Oct. 6, 1931. A. E. SMITH 1,825,759

BEVEL SQUARE

Filed Dec. 18, 1928

Fig. 1.

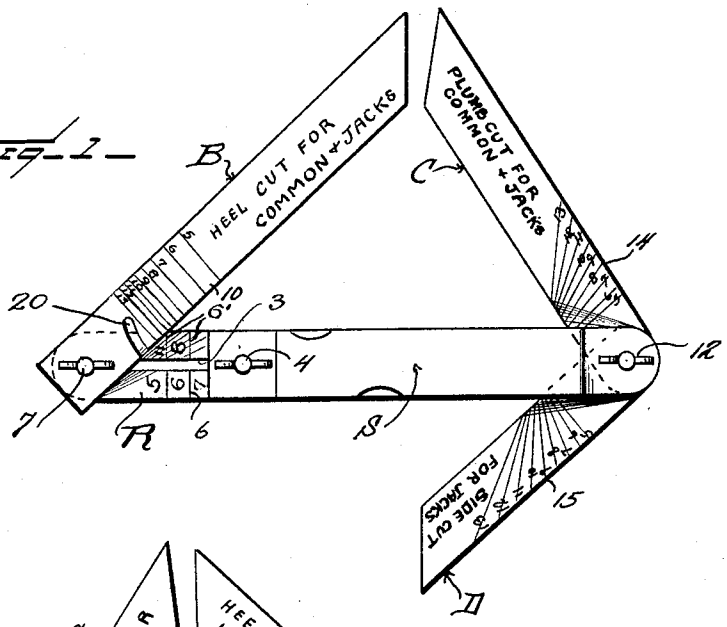


Fig. 2.

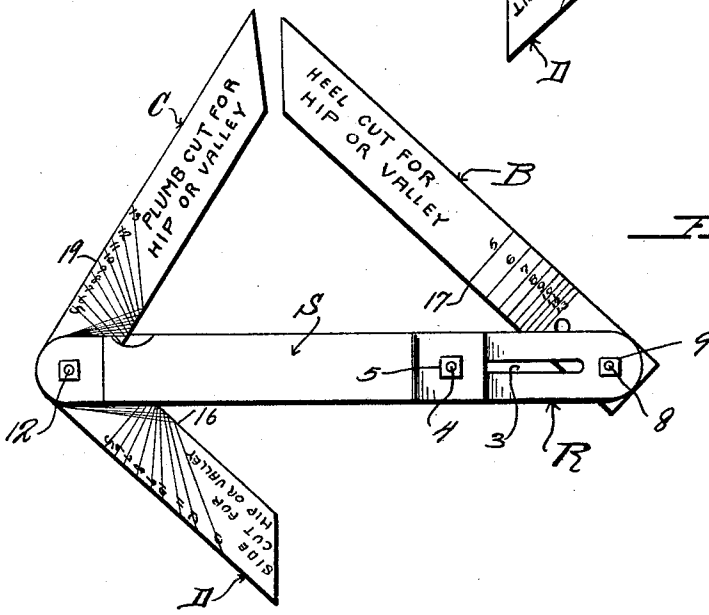
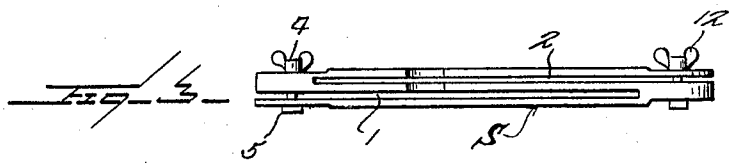


Fig. 3.



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UNITED STATES PATENT OFFICE

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BEVEL SQUARE

Application filed December 18, 1928. Serial No. 326,765.

This invention relates to bevel squares and it is primarily an object of the invention to provide a device of this kind especially designed and adapted for use in connection with roof construction.

It is also an object of the invention to provide a bevel square of this kind embodying means whereby the required pitches of the various cuts may be accurately laid out without requiring any particular or special skill or knowledge on the part of the workman.

Another object of the invention is to provide a device of this kind embodying a plurality of different blades adapted to be separately used to lay out plumb cut, heel cut and side cut for either common or hip jacks or valleys and in a manner whereby the required layout of the blades is determined in accordance with the rise in inches per foot.

An additional object of the invention is to provide a device of this kind including a stock or case having associated therewith a sliding foot run blade with which is operatively engaged a heel cut blade for either common or jack rafters and wherein the stock has operatively engaged therewith additional blades for laying out plumb cut and side cut for common and jack rafters, said last named blades being provided with indications or graduations to determine the angles of said blades with respect to the run blade or the stock, said graduations of said blades being identified in the same manner as graduations provided on the run blade so that upon setting of the run blade with respect to a selected graduation thereon the remaining blades will be adjusted in accordance with a similarly identified graduation thereon.

Furthermore, it is an object of the invention to provide a device of this kind including a case or stock having associated therewith a sliding run blade together with a second blade operatively engaged with the stock or case, said second blade on its opposite faces being provided with graduations adapted to be selectively brought into register with a straight edge on the stock or case, the graduations on one side of the blade being used to lay out a plumb cut for common and jack rafters and the graduations on the opposite side being used for laying out a plumb cut for hip or valley rafters, each set of graduations being consecutively identified in the same manner as graduations produced on the run blade whereby the positioning of said second blade will be determined by a graduation thereon of an identity similar to the identity of the graduation on the run blade employed to set such run blade.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved bevel square whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:—

Figure 1 is a view in plan of a bevel square constructed in accordance with an embodiment of my invention with the various blades extended.

Figure 2 is a view also in plan but opposite to that illustrated in Figure 1;

Figure 3 is a view in edge elevation of the stock or case as herein employed.

As disclosed in the accompanying drawings, S denotes an elongated stock or case having provided therethrough in a direction parallel to a flat face thereof a slot 1, said slot being open at both straight edges of the stock or case S and at an end thereof, the inner or opposite end of said slot 1 being closely adjacent to the opposite end of the stock or case. In parallelism with this slot 1 but reversely disposed with respect thereto is a second slot 2 or, in other words, these slots 1 and 2 are of substantially the same length with one slot open at one end of the stock or case and the second slot opening at the opposite end thereof.

Slidably extending within the slot 1 through the open end thereof is the elongated run blade R herein disclosed as being pro-

vided with a longitudinally disposed slot 3 through which is directed a clamping screw 4 also disposed through the adjacent portion of the stock or case S and which has associated therewith in a conventional manner a nut 5.

By loosening the screw 4 the blade R may be extended or retracted with respect to the adjacent end of the stock or case S as required and particularly as determined by the rise in inches per foot run. After the blade R has been properly set the same is effectively held in the desired adjusted position by tightening the screw 4.

The blade R has provided thereon a series of longitudinally spaced graduations 6 which are to be employed in connection with the adjacent end of the stock or case S to adjust the blade R in accordance with the rise of the foot run in inches per foot. It is to be noted that the outermost graduation 6 is to indicate the least rise in inches per foot and the space in succession between adjacent graduations 6 is to determine the extent the blade R is to be extended in accordance with the rise in inches per foot.

Pivotally connected, as at 7, with the outer end portion of the blade R is an end portion of a blade B to be employed in laying out a heel cut for common and jack rafters. This pivotal connection 7 is through the medium of a coacting screw 8 and nut 9 whereby the blade B may be effectively locked in desired adjustment with respect to the blade R. At a predetermined point adjacent to its pivoted end the blade B is provided along its inner marginal portion with the graduations 10 consecutively spaced in proper proportions and identified consecutively from its highest indication outwardly to its lowest indication, said indications 10 on the blade B being each correspondingly identified as the graduations 6 on the blade R.

Presuming it is desired to cut a heel for common or jack rafters wherein the rise in inches per foot is five inches, the blade R is longitudinally adjusted to bring the five inch indication 6 flush with the adjacent end of the stock or case S and the blade B is swung to bring the five inch graduation 10 thereon in coincidence with the adjacent longitudinal straight edge of the blade R whereupon the blade B is tightened against movement with respect to the blade R. This adjustment enables the accurate lay-out of the desired heel cut for common or jack rafters.

Pivotally engaged with a common bolt 12 and within the second slot 2 adjacent to its open end are the blades C and D. The blade C on a face similar to the face of the blade B provided with the graduations 10 is provided with the angularly related elongated straight graduations 14. These graduations 14 at the inner straight edge of the blade C are spaced apart in accordance with the desired angle of the blade C when in proper ratio with the extension of the blade R. These graduations 14 are similarly identified in succession as the graduations 6 on the blade R with the least valuation being innermost. By this means with the rise per inches of five inches, the blade C is swung inwardly towards the adjacent straight edge of the stock or case S until the graduation 14 indicating five inches will be brought into coincidence with said adjacent straight edge whereupon the blade is tightened upon proper manipulation of the screw 12.

The blade D on a face similar to that of the blade C provided with the graduations 14, is provided therealong with the properly spaced graduations 15 which are adapted to coact with the second straight edge of the stock or case S so as to determine the angle of the blade D for laying out a side cut for jacks. These graduations 15 are also numbered consecutively the same as the graduations 14 with the graduation of least value being also innermost.

This blade D on its opposite face is provided along its inner straight edge with the graduations 16 suitably spaced for coaction with the adjacent straight edge of the stock or case S to determine the required angle of the blade C in laying out a side cut for hip or valley rafters. These graduations 16 are also consecutively numbered in the same manner as the previous graduations hereinbefore referred to with the graduation of least amount being innermost.

By having all of the various graduations similarly identified, when it has been determined the rise in inches per foot run it is only necessary to extend the blade R until the required graduation 6 thereon is in coincidence with the adjacent end of the stock or case S and then to adjust or swing the remaining blades B, C and D until the similarly identified graduations thereon are brought into proper coincidence with their associated elements as hereinbefore explained. After this adjustment it is only required to tighten the various blades against movement and the workman then has the device set for making the various cuts desired in roof construction except, of course, the blade D will be in one adjustment for side cuts for jacks and another adjustment for side cuts for hip or valley rafters.

After the blades B and C have been properly adjusted in accordance with the rise in inches per foot run, the device is laid upon the rafter and the heel cut is marked thereacross from the blade B, at the same time the workman marks the beam at its edge immediately adjacent to the stock or case S where the second blade C meets the edge of the beam engaged by the stock S. The device is then moved until the blade B is brought into proper register with said marking

whereupon the beam is again marked at the point of the blade C immediately adjacent to the stock or case S. These operations are done a number of times equal to one-half of the width of the roof in feet or, in other words, if the width of the building is sixteen feet this operation is performed eight times or with eight steps.

It is also to be noted that the opposite face of the blade B is provided with the graduations 17 spaced lengthwise of the inner straight edge of said blade to indicate the desired arrangement of said blade B in laying out a heel cut for hip or valley rafters. The opposite side of the blade C is also provided along its inner straight edge with suitably spaced graduations 19 to determine the adjustment of said blade in laying out a plumb cut for hip or valley rafters. These graduations 19 are numbered consecutively the same as the graduations 6′ on the blade R except that the graduation in each instance of least value is innermost, whereas the graduations 17 on the blade B have the least value outermost.

As will be noted from the drawing, graduations 6′ on the blade R are merely continuations of the graduations which originate at the point of intersection of the inner edge of the blade B and the lower edge of the blade R and that when the blade B is swung on the pivot 7, the various graduations on the blade B will come into register with corresponding graduations 6′ on the blade R, the graduations 6′ disposed across one portion the face of the blade R being so positioned that suitable indicia may be placed on the blade to indicate the particular graduation originating at the pivot.

The various graduations 6′ of the blade R are positioned in such close proximity one to another that it is practically impossible or at least impracticable to place any indicia adjacent the inclined graduations without unduly crowding the indicia, but when these angularly disposed graduations are continued partially across the face of the blade R as shown, the proper indicia may be placed on the face of the blade R to indicate the correctly inclined graduation.

Similarly, the upwardly inclined graduations 14 on the blade C are merely continuations of corresponding graduations originating at the pivot of the blade C. Furthermore, the stock S is of a predetermined length which, taken in conjunction with the transversely disposed lines 6 on the blade R, will indicate the correct hypothenuse for the right angle formed from the outer edge portions of the blades B and C, it being of course understood that the graduations on the blade B cooperate with the graduations on the blade C so that if, as an example, it is desired to form a heel cut for common or jack rafters having a rise of 11 inches, the blade R will be moved outwardly of the stock so that the indicating line 11 will be in alignment with the outer edge of the stock S, and the blade B be swung on the pivot 7 until the transversely disposed graduation 11 registers with the complementary graduation on the blade R.

Cooperatively, the blade C will be swung on the pivot 12 until the graduation 11 registers with the top or inner edge portion of the stock S whereupon a line drawn along the outer edge of the blade B and a second line drawn along the outer edge of the blade C will be found to intersect at right angles, the stock S together with the extension of the blade R will therefore form the hypothenuse of the angle, and in determining the length of the beam it will only be necessary to move the stock S along the beam a number of times equal to one-half the width of the building.

The graduations 15 on the blade D are likewise continuations of the graduations originating at the pivot 12, and the angle formed between the stock S and the blade D will determine the correct side cut for beams, hips or valley rafters.

Through the provision of an arcuate groove or slot 20 in the blade B positioned spaced inwardly from the pivot 7, it is possible to swing the blade B so that when the device is not in use, the blade B will be in alignment with the opposite edge portions of the stock, the groove 20 being adapted to loosely engage the pivot 4.

From the foregoing description it is thought to be obvious that a bevel square constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:—

1. A bevel square for use in connection with roof construction comprising, in combination, a stock, an elongated run blade engaged with the stock for endwise movement lengthwise of the stock, said blade being provided with graduations for coaction with an end of the stock to compute the rise in inches per foot upon requisite withdrawal of the run blade, and a heel blade in pivotal connection with the outer end portion of the run blade, a marginal portion of the heel blade being provided with graduations for coaction with a longitudinal edge of the run blade, said graduations being spaced apart to denote the required heel cut in accordance

with the extension of the run blade, said graduations of the run blade and heel blade being similarly identified.

2. A bevel square of the character described comprising in combination a stock, an elongated blade adjustably secured to said stock, said blade having graduations thereon coacting with one edge of said stock whereby to determine the angular adjustment of said blade with respect to said stock, a slotted member secured to said stock and longitudinally adjustable with respect thereto and having longitudinally spaced graduations on one side of said slot, a second elongated blade, means for securing said second blade to said slotted member, said second blade having graduations thereon coacting with an edge of said slotted member and the graduations on said first blade, the graduations on said slotted member coacting with the stock and each of said blades whereby to determine the length of the rafter.

In testimony whereof I hereunto affix my signature.

ARTHUR E. SMITH.