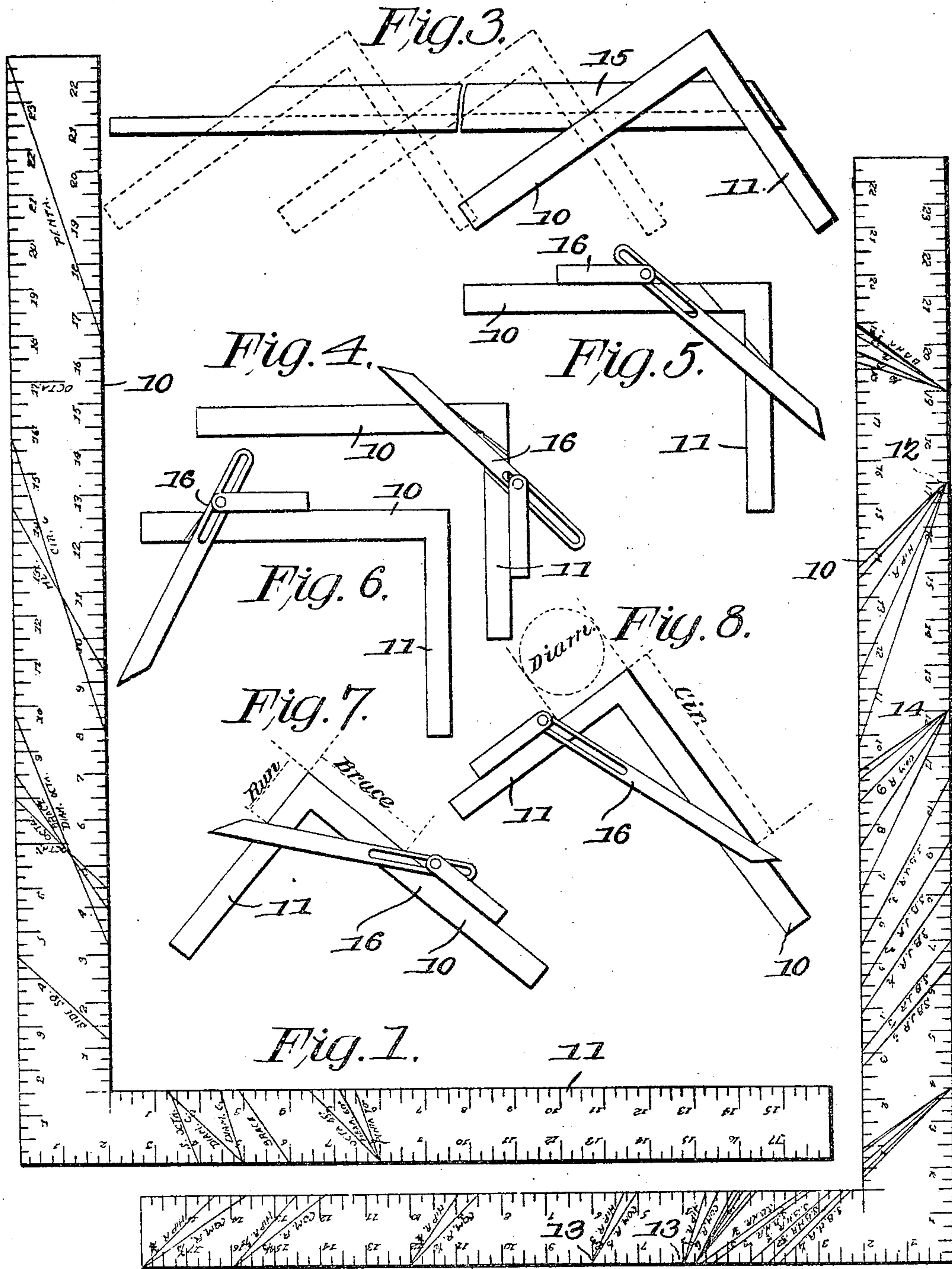


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H. H. WINSHIP.
IMPLEMENT FOR DETERMINING ANGLES.
APPLICATION FILED JAN. 21, 1905.



Witnesses
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Fig. 2. *Harry H. Winship*, Inventor
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UNITED STATES PATENT OFFICE.

HARRY H. WINSHIP, OF WEST UNION, NEBRASKA.

IMPLEMENT FOR DETERMINING ANGLES.

No. 800,964.

Specification of Letters Patent.

Patented Oct. 3, 1905.

Application filed January 21, 1905. Serial No. 242,118.

To all whom it may concern:

Be it known that I, HARRY H. WINSHIP, a citizen of the United States, residing at West Union, in the county of Custer and State of Nebraska, have invented a new and useful Implement for Determining Angles, of which the following is a specification.

This invention relates to implements for determining angles of various degrees and for various purposes, and has for its object to produce a simply-constructed and convenient device whereby a plurality of predetermined angles may be readily and accurately ascertained.

With these and other objects in view, which will appear as the nature of the invention is better understood, the same consists in certain novel features of construction, as hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which corresponding parts are denoted by like designating characters, is illustrated the preferred form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the invention is not necessarily limited thereto, as various changes in the shape, proportions, and general assemblage of the parts may be resorted to without departing from the principle of the invention or sacrificing any of its advantages.

The improved implement comprises a base member upon which the novel arrangement of lines forming the principal feature of this invention are disposed, and this base member will preferably be a carpenter's square substantially of the usual construction and having the usual graduations, and for the purpose of illustration the invention is shown thus applied.

In the drawings, Figure 1 is a view of the improved implement viewed from one side, and Fig. 2 is a similar view of the other side. Figs. 3, 4, 5, 6, 7, and 8 are diagrammatic views illustrating various methods of employing the implement.

The carpenter's square, herein illustrated in conventional form, has one blade 10 twenty-four inches long, and another blade 11, commonly called the "tongue" and disposed at right angles thereto and eighteen inches long, and both blades graduated in inches and fractions of inches in the usual form.

The improvement herein disclosed comprises a plurality of lines radiating at certain

predetermined angles from a common point on the base member, preferably at the edge on another side of the same, and with other lines radiating at certain predetermined angles from one or more of the terminals of the first-mentioned lines and extending thence over the base member and preferably concentrating to a common center or point thereon.

When a carpenter's square is employed as a base member, the radiating lines will be disposed thereon by cutting into the face of the metal in the same manner as the ordinary graduations are formed and will commence, as at 12, and on one blade radiate therefrom at certain predetermined angles and extend over the other blade 11 and terminate, as at 13, at the outer edge of the same. From one or more of the terminal points 13 other lines radiate at certain predetermined angles and extend across both blades 11 and 10 and terminate, as at 14, at the outer edge of the blade 10. Preferably the lines from the terminals 13 will concentrate to a common point 14 on the blade 10, as shown.

The angles employed may be of any degree and used for any desired purpose; but for illustration the angles generally used by carpenters and builders in determining the various angles of the rafters, braces, and like angularly-disposed frame members of buildings are the ones placed on the implement as illustrated in the drawings and will be described somewhat in detail. For instance, the lines shown radiating from the point 12 on the blade 10 are the angles generally employed for cutting "hip-rafters," the angles shown being for three-fourths, two-thirds, one-half, one-third, and one-fourth pitch, respectively, and these lines are thus marked, as shown. The lines leading from the various terminals of the lines radiating from the point 12 and concentrating at the point 14 are the angles usually employed in cutting the common rafters, and the angles shown are for "pitches" corresponding to the pitches of the hip-rafters. Thus the line radiating from the terminal of the angle for a hip-rafter of three-fourths pitch will be the one employed for determining a three-fourths-pitch common rafter, and so on throughout the series, as shown, the "common-rafter" lines concentrating at 14, as above stated. Of course it will be obvious that the series of angles may be varied to any desired extent and any desired degree of angularity employed for the various lines, but those shown are the ones usually

employed in building operations. The base member may also be employed for receiving various other lines disposed at various angles for the other members of a building—such as
 5 “braces,” the side and back bevels of hip-rafters, “jack-rafters,” and the like.

The improved square as manufactured has a line leading from the twelve-inch mark on the outer edge of the “blade” 10 to the six-inch mark on the tongue 11, which corresponds to the angle of a common rafter of one-fourth pitch; one line from the twelve-inch mark on the blade to the eight-inch mark on the tongue which corresponds to the angle
 15 of a common rafter of one-third pitch; one line from the twelve-inch mark on the blade to the twelve-inch mark on the tongue which corresponds to a common rafter of one-half pitch; one line from the twelve-inch mark on the blade to the sixteen-inch mark on the tongue which corresponds to the angle of a
 20 common rafter of two-thirds pitch; one line from the twelve-inch mark on the blade to the eighteen-inch mark on the tongue which corresponds to the angle of a common rafter at three-fourths pitch. Lines from the various terminals of these common-rafter angle-lines lead to one common center at the seventeen-inch mark on the blade and represent the angles
 25 for the various hip-rafters corresponding in pitch to the common rafters, as above described.

One line leads from the three and three-fourths inch mark on the blade to the three
 35 and five-sixteenths mark on the tongue which corresponds to the side bevel of a hip-rafter of one-fourth pitch. One line leads from the three and three-fourths mark on the blade to the four and one-eighth inch mark on the
 40 tongue and corresponds to the side bevel of a hip-rafter of one-third pitch, one line from the three and three-fourths inch mark on the blade to the four and nine-sixteenths mark on the tongue and corresponds to the side bevel
 45 of a hip-rafter of one-half pitch, one line from the three and three-fourths inch mark on the blade to the five and three-eighths mark on the tongue and corresponds to the side bevel of a hip-rafter of two-thirds pitch, and one line
 50 from the three and three-fourths inch mark on the blade to the five and nine-sixteenths mark on the tongue and corresponding to the side bevel of a hip-rafter of three-fourths pitch.

55 A series of lines lead from the nineteen-inch mark on the outer edge of the blade respectively to the eighteen and one-eighth, eighteen and five-sixteenths, eighteen and five-eighths, eighteen and seven-eighths, and eighteen and
 60 fifteen-sixteenths inch marks on the inner edge of the blade and corresponding to the back bevels of hip-rafters of one-fourth, one-third, one-half, two-thirds, and three-fourths pitch, respectively.

65 A series of lines lead from the five and three-

fourths mark on the tongue respectively to the six and seven-sixteenths, six and five-sixteenths, eight and three-sixteenths, nine and five-eighths, and ten and seven-sixteenths
 70 marks on the blade, the angles corresponding, respectively, to the side bevels of jack-rafters of one-fourth, one-third, one-half, two-thirds, and three-fourths pitch, respectively. By this means it will be obvious that all the
 75 various bevels and angles of the common hip and jack rafters may be readily “laid out” and with accuracy and in a comparatively short time.

The obverse surface of the implement represented in Fig. 1 is provided with lines disposed at angles which correspond to the angles of various geometrical figures—such as octagons, hexagons, pentagons, and the like—
 80 as well as one line leading from the eight and one-half inch mark on the blade to the six-inch mark on the tongue and corresponding to the angle of braces as usually employed in buildings. A line is also arranged from the five-inch mark on the tongue to the four and seven-
 85 sixteenths inch mark on the blade, the distance on the blade corresponding to the side of a square and the distance on the tongue corresponding to the diameter of a circle of approximately equal area. A line is also arranged
 90 from the four-inch mark on the tongue to the nine and seven-tenths inch mark on the blade, the longer distance corresponding to the diameter of a hexagonal figure measured between the flat surfaces and the shorter distance
 95 corresponds to the width of one of the flat surfaces of the same figure. The graduations for the seven and seventeen inch marks of the blade are extended inwardly to define them
 100 more clearly, and the distance between these marks (ten inches) is equal to one of the flat surfaces of an octagon figure, the diameter of which, measured between the flat surfaces, is
 105 equal to the whole length of the blade, or twenty-four inches.

It will thus be obvious that an extensive variety of dimensions of various kinds are compactly and conveniently arranged and easily
 110 accessible to the operator, so that much valuable time is saved when laying out the work and in calculating the dimensions of the various parts.

In Fig. 3 is illustrated the manner of using the improved implement when laying out a common rafter, the implement being first
 120 placed on the joint represented at 15 with the angular line corresponding to the required pitch cutting the lower line of the joint which will give the required angle to cut off the
 125 “ridge” end, and then by repeating the operation at the other end the wall-plate end can be marked and cut.

In Figs. 4, 5, and 6 is shown the manner of ascertaining the various bevels and angles for the hip-rafters, jack-rafters, braces, and the like, which may be quickly transferred to
 130

material to be cut by means of an ordinary carpenter's "bevel," (represented at 16.)

5 In Fig. 8 is shown the manner of ascertaining the approximate circumference of a circle from the diameter, which is done by first setting the bevel to correspond to the angle leading from the five-inch mark on the tongue to the four and seven-sixteenths mark on the blade to obtain the proper angle, and then set
0 the bevel implement upon the tongue of the improved implement at the mark corresponding to the diameter of the circle it is desired to measure, when the graduation which the blade of the bevel reaches on the blade will
5 denote the circumference of the circle approximately. Thus the circumference of any circle within the range of the tongue portion of the implement may be quickly ascertained. It will also be obvious that given the circumference of any figure the diameter may be as
0 quickly ascertained by merely reversing the action.

Having thus described the invention, what is claimed is—

A carpenter's square having a plurality of 25 lines radiating from a common point upon the outer edge of the blade member and extending across the same and the tongue member and intersecting the outer edge of the latter at predetermined angles of common rafters, and other lines leading across the tongue 30 from the outer ends of the first-mentioned lines and converging to a common point at the outer edge of the blade member at angles with the outer edge of the tongue member in 35 accordance with the angles of respective corresponding hip-rafter.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HARRY H. WINSHIP.

Witnesses:

WILLIAM WILLIAMS,
MARY J. RODERICK.