(No Model.)

G. C. HATCH & J. WENGER.

COMBINED MITER, LEVEL, AND SQUARE.

No. 513,183. Patented Jan. 23, 1894.

Fig. 1.

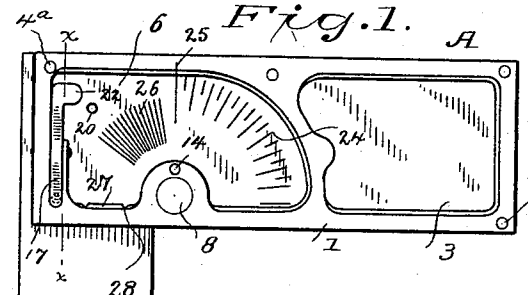


Fig. 2.

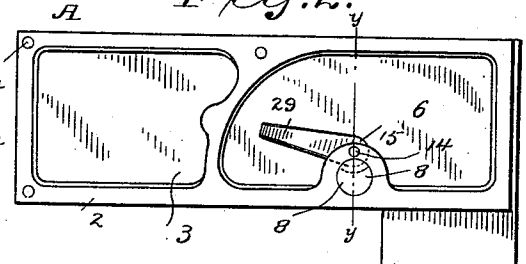


Fig. 3.

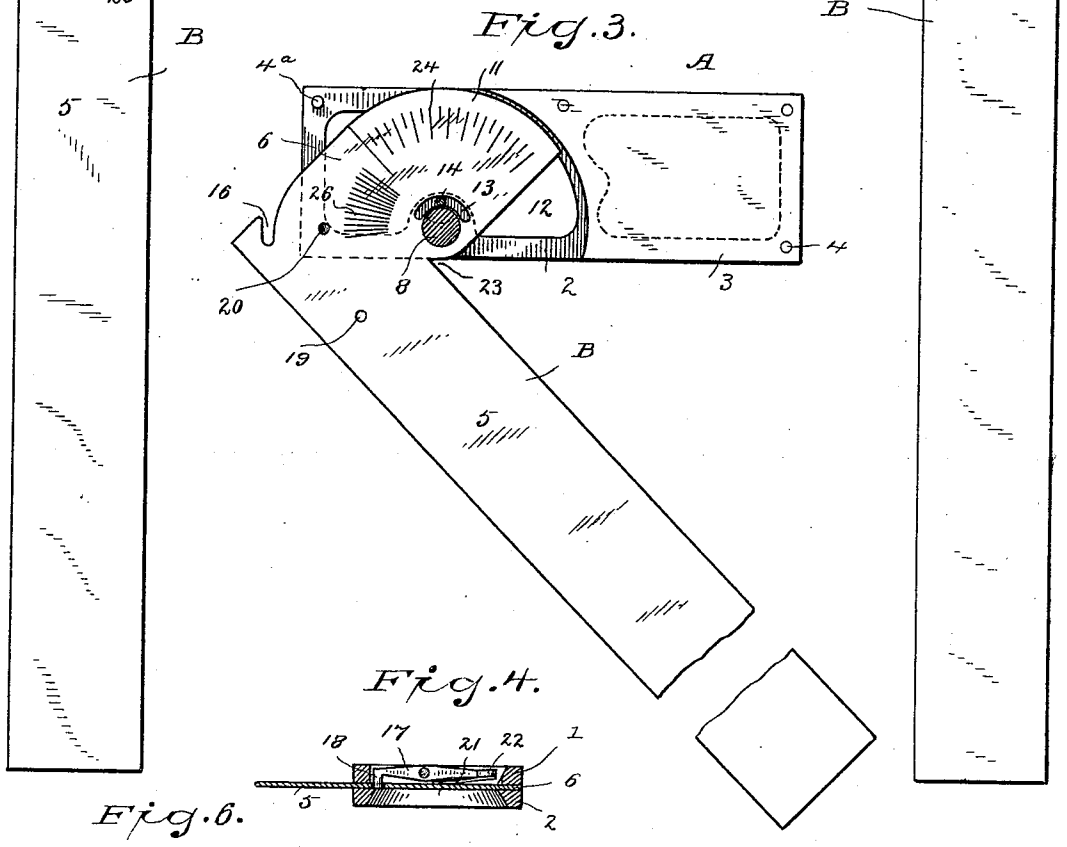


Fig. 4.

Fig. 6.

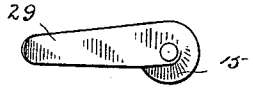


Fig. 8.

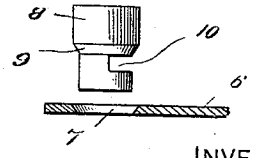
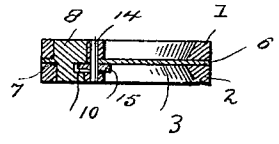


Fig. 7.

Fig. 5.



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GEORGE C. HATCH AND JULIUS WENGER, OF BRIDGEPORT, CONNECTICUT; SAID WENGER ASSIGNOR TO SAID HATCH.

COMBINED MITER, LEVEL, AND SQUARE.

SPECIFICATION forming part of Letters Patent No. 513,183, dated January 23, 1894.

Application filed April 28, 1893. Serial No. 472,196. (No model.)

To all whom it may concern:

Be it known that we, GEORGE C. HATCH, a citizen of the United States, and JULIUS WENGER, a citizen of Switzerland, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in a Combined Miter, Level, and Square; and we do hereby 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.

Our invention has for its object to provide a tool adapted for the use of mechanics generally and especially adapted for the use of carpenters, which shall include the features of a self locking square and miter, a bevel which may be locked at any angle, and which shall also be provided with a scale to indicate any required rise per foot.

With these ends in view we have devised the novel tool which we will now describe referring by numbers to the accompanying drawings forming part of this specification in which—

Figure 1 is a side elevation of our novel tool the blade being shown as adjusted at an angle of ninety degrees constituting a square; Fig. 2 a similar view showing the reverse side of the handle; Fig. 3 a sectional view, the upper half of the handle being removed and the blade adjusted at an angle of forty-five degrees, constituting a miter; Fig. 4 a section on the line *x x* in Fig. 1; Fig. 5 a section on the line *y y* in Fig. 2; Figs. 6 and 7 detail views on an enlarged scale of the locking cam detached, and Fig. 8 is a detail view on an enlarged scale showing the stud detached from the blade the latter being in section.

A denotes the handle as a whole which we make of metal, or other suitable material. It may be made of one piece if preferred although in practice we make it of two skeleton plates denoted by 1 and 2, and between these at the rear end of the plates place an intermediate plate 3 of uniform thickness with the blade which is denoted as a whole by B. The parts of the handle are secured together by rivets 4. The arm of the blade, denoted specifically by 5, does not vary from those in common use. The base of the blade denoted specifically by 6 is provided with a beveled hole 7 through which a stud 8 passes by which it is pivoted in the handle. The stud is provided with a bevel 9 and with a slot 10 the purpose of which will presently be explained. The outer edge of the base is rounded as at 11 so as to prevent it from projecting outside of the handle when the blade is at an angle of forty-five degrees. The base of the handle as already stated is made in skeleton form so as to leave an opening 12 in which the base oscillates both sides of the base being visible.

13 is a curved slot in the base through which a pin 14 passes. This slot serves merely as a clearance for the pin upon which a locking cam 15 is pivoted as will be more fully explained.

16 denotes a locking notch in the base which is engaged by one of the rivets, denoted specifically by 4^a, to prevent the possibility of the blade being sprung outward when in use as a square, that is as shown in Fig. 1, said rivet in that position engaging the end of the slot.

17 denotes a latch pivoted in opening 12 which is provided with a lug 18 adapted to engage a hole 19 in the blade to lock the latter from movement inward when set at an angle of ninety degrees, that is as a square, and to engage a hole 20 in the blade to lock the latter against movement in either direction when set at an angle of forty-five degrees, that is as a miter. See Fig. 3. A spring 21 acts to throw the latch to the locking position causing it to lock the blade automatically at an angle of either forty-five or ninety degrees to the handle, unless the latch is held out of locking position by means of thumb piece 22. The shape of the locking cam is clearly shown in Figs. 5, 6 and 7, the essential feature being an incline on the under side adapted to engage slot 10 in the stud to draw bevel 9 on the stud down into beveled hole 7 in the base thereby locking the blade in any position in which it may be placed.

23 denotes a notch at the intersection of the base and blade, the object of which is simply to remove sufficient metal from the base so that the line of the inner edge of the

blade shall intersect the base at the line of the inner edge of the handle as clearly shown in Fig. 3.

24 denotes a scale upon the base which in connection with a line 25 upon the handle indicates the exact angle at which the blade is set.

26 denotes a scale upon the blade which in connection with an edge 27 in opening 12 in the handle indicates any required rise per foot, as for example the pitch of a roof. At the ends of edge 27 are openings 28, which enable the operator to see both ends of the lines of the scale so that in laying out work the required line of the scale may be made to coincide exactly with the edge, thereby insuring perfect accuracy. Scales may be made upon the opposite side of the blade also if preferred.

The operation is as follows: When not in use the blade folds down close to the handle. This position of blade and handle is not shown in the drawings as it is obvious and therefore not thought to require illustration. Suppose the operator wishes to use the tool as a miter. He simply moves the blade outward until lug 18 engages hole 20 in which position the blade is locked at an exact angle of forty-five degrees to the handle. If it is desired to use the tool as a scale the operator by means of the thumb piece prevents lug 18 from dropping into hole 20 but permits it to drop into hole 19. When it is desired to use the tool for any bevel whether of a greater or less angle than forty-five degrees the operator sets the blade at the required angle as indicated by scale 24 and locks the blade in position by turning locking cam 15, said cam being provided with a hand piece 29 for convenience in operation. By swinging this hand piece outward the incline of the cam is caused to engage the lower side of slot 10 in the stud drawing said stud downward and causing bevel 9 to engage the beveled hole in the blade thereby locking the blade firmly in position. A backward movement of the hand piece releases the blade instantly.

When using the tool to indicate a rise, *i. e.*, a pitch, the operation is precisely the same as when using it as a bevel except that scale 26 and edge 27 are used instead of scale 24 and line 25.

Having thus described our invention, we claim—

1. The combination with a handle having a spring latch 17— of a blade pivoted in said handle and having holes 19 and 20 adapted to be engaged by the latch so that the blade may be locked positively in position to serve either as a miter or a square, and suitable means for locking the blade at intermediate angles.

2. The combination with a handle and a spring latch pivoted therein and having a lug 18 and a thumb piece 22, of a blade pivoted in said handle and having holes adapted to be engaged by the lug unless the latch is held out of operative position, whereby the blade is automatically locked in position for use either as a bevel or a miter.

3. The combination with a handle having an edge 27 with openings 28 at the ends thereof, of a blade pivoted in said handle and consisting of an arm and base having a scale 26 adapted to register with the edge, and suitable means for locking the blade in position to lay out any required rise per foot.

4. The combination with a handle having an opening 12 through it, of a blade pivoted therein and consisting of a base and arm, a notch 23 being formed at the intersection of the base and arm so that the base and arm shall intersect at the line of the handle in all positions of the blade, and suitable means for locking the blade at any required angle.

5. The combination with a handle and a blade having a beveled hole 7, of a stud passing through the blade and handle and provided with a bevel 9 and a slot 10, and a locking cam having an incline adapted to engage the lower side of said slot so as to draw the stud inward causing bevel 9 to engage hole 7 to lock the blade at any required angle.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE C. HATCH.
JULIUS WENGER.

Witnesses:
A. M. WOOSTER,
PEARL REYNOLDS.