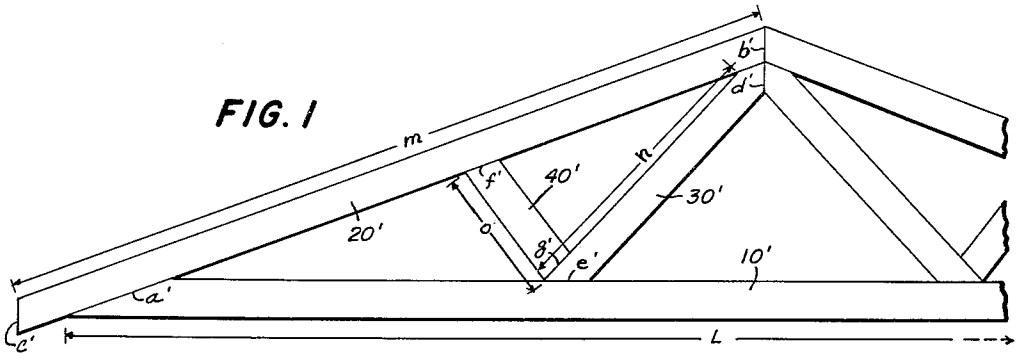
Nov. 28, 1961 P. G. McKINLEY 3,010,209

APPARATUS FOR LAYING OUT MEMBERS IN A ROOF TRUSS

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FIG. 1



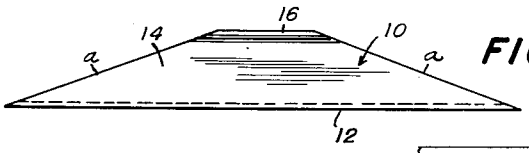


FIG. 2

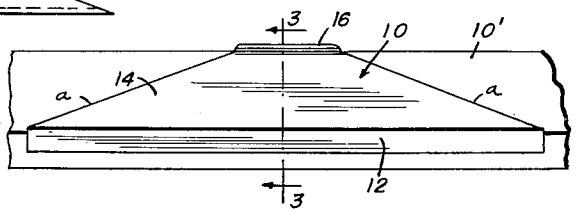


FIG. 2A

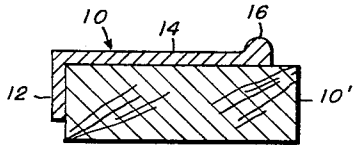


FIG. 3

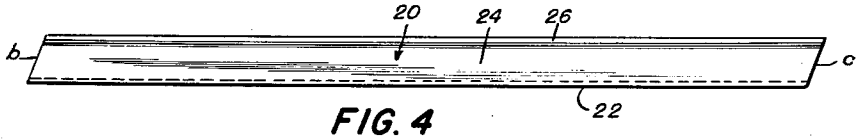


FIG. 4



FIG. 4A

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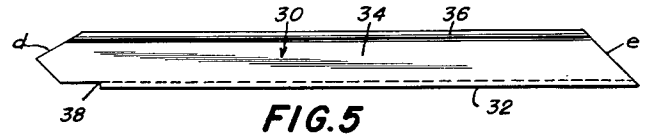


FIG.5

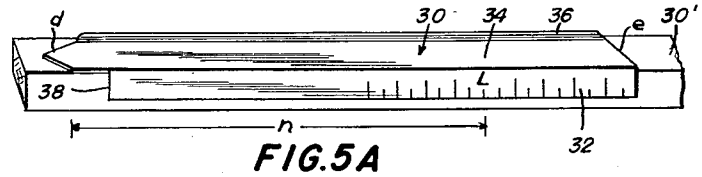


FIG.5A



FIG.6

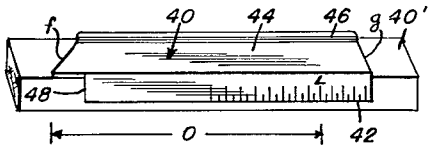


FIG.6A

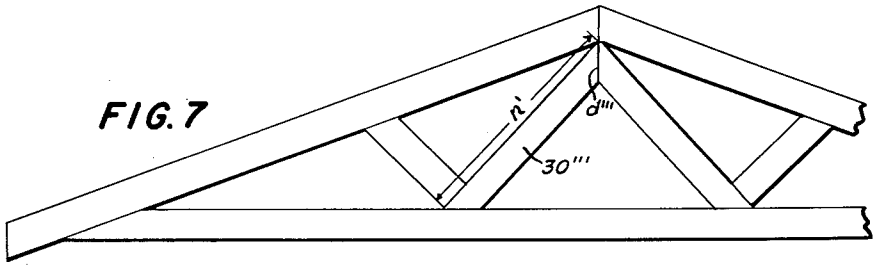


FIG.7

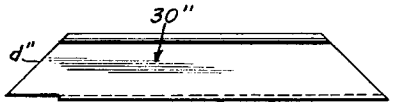


FIG.8

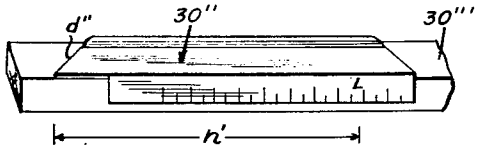


FIG.8A

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3,010,209
APPARATUS FOR LAYING OUT MEMBERS IN A ROOF TRUSS

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Filed Oct. 20, 1958, Ser. No. 768,237
1 Claim. (Cl. 33—90)

This invention relates to apparatus for laying out members in a roof truss. More specifically, this invention relates to a set of templates each of which is adapted for use in outlining the desired end shapes and indicating the desired length of one or a plurality of similar members in a roof truss.

In the past, the laying out of the members of a roof truss including a plurality of chord members and web members disposed in a single plane has been a time-consuming job requiring skillful computing and measuring, and trial and error fitting. Even so, unless done with painstaking care, the laying out of trusses in the past has produced uneven joints wherein the various structural members were not in even abutment, thus presenting a truss of diminished strength and sloppy, unworkmanlike appearance.

It is an object of this invention to provide apparatus whereby given only the desired length of the lower chord member and the desired pitch of the finished roof, a casual handy man, unversed in roofing structure or even the rudiments of trigonometry is capable of quickly laying out the chord and web members of a perfectly fitted truss.

It is a further object of my invention to provide apparatus for laying out the elements of a roof truss, said apparatus making unnecessary the use of protractor, scale or carpenter's rule or additional measuring devices of any type.

It is a still further object of my invention to provide apparatus for laying out the various elements of a roof truss incorporating means to adjust for various widths and thicknesses of the stock selected for forming the truss.

This invention embodies other novel features, details of construction and arrangement of parts which are hereinafter set forth in the specification and claim, and illustrated in the accompanying drawings, wherein:

FIG. 1 is a fragmentary side elevation of a roof truss of the type made by templates embodying the invention;

FIG. 2 is a top plan view of a lower chord template embodying the invention;

FIG. 2A is a perspective of a lower chord template embodying the invention and applied to a piece of stock;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2A;

FIG. 4 is a top plan view of an upper chord template embodying the invention;

FIG. 4A is a perspective view of a top chord template embodying the invention and applied to a piece of stock;

FIG. 5 is a top plan view of a tension web member template embodying the invention;

FIG. 5A is a perspective view of a tension web member template embodying the invention and applied to a piece of stock;

FIG. 6 is a top plan view of a compression web member template embodying the invention;

FIG 6A is a perspective view of a compression web member template embodying the invention and applied to a piece of stock;

FIG. 7 is a fragmentary side elevation of a modified roof truss made by templates embodying the invention;

FIG. 8 is a top plan view of a modified tension web member template used to produce the modified truss of FIG. 7; and

FIG. 8A is a perspective view of the modified tension web member template shown in FIG. 8 and applied to a piece of stock.

Briefly, the invention is a set of templates adapted to be used cooperatively to lay out the various members in a roof truss. Each template has its ends cut off in the shape of the ends of its corresponding truss member and bears graduation means in terms of the known length of the lower chord to indicate the length of its corresponding truss member.

More specifically, and referring to the drawings, FIG. 1 is a view of a truss adapted to be laid out by templates embodying the invention. The truss comprises the lower chord **10'** and the upper chords **20'**. (For simplification, since the truss is symmetrical, reference numerals have been applied to only one-half of the structure.) The truss also comprises web members connecting the chords, said web members designated throughout this application for simplification as the tension web member **30'** and the compression web member **40'**. In fabricating a roof truss as shown in FIG. 1, the various chords and web members are joined together and the ends thereof must be appropriately angled off in order to produce a structure of maximum strength and neatness. More specifically, the ends of the lower chord **10'** are angled off to a face *a'*. They flatly abut respectively the undersurfaces of the upper chords and are joined thereto in what is known as a heel joint. The upper end of each of the upper chords **20'** is angled off in a face *b'* and abut each other in a peak joint. The lower end of each of the upper chords is angled off in a face *c'* which is substantially vertical and comprises the overhang end.

Each tension web member **30'** has its upper end angled off in a compound face *d'* so that a portion of the peak joint end of each of the tension web members abuts the opposite tension web member and a portion abuts the underside of the upper chord at the peak joint. The lower end of each tension web member is angled off in a face *e'* to abut flatly the top surface of the lower chord **10'** where they meet in a web-lower chord joint. Each compression web member **40'** has its lower end angled off in a face *g'* to abut flatly the top surface of the tension web member at the web-lower chord joint, and has its other end angled off in a face *f'* to abut flatly the undersurface of the upper chord **20'** at the web-upper chord joint.

It is often the case in constructing a peaked roof truss that the only known information is the length of the desired lower chord and the desired roof pitch. It is with this information only and templates embodying my invention that a roof truss as shown in FIG. 1 can be easily laid out.

FIG. 2 shows an embodiment of a template according

to the invention adapted to be used in laying out the lower chord **10'**. It is generally designated **10**, and as shown in FIG. 3, comprises an extrusion of L-shaped cross-section. The top flange is designated **14** while the side flange is designated **12**. The L-shaped construction enables it to flatly engage both the top and side surfaces of a piece of stock (see FIG. 3). For ease in handling, the extrusion is additionally formed with an upwardly extending ridge **16** running the length of the extrusion along the distal edge of the top flange. FIG. 3 is typical of the shape in cross-section of all templates shown in the drawings.

The lower chord template **10** has the opposite ends of its top flange cut off at angle *a* whereby the ends can each be used as a straight edge to indicate the cut off lines for the lower chord **10'**. Since the length of the lower chord is known, it can be measured by an ordinary carpenter's rule.

The upper chord template **20** shown in FIGS. 4 and 4A is designated **20**. The opposite ends of the top flange **24** thereof are cut off at angles *b* and *c*, corresponding respectively with the angle faces *b'* and *c'* of the upper chord **20'**. As shown in FIG. 4A, the side flange **22** of the template **20** is marked with graduations in terms of the known length of the lower chord **10'**. In other words, for a lower chord of length L stock for an upper chord of appropriate length *m* can be measured by marking off the stock opposite the reading L on the graduation. Obviously, as the length of the lower chord of a roof of given pitch is increased, there is an increase, however not so great, in the length of the upper chord. Thus, to lay out an upper chord, a piece of stock is marked off using the end *b* of the template as a straight edge, and the length of the upper chord is indicated by marking on the stock opposite the length L of the lower chord **10'** read on the graduations on side **22** of the template. Next, the template is slid along the stock until end *c* of the template is opposite the mark and the end *c* is used as a straight edge to mark off the angled cut *c'* for the overhang end face. If it is desired to have extra overhang in the truss, that extra length is added to length *m* before marking for cut *c'*.

FIGS. 5 and 5A show the tension web member template **30** which has one end cut off at the compound angle adapted for laying off the compound face *d'*. Side flange **32** is graduated off in terms of the known length L of the lower chord **10'** and the tension web member length *n* may be determined therefrom. The opposite end of the top **34** is angled off at *e* to be used in laying off the angled face *e'* for the tension web member at the web-lower chord joint.

The compression web member template **40** is shown in FIGS. 6 and 6A. Its top flange **44** is cut off at *f* and *g* to lay out the angled cuts *f'* and *g'* of the compression web member **40'**. The length *o* of the compression web member is determined by reading the length L of the lower chord on the graduations on side **42** of the compression web member template.

From inspection of the drawings it can be seen that the graduations on template **40** are closer together than on template **30** and those on template **30** are closer than those on template **20**. This is because that for every increase in the length of the lower chord **10'**, there is a less increase in the length of upper chord **20'**, a still less increase in the length of tension web member **30'**, and an even less increase in the length of compression web member **40'**. In other words, the ratio of the length of the unit of length in which the lower chord element is measured (usually a foot) to the length of the unit of length in which the graduations along a given template is measured is equal respectively to the ratio of the length of the lower chord element to the length of the proposed upper element for which the template is appropriate.

In forming some trusses, it is desirable to have a lower chord member made from stock of greater height or vertical thickness than that shown in FIG. 1. For instance, instead of 2 x 4, a 2 x 6 inch stock may be desired. This will require decrease in the length of the web members **30'** and **40'** necessary to come down to meet the upper surface of the lower chord. To allow for this modification in a truss, the tension web member template **30** has its side undercut as at **38**. Thus, when laying out the tension web member of the modified truss, the edge *d* of the template **30** is used to lay off the end *d'* and a line is drawn down the front of the stock to indicate where the stock is to be cut off. The template is then moved leftward so that the undercut edge **38** is opposite this line on the front of the stock. The length L of the lower chord member is then read on the side of the tension web member template and a mark made opposite. The line for the end *e* of the web member is made at that mark. Thus the shortening of the length *n* by the distance of the undercut **38** will shorten the tension web member the desired amount for use with a 2 x 6 lower chord.

For laying out the compression web member in the modified truss, having a thicker lower chord, the compression web member template has its side **42** similarly undercut as at **48** and is used as the tension web member template.

FIG. 7 shows a modified form of truss in which the tension web member **30'''** has its end cut *d'''* at the peak joint in a single plane rather than in a compound face as shown at *d'* in FIG. 1. For this modified tension web member, the template **30''** shown in FIGS. 8 and 8A has its end beveled off in a single straight edge *d''*.

With the set of templates of my invention, a roof truss of a given pitch can be laid out for any length L of the lower chord **10'**. For making roofs of different pitches, different sets of templates made according to this specification may be used. It should be understood that templates embodying my invention may take various forms and may be used for making trusses other than the simple triangular truss shown.

By using a set of templates embodying my invention, a workman having relatively little skill in roof truss making is able to lay out quickly and easily the members of a truss which will abut flatly and be accurately measured to produce a truss of greater strength and neatness than the workman could otherwise produce. Also the workman can be assured of turning out uniform trusses time after time. Through my invention, the guesswork, trial and error and the painstaking time-consuming laying out have been taken out of roof truss fabrication.

While this invention has been shown but in one form, it is obvious to those skilled in the art that it is not so limited but is susceptible of various changes and modifications without departing from the spirit and scope of the claimed invention.

I claim:

A template for laying out a selected element for a truss, said truss being of known geometrical configuration and having a lower chord element whose length is measured in a first unit of length and whose thickness may be either of two sizes, said template comprising an elongate member of L-shape in transverse cross-section comprising a top flange and a side flange depending from one longitudinal edge of said top flange, the length of said side flange being shortened at one end of said template with its adjacent end edge extending perpendicularly from said one longitudinal edge and spaced inwardly from the adjacent end of said longitudinal edge by a distance which allows for the difference between said two sizes, the opposite ends of said top flange being shaped in the desired outlines respectively of the opposite ends of said element, said side flange having graduations therealong measured from said one end of said template, said graduations being spaced apart by a second unit of length, the ratio of the first unit of length to the second unit of

length being equal to the ratio of the length of the lower chord to the length of said selected element in a truss having said known configuration, whereby said end edge of said side flange and the adjacent end of said longitudinal edge provide separate indexes for use respectively with said two sizes of vertical thickness of the lower chord in laying off on a piece of stock the length of said selected element using said graduations, in order to mark in correct positions the shapes of the ends of said element with the ends of said top flange.

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