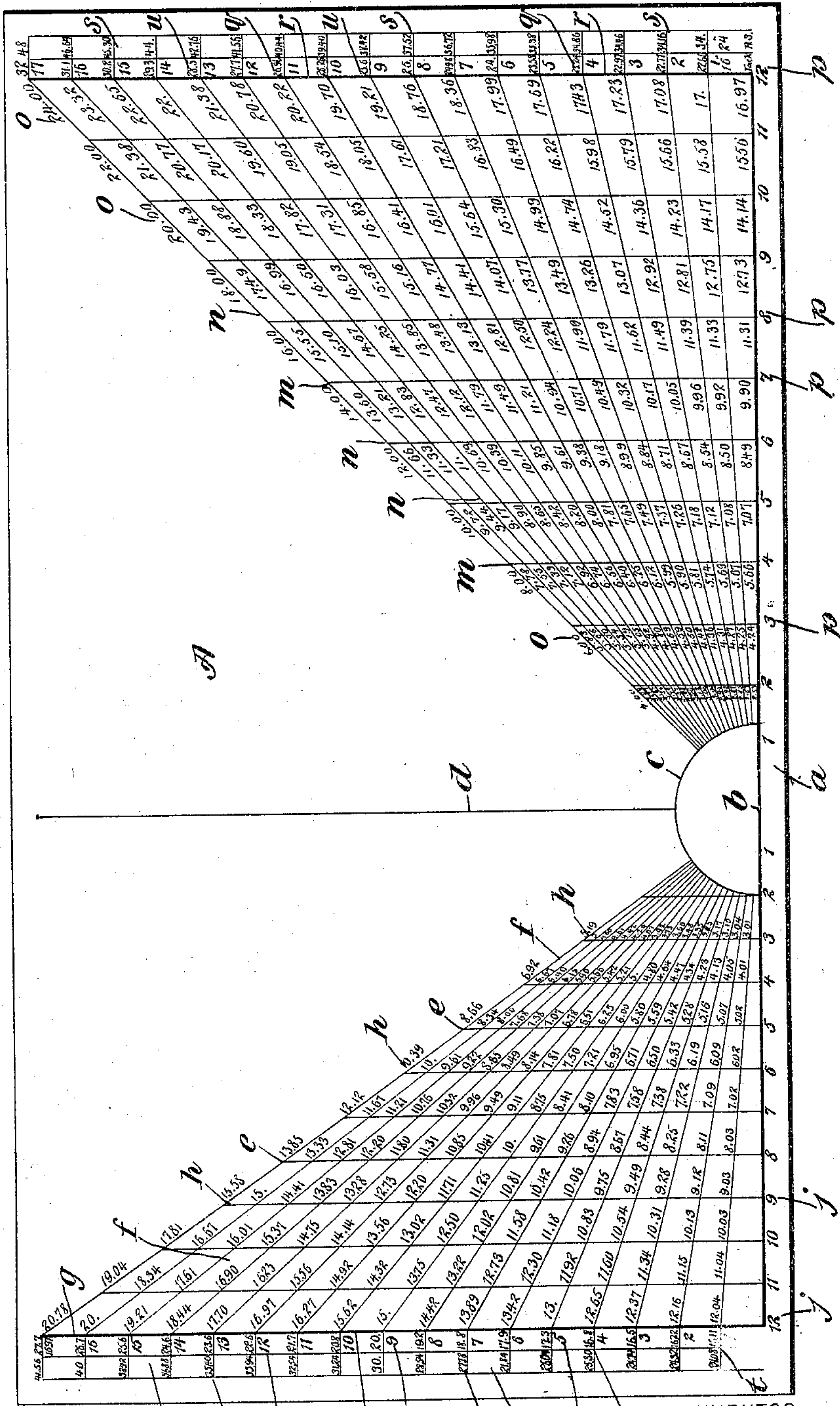


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E. E. WHITE.
ROOF FRAMING CHART.
APPLICATION FILED MAY 6, 1903.



WITNESSES:

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ROOF-FRAMING CHART.

SPECIFICATION forming part of Letters Patent No. 793,486, dated June 27, 1905.

Application filed May 6, 1903. Serial No. 155,863.

To all whom it may concern:

Be it known that I, ELMER E. WHITE, a citizen of the United States, and a resident of Fertile, in the county of Worth and State of Iowa, have invented new and useful Improvements in Roof-Framing Charts, of which the following is a full, clear, and exact description.

My invention relates to certain novel and useful improvements in roof-framing charts. Primarily I have in view as an object the provision of a chart the surface of which is so graduated or marked that the lengths, cuts, or bevels of common hip and valley and jack rafters will be readily indicated to the ordinary mechanic or builder.

A further object of the invention is to provide a chart which when used in conjunction with the common steel square will assist the beginner in cutting rafters, roof-boards, cornice-boards, and molding.

With these objects and others of a similar nature in view the invention consists in the construction, combination, and arrangement of parts, as is described in this specification, delineated in the drawing, and set forth in the annexed claim.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure illustrates a roofing-chart embodying my improvement.

In the drawing, A represents the body of the chart, which may be formed of any suitable and durable material, such as cloth, oil-cloth, or the like. At a point on the base-line *a* is a mark *b*, which is the center of the base-line or horizontal diameter of the semicircle *c*. Extending from the center of the arc of the semicircle is the perpendicular *d*, which practically divides the chart-surface into two parts, a right side and a left side. The center point *b* of the semicircle is the point to which all the angles run or, in other words, from which the inclined lines of measurement radiate. In order to cut common rafters, on the left side of the chart are marked perpendicular lines *e*, varying in distance from the center point, such lines *e* representing lines running perpendicular from the center of a building or span over which the rafters are to be raised.

Radiating from the semicircle and running at different angles are the lines *f*, designed to represent rafters of different pitch. For the sake of convenience in measurement the perpendicular lines may be taken to be one foot or twelve inches apart, and the inclined angle-lines *f* where they intersect the heavy perpendicular line *g* are also to be taken as spaced twelve inches apart. The figures, such as *h*, which are marked at the intersection of the different angle-lines and perpendiculars, represent the exact length of rafters, given in feet and hundredths of a foot. For convenience in cutting these rafters inch measurements are employed, and the pitch of the roof is represented by one or more inches rise per foot, this being shown by the heavy figures *i* at the left of the perpendicular *g*, such members *i* running from "1" to "16.97," inclusive.

In cutting the common rafters the numeral "12" of the series of numbers *j*, extending along the horizontal base-line, is used for the base cut, and one of the heavy figures *i*, showing the rise per foot, is taken for the perpendicular cut. These lengths may be multiplied by one-half the width of the span and divided by twelve, which gives the length of the rafter, or read as feet and hundredths. Thus on a pitch-roof where the building is eighteen feet wide I use "12" for the bottom cut on common rafters and "8" for the top, and to find the length of common rafters I follow the line running from the starting-point to figure "8," that being the rise of the roof where "12" is the base, until I intersect the line running perpendicular from figure "9" on the base-line, that being one-half the width of the building. Thus I find the exact length of the rafter for an eighteen-foot building, which is 10.81 feet. If it is desired to ascertain the rise of a roof steeper than ordinary, I may employ the numerals *k*, found in the additional column *l*, this column of numerals permitting the operator to ascertain the rafter of a roof ranging from eighteen to twenty-four inches rise. The dimensions and sizes of valley and hip rafters may be ascertained in a similar manner. On the right-hand side of the chart are perpendicular lines

m, similar to the lines *e*, and angle or radial lines *n*, similar to the lines *f*. The figures *o* at the points of intersection of the perpendicular and angle lines represent the exact length of the valley and hip rafter. The heavy figures *p* at the bottom of the chart at the right-hand side indicate one-half of the span or building, while the heavy figures *q* at the right of the heavy perpendicular *r* represent the rise of the roof.

In cutting valley and hip rafters the numeral "16.97" is used as the base cut, and the rise per foot of the roof indicated by the heavy figures at the left is employed for the perpendicular cut. The length of the rafter is then found as in the case of common rafters. For steeper roofs an extra column of figures, as shown at *s*, is provided. To find the valley-rafter with the same, the right-hand side of the chart is used, following the line running from the starting-point to the figure "8" on the perpendicular line until I intersect the line running from figure "9" on the base-line, where I find the exact length of the valley or hip rafter, which is 14.07 feet.

It is to be noticed that I always employ "12" for the bottom cut on common rafters and "16.97" for the bottom cut for valley-rafters, "17" being employed in substitution of the latter, because it is generally more practical and easier to find on a square. The numeral "16.97," which is employed in getting valley and hip rafters, is used in such cases, because it will be noted that such numeral will represent the measurement of the hypotenuse of a triangle the other two sides of which measure twelve inches each.

At the left of the heavy perpendicular line *g* I place a row of numerals, such as shown at *t*, which indicate how much shorter each following jack-rafter must be cut when placed on sixteen or twenty-four inch centers, and it is to be noted that any spacing can be found by multiplying or dividing the figures given. At the left of the heavy perpendicular line *r* on the right-hand side of the chart are similar figures *u*, which figures indicate the manner of spacing the valley or hip rafters for jacks when spaced on sixteen or twenty-four inch centers. It is to be observed that the finding

of lengths by multiplying and dividing is necessary only on steeper roofs than as shown on the chart. It will further be noted that in order to cut the jack-rafters the bevel and perpendicular cuts are the same as in the common rafters.

In the above description I have given a few examples of the use to which my improved chart may be applied, and it is to be noted that it may be adapted to a variety of other uses. For instance, in cutting roof-boards it may be employed for assisting the cut for the edge of the board as well as for the surface side.

It will be observed that my improved chart contains no adjustable parts, and its exposition of the points from which a cut is to be made is often the means of avoiding mistakes that are liable to occur especially when using tools requiring adjustment. This chart will be found extremely useful to a beginner or to the carpenter, as well as to architects or builders and the members of other like professions.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A chart provided with a base-line having a point of division thereon, said point indicating the center of the diameter of a semicircle, a series of graduated parallel perpendicular lines joining the base-line, the two longest perpendiculars of the series joining the extremities of the base-lines, diagonal angle-lines radiating from the semicircle and terminating at the longest perpendiculars, said radial lines in conjunction with the perpendiculars and the base-line forming right-angle triangles, numerals designating the measurement of the base, and the hypotenuse of each triangle formed, and a column of additional numerals arranged adjacent to the longest perpendiculars at the extremities of the base-line, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELMER E. WHITE.

Witnesses:

A. W. HANSON,
CLYDE E. BROOKS.