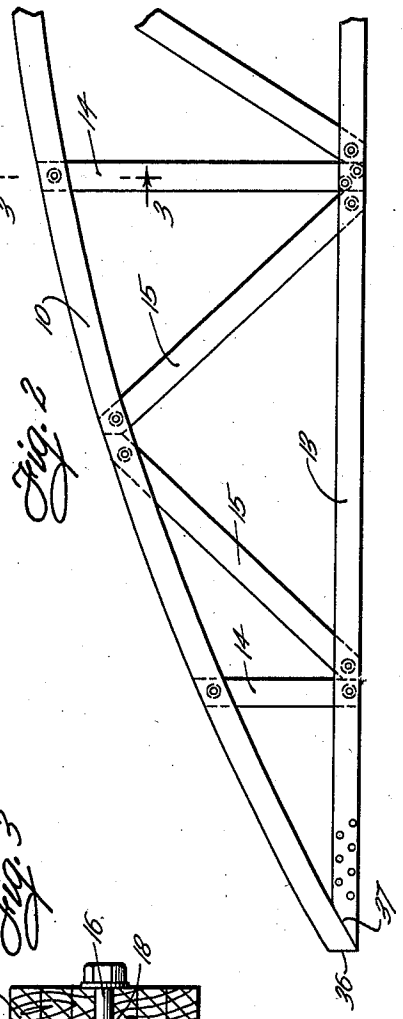

Fig. 2

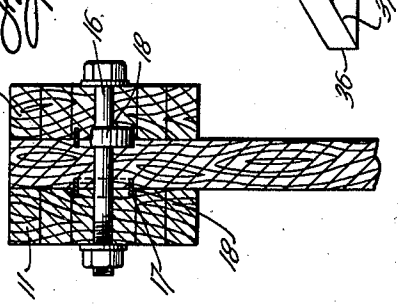

Fig. 3

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Fig. 4

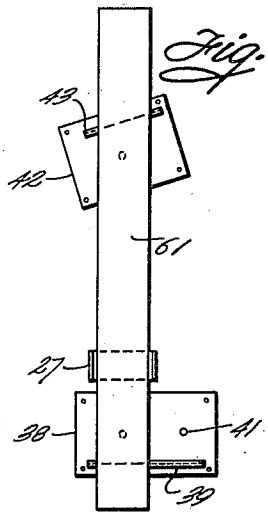


Fig. 5

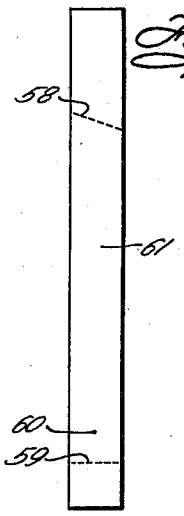


Fig. 6

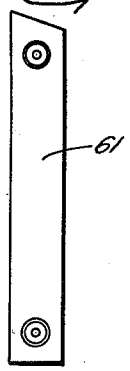


Fig. 7

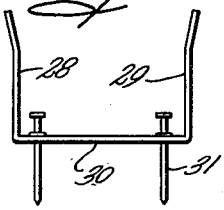


Fig. 8

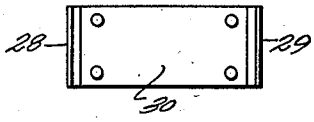


Fig. 12

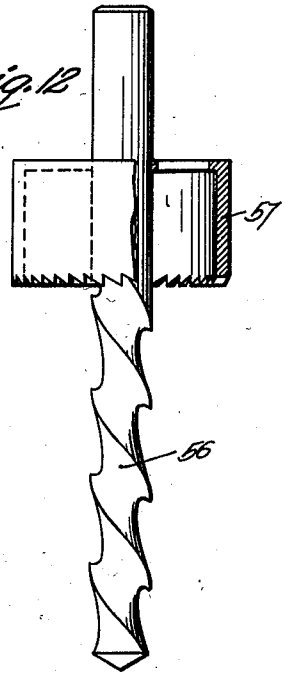


Fig. 9

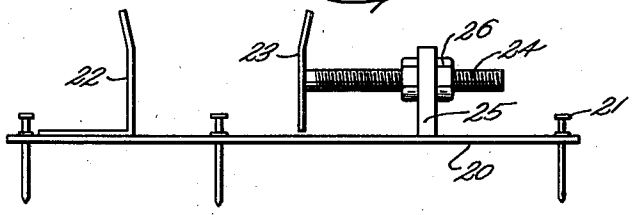


Fig. 10

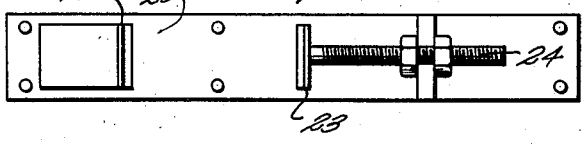
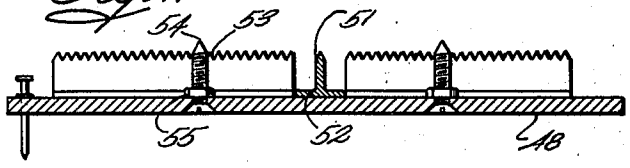


Fig. 11



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TEMPLATE FOR FASHIONING ELEMENTS OF ROOF TRUSSES AND LIKE STRUCTURES

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Application June 18, 1941, Serial No. 398,568

5 Claims. (Cl. 33—189)

This invention relates to a means and method for fashioning elements of roof trusses and similar structures.

An object of the invention is to provide a means and method by which timbers or fabricated parts of roof trusses and similar structures can be very easily marked to facilitate the proper cutting or shaping of the ends of such elements and to properly locate the centers of bolt holes that are to be drilled therethrough.

Heretofore, in the construction of roof trusses and similar structures it has been customary to assemble together temporarily the top and bottom chords and web members so that these may be properly marked to be cut to length and have their ends shaped to cause them to properly fit together. The bolt holes have been drilled through the temporarily assembled members and when this is accomplished the elements of the trusses have been taken apart for purposes of cutting or shaping the ends of the web members and for the purpose of grooving the opposed surfaces of the chord and web elements for the reception of timber connectors. When the web members have been thus cut to length, shaped, and grooved all of the elements of the truss have been then reassembled to form the completed truss. Such a method of construction involves a considerable waste of time and labor in that, in effect, each truss must be assembled or constructed twice, the first time being when the elements are temporarily assembled together for marking and hole drilling purposes, and the second being when the completely fashioned elements are reassembled together in the construction of the completed truss. Trusses constructed as above described are also subject to the further disadvantage in that the proper fitting or shaping of the various elements depends to a large extent upon the skill and accuracy of the workmen marking and cutting the various elements.

In the construction of large buildings that employ roof trusses there is usually required a series of trusses which may and should be exact duplicates of each other. Consequently, it is desirable to provide a means and method of quickly and accurately marking the elements of the truss so that they may be accurately and properly cut to shape and have their bolt holes and grooves for the timber connectors accurately located. In this manner the first or temporary assembly of the elements may be entirely avoided but the elements will nevertheless be accurately shaped and drilled so that when the completed trusses are assembled, all elements thereof will properly fit together.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a top plan view of approximately one-half of a template embodying the present invention, illustrating in dotted lines the positions assumed by various elements of a roof truss when applied thereto for marking purposes.

Fig. 2 is a partial view in side elevation of the completed roof truss made from elements that have been marked by means of the template illustrated in Fig. 1;

Fig. 3 is a partial view in vertical section taken substantially upon the line 3—3 upon Fig. 2, illustrating the connection between one of the vertical web members and the top or curved chord of the truss;

Fig. 4 is a top plan view illustrating two elements of the template shown in Fig. 1 and the manner in which a vertical web member of the truss is applied thereto for marking purposes;

Fig. 5 is a view of the underside of the vertical web member shown in Fig. 4 illustrating the manner in which it has been marked;

Fig. 6 is a view of the vertical web member illustrated in Fig. 5 after it has been cut to length and shaped and the bolt holes and timber connector grooves have been cut therein;

Fig. 7 is a view in side elevation of one of the U-shaped guides such as that illustrated in Fig. 4 that are used to properly position the web members;

Fig. 8 is a top plan view of the U-shaped guide illustrated in Fig. 7;

Fig. 9 is a view in side elevation of one of the adjustable guides forming a part of the template which may be advantageously used to properly position either the bowed top chord or the horizontal bottom chord of the truss;

Fig. 10 is a top plan view of the adjustable guide illustrated in Fig. 9;

Fig. 11 is a sectional view through one of the marking devices forming a part of the template and may be considered as having been taken upon the line 11—11 upon Fig. 1; and

Fig. 12 is a view in side elevation, parts being broken away and shown in section illustrating a combined drill and grooving tool that may be employed to drill the bolt holes through the

elements of the truss and cut the grooves to receive the timber connectors.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the elements forming the improved template are mounted and located on a suitable supporting surface such as a wooden floor or platform. For purposes of illustration I have illustrated the template as being used to mark the elements of a roof truss consisting of a curved or bowed top chord **10** made up of two parallel bowed top chord members **11** and **12**. The bottom chord or horizontal chord **13** is similarly made up of two parallel spaced members. The web members, some of which are vertical as indicated at **14** and others of which are inclined as indicated at **15** have their ends disposed between the members **11** and **12** of the top chord **10** and between the members that form the bottom chord **13**. The web members are connected to the chords as by bolts **16** and in the conventional form of construction the sides of the web members and the inner faces of the elements that form the top and bottom chords are grooves as indicated at **17** to receive rings or timber connectors **18** which cooperate with or assist the bolts **16** in the transmission of stresses.

The particular method of construction of the bowed top chord may vary under different circumstances. In the construction illustrated, however, the bowed top chord is made up of laminations as illustrated in Fig. 3 which are glued together and bent around a form which imparts the desired shape to the top chord. When the glue sets or dries these laminations are retained in their bent or bowed shape.

On the floor or platform that supports the elements of the template there are temporarily fastened guides for properly positioning or locating the various elements of the truss including the top chord members, the bottom chord members, and the web members. In the preferred form of construction those guides that are employed to properly position the top chord members and the bottom chord members are made adjustable as to width. These guides are indicated by the reference character **19** and are illustrated in detail in Figs. 9 and 10. Each of these guides comprises a base plate **20** having holes suitably located therein for the reception of double-headed nails **21** or equivalent fastening device that may be driven into the wooden floor or platform that supports the template. These double-headed nails or equivalent fastening device can be removed readily to permit of the repositioning of these guides in making trusses of different spans or having top chords of varying curvature.

On one end of the base plate there is an upstanding angle or side **22** which is preferably located outwardly with respect to the chord. In other words, this upright side is adapted to be engaged by the outer side of its chord.

The opposed side of the guide is indicated at **23** and is adapted to be engaged by the inner side of its chord. This side of the guide is adjustable toward and away from the stationary side **22** having on its back a threaded shank **24** extending through an upstanding lug **25**. Jamb nuts **26** are threaded onto the shank and are adapted to be tightened against opposite sides of the lug to hold the adjustable side **23** in any adjusted position.

The purpose of making these guides for the chords adjustable is to accommodate chords of different depths. In roof truss construction it not infrequently occurs that the depths of the chords vary and the adjustable guides may be readily adjusted to allow for such variation. Ordinarily, however, the widths of the web members do not vary and for this reason the guides for web members indicated by reference character **27** need not be adjustable.

The guides for the web members are illustrated in detail in Figs. 7 and 8 consisting of merely U-shaped guides having upstanding sides **28** and **29** connected by a bottom **30** which is apertured to receive double-headed nails or equivalent fastening means **31**. These guides are so positioned on the floor or platform as to properly locate the positions of the web members **14** and **15**.

At the extreme ends of the template there is a marking construction for marking the ends of the chords, one such marking construction being illustrated at the left-hand end of Fig. 1 by the reference character **32**. This marking construction comprises a suitable base plate removably fastened to the floor or platform by double-headed nails or the equivalent having a vertically arranged serrated edge **33** and an inclined serrated edge **34**. Also, on the base plate are a series of upstanding pointed screws **35**. The upstanding serrated edge **33** is intended to mark and thus define the vertical ends of the bowed top chord members, or in other words, to locate the end surfaces **36** on the top chord. The inclined serrated edge **34** is intended to mark and thus accurately locate the inclined end surfaces **37** on the bottom chord members **13**. The pointed screws **35** serve to mark and thus locate the centers of bolt holes that are to be drilled through the bottom chord members to receive the bolts that attach the shoe that extends around the end of the truss across the end surfaces **36**.

Proceeding toward the right on Fig. 1 there is another marking device **38** located at what is to be the location of the bottom of the first vertical web member **14**. This marking device consists of a base plate detachably fastened to the floor or platform having an upstanding serrated edge **39** flush with the bottom surface of the bottom chord **13**. It also has a vertical serrated edge **40** arranged to be flush with the right-hand edge of the first vertical web member **14**. It will be noted that the horizontal serrated edge **39** extends to the right beyond the base of the vertical edge **40** so as to traverse the bottom of the first inclined web member **15**. The marking device **38** is also equipped with pointed screws **41** on opposite sides of the edge **40** which serve to punch or mark the centers of bolt holes to be drilled in the bottom chord **13** and in the vertical and inclined web members which are to be connected thereto. Above the marking device **38** there is a marking device **42** consisting of a base plate detachably fastened to the floor or platform having a serrated edge **43** flush with the top or outer surface of the upper curved chord 10. This serrated edge is designed to mark and thus locate where the timber forming the first vertical web member **14** is to be cut so as to be flush with the top of the top chord. It is also equipped with a pointed screw **44** that is intended to punch and thus locate the center of the bolt hole that is to be drilled in the top of the vertical web member and in the top chord members **11** and **12**.

Similar marking devices indicated at **45**, **46**, **47**, **48**, and **49** are located on the floor or platform having serrated edges and pointed screws which serve to mark how the ends of the web members are to be cut or shaped and where the bolt holes are to be drilled in the web members and the chords. The particular location or shape of these serrated edges will vary considerably depending upon the design of the truss. Thus, where the marking device is located at the apex of the angle formed by two inclined web members **15**, the serrated edges are so arranged as to define the ends of the web members and to indicate lines upon which the members should be cut so as to have a mitered fit. Similarly the marking device **47** has its serrated edges so arranged as to indicate where the bottoms of web members are to be cut and how they are to be shaped so as to fit properly together with the vertical web member. The marking device indicated at **50** may be equipped with a series of pointed screws or punches to indicate where bolt holes are to be drilled in effecting a splice in the bottom chord, if such a splice is necessary. A similar marking device may be positioned along the length of the top chord if splicing of the top chord is required.

The details of construction of the marking device **48** are illustrated in Fig. 11 and these details may be regarded as typical of all of the marking devices illustrated in Fig. 1. The serrated edges are provided by sharpening the webs **51** of T irons **52** which are welded or otherwise fastened to the base plate. The pointed screws are indicated at **53** having sharpened points **54** and these screws have heads countersunk on the underside of the base plate. They are held in place by means of nuts **55**.

When the various guides and marking devices are located on the floor or platform the various elements of the truss may be positioned thereon individually and marked. Thus, for example, the members **11** and **12** of the top chord can be consecutively positioned in the guides **19** for the top chord. They will then be resting largely on the serrated edges of the marking devices and on the pointed ends of the screws. The members may then be forced downwardly on the marking devices or tapped thereon wtih a mallet in which case the serrated edges will mark the ends of the top chord by means of a saw mark or dotted line. The points on the screws locate the centers of the bolt holes. Although marking devices **45** and **48** will also transversely mark the top chord members intermediate their ends these marks are disregarded as the top chord is to be cut only at its ends except in the event of a splice. When the top chord member is thus marked it is removed from the template and accurately cut at its ends along the mark applied thereto by the marking device **32**. It is also drilled at the various points along its length where the pointed screws have made punch marks.

I prefer to employ a tool such as that illustrated in Fig. 12 for drilling the holes. This consists of a bit **56** having rigidly secured thereon a cylindrical marking or grooving tool **57**. When the holes are drilled by means of the bit the bit serves as a pilot for the marking or grooving tool which is caused to partially cut or groove into the top chord members to form the grooves **17** that receive the timber connectors **18**.

When the top chord members have been thus marked and cut the bottom chord members can be positioned on the template and similarly marked. The ends of these members may be cut off on a bevel to provide the end surfaces **37** and the various bolt holes may be drilled and the grooves for the timber connectors cut. The web members may then be individually applied so as to be accurately marked both as to length and end shape and to have the centers of the bolt holes accurately indicated. In Fig. 4, I have illustrated one of the vertical web members being thus applied and marked. When this member is positioned and tapped with a mallet the saw lines **58** and **59** are applied to define the ends of the web members and the punch mark **60** defining the centers of the bolt holes are likewise applied. The timber forming the web member can then be accurately cut along the lines **58** and **59** by even unskilled labor and the bolt holes and grooves can be easily cut producing the completed or finished web member **61** as illustrated in Fig. 6.

It will thus be appreciated that by means of the template the marking devices of which are stationarily arranged that the top chord, the bottom chord, and the web members can be accurately marked by merely applying these various elements individually or consecutively to the template. The positions of the bolt holes will be accurately indicated on all members and the markings at the ends of the members will be accurately applied. Consequently, with a template set up as indicated it is possible to quickly and accurately mark all of the necessary elements of a series of roof trusses so that they may be easily cut to shape, have their bolt holes and grooves drilled therein, and when assembled, the various parts will nicely fit together. Consequently, by means of the improved construction the marking can be easily accomplished with a great deal of accuracy and the temporary assembly of the elements of the truss is entirely avoided. When the elements have been marked and cut they are assembled together for the first and final time, thus producing the completed truss.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A template for marking elements of a wooden truss comprising guide means for positioning the top and bottom chord forming elements of the truss and the connecting web members, and marking means located at the points of intersection of the top and bottom chords and at the points of intersection of the web members with the chords for marking the chord and web forming elements on lines on which they are to be cut.

2. A template for marking elements of a wooden truss comprising guide means for positioning the top and bottom chord forming elements of the truss and the connecting web members, marking means located at the points of intersection of the top and bottom chords and at the points of intersection of the web members with the chords for marking the chord and web forming elements on lines on which they are to be cut, and the centers of bolt holes to be drilled therein.

3. A template for marking elements of a wooden truss having serrated edges located at the points of intersection of elements making up the completed truss on which the elements may be placed to be marked as to length and end shape.

and guide means engageable with the sides of the elements between the locations of said serrated edges to properly position the elements with respect thereto.

4. A template for marking elements of a wooden truss comprising guide means for positioning the top and bottom chord-forming elements of the truss and the connecting web members, and marking means located at the points of intersection of the top and bottom chords and at the points of intersection of the web members with the chords for marking the chord and web forming elements on lines on which they are to be cut, the guide means for the chord forming elements being adjustable as to width.

5. A template for marking elements of a wooden structure wherein the elements meet and overlap in the assembled structure at points of intersection comprising means providing a support, marking means on the support adjacent the points of intersection arranged to mark the lengths and end shapes on lengths of element-forming material applied thereto, and means on the support between the marking means arranged to guide the lengths of element-forming material as they are forced against the marking means.

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