April 30, 1946. W. THOMAS 2,399,303

BEVEL, LEVEL, AND PROTRACTOR INSTRUMENT

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Fig. 1.

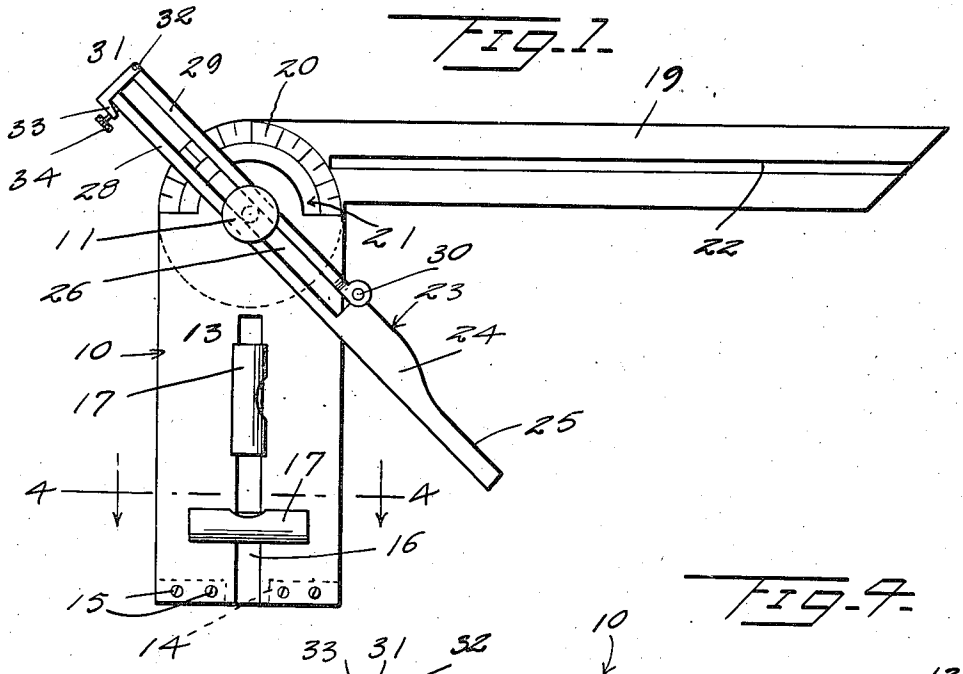


Fig. 2.

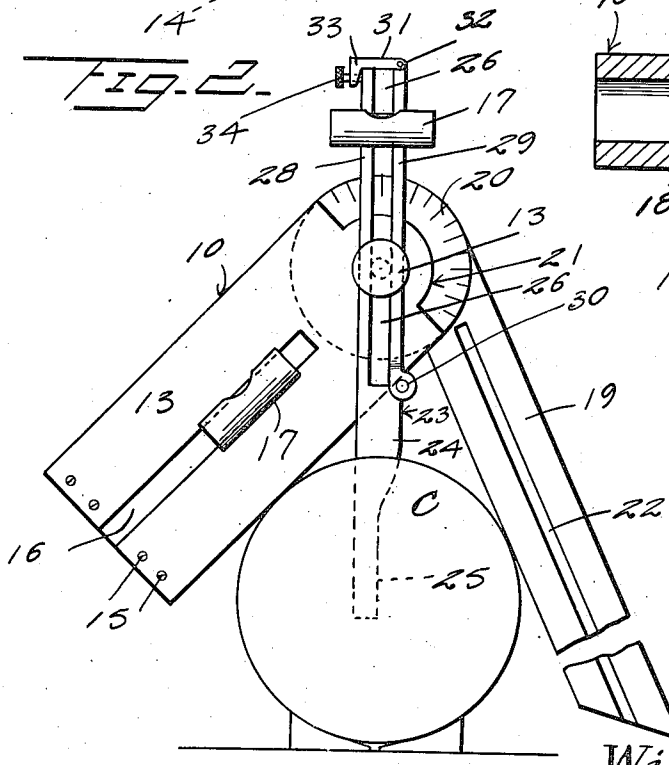
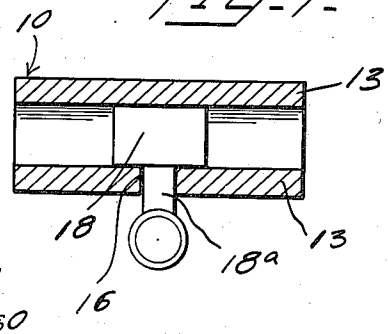


Fig. 4.



Inventor

William Thomas

By L. F. Randolph Attorney

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Fig. 3.

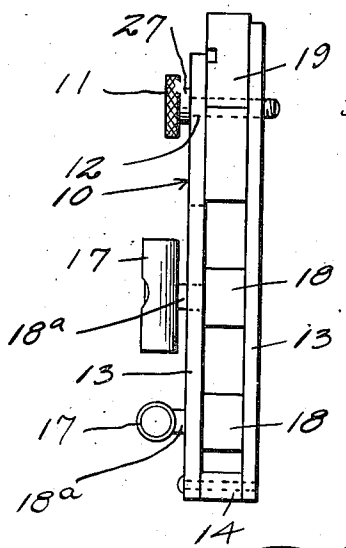


Fig. 5.

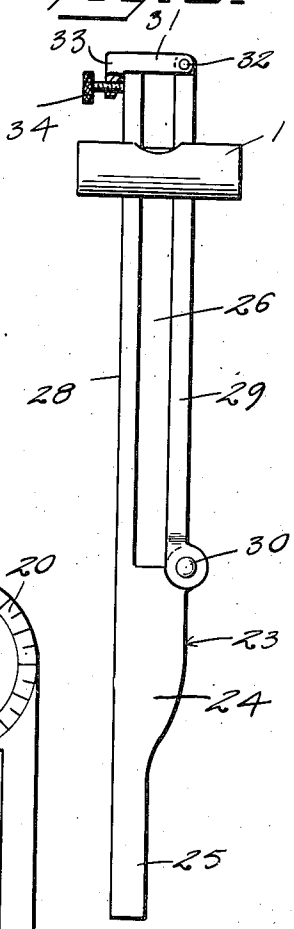


Fig. 6.

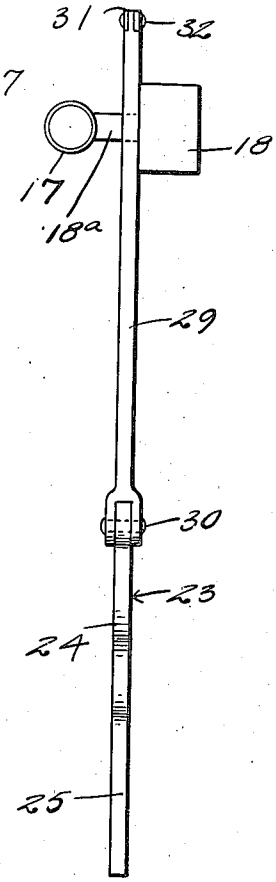


Fig. 8.

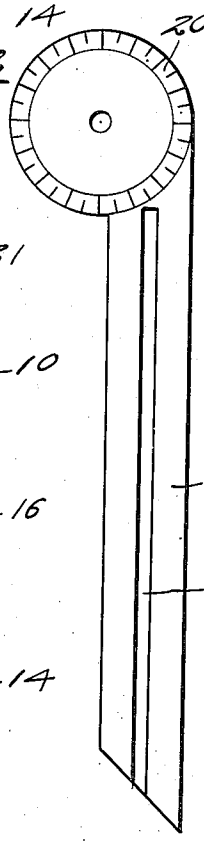
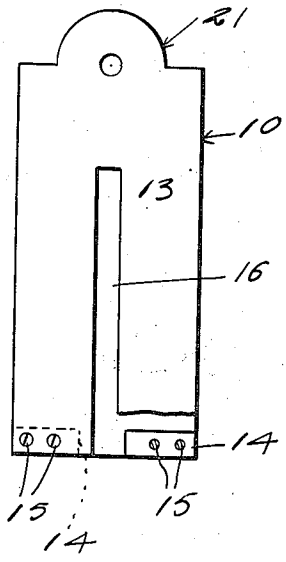


Fig. 7.



Inventor

William Thomas

By L. F. Randolph

Attorney

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UNITED STATES PATENT OFFICE

2,399,303

BEVEL, LEVEL, AND PROTRACTOR INSTRUMENT

William Thomas, San Francisco, Calif.

Application April 15, 1943, Serial No. 483,213

3 Claims. (Cl. 33—88)

This invention relates to a bevel, level, and protractor instrument, tool, or combination.

It is particularly aimed to provide a construction having a novel angle divider and a novel combination utilizing such divider in connection with levels selectively applicable to the stock of the bevel and the angle divider, particularly to enable the finding of longitudinal lines on cylinders or cones.

I further aim to provide a novel angle divider which is applicable as an attachment to the pivot bolt of a bevel, and which is of a particular construction to facilitate such end, and the selective use of a level in connection therewith.

The more specific objects and advantages will become apparent from a consideration of the description following taken in connection with accompanying drawings illustrating an operative embodiment.

In said drawings:

Figure 1 is a view in elevation of the improved instrument or tool;

Figure 2 is a view similar to Figure 1 showing the instrument or tool in use as during the finding of longitudinal lines on a cylinder or cone;

Figure 3 is an end elevation of the instrument or tool with the angle divider removed;

Figure 4 is a detail section taken on the line 4—4 of Figure 1;

Figure 5 is an elevation of the angle divider alone, with a bevel positioned thereon;

Figure 6 is an edge view of the parts of Figure 5;

Figure 7 is an elevation, partly broken away, of the stock; and

Figure 8 is an elevation of the bevel protractor blade or arm.

Referring specifically to the drawings wherein like reference characters designate like or similar parts, 10 designates a stock having a screw 11 threaded thereto as at 12. This stock has spaced-apart plates 13, rigidly secured together by means of interposed blocks or spacers 14 and rivets or bolts 15 passing through such spacers and the plates. The outermost plate 13 has a central longitudinal slot 16 open at one end between the inner ends of the spacers 14, as best shown in Figure 7.

Conventional spirit levels or any equivalent 17 are for use at right angles to each other, are removably positioned on the stock 10 and to this end the spirit levels 17 have T-shaped heads 18 which are positioned and movable in the slot 16 and the space between the plates 13, the heads 18 having sufficient frictional engagement with the plates to remain in position on the stock but so as to enable ready removal and replacement.

The aforesaid bolt 11 bridges the space between the plates 13 and extends through both plates 13, although screw-threaded to only one of them, to afford maximum bearing. Pivotally mounted on such bolt 11 between the plates 13 is a protractor blade or arm 19 which has protractor calibrations 20 concentric with the bolt 11. The plate 13 opposite said calibrations 20 is cut away or reduced as at 21 in order to expose the calibrations. If desired, any suitable type of peep sight may be slidably and removably applied in an undercut groove 22 centrally and longitudinally of the protractor blade 19.

It will be realized that the structure thus described may be used as an ordinary bevel, level, or protractor.

In association with the foregoing parts, I preferably provide an angle divider structure generally designated 23, which may be made of any suitable material such as flexible sheet metal, plastic, or the equivalent. This divider has a blade at 24, provided with a longitudinal edge at 25 in line with the center line of the blade and axis of the screw 11. Such divider has a central longitudinal slot 26 slidably and turnably mounting the divider on a cylindrical enlargement 27 of the screw 11 concentric with its longitudinal axis. Said slot 26 is provided between tine 28 integral with the blade 24, and a tine 29 pivoted at 30 to such blade. A closure element 31 is pivoted at 32 to the movable tine 29 and it has a lug 33 adapted to overlap the fixed tine 28. A screw 34 is mounted in the lug 33 and movable into binding relation with the tine 28 to maintain the closure 31 and tine 29 fixed with respect to the tine 28 and the slot 26 thus closed. It will be realized that the opening of the closure 31 and swinging of the tine 29 facilitate the application and removal of the divider blade to and from the bolt 11.

In addition, said closure 31 and removable tine 29 facilitate the application and removal of either spirit level 17 to and from the slot 26 since the neck 18a of the heads of the spirit levels will fit and slide in the slot 26 as they fit and slide in the slot 16 and the heads 18 will underlap the tines 28 and 29. Further, the tightening of the screw 34 may be to such a degree as to secure the angle divider 23 fixed with respect to the enlargement 27 and also to bind the heads 18 of the spirit levels in the slot 26 between the tines 28 and 29.

The various geometrical or equivalent uses of

the parts of the parts of the tool or instrument will be apparent, but it is particularly adapted for use in finding, through the coaction of the angle divider **23**, the center lines of cylinders or cones such as C in Figure 2, and especially with the aid of one of the levels, the longitudinal lines on such a cylinder or cone.

Various changes may be resorted to provided that they fall within the spirit and scope of the invention.

I claim as my invention:

1. In combination with a stock, a blade and a pivot member securing them together, an angle measuring element of the class described, such element having a slot open at one end whereby said element is pivotally and slidably mounted on said pivot member, and closure means for said open end of the slot to prevent detachment of the angle element from the pivot member.

2. In combination with a stock, a blade and a pivot member securing them together, an angle measuring element of the class described, such element having a slot open at one end whereby said element is pivotally and slidably mounted on said pivot member, and closure means for said open end of the slot to prevent detachment of the angle element from the pivot member, consisting of a bar pivoted on one side of the slot, and means to secure the bar in place against pivotal movement on the other side of the slot.

3. In combination with a stock, a blade and a pivot member securing them together, an angle measuring element of the class described, such element having a slot open at one end whereby said element is pivotally and slidably mounted on said pivot member, and closure means for said open end of the slot to prevent detachment of the angle element from the pivot member, consisting of a bar pivoted on one side of the slot, and means to secure the bar in place against pivotal movement on the other side of the slot, the part of the element on one side of said slot being a tine pivoted to the remainder, said element having a centerline edge at a portion thereof.

WILLIAM THOMAS.