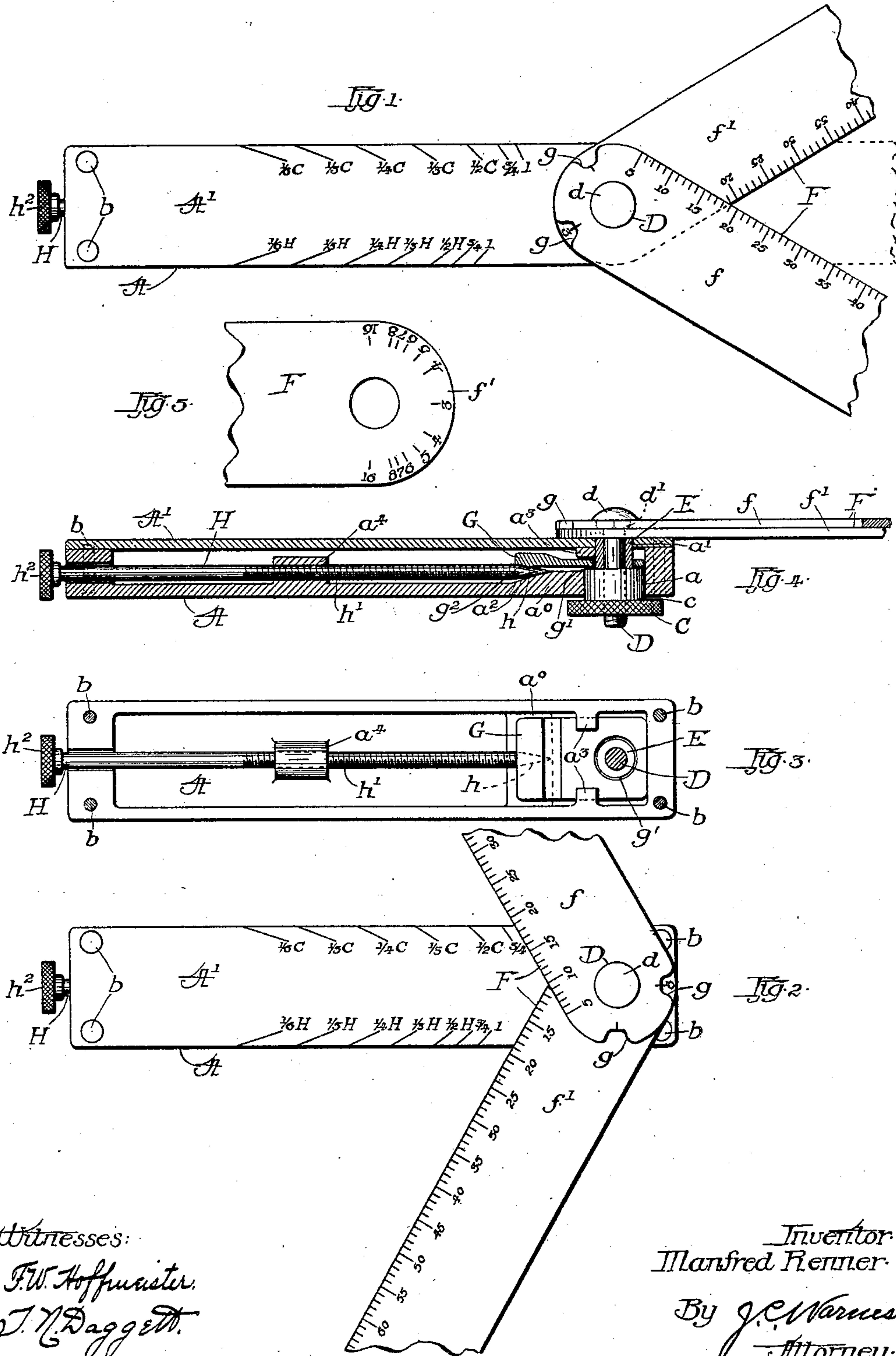


No. 886,639.

PATENTED MAY 5, 1908.

M. RENNER.  
BEVEL SQUARE.

APPLICATION FILED SEPT. 26, 1907.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## BEVEL-SQUARE.

No. 886,639.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed September 26, 1907. Serial No. 394,611.

*To all whom it may concern:*

Be it known that I, MANFRED RENNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bevel-Squares, of which the following is a complete specification.

This invention relates to two-bladed bevel squares, and more particularly to the means employed for setting and fixing the blades at any desired angle with respect to each other, and for setting the stock in a fixed relation to the blades and in a position to bisect the angle therebetween.

The object in view is to provide a simple and effective tool for facilitating the cutting of butt and miter joints, for measuring, laying off and bisecting either exterior or interior angles, for marking rafter cuts and general use in framing work.

Referring to the accompanying drawings—Figure 1 shows a plan of a bevel square embodying my invention. Fig. 2 is a similar view but with the blades in position to measure an interior angle. Fig. 3 represents also a plan view but with the covering plate and blades removed from the stock. Fig. 4 represents a central longitudinal section of the stock; and Fig. 5 is a detail plan of the graduated end of the lower blade.

In the drawings A designates the stock which is preferably formed of a rectangular shaped casting recessed on its upper surface to provide space for the device which fixes the blades to the stock. A covering plate A<sup>1</sup> is secured to the upper face of the stock by means of the rivets b. In the stock A and covering plate A<sup>1</sup>, at the blade ends thereof, are formed the alining perforations a and a<sup>1</sup>, respectively, the perforation in the stock being considerably larger than that in the cover. In the perforation a fits the boss c of the thumb nut C of the binding screw D. In the perforation a<sup>1</sup> fits the sleeve E, the said sleeve surrounding the screw D and being interposed between the inner end of the boss c and the two blades f and f<sup>1</sup> on the projecting end of said screw. The binding screw D thus forms a pivotal axis for the blades F, and the head d thereof, when the screw is tightened, draws the blades down tightly upon the end of the sleeve. To prevent the blades being drawn against the cover plate A<sup>1</sup> when the thumb nut C on the binding screw is tightened, the sleeve E is made to project a slight distance through the cover

plate, when the head of said thumb nut bears against the stock A; or in other words, the combined length of the boss c and said sleeve E is made a trifle greater than the thickness of the stock A and cover A<sup>1</sup>. The effect of this will be to bind or fix the blades with respect to each other but allow them to remain free to turn on their pivotal axes on the stock, the screw D, the nut C and sleeve E all turning at such time in the stock. The head end d of the screw D is provided with the squared portion d<sup>1</sup>, which fits a corresponding aperture in the upper blade f, thus causing the screw to turn with said blade.

The following means are provided for fixing the blades to the stock: The boss a<sup>0</sup> which surrounds the aperture a, and is somewhat shorter than the boss c of the nut C, extends rearwardly, as shown in Fig. 4, and is provided at its end with the V-shaped notch a<sup>2</sup>. Laterally and inwardly projecting lugs or shoulders a<sup>3</sup> are formed on the side walls of the stock A, near the top thereof and intermediate the notch a<sup>2</sup> and the center of the screw D. Beneath these shoulders a<sup>3</sup>, and on top of the boss a<sup>0</sup>, is placed the binding block G. This binding block is provided with an aperture g<sup>1</sup>, which loosely engages the sleeve E and is adapted to bear downwardly on the end of the boss c. The rear end of the block G has formed on its under side a V-shaped notch which registers with the notch a<sup>2</sup> in the boss a<sup>0</sup>. A longitudinally extending, conically headed rod H engages with its cone-shaped head h the two notches g<sup>2</sup> and a<sup>2</sup>. This rod H is provided with a threaded portion h<sup>1</sup> which engages the correspondingly threaded lug a<sup>4</sup> in the stock A. By turning the thumb nut h<sup>2</sup>, fixed on the end of the rod H, which projects through an aperture in the end wall of the stock, the said rod will be advanced or retracted. Such movement of the rod, it is evident, will cause its conical head h to lift or depress the rear end of the binding block G about the fulcrum formed by the shoulders a<sup>3</sup>. If the rear end of the block is pressed upwardly, its forward end will be forced downward against the inner end of the boss c, thus pressing the ends of the blades into contact with the cover plate A<sup>1</sup> and holding them securely by frictional contact. By the construction thus described the blades are first fixed in relation to each other and then, by an independently acting device, are fixed to the stock.



In order to set the blades at any desired angle with respect to each other, a scale or series of graduations is formed on the pivotal end of one of the blades, with corresponding index marks on the other blade.

As it is more frequently desired to lay off the angles which correspond with the interior or exterior angles of regular polygons, or to lay off given angles upon the work irrespective of their measured amount, the graduations shown measure not the degree but the angle of regular polygons. The graduations on the lower blade  $f^1$  start, preferably, from the center line on the end thereof and extend in either direction over little more than a quadrant. By having the graduations extend in both directions the same working edges may be used on the blades for both exterior and interior angles. Cut-away portions  $g$  are formed in the upper blade in alinement with the index marks thereon, the cut-away portions exposing the graduation on the lower blade and the numeral designating the number of sides of the polygon corresponding with that particular position.

In the position indicated in Fig. 1 the index mark on the top blade  $f$  registers with the graduation numbered 3 on the lower blade, which indicates that the blades are set to measure off the exterior angle of a triangle; while in Fig. 2 they are set to measure the interior angle of a hexagon. It is evident that the blades may thus be employed to transfer established angles or lay off angles corresponding to polygons of any number of sides provided for. After setting to the required angle the blades are fixed to each other by tightening the thumb screw C. In transferring these angles to the work it becomes necessary to bisect the angle between the blades. This is done by moving the stock A around to a bisecting position between the blades and then securing the blades to the stock by advancing the threaded rod H and lifting the binding block G, as before explained. The bisecting position of the stock is determined by means of corresponding finely divided scales along the opposing edges of the blades, as shown; for instance, in the dotted line position of the stock A, shown in Fig. 1, the stock has been moved until its edges register with the corresponding number, 35 in this instance, on the scale along the edges of the blades. After having been adjusted to this position the blades are fixed to the stock as before explained.

To facilitate the laying out of rafters, graduations are provided along the edges of the plate  $A^1$  which will indicate a certain pitch angle when one of the blades is made to

register therewith. The graduations on one side of the stock, or plate, are marked  $\frac{1}{2}C$ ,  $\frac{1}{3}C$ , etc., which refers to the pitch for common rafters, and the graduations on the other side are marked  $\frac{1}{2}H$ ,  $\frac{1}{3}H$ , etc., referring to the angle for hip rafters of the corresponding pitch.

What I claim as my invention, and desire to secure by Letters Patent, is:

1. A bevel square comprising a stock, two independently movable blades pivotally mounted thereon, two sets or series of graduations and corresponding index marks provided on the pivotal ends of said blades, one series for measuring external angles and one for measuring interior angles, the said graduations enabling the blades to be set at any angle with respect to each other, means for fixing the blades relative to each other, and independent means for fixing the blades to the stock, substantially as and for the purpose described.

2. A bevel square comprising a stock provided on its upper face with rafter-pitch graduations with which the blades may be made to register and thereby indicate the required angle in rafter work, one margin of said face being provided with pitch graduations for common rafters, and the other margin thereof with pitch graduations for hip rafters, two independently movable blades pivotally mounted thereon, said blades having on their pivotal ends two series of graduations enabling them to be set at any desired angle with respect to each other, a thumb screw a sleeve and bolt for fixing the blades relative to each other, and means for fixing the blades to said stock, substantially as and for the purpose described.

3. A bevel square comprising a two-piece hollow stock, a bolt extending through one end of the stock, two independently movable blades mounted on one end of said bolt, a thumb screw provided with an inwardly projecting boss engaging the other end of said bolt, a sleeve surrounding said bolt and interposed between the end of the inwardly projecting boss and the said blades, the length of the boss and sleeve being slightly greater than the thickness of the stock, thereby permitting the blades to be fixed to each other without being fixed to the stock, graduations formed in the pivotal ends of said blades to enable them to be set at any desired angle with respect to each other, and means for fixing the blades to the stock, substantially as and for the purpose specified.

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