Jan. 13, 1953 E. PENKER 2,624,947

FOLDING RAFTER SQUARE

Filed July 24, 1951 2 SHEETS—SHEET 1

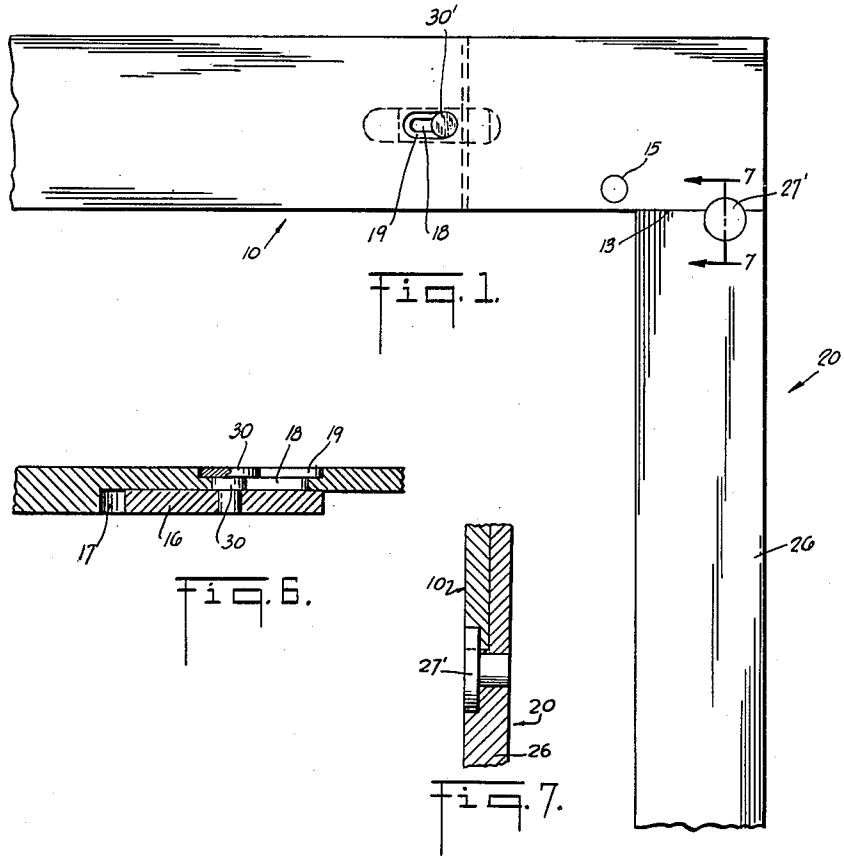


Fig. 1.

Fig. 6.

Fig. 7.

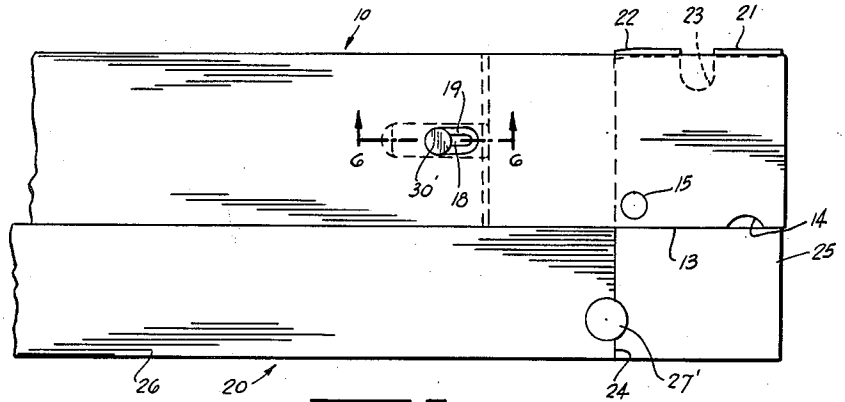


Fig. 2.

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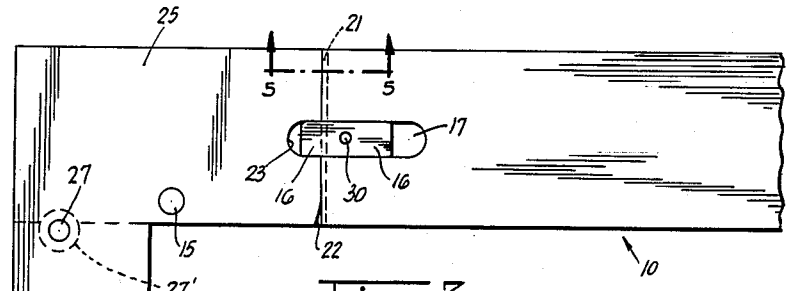


Fig. 3.

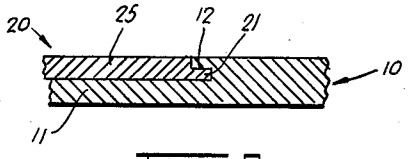
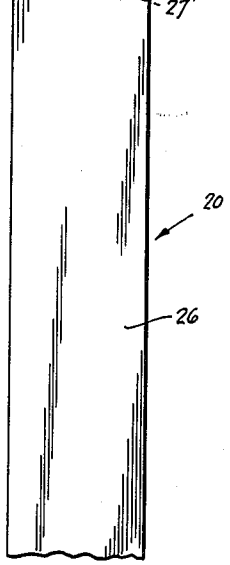


Fig. 5.



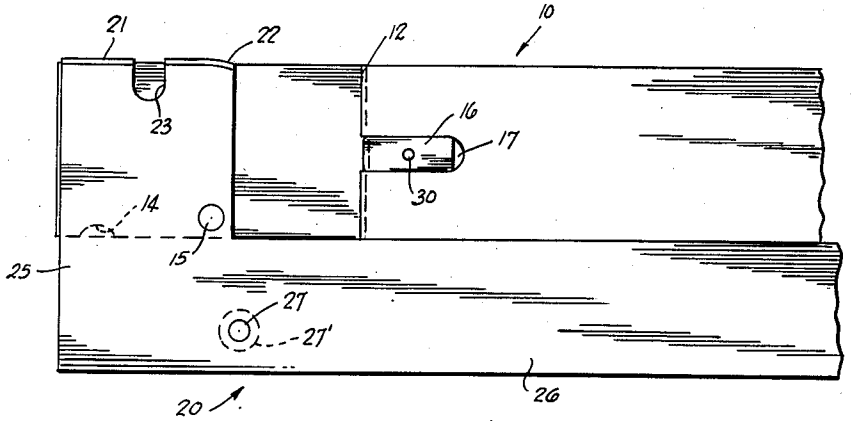


Fig. 4.

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UNITED STATES PATENT OFFICE

2,624,947

FOLDING RAFTER SQUARE

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Application July 24, 1951, Serial No. 238,242

6 Claims. (Cl. 33—117)

1

This invention relates to carpenters' folding squares, such as a roofing or rafter square and, more particularly, to an improved, more accurate, and more rugged folding square.

Folding square constructions have been proposed to provide for compact packing of the square in a carpenter's tool chest, the rigid type of square, particularly in the larger sizes, being difficult to pack and usually having one leg projecting. However, these constructions have had numerous disadvantages, such as complicated interconnections, lack of accuracy, and liability to derangement. In particular, prior locking arrangements for holding the arms of the square in properly oriented relation have either been unduly complicated or else unsatisfactory in operation.

The present invention is directed to an improved folding square eliminating the disadvantages of prior constructions. To this end, the invention square includes a pair of pivotally interrelated arms, one of which is substantially rectilinear and the other of which is L-shaped in plan. The short leg of the L is reduced in thickness throughout its length, forming shoulder on the longer leg aligned with the inner edge of the short leg. The rectilinear arm of the square is correspondingly reduced in thickness at its inner end for a distance equal to the length of the short leg of the L.

The resultant shoulder on the straight arm is undercut to receive a projecting lip on the end of the short leg of the angular arm. The two arms are pivotally interconnected by a substantially fixed and preferably hardened bearing, with the reduced thickness sections in constant engagement with each other.

The outer end of the short leg of the angular arm has a notch which, in the extended position of the square, receives a sliding finger on the straight arm, the finger and notch cooperatively maintaining the arms in correct angular relation. Near its inner end, the inner edge of the straight arm has a recess, preferably arcuate, which receives a headed element set into the surface of the angular arm and projecting somewhat beyond the aforementioned shoulder thereon. The recess and headed element rigidly maintain the reduced thickness arm portions in firm bearing engagement in the open position of the square.

For an understanding of the invention principles, reference is made to the following detailed description of a typical embodiment thereof as illustrated in the accompanying drawing.

2

In the drawing:

Figs. 1 and 2 are top plan views of the invention square in the open and the folded positions, respectively;

Figs. 3 and 4 are bottom plan views of the open and folded square, respectively;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3; and

Fig. 6 is a sectional view on the line 6—6 of Fig. 2.

Fig. 7 is a sectional view on line 7—7 of Fig. 5.

Referring to the drawing, the square includes a substantially straight arm 10 and an angular L-shape arm 20, both preferably of a suitable relatively rigid metal. Arm 20 has a relatively short leg 25 and a relatively long leg 26. Leg 25 is reduced to a thickness substantially one-half that of leg 26, and its outer edge has a projecting lip 21, the outer edge being arcuate at one end 22. This outer edge also has a notch 23 for a purpose to be described.

A shoulder 24 is formed by the junction of legs 25 and 26, being aligned with the inner edge of leg 25. A rivet, or the like, 27 headed as at 27' is affixed through leg 26 adjacent shoulder 24 so that its head partly extends over leg 25, the head 27' being spaced from the surface of leg 25. The two arms, 10 and 20, are pivotally interconnected by a fixed position bearing, such as a rivet 15, which is located near the inner corner of the square and connecting arm 10 to leg 25. Bearing 15 is preferably hardened to reduce wear thereon.

The inner end of arm 10 is reduced in thickness as at 11 for a length corresponding to leg 25. This reduction forms a rectilinear shoulder 12 which is undercut, to receive lip 21 on leg 25. The reduced thickness portion 11 of arm 10 is always in surface engagement with leg 25. The relative dimensions and locations of shoulders 12 and 24 and rivet 27 are such that, in the open position of the square, shoulder 24 is flush with the inner side 13 of arm 10, and shoulder 12 is flush with the outer edge of leg 25. This flush engagement is facilitated by the arcuate portion 22 of such outer edge, which allows clearance of the arms during pivoting thereof.

The inner side 13 of arm 10 has an arcuate recess 14 of a depth equal to the thickness of the head 27' of rivet 27, so that head 27', engaging in recess 14, assures firm maintenance of the surface-to-surface contact of arm 10 and leg 25 when the square is open.

Recess 23 in the outer edge of leg 25 receives the end 16' of a keeper or lock bar 16 in the open

position of the square. Bar 16 is longitudinally slidable in an elongated recess 17 in the bottom surface of arm 10. A slot 18 connects recess 17 to the top surface of arm 10, which surface has a recessed ledge 19 bounding slot 18. A rivet 30 headed as at 30' is connected to bar 16, having a shank extending through slot 18, the rivet head 30' riding on ledge 19. Keeper 16 is easily engaged and disengaged relative to recess 23 by a simple sliding movement, and serves to lock arms 10 and 20 accurately at a right angle when the square is open.

The described square is compact and rugged and its arms are maintained in firm surface engagement by the keeper bar arrangement and rivet 27. Keeper 16 also assures accurate perpendicularity of the arms when the square is open. The hardened bearing rivet 15 greatly assists the maintenance of rigid interrelation of the arms.

While a specific embodiment of the invention has been shown and described in detail to illustrate the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A foldable square comprising, in combination, a pair of pivotally interconnected arms, one of said arms being substantially straight and the other arm being substantially L-shaped in plan, and one leg of the L and the end portion of the straight arm being substantially one-half the thickness of the main portions of the arm and having surface bearing engagement in all positions of the arms, such reduced thickness portions forming shoulders at their junctions with the main portions of the arms, a pivot bearing interconnecting the reduced thickness portions of the two arms, an end of the outer edge of at least one of the reduced thickness portions being arcuate, the shoulder on the angular arm being aligned with the inner edge of such one leg and having flush engagement with one side of the straight arm when the square is open, the other shoulder having flush engagement with the outer edge of such one leg when the square is open, each arm having means at its shoulder closely overlying a portion of the cooperating edge of the other arm when the square is open, and a keeper bar mounted on one arm adjacent the shoulder thereof for longitudinal sliding movement to and from projected relation to the shoulder, the cooperating edge of the other arm having a recess therein to receive said keeper bar in the open position of the square.

2. A foldable square comprising, in combination, a pair of pivotally interconnected arms, one of said arms being substantially straight and the other arm being substantially L-shaped in plan, and one leg of the L and the end portion of the straight arm being substantially one-half the thickness of the main portions of the arm and having surface bearing engagement in all positions of the arms, such reduced thickness portions forming shoulders at their junctions with the main portions of the arms, a pivot bearing interconnecting the reduced thickness portions of the two arms, the shoulder on the angular arm being aligned with the inner edge of such one leg and having flush engagement with one side of the straight arm when the square is open, the other shoulder having flush engagement with the outer edge of such one leg when the square is open, a headed element secured through one arm at the shoulder thereof and projecting partly from the shoulder in spaced relation to the reduced thickness portion of such one arm, the other arm having a recess in its edge arranged to fittingly receive such headed element in the open position of the square, and a keeper bar mounted on one arm adjacent the shoulder thereof for longitudinal sliding movement to and from projected relation to the shoulder, the cooperating edge of the other arm having a recess therein to receive said keeper bar in the open position of the square.

3. A foldable square comprising, in combination, a pair of pivotally interconnected arms, one of said arms being substantially straight and the other arm being substantially L-shape in plan, and one leg of the L and the end portion of the straight arm being substantially one-half the thickness of the main portions of the arm and having surface bearing engagement in all positions of the arms, such reduced thickness portions forming shoulders at their junctions with the main portions of the arms, a pivot bearing interconnecting the reduced thickness portions of the two arms, the shoulder on the angular arm being aligned with the inner edge of such one leg and having flush engagement with one side of the straight arm when the square is open, the other shoulder having flush engagement with the outer edge of such one leg when the square is open, a headed element secured through one arm at the shoulder thereof and projecting partly from the shoulder in spaced relation to the reduced thickness portion of such one arm, the other arm having a recess in its edge arranged to fittingly receive such headed element in the open position of the square and the shoulder of the other arm being undercut to receive a lip projecting from the cooperating edge of such one arm, and a keeper bar mounted on one arm adjacent the shoulder thereof for longitudinal sliding movement to and from projected relation to the shoulder, the cooperating edge of the other arm having a recess therein to receive said keeper bar in the open position of the square.

4. A foldable square comprising, in combination, a pair of pivotally interconnected arms, one of said arms being substantially straight and the other arm being substantially L-shape in plan, and one leg of the L and the end portion of the straight arm being substantially one-half the thickness of the main portions of the arm and having surface bearing engagement in all positions of the arms, such reduced thickness portions forming shoulders at their junctions with the main portions of the arms, a hardened pivot bearing interconnecting the reduced thickness portions of the two arms, an end of the outer edge of the leg of the L of reduced thickness being arcuate the shoulder on the angular arm being aligned with the inner edge of such one leg and having flush engagement with one side of the straight arm when the square is open, the other shoulder having flush engagement with the outer edge of such one leg when the square is open, each arm having means at its shoulder closely overlying a portion of the cooperating edge of the other arm when the square is open, and a keeper bar mounted on one arm adjacent the shoulder thereof for longitudinal sliding movement to and from projected relation to the shoulder, the cooperating edge of the other arm having a recess therein to receive said keeper bar in the open position of the square.

5. A foldable square comprising, in combination, a pair of pivotally interconnected arms, one of said arms being substantially straight and the

other arm being substantially L-shape in plan, and one leg of the L and the end portion of the straight arm being substantially one-half the thickness of the main portions of the arm and having surface bearing engagement in all positions of the arms, such reduced thickness portions forming shoulders at their junctions with the main portions of the arms, a pivot bearing interconnecting the reduced thickness portions of the two arms, the shoulder on the angular arm being aligned with the inner edge of such one leg and having flush engagement with one side of the straight arm when the square is open, the other shoulder having flush engagement with the outer edge of such one leg when the square is open, a headed element secured through the angular arm at the shoulder thereof and projecting partly from the shoulder in spaced relation to the reduced thickness portion of such angular arm, the straight arm having a recess in its edge arranged to fittingly receive such headed element in the open position of the square, and a keeper bar mounted on the straight arm adjacent the shoulder thereof for longitudinal sliding movement to and from projected relation to the shoulder, the outer edge of such one leg of the other arm having a recess therein to receive said keeper bar in the open position of the square, said keeper bar being slidable in an elongated recess in one surface of the straight arm and being flush with such one surface.

6. A foldable square comprising, in combination, a pair of pivotally interconnected arms, one of said arms being substantially straight and the other arm being substantially L-shape in plan, and one leg of the L and the end portion of the straight arm being substantially one-half the thickness of the main portions of the arm and having surface bearing engagement in all positions of the arms, such reduced thickness portions forming shoulders at their junctions with the main portions of the arms, a pivot bearing interconnecting the reduced thickness portions of the two arms, the shoulder on the angular arm being aligned with the inner edge of such one leg and having flush engagement with one side of the straight arm when the square is open, the other shoulder having flush engagement with the outer edge of such one leg when the square is open, a headed element secured through angular arm at the shoulder thereof and projecting partly from the shoulder in spaced relation to the reduced thickness portion of such angular arm, the straight arm having a recess in its edge arranged to fittingly receive such headed element in the open position of the square and the shoulder of the straight arm being undercut to receive a lip projecting from the cooperating edge of such one leg, and a keeper bar mounted on the straight arm adjacent the shoulder thereof for longitudinal sliding movement to and from projected relation to the shoulder, the outer edge of such one leg of the other arm having a recess therein to receive said keeper bar in the open position of the square, said keeper bar being slidable in an elongated recess in one surface of the straight arm and being flush with such one surface.

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