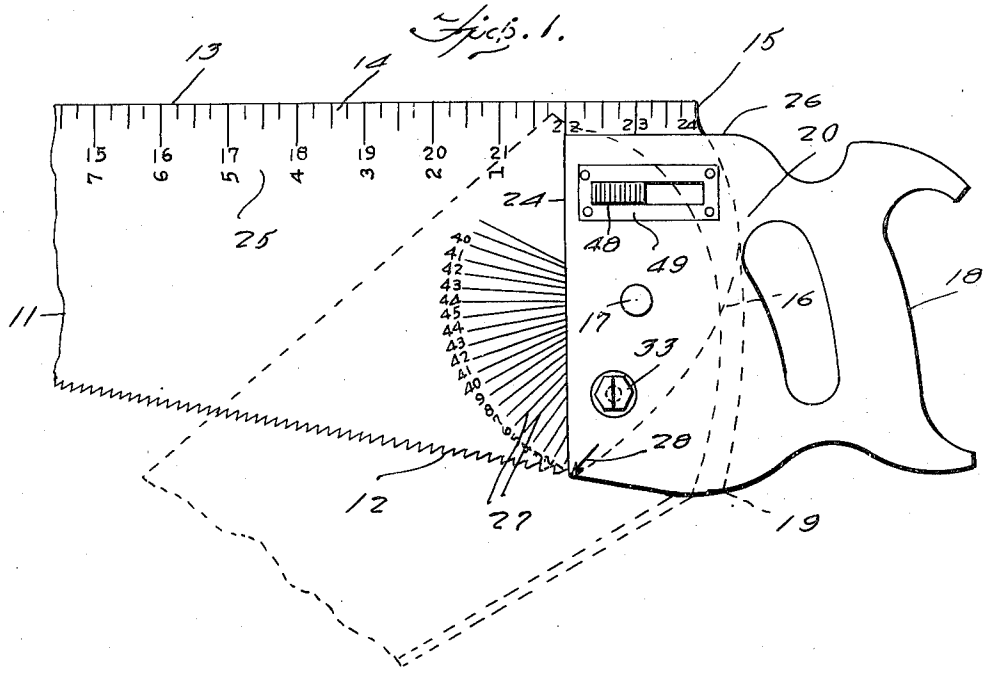
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COMBINATION HANDSAW AND MEASURING TOOL

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Fig. 1.



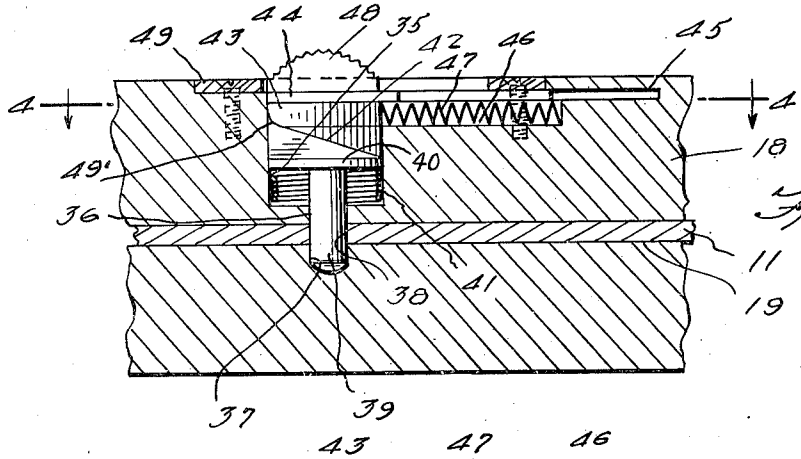




Fig. 3.

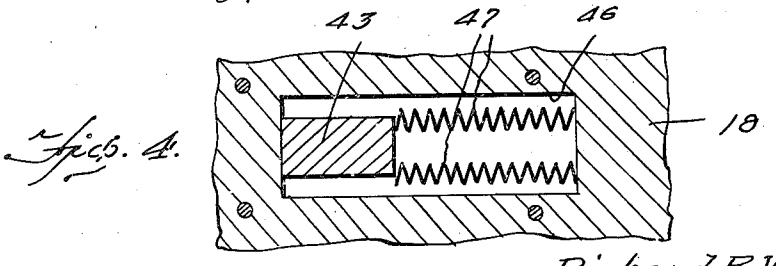



Fig. 4.

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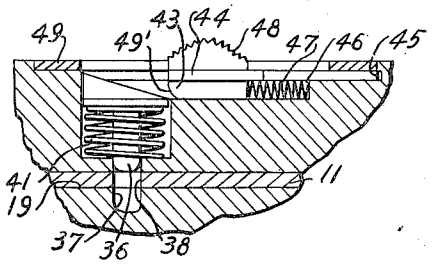



Fig. 8




Fig. 2

Fig. 6.

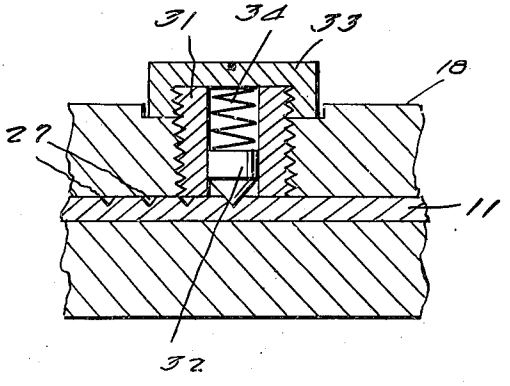



Fig. 5.

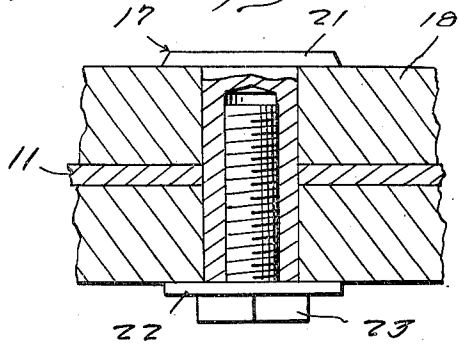
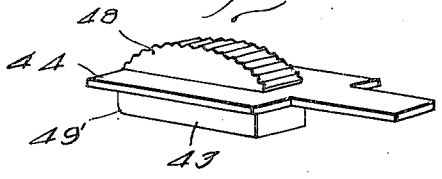



Fig. 7.




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# UNITED STATES PATENT OFFICE

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## COMBINATION HANDSAW AND MEASURING TOOL

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Application August 8, 1947, Serial No. 767,372

1 Claim. (Cl. 7—13)

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This invention relates to hand tools and more particularly to a combination hand saw and measuring tool.

A main object of the invention is to provide a novel and improved combination hand saw and measuring tool which may be employed in making linear or angular measurements, or may be employed as a square or as a level, said tool being very simple in construction, easy to use and accurate in performance.

A further object of the invention is to provide an improved carpenter's hand tool normally employed as a saw, which is also useful as a universal measuring tool, said tool providing means for marking angles, measuring unknown pitch angles, measuring lengths, and the like, and involving only a few simple parts which are readily assembled and inexpensive to manufacture, the assembly being easy to manipulate and having wide utility in woodworking operations and carpentry.

Further objects and advantages of the invention will become apparent from the following description and claim, and from the accompanying drawings, wherein:

Figure 1 is an elevational view of one side of the handle end portion of a combination hand saw and measuring tool constructed in accordance with the present invention.

Figure 2 is an elevational view of the opposite side of the tool structure shown in Figure 1, with the handle angled with respect to the blade, as when the tool is employed to measure an unknown roof pitch angle.

Figure 3 is an enlarged cross-sectional detail view taken through the blade locking portion of the tool of Figure 1.

Figure 4 is a cross-sectional detail view taken on line 4—4 of Figure 3.

Figure 5 is an enlarged cross-sectional detail view taken through the pivotal connection of the handle to the blade of the tool of Figure 1.

Figure 6 is an enlarged cross-sectional detail view taken through a ratchet device employed in the tool of Figure 1 which serves as an aid in setting the handle at a predetermined angle with respect to the blade.

Figure 7 is an enlarged perspective detail view of a lock release button member employed in the blade locking structure of Figure 3.

Figure 8 is a view similar to Figure 3 with the slide in retracted position.

Referring to the drawings, 11 designates a saw blade having the saw teeth 12 formed at its lower edge. The top edge of blade 11 is straight, as

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shown at 13 and is calibrated on each side thereof with a first inch scale 14 running from the forward tip of the blade to the rearward end 15 thereof. Said rearward end is arcuately curved, as shown at 16.

Pivotally secured to blade 11 at 17 is a handle 18 formed with a slot 19 in which the rear end of the blade is secured, said slot allowing the blade to be angled with respect to the handle 18, as shown in dotted view in Figure 1, around the pivotal connection 17. When the blade is in its normal position with respect to the handle, as shown in full line view in Figure 1, the bottom of the slot 19 abuts the upper portion of the rear curved edge of the blade, as shown at 20 in Figure 1, whereby force may be transmitted from the handle directly to the blade, as required for efficient use of the tool as a saw.

The pivotal connection 17 comprises a headed internally threaded sleeve member 21 which passes through the handle 18 and through an opening in the saw blade 11, as shown in Figure 5. Threaded into the sleeve member 21 is a bolt 22 having a head flange formed with a hexagonal portion 23 which may be engaged by a suitable wrench to regulate the pressure of the head flange of bolt 22 on the adjacent surface of handle 18, whereby the clamping pressure of said bolt at the pivotal connection 17 may be set to a desired degree.

The forward edges of the handle 18 are straight, as shown at 24, and in the normal position of the blade 18 are at right angles to the top blade edge 13. Adjacent the scale 14 the top portion of each side of the blade is marked with a second inch scale 25 beginning at the handle edge 24 and extending toward the forward tip of the blade. As shown in Figure 1, the top edge portion of the blade extends upwardly a substantial distance beyond the top edge surfaces 26 of the handle. This enables the top edge portion of the blade to be laid over the edge of a board when making linear measurements thereon, when the tool is set in its normal position. Since the handle forward edges 24 are at right angles to the top blade edge 13 in this position, the tool may be also employed as a square.

Blade 11 is scribed or grooved with angle-defining lines 27 extending radially from pivotal connection 17 and suitably calibrated in terms of degrees with respect to index pointers 28 at the lower forward corners of the handle 18. Carried on said handle is a first bubble level 29 and a second bubble level 30 positioned at right angles to level 29. In measuring an unknown

angle of inclination, such as a roof pitch angle, the straight edge 13 of the blade 11 is laid on the inclined surface and the handle 18 is swung around the pivotal connection 17 until the bubble of lever 29 is centered. The pointers 28 will then indicate the pitch angle at the calibrated angle lines 27.

Threaded into the handle 18 adjacent the lower forward corner thereof is a hollow stud 31 in which is slidably positioned a pointed ratchet member 32. Threaded on stud 31 is a cap 33. A coil spring 34 is positioned in the hollow stud, bearing between cap 33 and ratchet member 32. The pointed ratchet member 32 engages in the scribed lines 27 and aids in positioning the handle at a desired angular setting with respect to straight edge 13 of the saw blade by producing an audible click each time the ratchet member moves past a scribed line 27.

The bubble level 30 is employed as a horizontal level testing device when the blade is set in its normal position with respect to handle 18 and the straight edge 13 is laid on the surface to be tested. The bubble level 29 is employed as a plumb testing device when the blade is in normal position by placing the straight edge 13 against the wall or other surface to be tested for perpendicularity to the horizontal.

Adjacent an upper forward corner thereof handle 18 is formed with a bore 35 and at the center of bore 35 with a smaller bore 36 which extends to the slot 19 and is continued beyond said slot by a bore portion 37. Blade 11 is formed with an opening 38 which registers with the bore portions 36 and 37 when the blade is in its normal position with respect to handle 18, as shown in Figures 1 and 3. Slidable in the aligned bore portions 36 and 37 and in blade opening 38 is a locking pin 39 having a circular head 40 which fits slidably in the larger bore 35. A relatively weak coiled spring 41 is positioned in bore 35 beneath the circular head 40 and biases the pin 39 towards release position with respect to the opening 38 in blade 11. The circular head 40 is formed with an inclined top surface 42 which is engaged by a depending bar 43 carried by a slide member 44, shown in Figure 7. Slide member 44 is longitudinally slidable in a recess 45, formed in handle 18 adjacent bore 35, said recess having a subadjacent portion 46 adapted to receive the lug 43 when the slide member is moved rearwardly in the recess. A pair of coiled springs 47, 47 bear between lug 43 and the rear wall of recess portion 46, thereby biasing said lug forwardly into overlying relation to the head 40 of pin 39. Slide member 44 carries a serrated button element 48 which projects upwardly through a slotted frame plate 49 secured to the handle 18 in overlying relation to slide member 44. When button element 48 is moved rearwardly against the biasing pressure of springs 47, 47, lug 43 is moved out of engagement with the inclined cam surface 42 of head 40, allowing the spring 41 to move the pin 39 to blade-releasing position. When the blade 11 is angled with respect to handle 18 around the pivotal connection 17, blade opening 38 moves out of registry with the bore portions 36 and 37 so that when button element 48 is released the lug 43 engages the cam surface 42 to exert downward pressure on pin 39, but the end of the pin merely engages the surface of blade 11. This allows angular adjustments of the blade 11 with respect to handle 18 to be freely made until the blade is again rotated to its normal position with respect to the handle, at which time the pin 39 again enters the blade opening 38 and locks the blade in said normal position.

The forward lower corner of lug 43 is smoothly rounded, as shown at 49' to facilitate its camming engagement with inclined head surface 42.

It is thus seen that the blade 11 may be readily unlocked by moving button 48 rearwardly and will remain unlocked, except for the frictional locking action provided by ratchet element 32, as long as the blade is in angled position with respect to handle 18. When the blade is restored to the normal position shown in full line view in Figure 1, it is automatically locked by the movement of pin 39 through the blade opening 38 produced by the biasing action of springs 47, 47 on lug 43 and the camming action of said lug on the inclined pin head surface 42. The coiled spring 41 is relatively weak as compared with springs 47, 47 so that it does not prevent the return of pin 39 to locking position under the force transmitted to said pin from springs 47, 47 through the lug 43 and cam head 40. However, spring 41 is sufficiently strong to raise the pin 39 to unlocking position when the button element 48 is manually moved rearwardly, as above described.

It will be noted that the pivot sleeve member 21 has a relatively large diameter. This provides a substantial pivot bearing surface, thereby minimizing wear and maintaining the accuracy of the pivotal connection between the handle 18 and blade 11.

While a specific embodiment of a combination hand saw and measuring tool has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claim.

What is claimed is:

In a combination hand saw and measuring tool wherein the handle is pivotally connected to the blade, means for releasably locking the handle to the blade in their normal position and against pivotal movement, said means comprising a locking pin movably carried by said handle, the blade having an opening to receive said pin when the handle and blade are in said normal position, a first spring means biasing the pin away from said opening, a cam carried by said pin, a slide member slidably carried by said handle and engageable with said cam, and a second spring means biasing said slide member into camming engagement with said pin, said second spring means being stronger than said first spring means, the slide member cooperating with the cam under the force of said second spring means to move the locking pin into the blade opening when said opening comes into registry with said pin.

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