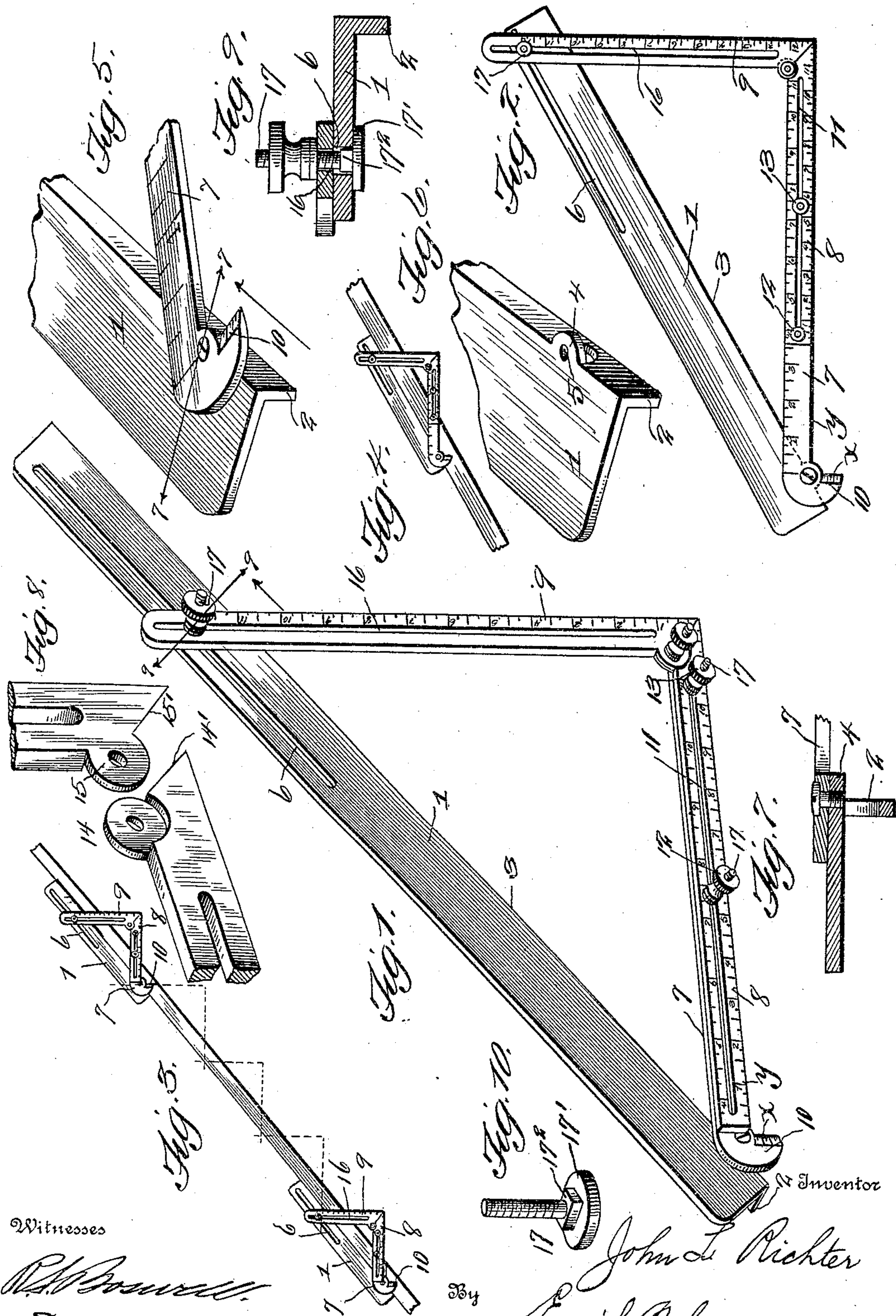


J. L. RICHTER.
 RAFTER MARKING INSTRUMENT.
 APPLICATION FILED JAN. 16, 1909.

940,067.

Patented Nov. 16, 1909.



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RAFTER-MARKING INSTRUMENT.

940,067.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN L. RICHTER, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Rafter-Marking Instruments, of which the following is a specification.

This invention relates to that class of measuring instruments which are used by carpenters, builders and other wood-workers for obtaining and marking bevels and angular cuts on various building members such as stair-horses, joists and rafters, and pertains more particularly to an instrument especially adapted to quickly and accurately determine and lay out, without extra computation, the top and bottom cuts of common, hip and valley and jack-rafters, and also their proper length.

The principal object of my invention is to provide a rafter marking instrument which will possess all the efficiency and accuracy demanded of such a device which being constructed of few and no complicated parts, thereby produces an instrument of improved construction and usefulness.

A further object is to produce an instrument of the type set forth which can be readily set to measure off rafters of various sorts without preliminary computations or interchanging of parts of the device.

With these and further objects as will hereinafter appear, in view, my invention consists in the novel construction and arrangement of parts as herein described, and shown in the accompanying drawings which form a part of this specification.

In said drawings: Figure 1 is a perspective view of my improved measuring device, showing the parts arranged to mark off the cuts of a common rafter, Fig. 2 is a plan view showing the device set to mark off the cuts of a hip and valley rafter, Fig. 3 shows this device applied to a rafter, for the purpose of marking the cuts and length of a common rafter, Fig. 4 shows my device applied to a rafter for marking the cut of a hip and valley rafter, Fig. 5 is a detail perspective view showing the method of pivoting one of the adjustable slides to the base, Fig. 6 is a detail perspective view showing the construction of the above mentioned pivot-point, Fig. 7, shows a sectional elevation through line 7—7 of Fig. 5, looking in the direction of the arrow, Fig. 8 is a detail

perspective view showing the interfitting pivot members of the adjustable slides of the instrument, Fig. 9 is a cross sectional elevation through 9—9 of Fig. 1, looking in the direction of the arrow showing the construction of the adjusting nuts, and Fig. 10, is a perspective view of the base of one of the adjusting nuts.

Referring now more particularly to said drawings, in which similar reference numerals indicate like parts, 1 represents a base rod or bar formed of any suitable material, though preferably it is stamped from sheet metal, said base bar having a marginal portion along its inner edge turned down to form a depending flange 2. This flange 2 forms the guiding base of the instrument, and its edge 3 is the base of the triangle formed by the various adjustments of the adjustable members. Near one end of the base bar 1, is formed an ear 4, said ear consisting of an overhanging portion of preferred semi-circular form, which was cut from the marginal portion or flange 2 and left projecting in the plane of the main portion of the bar 1 when said flange 2 was struck down. Said ear 4 is provided centrally with a pivot-bearing opening 5, said opening being formed with its center in line with the edge 3, for the purpose hereinafter set forth. At its opposite end said bar 1 is provided with a longitudinal slot 6, which extends substantially half the length of said bar, and forms a slideway for the adjustment devices of the swinging members. Said swinging or adjustable members comprise the legs 7, 8 and 9, which when extended, form a triangle with the base bar 1. Leg 7 comprises a flat bar having a substantially semi-circular enlargement or extension 10 which forms with the edges of said leg 7 a squaring member or right angle, as between x and y , the edge x being beveled and graduated as shown. The intersection of the edges x and y indicates the pivotal point of said leg 7, at which it is riveted or otherwise suitably mounted on the base bar 1 to the ear 4. By this means the accurate adjustment of the instrument is insured in that the edge y will always intersect the edge 3 at the pivotal point of the jointed members, for all angles. Said leg 7 is also graduated, as will hereinafter appear.

Leg 8 comprises a flat bar similar in size to leg 7 and being as long as said leg 7 from

its edge x to its outer extremity, and having a longitudinal slot 11, extending for the greater part of its length and receiving the adjusting nuts 12, and 13 which are secured to leg 7 and by means of which leg 8 is adjustably slidable on and lengthwise of said leg 7. Leg 8 is graduated on its outer edge in inches and on its inner edge is scaled to continue the graduations carried on the leg 7. The leg 9 corresponds in general construction and shape to the legs 7 and 8 and is pivotally secured to leg 8 by means of a rule joint which, when fully open causes said legs to form a right angle and may be tightened by means of a set screw. Said rule joint, as shown in Fig. 8 comprises substantially circular members 14 and 15 which are oppositely countersunk on their respective members or legs 8 and 9 to form a smooth joint between said members, while the inclined faces 14' and 15' form opposing abutments which determine the angle between said legs when they are fully extended. Said leg 9 has a slot 16 extending substantially its full length, which engages with a suitable set screw or thumb nut 17 which is slidable universally in said slot 16 and in the aforementioned slot 6 formed in the bar 1, whereby said leg 9 may be variably adjusted with relation to said bar. Leg 9 is graduated on its outer edge in inches for its entire length. Said thumb nut 17 and all other similar nuts used for adjusting the various parts of this device, are constructed as shown in Fig. 10. The lower portion of the nut, which bears against the sliding members is formed as a large flat head 17'. That portion which moves in the slots is squared, as at 17'', whereby said nut may freely slide in the slots, but may not turn when being tightened up.

As above stated, this instrument is adapted to give directly the cuts for hip and valley rafters as well as common rafters. To accomplish this purpose the legs are so proportioned in length with respect to the base-bar and to one another as to give, on adjustment to any particular measurements, the proper analogous relationship of height, width and pitch, so that a mere laying off of the instrument the proper number of times on a rafter timber will give the requisite length as well as the proper top and bottom cuts. For instance, in the particular instrument described, the entire length between the pivot-points of leg 7 and the extreme outer ends of legs 7 and 8 when they are in the folded or closed position shown in Fig. 1 is twelve inches, and the outer edge of leg 8 is so graduated. Leg 9 is also graduated in inches to permit of its proper adjustment relative to edge 3 of the base bar 1. Therefore, given the common rafters in a roof of twelve foot rise and eighteen foot span, with the legs 7 and 8 fully closed and leg 9 set for 9 inches,

which would be half the span, on a basis of twelve to one ratio, it would merely be necessary to lay off on a timber nine times the distance between the outer edges of legs 7 and 9 along the edge 3, having said edge as a base bearing on the edge of the timber.

For cutting hip and valley rafters, the legs 7 and 8 are extended, and are so proportioned that the ratio of their added lengths when extended is to their length when closed upon one another, as the pitch of a common rafter is to the pitch of a hip and valley rafter of a roof of the same span and rise. So that it is evident that to set the instrument for laying off said hip and valley rafters, it is merely necessary to extend the legs 7 and 8, and after setting them rigidly so with relation to one another, to proceed as for common rafters.

While it is preferred to construct this instrument of stamped metal, I do not desire to be restricted to that material as it is evident that various suitable materials may be employed. And I do not desire to be confined to the specific construction herein set forth, since it is evident that my improved device may be varied in different details of construction while still keeping within the bounds of my invention.

It will be obvious from the above that my instrument comprises a simplified, serviceable, and desirable device, and that it is well adapted to be economically manufactured as well as quickly and accurately used, since there are few parts and no complications of elements. Furthermore, this instrument, when not in use, may be quickly and compactly folded and stored away, in a small space and without danger of injury.

Having now fully described my invention, what I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. A device for measuring rafters, comprising, in combination with a base bar, a leg pivotally mounted on said bar on the line of its measuring edge, a member extensibly mounted on said leg, and a leg pivotally secured to said extensibly mounted member and having a universally movable connection with said bar, whereby the angular relationship of said legs and bars may be varied.

2. A device for measuring rafters, comprising, in combination with a base-bar, a leg pivotally mounted on said bar on the line of its measuring edge, a member extensibly mounted on said leg, and a leg pivotally secured to said extensibly mounted member and having a pivotal and sliding connection with said bar, said pivotal connection between said extensibly mounted member and said second mentioned leg being limited to a maximum right angle.

3. A device for measuring rafters, com-

prising, in combination, a slotted base-bar, a leg pivotally secured to said bar, a slotted member extensibly mounted on said leg, and a slotted leg pivotally secured to said slotted member, and having its arcual movement thereon limited to a maximum right angle, said slotted leg also having a connection with the slot in said base-bar whereby a universal connection is made to adjust said slotted leg independently of said first leg.

4. A device for measuring rafters comprising in combination a slotted base-bar, a leg pivotally secured to said bar, a right angled member formed on said leg to indicate a line through the pivot point of said leg, a slotted member extensibly mounted on said leg, a slotted leg pivotally secured to said slotted member and having a universally slidable connection with said slotted

portion of said bar, whereby to vary the angular adjustments of its various parts.

5. A device for measuring rafters comprising in combination, a base-bar comprising an angle-bar, and having a pivot bearing formed on the line of its measuring edge, a leg pivotally mounted on said bearing, a member extensibly mounted on said leg, and a leg pivotally secured to said extensibly mounted member and having a universally movable connection with said bar, whereby the angular relationship of said legs and bar may be varied.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN LUDWIG RICHTER.

Witnesses:

J. D. GUINN,

A. G. McNEILL.