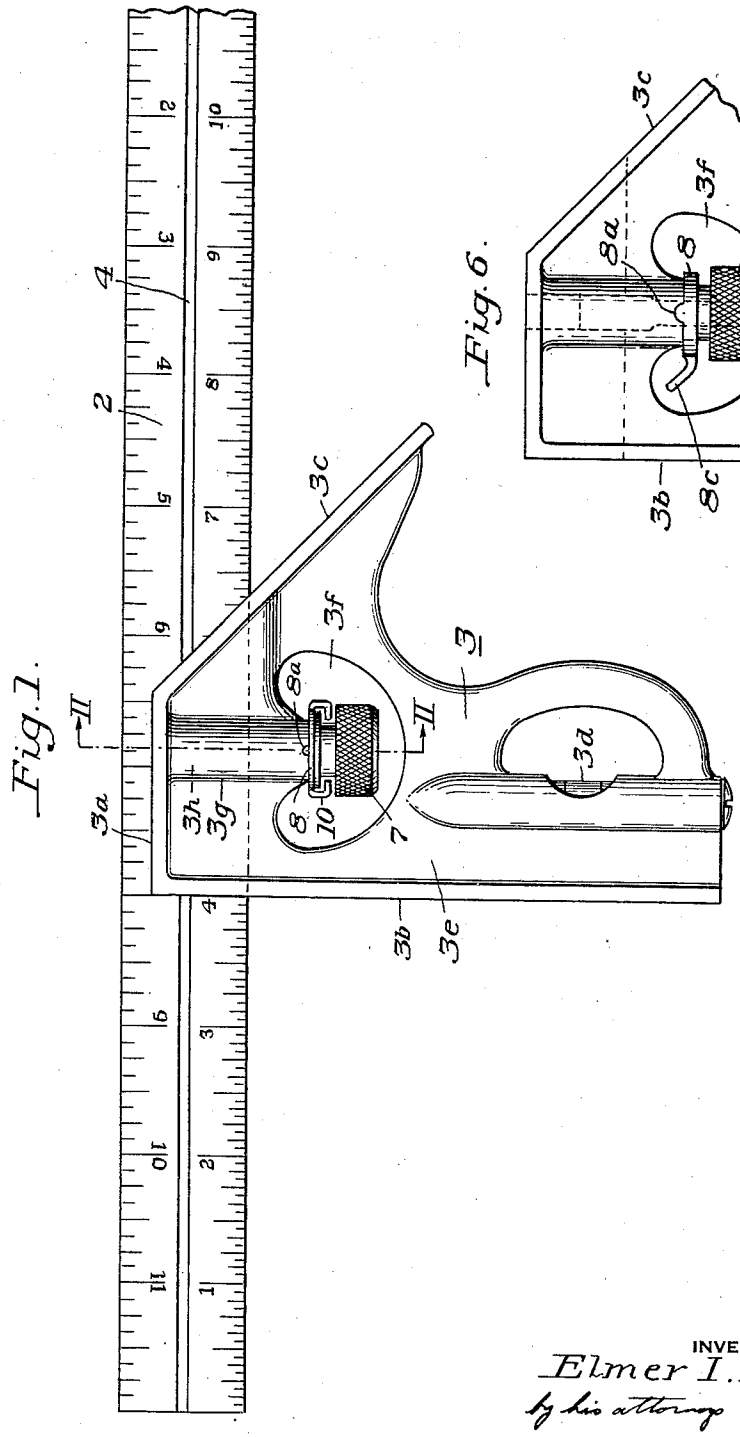
Aug. 31, 1948. E. I. KING 2,448,440

MECHANICS SQUARE

Filed June 15, 1945 2 Sheets-Sheet 1



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MECHANICS SQUARE

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Fig. 3.

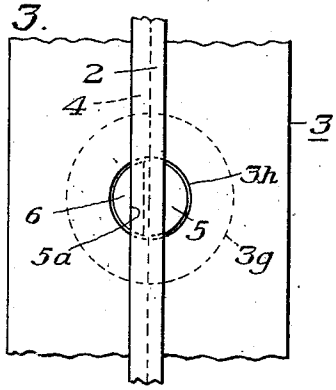


Fig. 2.

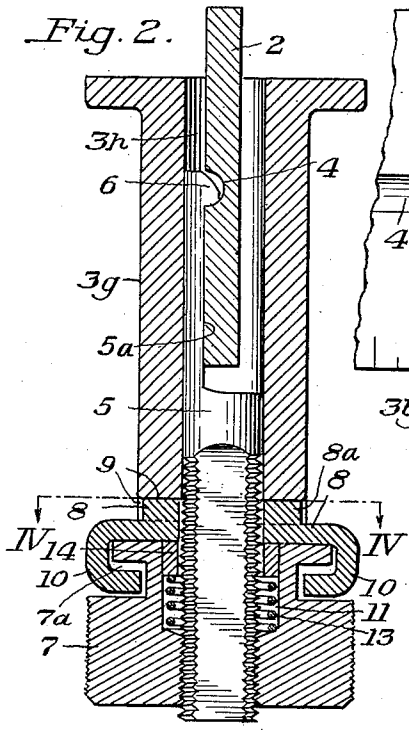


Fig. 4.

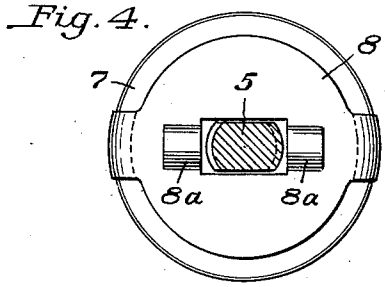
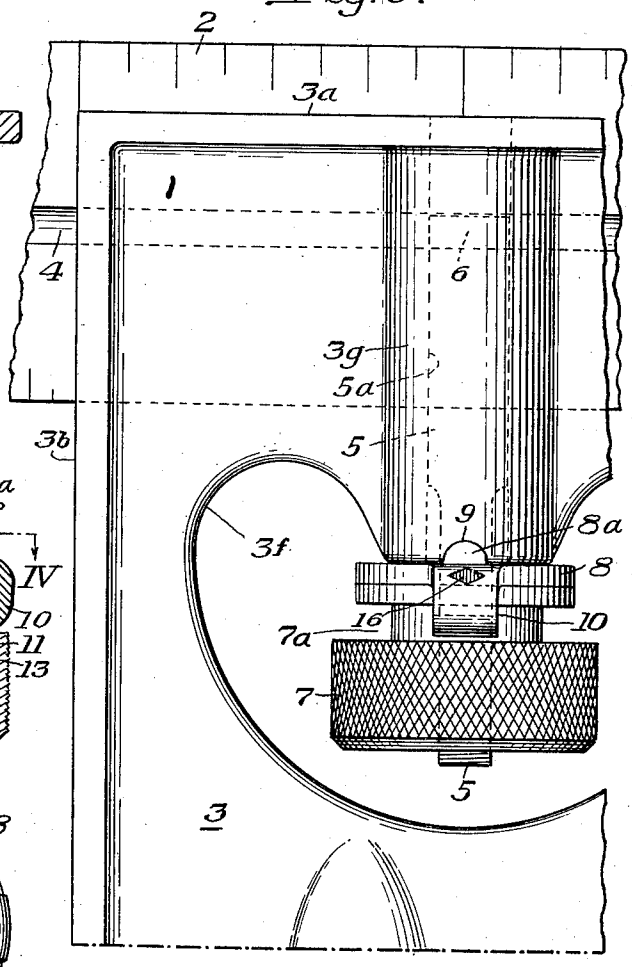


Fig. 5.



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MECHANIC'S SQUARE

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Application June 15, 1945, Serial No. 599,651

10 Claims. (Cl. 33—95)

1

This invention relates to tools of the type used by artisans and mechanics known generally as universal squares, and to like implements.

The conventional square of this type comprises a metal straight edge or rule with several scales on it, there being a scale along each edge on each face of the rule. There is a longitudinal groove in one face of the rule. Associated with the rule is a slide, which in the case of a universal square has one face which is at 90° to the edge of the rule and one at 45°. The slide may be adjustably locked in any position along the rule by means of a post element carried on the slide, which post engages in the groove in the rule. The other end of the post is threaded, and a clamping nut on the threaded end, when it is tightened down, causes the nib to be drawn against and to clamp one edge of the groove in the rule.

No means is normally provided for holding this post against rotation, except its engagement with the rule. Frequently it is desirable to turn the rule end-for-end in which case the post may rotate when the rule is removed and interfere with the rule being reinserted. Again, the operator of the tool may desire to turn the rule over relatively to the slide in order to make one of the scales more readily available. To do this, he must loosen the holding means, remove the rule, rotate the post 180° and then turn the rule over and reinsert it. This is often quite annoying, because there is no way to gauge when the post has been turned 180° and if it is not turned to exactly the right position the insertion of the rule into the slide is obstructed. This is especially annoying when the mechanic's hands are greasy and when, as is usually the case, he is right handed, requiring his right hand to loosen and tighten the clamping nut and also requiring his right hand for pulling out the slide and reinserting it, so that he must shift the instrument from hand to hand several times in making the change.

While clamping devices intended to accelerate this turning of the rule have been provided, they are unsatisfactory in several respects.

The present invention has as its primary object the provision of a simple locking adjustment in which the post is normally restrained from rotation whether the rule is in the slide or not, but which may be quickly and accurately rotated through an arc of 180° when the blade is to be reversed or turned over.

According to my invention the threaded end of the post has a turning element slidably but non-rotatably mounted thereon under the clamping nut. This turning element is normally interlocked with the body of the slide, and is movable in 180° steps when the clamping nut is loosened and the rule is out of the slide, but is restrained against accidental rotation.

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My invention may be more fully understood by reference to the accompanying drawings in which:

Fig. 1 is a side elevation of a tool embodying my invention;

Fig. 2 is a fragmentary sectional view on a larger scale, the view being in the plane of line II—II of Fig. 1;

Fig. 3 is an end elevation of the portion of the part of the tool shown in Fig. 2;

Fig. 4 is a transverse section in the plane of line IV—IV of Fig. 2;

Fig. 5 is a fragmentary elevation of the clamping nut and associated parts on a larger scale than Fig. 1; and

Fig. 6 is a fragmentary side view of a slightly modified construction.

In the drawings, **2** is a steel rule and **3** designates generally the slide of a universal square. The rule, which has a scale along each edge of each face, is provided in one face with a centrally positioned longitudinally extending groove **4** therein. It is of conventional form used in tools of this kind.

The slide **3** has a longitudinal slit therein to receive the rule, and it has an end face **3***a*, a perpendicular face **3***b* and a 45° face **3***c*. It has the usual bubble tube **3***d*. There is a web **3***e* with an opening **3***f* therethrough. The slide is formed with an integral barrel portion **3***g* therein through which is a central bore or hole **3***h*.

The locking means comprises a post **5** in the hole **3***h*, the post having an eccentric flattened extension **5***a* on which is an inwardly overhanging nib **6** that engages in the groove **4** of the rule, as shown in Fig. 2.

The other end of the post **5** is threaded and is flattened on two sides. Screwed onto the end of the post is a knurled clamping nut **7**, generally similar to that now commonly provided, the general organization except for the flattening of the post being conventional.

According to my invention a washer-like disk or element **8** is interposed between the nut **7** and the end of the barrel **3***g*. This washer has a non-circular hole (see Fig. 4) therein through which the post passes, so that the washer is slidable but non-rotatable on the post. The washer has two diametrically opposed ribs **8***a* on the inner face

thereof which normally seat in grooves or notches 9 in the end wall of the barrel 3g.

On the periphery of the washer 8 at diametrically opposite points are lugs 10 which are turned inwardly to engage in an annular groove 7a on the inner face of the nut 7. This enables the nut 7 to rotate on the post to screw one way or the other, and as it moves, pull or push the washer or post-turning element 8 with it, allowing the nut to turn on the post while the washer does not turn on the post. Fig. 1 shows the preferred positions of the lugs 10 and ribs 8a but in Figs. 2, 3 and 5, the lugs are shown, for clearness of illustration 90° from the position shown in Fig. 1. Either form is satisfactory.

Within the nut 7 is a cavity 11 and in this cavity is a compression spring 13 which exerts pressure against washer 8, there being a small washer 14 providing a wear plate between spring 13 and washer 8. There is a slight play between the nut 7 and the washer 8 which the spring 13 takes up.

In use, the nut 7 is usually screwed down tight against washer 8, pressing this washer against the end of the barrel with the ribs 8a in the grooves 9. This pulls the nib 6 against the lower edge of the groove 4, pulling the rule tightly against the bottom of the slit to clamp the rule and slide against relative movement. Upon slightly loosening the clamping nut, the spring 13 will hold the washer 8 against the end of the barrel, but the clamping tension on the rule is relieved to enable the slide to move along the rule. If the rule is entirely removed, the washer 8, by reason of the engagement of the ribs 8a with the barrel 3g and the non-rotatable engagement of the washer 8 and the post, holds the post from turning. If it is desired to turn the rule over so that the groove faces in the opposite direction from Fig. 2, the nut 7 may be loosened further, and with the rule removed, the washer 8 is rotated one-half turn when the ribs 8a will snap into the grooves 9, indicating the half turn position, and indexing its movement so that the post will be accurately turned 180°. The pressure of the spring against the washer provides a kind of friction clutch to cause the washer 8 to rotate with the nut 7 when the nut has been loosened and the rule removed from the slide. Then the rule which has been turned over, is put back in the slide and the nut 7 is tightened down.

For convenience a colored dot or other indicating means 16 may be placed on the washer or turning element 8 to indicate the position of the nib, so that if the operator is momentarily distracted, its position will be instantly known from the location of this indicating means.

A cheaper but somewhat less convenient arrangement is shown in Fig. 6, where the washer 8, constructed as hereinbefore described, has a little lever or lug 8c thereon. It does not have lugs similar to lugs 10, and no spring is required. The nut 7 normally holds the washer against rotation, but when the nut 7 is unscrewed sufficiently, the operator pushes the washer around one-half turn with his finger, after which the nut may be tightened. Of course washer 8 is slidably but non-rotatably carried on post 5, as previously described.

The construction of my invention involves little departure from conventional tools of this type and while substantially increasing the utility and convenience of these tools, adds only a trivial amount to the cost. It normally holds the post from turning but enables it, upon removal of the rule, to be easily turned and accurately positioned. While I have shown a preferred embodiment of my invention, it will be understood that it may be modified in various respects within the contemplation of my invention, and while I have specifically shown a slide having right angle and 45° angle faces, the invention is applicable to other tools of this type using a slide and a grooved rule.

I claim:

1. A tool of the class having a grooved rule and an adjustable slide with a locking means on the slide engaging the groove in the rule comprising a post in the slide having a nib on one end that engages in the groove in the rule and a threaded terminal with a nut thereon, wherein there is a post-turning element slidably and non-rotatably engaged with the post interposed between the nut and a portion of the slide, and means on the post-turning element releasably interfitted with a portion of the slide for indexing the post-turning element.

2. A tool of the class having a grooved rule and an adjustable slide with a locking means on the slide engaging the groove in the rule comprising a post in the slide having a nib on one end that engages in the groove in the rule and a threaded terminal with a nut thereon, wherein there is a post-turning element slidably and non-rotatably engaged with the post interposed between the nut and a portion of the slide, means on the post-turning element releasably interfitted with a portion of the slide for indexing the post-turning element, and spring means operatively positioned between the nut and the post-turning element.

3. A tool of the class having a grooved rule and an adjustable slide with a locking means on the slide engaging the groove in the rule comprising a post in the slide having a nib on one end that engages in the groove in the rule and a threaded terminal with a nut thereon, wherein there is a post-turning element slidably and non-rotatably engaged with the post interposed between the nut and a portion of the slide, means on the post-turning element releasably interfitted with a portion of the slide for indexing the post-turning element, spring means operatively positioned between the nut and the post-turning element, and means for connecting the nut and post-turning element for movement together along the post and permitting rotation of the nut relatively to the post-turning element.

4. In a tool having a centrally located longitudinally extending groove in one face thereof and a slide element in which the groove is engaged, a post element in the slide having an eccentric and with a nib thereon engaging the groove in the rule, the other end of the post being threaded and having an adjusting nut thereon, the slide having a barrel portion through which the post extends, a washer-like member slidably but non-rotatably engaged on the threaded end of the post, said washer-like element being interposed between the nut and the barrel, and interfitting recess and projecting elements on the washer and barrel at positions separated 180° for locking the washer-like member to the barrel in either of two positions.

5. In a tool having a centrally located longitudinally extending groove in one face thereof and a slide element in which the groove is engaged, a post element in the slide having an eccentric and with a nib thereon engaging the groove in the

rule, the other end of the post being threaded and having an adjusting nut thereon, the slide having a barrel portion through which the post extends, a washer-like member slidable but non-rotatably engaged on the threaded end of the post, said washer-like element being interposed between the nut and the barrel, interfitting recess and projecting elements on the washer and barrel at positions separated 180° for locking the washer-like member to the barrel in either of two positions, and means connecting the nut and washer-like member for relative independent rotation and joint longitudinal movement.

6. In a tool having a centrally located longitudinally extending groove in one face thereof and a slide element in which the groove is engaged, a post element in the slide having an eccentric and with a nib thereon engaging the groove in the rule, the other end of the post being threaded and having an adjusting nut thereon, the slide having a barrel portion through which the post extends, a washer-like member slidable but non-rotatably engaged on the threaded end of the post, said washer-like element being interposed between the nut and the barrel, interfitting recess and projecting elements on the washer and barrel at positions separated 180° for locking the washer-like member to the barrel in either of two positions, means connecting the nut and washer-like member for relative independent rotation and joint longitudinal movement, and spring means operatively interposed between the nut and the washer-like member.

7. In a tool of the class described, a slide, a post rotatable in the slide, a nut on the post for clamping it in locked position, and means interposed between the nut and slide normally held against movement by the nut for indexing the turning movement of the post and when the nut is tight, holding the post from turning, said means including a washer-like member slidably and non-rotatably carried on the post and retained in place by the nut, the washer-like member having a projection releasably interfitted with the slide.

8. In a tool of the class described, a slide, a post rotatable in the slide, a nut on the post for clamping it in locked position, and means interposed between the nut and slide normally held against movement by the nut for indexing the turning movement of the post and when the nut is tight, holding the post from turning, said means including a washer-like member slidably and non-rotatably carried on the post and retained in place by the nut, the washer-like member having a projection releasably interfitted with the slide, the washer having a lever thereon by means of which it may be turned when the nut is loose to thereby turn the post.

9. In a tool of the class described, a slide, a post rotatable in the slide, a nut on the post for clamping it in locked position, and means interposed between the nut and slide normally held against movement by the nut for indexing the turning movement of the post and when the nut is tight, holding the post from turning, said means including a washer-like member slidably and non-rotatably carried on the post and retained in place by the nut, the washer-like member having a projection releasably interfitted with the slide.

10. In an instrument wherein a rule formed with a groove along one face thereof is releasably secured to a head slotted to receive the rule, said head being formed with a bore in the plane of the slot and with aligned grooves formed in the material of the head at the end of the bore remote from the slot, a clamping bolt received in said bore, its end within the confines of the slot being formed to present a finger having at its free end a transverse rib to be received in the groove in the face of the rule, said bolt intermediate its ends having a non-circular portion formed on the bolt and a washer having a non-circular perforation formed therein to fit slidably on the non-circular portion of the clamping bolt and having a pair of projections formed on one face thereof and engageable in the aligned grooves in the head whereby the transverse rib on the finger of the bolt may be presented to the groove in the rule to engage either face of the rule to either side of the head.

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