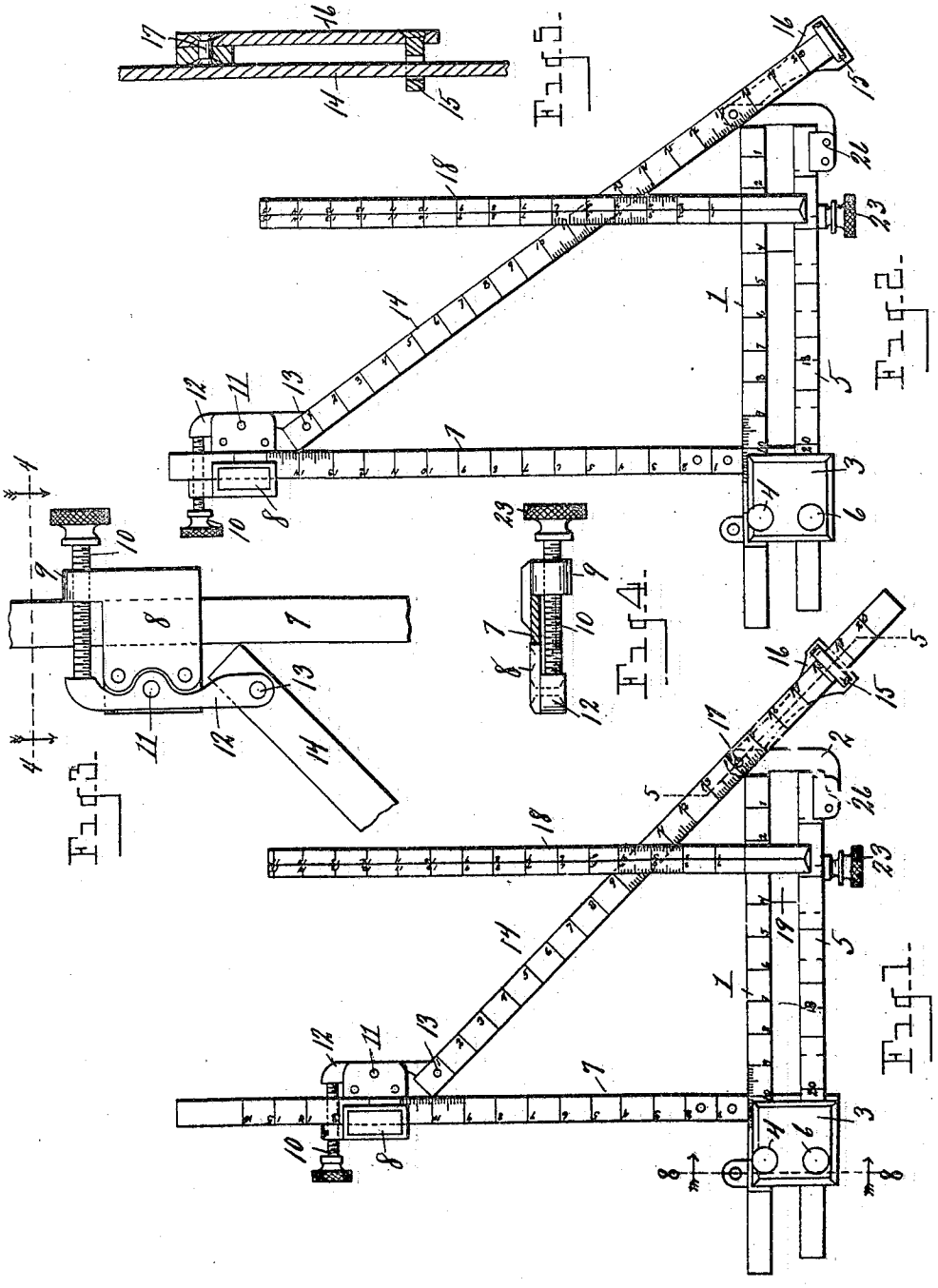
No. 809,686. PATENTED JAN. 9, 1906.

E. H. HORTON.

RAFTER GAGE.

APPLICATION FILED OCT. 20, 1904.

2 SHEETS—SHEET 1.



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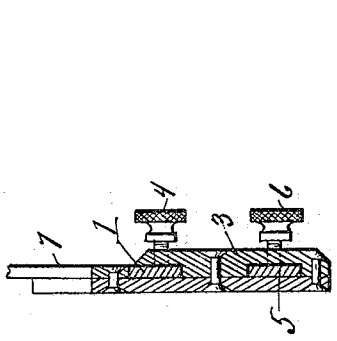

Fig. 8.

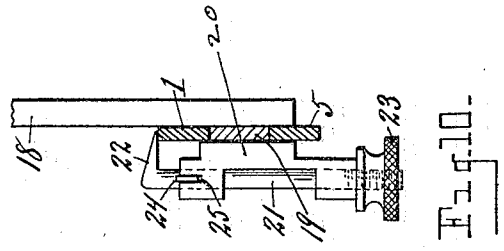

Fig. 10.

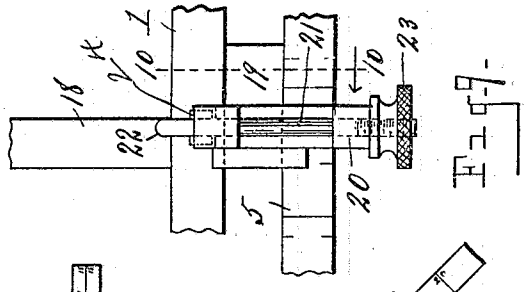

Fig. 9.

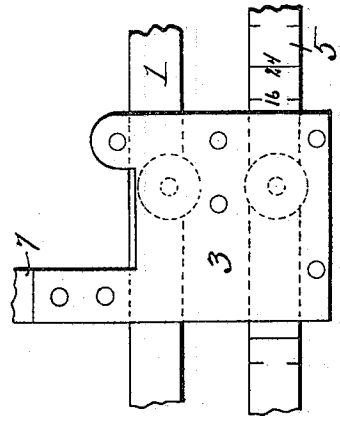

Fig. 7.

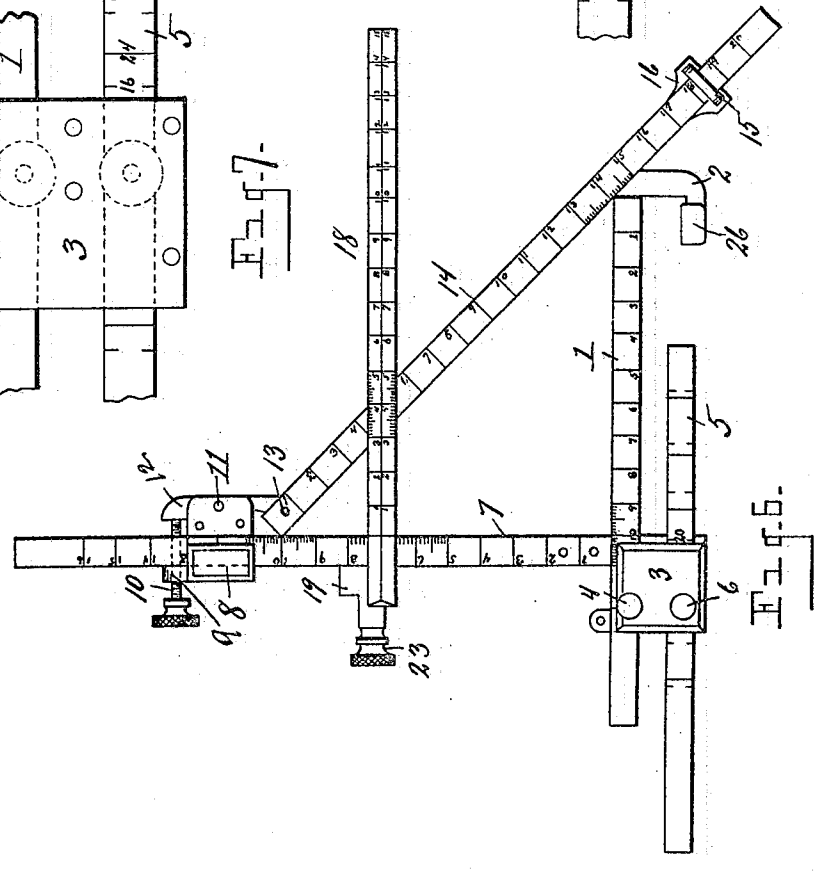

Fig. 5.

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UNITED STATES PATENT OFFICE.

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RAFTER-GAGE.

No. 809,686. Specification of Letters Patent. Patented Jan. 9, 1906.

Application filed October 20, 1904. Serial No. 229,236.

To all whom it may concern:

Be it known that I, EDWIN H. HORTON, a citizen of the United States, residing at Pontiac, in the county of Oakland, State of Michigan, have invented certain new and useful Improvements in Rafter-Gages; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to an adjustable rafter-gage more expressly designed for framing the timbers which enter into the superstructure of roofs; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to provide means for quickly and accurately ascertaining the hypotenuse of a right-angle triangle without measuring — as, for instance, the determining of the length of main rafters with respect to a given base and a predetermined elevation of ridge-board and in determining the length of hip-rafters and valley-rafters, as well as the length of jack and cripple rafters, the spacing of said rafters, and the length of the collar-ties. The above object is attained by the structure illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of my improved rafter-gage, showing the parts in position for determining the length of the main rafter in a roof of one-half pitch. Fig. 2 is an elevation showing the position of parts when determining the length of the hip-rafter in a hip-roof. Fig. 3 is an enlarged fragmentary view in elevation of the rear side of the vertically-movable clamping-head. Fig. 4 is a sectional view on line 4 4 of Fig. 3. Fig. 5 is an enlarged sectional view on line 5 5 of Fig. 1. Fig. 6 is an elevation showing the gage adjusted to determine the length of collar-ties. Fig. 7 is an enlarged fragmentary view, in rear elevation, of the slidable block mounted upon the base-rule and carrying the lower spacing-rule. Fig. 8 is an enlarged section on dotted line 8 8 of Fig. 1. Fig. 9 is a fragmentary view, in rear elevation, of the clamping-hook which secures the beveled vertical gage in position. Fig. 10 is a sectional view on line 10 10 of Fig. 9.

Referring to the characters of reference, 1 designates the base-rule, which is rigidly secured at its forward end to the bracket 2. Mounted to slide upon the base-rule is a block 3, having a way in its upper edge which receives said rule, as shown in Fig. 8, and in which said rule is engaged by a set-screw 4, whereby said block may be adjusted upon the base-rule and secured at any desired point. Below the base-rule and parallel therewith is a spacing-rule 5, which is adapted to slide through a way in the block 3 and in which it may be bound by the set-screw 6.

Rigidly secured to the block 3 and projecting vertically therefrom in the plane of the base-rule 1 is the vertical rule or standard 7. Mounted to slide vertically upon the vertical rule or standard 7 is a head 8, having a way in the face thereof which freely receives said standard and having a bracket 9, which projects in the rear of the standard and is threaded to receive the screw 10. Pivoted at 11 to the rear of the head 8 is an arm 12, to the depending lower end of which is pivoted at 13 the upper end of the hypotenuse-rule 14, the upper end of said arm being adapted to be engaged by the inner end of the screw 10. By causing said screw to impinge against the arm 12 it will be swung upon its pivot to carry the upper corner of the rule 14 against the vertical edge of the rule or standard 7, whereby said parts may be clamped together at any desired point of adjustment. The lower end of the hypotenuse-rule rests against the end of the base-rule 1 and passes through a guiding-yoke 15 upon the lower end of the arm 16, which is pivoted at 17 to the bracket 2. By this arrangement the hypotenuse-gage is held properly in place irrespective of the vertical adjustment of the head 8, the arm 16 swinging to allow the angle of the gage 14 to change in accordance with the elevation of said head.

All of the rules are graduated in accordance with any desired scale, the graduations upon those shown in the drawings indicating feet and inches. It will be understood that the block 3 is slidable upon the base-rule and the spacing-rule, and that said spacing-rule is independently removable as well as independently adjustable.

In illustrating the application of this invention reference will be had first to Figs. 1 and 2. In Fig. 1 the gage is set to determine the length of the main rafters of the roof of a building twenty feet wide, having a roof of one-half pitch. The vertical rule 7 being set

in alinement with 10 upon the base-rule for the base of the rafter and the movable head 8 being set on the vertical rule so as to bring the upper end of rule 14 at figure "10" thereof, which indicates the height of the ridge-board, when the length of the main rafter will be determined by the length of the hypotenuse-rule 14 from its point of contact with the vertical rule to its point of contact with the base-rule, the graduations on said hypotenuse-rule showing accurately the length of the main rafters. To determine the length of a hip-rafter for a roof wherein the main rafter is of the length illustrated in Fig. 1, the sliding head is raised upon the vertical rule 7 to a point where the upper end of the hypotenuse rule will engage said vertical rule at a height equal to the length of the main rafter, (illustrated in Fig. 1,) when the length of the hip-rafter will be indicated on the hypotenuse-rule at the point of its engagement with the end of the base-rule 1, as clearly shown in Fig. 2. The length of a valley-rafter is determined in exactly the same manner as that employed in determining the length of a hip-rafter. To determine the length of the jack-rafters, which extend from the plate to he hip-rafter in the construction of a hip-roof, or to determine the length of cripple-rafters in the construction of a valley, there is provided the vertical bevel-rule 18, which is graduated upon two of its prismatic surfaces as a matter of convenience to enable the mechanic to work from either side of the rule. This rule 18 has attached to its lower end a plate 19, Figs. 6, 9, and 10, adapted to slide between the rules 1 and 5, and is provided with the bracket 20, which is attached to said plate and through which passes the rod 21. One end of said rod is threaded and carries a knurled nut 23, and the other end is provided with a hook 22, adapted to engage the upper edge of the base-rule 1. Projecting from opposite sides of the rod 21 are the lateral wings 24, which fit in ways 25 (see Figs. 9 and 10) in the bracket 20, whereby the rod 21 is prevented from turning until the nut has been unscrewed sufficiently to allow said wings to pass from said ways, when the hook 22 may be turned so as to disengage it from the base-rule 1 and allowing the beveled rule 18 to be removed therefrom. The lower spacing-rule 5 passes between the bracket 20 and the lower end of the beveled rule 18, and its inner end is supported by the slotted portion 26 of the bracket 2. The spacing-rule is employed to properly space the rafters, and the graduations thereon indicate the distance between centers, the spaces between the half-length graduations being equal to eighteen inches and the spaces between the full-length graduations being equal to twenty inches. By simply loosening the nut 23 the rule 18 may be adjusted upon the base-rule at will. In employing said rule to determine the length of either jack-rafters or cripple-rafters the tool is set as shown in Fig. 2, which shows it in position for determining the length of a hip-rafter. If it is desired to set the jack-rafters either eighteen or twenty inches between centers, the rule 18 is adjusted upon the spacing-rule to coincide with the graduations thereon, accordingly as it is desired to space the rafters, when the length of the rafter will be indicated at the point where said rule crosses the hypotenuse-rule 14, the length of each of the jack-rafters being indicated in succession as the rule 18 is moved from space to space on the rule 5. The bevels at which the several rafters shall be cut in order to make them fit properly in place may be readily determined by any one skilled in the art. To employ the rule 18 for determining the length of collar-ties, the set-screw 6 is loosened, so as to enable the rule 5 to be withdrawn sufficiently to permit the removal of said rule 18 from the base-rule, as shown in Fig. 6, when the rule 18 may be placed upon the vertical standard 7, as also shown in Fig. 6, and secured at any desired point of adjustment, in which position said rule extends across the hypotenuse-rule 14, which indicates the main rafter of the building, and the length of the collar-tie will be indicated upon the rule 18 where it crosses the rule 14, the figure indicated on said rule 18 being doubled to give the proper length of the collar-tie. This arrangement enables the length of the collar-tie to be quickly and accurately determined at any desired point of elevation.

By means of this improved gage every timber which enters into the roof structure may be properly cut with the assurance that it will fit correctly when inserted in its proper place without the necessity of measuring each individual piece, as is commonly practiced, as the measurements are correctly give upon this gage and said measurements indicated upon the graduated rules.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A gage comprising a base-rule, a vertical rule slidably mounted on the base-rule, an angle-rule, means for pivotally and slidably connecting the angle-rule to the vertical rule, said angle-rule lying in engagement with the end of the base-rule.

2. A gage comprising a base-rule, a vertical rule longitudinally movable on the base-rule, a hypotenuse-rule longitudinally movable at each end with respect to the vertical rule and to the base-rule respectively, and a rule slidable upon the base-rule and intersecting the line of the hypotenuse-rule.

3. A gage comprising a base-rule, a vertical rule, a hypotenuse-rule, a spacing-rule parallel with the base-rule, and a rule mov-

able longitudinally of the base and spacing rule and intersecting the line of the hypotenuse-rule.

4. A gage comprising a base-rule, a block slidable thereon, a rule mounted on said block extending at right angles to the base-rule, a movable head upon said last-mentioned rule, a hypotenuse-rule pivoted at its upper end to said head and having a slidable engagement at its lower end with the base-rule.

5. A gage comprising rule members describing a right angle, movably joined at the point of union, a hypotenuse-rule, means for slidably and pivotally connecting one end of the hypotenuse-rule to one of said rule members, and means for affording a longitudinally-movable engagement between the opposite end of the hypotenuse-rule and the other of said rule members.

6. A gage comprising rule members describing a right angle, movably joined at the point of union, a hypotenuse-rule, means for slidably and pivotally connecting one end of the hypotenuse-rule to one of said rule members and means for affording a longitudinally-movable engagement between the opposite end of the hypotenuse-rule and the other of said rule members, and an auxiliary rule member movably mounted upon one of the first-mentioned rule members and intersecting the hypotenuse-rule.

7. A gage comprising a base-rule, a block movable thereon, a spacing-rule movable in said block and parallel with said base-rule, a rule member rigidly mounted on said block and extending at right angles to the base-rule, a hypotenuse-rule crossing between the ends of said rule members, and an auxiliary rule mounted to slide upon the base-rule and spacing-rule and intersecting the hypotenuse-rule.

8. A gage comprising a base-rule, a block movable on the base-rule and attachable thereto, a vertical rule fixed in said block and extending at right angles to the base-rule, a head movable upon said vertical rule, a pivoted arm on said head, a screw engaging one end of said arm, a hypotenuse-rule pivoted at its upper end to the other end of said arm, and a guide for lower end of said hypotenuse-rule affording a longitudinally-movable engagement thereof with the end of the base-rule.

9. A gage comprising a base-rule, a vertical rule movably mounted on the base-rule, a head slidably mounted on said vertical rule, a pivoted arm on said head, means for actuating said arm, a hypotenuse-rule pivoted at its upper end to said pivoted arm, an arm pivoted to the end of the base-rule having a guide at the end thereof, the lower end of the hypotenuse-rule passing through said guide.

In testimony whereof I sign this specification in the presence of two witnesses.

EDWIN H. HORTON.

Witnesses:
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ELIZABETH CRAWFORD.