May 1, 1928. 1,668,290

A. STEVENS

FOLDING SQUARE

Filed Nov. 20, 1924

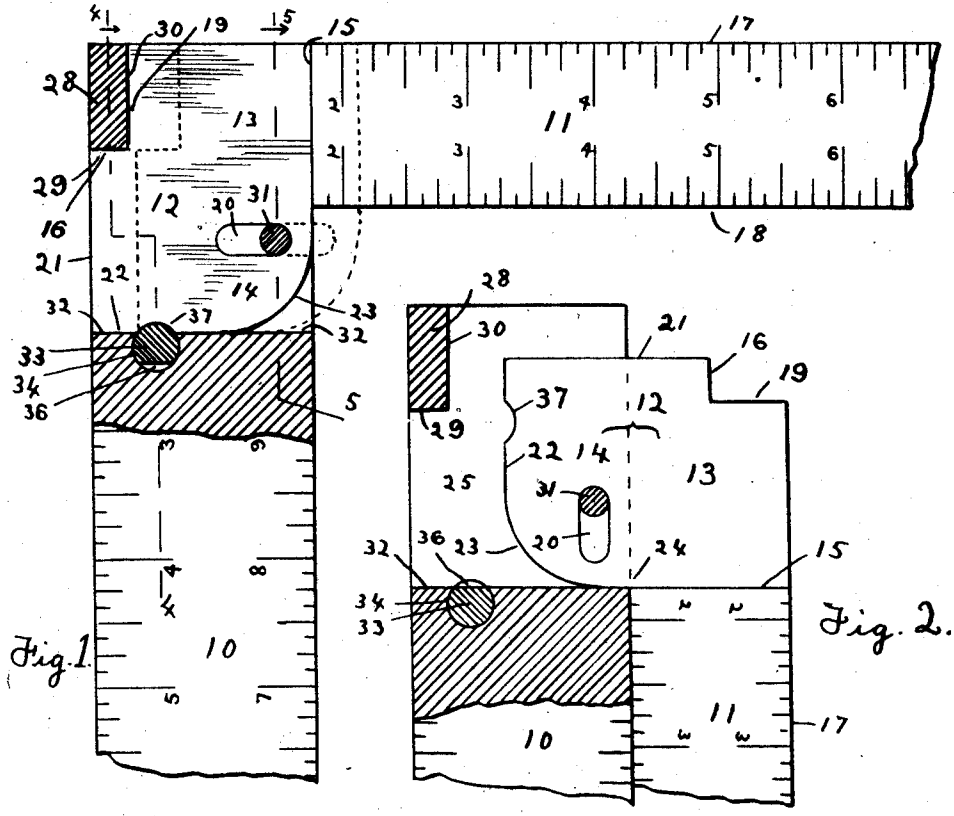


Fig. 1.

Fig. 2.

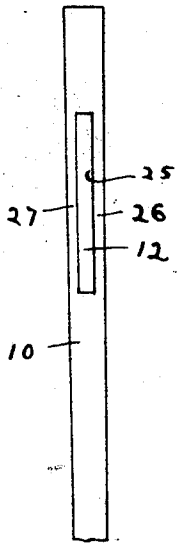


Fig. 3.

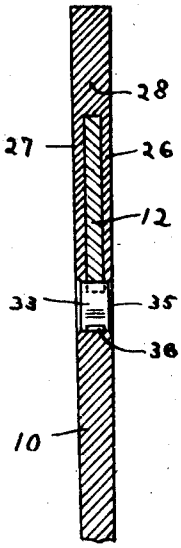


Fig. 4.

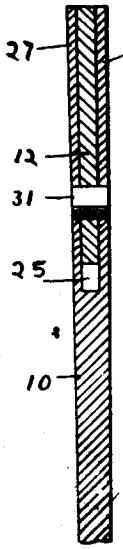


Fig. 5.

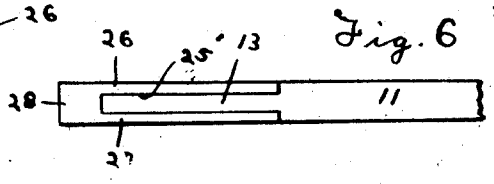


Fig. 6.

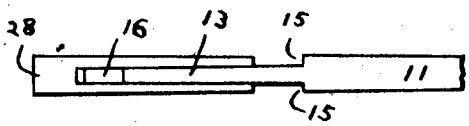


Fig. 7.

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UNITED STATES PATENT OFFICE.

ARTHUR STEVENS, OF JACKSONVILLE, FLORIDA.

FOLDING SQUARE.

Application filed November 20, 1924. Serial No. 751,110.

My present invention relates to a folding square.

The purpose of this invention is to provide a folding square of novel and improved construction and particularly one which is simple and economical in construction and very durable, rigid and convenient in use.

Further purposes are to provide a folding square wherein the arm is permanently connected to the body portion of the square so as to avoid misplacement of the parts and to have the arm and body connected by a mortise and tenon joint whereby the arm may be slid into rigid attachment or connection with the body member of the square and held in such position without dependence upon any fastening member or pivoting member and yet to allow the tenon to be sufficiently withdrawn from the mortise so as to allow the arm to swing towards the body of the square with the arm parallel to and adjacent to the body member; to provide a folding square wherein the engaging surfaces are of considerable extent and do not depend upon wedging action for the fit of the parts and do not require any third members or movable parts, springs or other devices to maintain the two members of the square in working position; further to provide a device of the type mentioned where an additional locking member may be and preferably will be provided, such locking member, however, operating simply to prevent detachment of the parts and not being necessary to maintain the parts at a right angle.

Fig. 1 is a plan view of a square embodying my invention with a portion of the body member cut away at the joint to more clearly show the construction, the parts being shown in full lines in extended or working position and showing in dotted lines the position of the arm after it has been slid straight out from holding position relative to the mortise of the body member.

Fig. 2 is a similar view showing the parts in folded position.

Fig. 3 is an edge view looking at the left hand edge of the body member as shown in Fig. 1.

Fig. 4 is a sectional view on line 4—4 of Fig. 1.

Fig. 5 is a sectional view on line 5—5 of Fig. 1.

Fig. 6 is a top edge view of the joint portion of the device looking at the top of the parts as seen in Fig. 1, the arm being in locked position.

Fig. 7 is a view similar to Fig. 6 but showing the arm after its tenon has been moved from holding position in the mortise of the body member, but before the arm has been swung from its position at a right angle to the body member.

Referring to the drawings in a more particular description it will be seen that I have shown my invention embodied in a carpenter's square composed of a larger or body member 10 and a smaller or arm member 11 which is adapted to be extended at a right angle to the body member or to be folded closely parallel and adjacent thereto.

Preferably both members will be thicker at the joint ends than at the other ends of the respective members with said members tapering down to be thinner at the farther end as plainly indicated in Figs. 3 to 7. This construction is common now in rigid carpenter squares and admits of having sufficient thickness of material in both members of the square at the joint end in the case of a jointed square.

At the joint end of the arm member there is provided a tenon 12 composed of two parts 13 and 14. The portion 13 is the extreme end of the arm proper and the portion 14 is an irregular shaped ear extending laterally from portion 13 as plainly shown in Figs. 1 and 2.

In the preferred form of my construction and as shown in the drawings herein the tenon 12 is thinner than the adjacent portion of the arm leaving a square shoulder 15 on both sides of the arm as more plainly indicated in Figs. 6 and 7. The end corner of the arm portion 13 of the tenon 12 opposite the ear portion 14 is cut away forming a reentering right angle leaving a shoulder 16 preferably parallel to the two working edges 17 and 18 of the arm and leaving a shoulder 19 preferably at right angles to said working edges.

In the ear portion 14 of the tenon there is provided an elongated slot 20 extending lengthwise of the arm and relatively near to the portion 13 and spaced as far as practical away from the end 21 of the tenon.

The edge of the ear portion 14 away from the arm proper has a straight edge 22 of considerable extent extending in from the end 21 of the tenon. From the inner end of said straight portion 22 the ear has a

curved portion 23 being practically a quarter circle and extending to the arm proper at joint 24 being the junction between the part 13 of the tenon and the shoulder 15.

The joint end of the larger or body portion 11 of the square has provided therein a closed or four-sided mortise 25. This is made by forming a slot crosswise of the member and extending from edge to edge thereof with the opposite leaf portions being however connected at the extreme end of the body by a block portion 28 at the outer corner of the body, that is the corner away from the projecting arm 11. This block portion is rectangular in cross section as seen in Fig. 1 and of a size exactly fitting the cut out portion formed by shoulders 16 and 19 of the arm. Upon the block 28 the face or shoulder 29 engages the shoulder 16 of the arm when the arm is in working position and the face 30 of the block 28 engages the shoulder 19 of the arm when the parts of the square are in working position.

Through the mortise portion of the body opposite the elongated slot 20 of the arm there is fixed a pivot pin 31 which extends through the said slot 20.

It will now be seen that when the parts are assembled and placed in working position the tenon 12 has the full extent of both faces of its portions 13 and 14 in the mortise 25 between the leaves 26 and 27 of the body member and that the parts are retained at right angles by reason of the engagement of shoulder 16 of the arm engaging shoulder 29 of the block 28 on one side of said tenon while the other side of said tenon has the extended straight edge 22 of the ear resting throughout its length against the bottom 32 of the mortise slot 25 which shoulder is at the base of the two leaves 26 and 27.

The parts are further held at this right angle position by means of the pin 31 closely engaging opposite long sides of the slot 20. By reason of the arrangement and wide distribution and the great extent of contact surface provided the tool is now perfectly rigid and does not depend upon auxiliary fastening means, springs, clamps or other contrivances to hold the arm at right angles to the body member. By making the parts accurately the arm will remain in this position during use or handling without the necessity of auxiliary locking or fastening means.

To fold the tool the arm 11 is drawn lengthwise of itself or at right angles from the body 10 as allowed by the elongated slot 20 until the parts come to the position shown in dotted lines in Fig. 1. In this position it will be seen that the shoulder 16 is entirely disengaged from the shoulder 29 of the block 28 and that the unoccupied portion of the elongated slot 20 is at the right of pivot pin 31 instead of to the left as was the case when the parts were in working position. After the arm 11 has been thus moved to the position shown in dotted lines in Fig. 1 it may be readily swung on pivot 31 towards and to the body 10 bringing the parts into the position shown in Fig. 2. The moving of the parts to this position it will be seen is allowed first through the fact that the shoulder 16 is clear of shoulder 29 of the block 28 and secondly through the clearance allowed by the curved edge 23 on the slot end of the ear 14 relative to the bottom 32 of the mortise slot.

To reassemble the parts into working position the arm 11 is swung out from the position shown in Fig. 2 to a position at right angles to the body 10 which is the position shown in dotted lines in Fig. 1; then the arm 11 is pushed towards the body 10 during which motion the pin 31 slides through slot 20 and the shoulder 16 slides along shoulder 29 until the shoulder 19 engages shoulder 30 and stops the parts at working position. At this working position also it will be noted that the shoulders 15 from the thickened portion of the arm 11 engage the adjacent edges of the leaves 26 and 27 on either side of the mortise.

As means for positively locking the arm 11 in working position and preventing the said arm from accidentally sliding or loosening from working position to the intermediate position as shown in dotted lines in Fig. 1, I provide a locking pin 33. This is a pin mainly circular in cross section projecting through a round hole 34 provided in the body near the bottom 32 of the mortise with said hole being mostly, that is more than half, in the solid portion of the body and extending slightly into the leaf portions 26 and 27. As shown in Fig. 4 this pin is mounted and retained in the tool by said pin having its opposite ends slightly enlarged and resting in correspondingly countersunk portions of the opposite faces of the body 10. This may be readily accomplished by having the head end formed with such an enlargement and having the opposite end spread or riveted out into the countersink after the pin is in place. One end of the pin is provided with a transversely extending slot 35 allowing the pin to be turned by a screwdriver or a similar tool.

One side of the central portion of the pin opposite the mortise 25 will be cut away forming a recess 36 of such extent so that when this recess is turned towards the mortise 25 the bottom of said recess will be flush with the bottom 32 of the mortise as plainly indicated in Fig. 2. With the pin in this position it will be seen that the arm 11 may be slid into working position or

slipped from working position to intermediate position without interference from said pin. Opposite the pin 33 there is provided in the straight edge 22 of the ear 14 when the arm 11 is in working position an arcuate bottomed notch 37 allowing the pin 33 to be rotated from the position shown in Fig. 2 more or less to the position shown in Fig. 1 with the pin extending into the said notch 37.

It will now be obvious that the pin in this position positively locks the arm in its working position by preventing the arm from being slid outwardly from the body member 10. It will be noticed, however, that any angular strain incident to using the tool will fall upon the solid portions of the body and arm and not simply upon the pin 33. When it is desired to fold the square the pin will be rotated from the position shown in Fig. 1 to the position shown in Fig. 2 and the arm then moved to intermediate position and then to folded position as already described.

What I claim as new and desire to secure by Letters Patent is:

1. In a folding square the combination of a body member having at one end a slot extending transversely from the inner and arm-receiving edge face and terminating near the outer edge face in a mortise with its opposing end faces at right angles to the edge face of said body member, an arm member having one end of greater width than the main portion of said arm and sliding in said slot and reduced at its end to slidingly fit into said mortise and hold the arm at a right angle to the body, the portion of the arm projecting beyond the working edge of the arm being provided with an elongated slot extending lengthwise of the arm, and a pivot pin mounted in the slotted part of the body member and projecting through said slot in the arm whereby the arm is permanently connected to the body member and may have its said reduced end slid into said mortise or withdrawn therefrom sufficiently to fold said arm parallel with and adjacent to the body member.

2. In a folding square the combination of a body member having at one end a slot extending transversely from the inner and arm-receiving edge face and terminating near the outer edge face in a mortise with its opposing end faces at right angles to the edge face of said body member, an arm member having one end of greater width than the main portion of said arm and sliding in said slot and reduced at its end to slidingly fit into said mortise and hold the arm at a right angle to the body, the portion of the arm projecting beyond the working edge of the arm being provided with an elongated slot extending lengthwise of the arm, and a pivot pin mounted in the slotted part of the body member and projecting through said slot in the arm whereby the arm is permanently connected to the body member and may have its said reduced end slid into said mortise or withdrawn therefrom sufficiently to fold said arm parallel with and adjacent to the body member and means for locking the arm in working position, said means comprising a spool with a flattened side rotatably mounted in the body adjacent the bottom of said slot and opposite a shallow rounded recess provided in the opposing edge of the arm whereby the placing of the flattened side of the spool in line with said recess allows the arm to be withdrawn and placing the rounded side of said spool into said recess locks the arm from being withdrawn from said mortise.

In witness whereof I have affixed my signature, this 31st day of October, 1924.

ARTHUR STEVENS.