No. 868,421. PATENTED OCT. 15, 1907.

J. G. FEIL.

CARPENTER'S SQUARE.

APPLICATION FILED MAY 1, 1907.

2 SHEETS—SHEET 1.

FIG. 1.

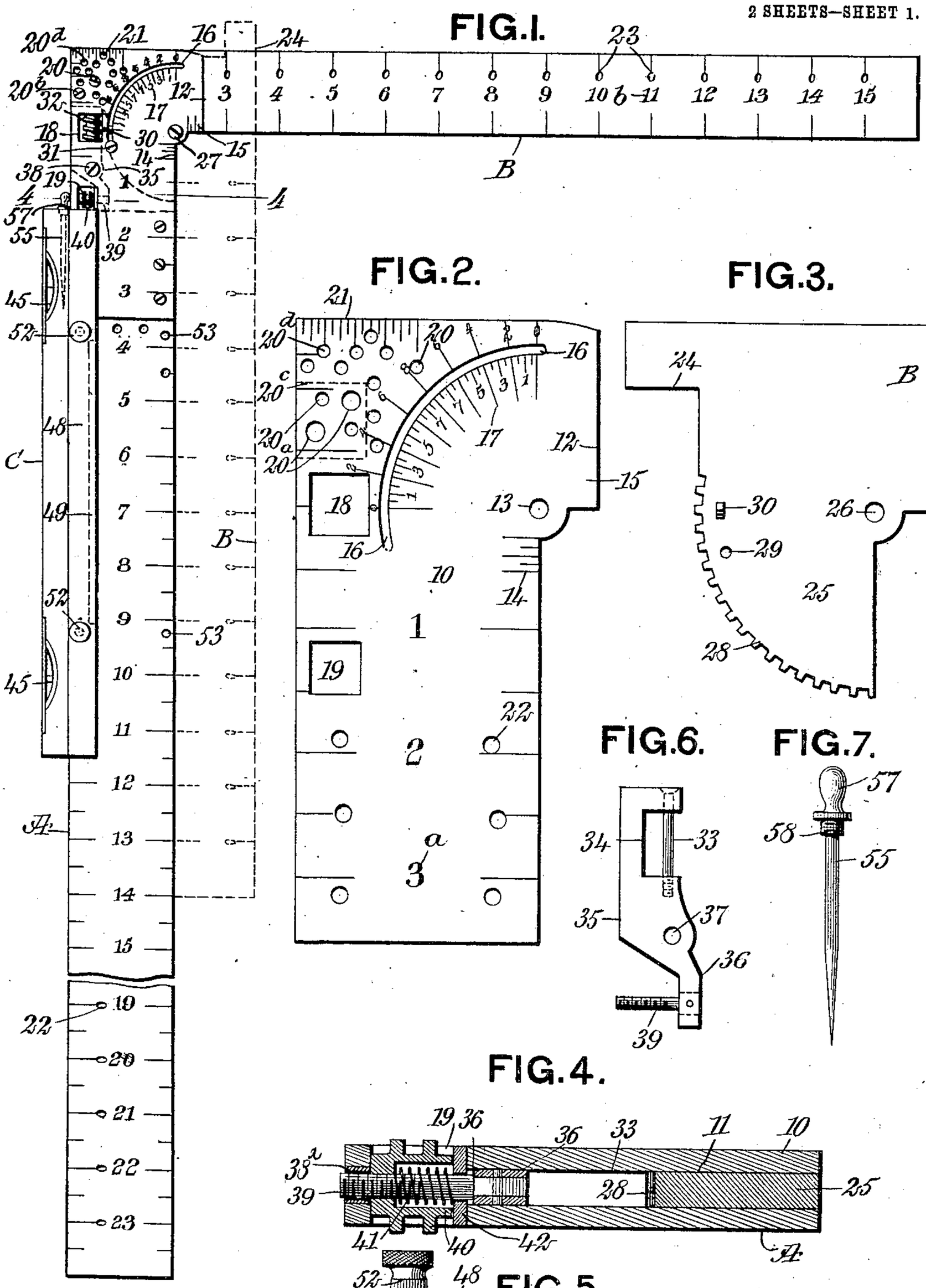

FIG. 2.

FIG. 3.

FIG. 6.

FIG. 7.

FIG. 4.

FIG. 5.

WITNESSES

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2 SHEETS—SHEET 2.

FIG.8.

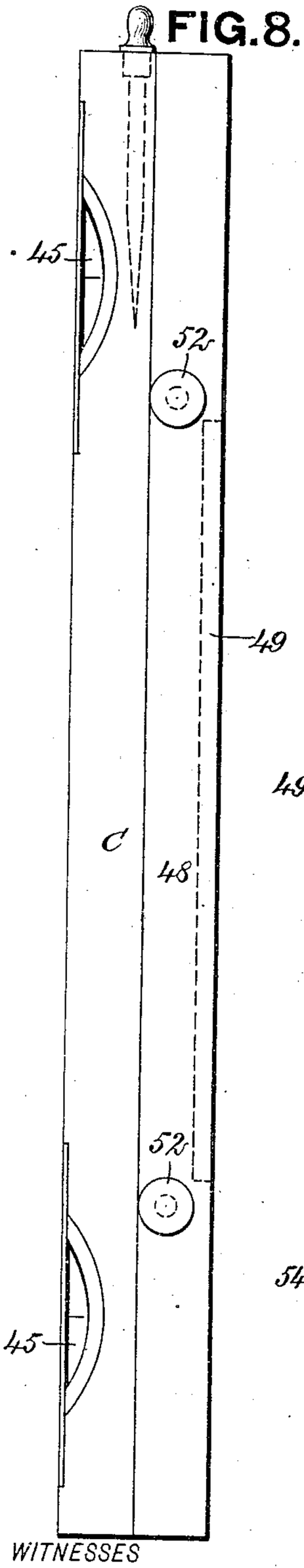


FIG.9.

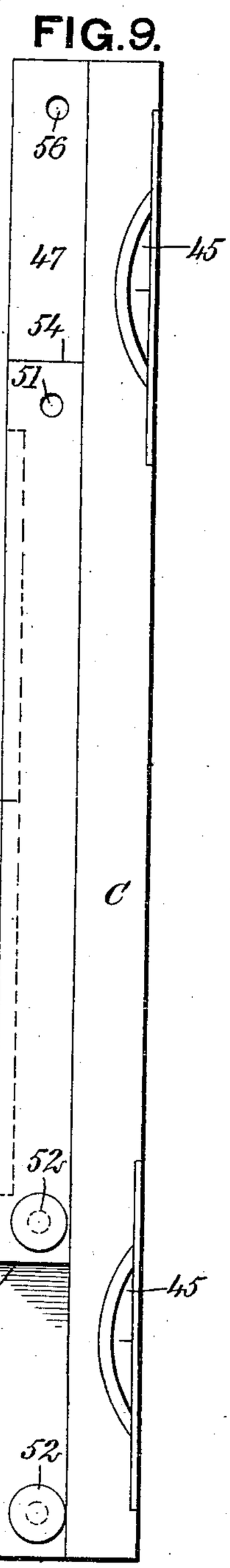


FIG.10.

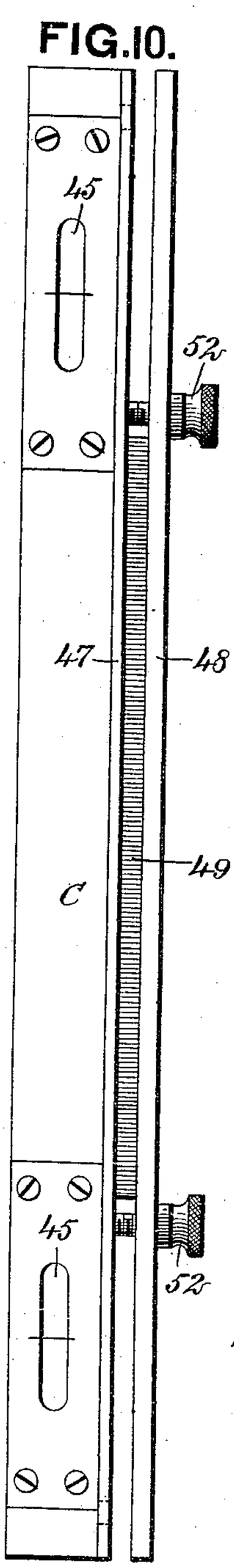
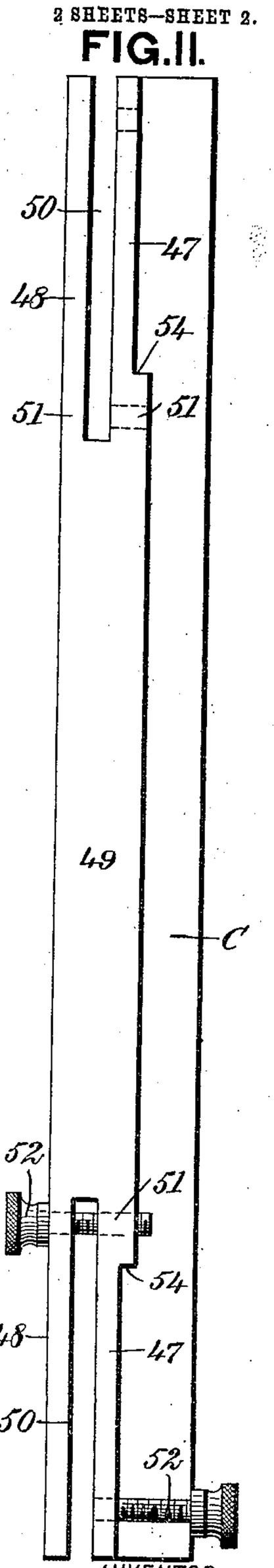


FIG.11.



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CARPENTER'S SQUARE.

No. 868,421. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed May 1, 1907. Serial No. 371,214.

To all whom it may concern:

Be it known that I, JOHN GUSTAV FEIL, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Carpenters' Squares, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a folding carpenter's square so constructed that one limb can be carried at any desired angle to the other and be firmly held in adjusted position, and wherein the two limbs can be folded to lie closely edge to edge.

A further purpose of the invention is to provide a socket section for the main limb in which the shorter limb is pivoted, and to provide a scale of the degrees of a circle upon said socket section, read in connection with an indicator on the shorter limb, together with means for quickly adjusting the shorter limb to any desired position relatively to the main limb, and means for as quickly and conveniently locking the shorter limb against movement.

Another purpose of the invention is to provide both limbs of the square with apertures at the scale marks thereof through which a pencil may be passed, and to provide a series of apertures at the angle of the socket member of the main limb, through any one of which apertures a pin will be passed, so that through the medium of the square, the pencil and the pin, a circle of any desired arc within predetermined bounds may be quickly and conveniently struck.

It is another purpose of the invention, to provide a level and plumb attachment capable of being readily secured to either edge of either limb of the square, which level and plumb attachment is readily removable from the square when not needed, and which may be used for various other purposes as, for example, when the attachment is made to the top portion of the main limb of the square the tool may be used as a try square or gage.

It is also a purpose of the invention to provide a universal steel square capable of being set to any bevel, miter, or for the cuts of body clips, files and octagonal surfaces, or plumb and level cuts.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improved square illustrating it in normal position in positive lines, and showing in dotted lines the shorter limb folded close to the longer one so that the two limbs are parallel; Fig. 2 is an enlarged plan view of the central or upper section of the main limb, the shorter limb having been removed therefrom; Fig. 3 is a plan view of the entering or pivot section of the shorter limb also drawn upon an enlarged scale; Fig. 4 is an enlarged transverse section taken practically on the line 4—4 of Fig. 1; Fig. 5 is an enlarged end view of the main limb of the square and the combined level and plumb in position thereon; Fig. 6 is a detail view of a lever arm for adjusting the shorter limb relatively to the longer one, and for holding the shorter limb of the square in adjusted position; Fig. 7 is a detail view of the pin employed when a circle is to be struck; Fig. 8 is a view of one side of the combined level and plumb; Fig. 9 is a view of the opposite side of the same; Fig. 10 is a top face view of the combined level and plumb; and Fig. 11 is a bottom face view of the same.

The square as is customary consists of a main limb A and a shorter limb B that is normally at a right angle to the main limb, as is shown in Fig. 1. The main limb A at its upper end is provided with a socket section 10, that is of greater depth than the other portions of the said limb A, and this socket section or member 10 is provided with a chamber 11 extending through the side and outer end edge of said section, as is shown in Fig. 4. The socket section 10 is also provided with a substantially lip-shaped extension 12 at the inner longitudinal edge of its upper portion, and where this lip extension 12 connects with the longitudinal portion of the main limb A an opening 13 is produced, extending through the said socket section. At each side of the aforesaid opening 13 a scale is produced in inches, one scale being designated as 14 and the other as 15, and they designate respectively the fine graduations of the ordinary scales on the limbs A and B. In the upper face of the socket section 10 of the limb A a segmental slot 16 is produced, the arc of which is struck from the center of the aforesaid opening or aperture 13; and a scale 17 is produced upon the outer face of the upper member of the socket section 10, the said scale indicating the degrees of a circle. Adjacent the lower end of the segmental slot 16 and between said slot and the outer longitudinal edge of the limb A, a preferably rectangular opening 18 is made, which is duplicated in the under or back face of said member; and below this opening 18, a second and correspondingly shaped opening 19 is made also in both faces of the socket section 10 of the square.

A series of circular openings 20 is made in the upper corner portion of the limb A between the outer edge at that point and the segmental slot 16, and these openings 20 likewise extend through the said limb A of the square and are used as will be hereinafter set forth, in connection with a scale 21 produced at the upper side edge of the said limb A upon its upper face, as is particularly shown in Fig. 2, which scale 21 is a finely graduated continuation of the scale *b* on the limb B. Two of the series of openings just mentioned are larger than the

others, and screws 20^b are passed through said openings and through a plate 20^c located between the members of the socket section 10, as is shown in dotted lines in Fig. 2. Each limb of the square is provided with the conventional scale in feet and inches, designated as stated, as *a* and *b*, and at various divisions of the said scale openings 22 are produced in the limb A and corresponding openings 23 are produced in the limb B of the square. These openings are adapted to receive the point of a pencil in order that a surface may be marked, and also in order that a circle may be struck in the manner to be hereinafter described, the openings 22 and 23 may be any desired distance apart.

A horizontal lip 24 is formed at the inner end of the shorter limb B, as is shown best in Fig. 3. This portion of the limb B is adapted to enter the chamber 11 in the socket section of the limb A, and when the two limbs A and B are at right angles the lip 24 rests upon the plate 20^c, and the said entering section is provided with a downwardly extending segmental section 25, and with an opening 26 at the junction of the section 25 with the main body of the limb B, and when this portion of the limb B is properly placed in the chamber 11 of the limb A, a pivot screw 27 is passed through the apertures 13 in the socket section of the limb A and through the aperture 26 in the limb B. The lip 24 when the limb B is at right angles to the limb A, extends outwardly within the chamber 11 parallel with the upper end edge portion of the limb A and serves to strengthen the structure.

The segmental section 25 of the limb B is provided with teeth 28 at its outer or convexed edge, as is particularly shown in Fig. 3, and adjacent to this toothed edge of the section 25 an aperture 29 is produced and above the aperture 29 an upwardly extending pointer 30 is provided, and when the limb B is pivoted as has been described in the socket section of the limb A, the pointer 30 extends up and out through the segmental slot 16 to facilitate the reading of the scale 17, while a set screw 31 is passed loosely through the said segmental slot 16 and is screwed into the aperture 29 of the extension section 25 of the limb B, so as to guide the latter limb in its movement to and from the main limb A, but being especially adapted to lock the shorter limb B, in the position to which it is set, this set screw is not absolutely necessary.

A rapid adjustment of the limb B is obtained through the medium of a worm 32, which crosses the opening 18 in the socket section of the limb A and is accessible at both faces of the said socket section, the said worm 32 engaging with the teeth 28 of the segmental extension 25 of the limb B, and the said worm 32 is mounted to turn on a shaft 33 that spans a recess 34 in a side edge of a lever arm 35 shown in detail in Fig. 6.

The lever arm 35 is located in the space between the members of the socket section 10 opposite the teeth 28 of the shorter limb B, as is shown in dotted lines in Fig. 1, and the said lever arm 35 at its lower end has a reduced downwardly extending member 36 and above said member is provided with an aperture 37 through which is passed a pivot screw 38. A screw bolt 39 is pivoted to the extension member 36 of the lever arm 35, as is shown in Fig. 6, which screw crosses the opening 19 in the socket plate 10 being loosely mounted at its outer end in the said socket plate 10, by means of a bushing 38^a, as is shown in Figs. 1 and 4. A milled chambered nut 40 is mounted in the screw 39 at the opening 19, in the socket plate and by turning the nut one way or the other, the worm 32 is carried into or out of engagement with the teeth 28 on the shorter limb B to adjust the same up or down. The bolt 39 also passes through a washer 42 located in the opening 19 and a spring 41 is usually coiled around the bolt 39 within the chamber of the nut 40, having bearing against the washer, as is shown in Fig. 4. The spring 41 and washer 42 prevent too much lost motion relatively to the nut 40.

When the limb B is carried down parallel and in closed engagement with the limb A, as is indicated in Fig. 1, the square may be as conveniently placed in a tool box as any straight tool.

In addition to the square, I employ a combined level and plumb C. This combined level and plumb is provided with the usual vial 45 at each end portion of its upper face, reading from the said upper face and likewise from the side of the device, as is shown in Figs. 8, 9 and 10, and the customary screw 46 is shown, whereby to hold the vial casing in place at the end portions of the body of the said combined level and plumb.

Two parallel bars 47 and 48 are located below the bottom of the body of the combined level and plumb C, as is best shown in Fig. 5, the innermost bar 47 at its upper edge being attached to or integral with the bottom of the body of the device C at one of its longitudinal edges, and the lower portions of the bars 47 and 48 are connected by a web 49, shown best in Figs. 5 and 10, but this web extends only along the central portion of the device leaving an open space 50 between the bars 47 and 48 at their end portions. These bars 47 and 48 may be properly termed clamping bars, as they are employed in affixing the combined plumb and level to the limbs A and B of the square. These clamping bars 47 and 48 are provided with plain apertures 51 extending through them at the end portions of the web 49, and these apertures are adapted to receive set screws 52, which set screws when the combined plumb and level is to be attached to an edge of the main limb A of the square, are passed through threaded apertures 53 produced in said limb adjacent its longitudinal edges, and at such time the innermost clamping bar 47 engages with a face of the square. Also preferably the inner clamping bar 47 is thickest at its central portion thus providing shoulders 54, to facilitate its use in connection with other tools.

When placing the combined plumb and level on a limb of the square, in some positions it is necessary to cause the edge of the square to pass up between the clamping bars 47 and 48, and at such time the position of the combined level and plumb is reversed, that is to say its normal upper face will be the lower face, and the set screws 52 are then passed through threaded apertures 56 in the inner clamping bars 47 to a binding engagement with the limbs of the square upon which the level and plumb is located. The open spaces 50 and the apertures 51 and 56 are especially used to locate the combined plumb and level on a limb of the square when the square is to be employed in laying out the string pieces of stairs.

In connection with the square, I employ a pin 55 shown in Fig. 7, which pin is passed down through an aperture 20^d at the upper corner of the square when a

lead pencil is passed through an opening 22 or 23 in the square for the purpose of producing a circle. This pin is provided with a suitable head 57 and with a threaded portion 58 adjacent to the head, and by preference a chamber is formed in one end of the combined level and plumb C to receive the body portion of the pin 55, the walls of the said chamber being threaded to receive the threaded portion 58 of the pin, as is shown in dotted lines in Fig. 1.

Having thus described my invention, I claim as new and desire to secure by Letters Patent,—

1. A carpenter's square, having a short limb pivotally connected with the main or long limb, a toothed segment extending below the pivot portion of the short limb, a rocking member carried by the main limb, a worm mounted to turn in said member and adapted for engagement with the teeth of said segment, which worm is exposed at both sides of the said main limb, and exteriorly operated means for locking the limb in adjusted position.

2. A carpenter's square, having a short limb pivotally connected with the main or long limb, a toothed segment extending below the pivot portion of the short limb, a rocking member carried by the main limb, a worm mounted to turn in said member and adapted for engagement with the teeth of said segment, which worm is exposed at both sides of the said main limb, exteriorly operated means for locking the limb in adjusted position, the said limb of the square being provided with apertures for the reception of a stylus, and independent apertures for the attachment of a level.

3. In a carpenter's square, a main limb having a socket section at its upper end, and also a series of apertures produced at the corner portions of said socket section, a short limb pivotally connected with the socket section of the long limb, the short and the long limbs being provided with longitudinally arranged openings, a worm adapted for meshing engagement with the introduced end of the short limb, an adjustable carrier for the worm, and a pin adapted to be passed through any one of the said corner apertures whereby upon placing the pencil through any one of the openings in the limbs a circle may be struck.

4. In a carpenter's square, the combination with the long or main limb thereof having a socket section at its upper end, a segmental slot in said socket section, and a scale representing the degrees of the circle at said slot, of a short limb the inner end of which enters the socket section of the long limb and is provided with a downwardly extending segmental toothed section, the pivotal connection between the two limbs being the center of the radius on which the said circular opening is formed, a pointer carried by the toothed extension of the short limb that extends out through the said slot, a worm exteriorly accessible and carried by the long limb in position for engagement with the teeth of the extension from the short limb, a lever arm carrying said worm movable to and from the extension from the short limb, and exteriorly operated means for controlling the movement of said lever arm.

5. In a carpenter's square, the combination with a long or main limb provided with a series of apertures adjacent its longitudinal edge, the said limb being provided with a socket section formed at its upper end and apertures at the angle portion of the said socket extending through the limb, together with a segmental slot that extends through the upper face of the limb, a worm mounted to turn within the said socket adjacent the said segmental slot, the said socket section of the main limb being provided with a scale indicating the degrees of a circle, the scale being located adjacent the said segmental slot, of a short limb, the inner end of which enters the socket section of the main limb, a segmental section extending down from the entering end of the short limb, which section is provided with teeth at its convexed surface for engagement with the said worm, the pivotal connection between the two limbs being the center of the arc on which the segmental slot is drawn, a pointer extending from the segmental extension of the short limb out through the said segmental slot, a guide for the said segmental extension from the short limb, likewise extending out through the said slot, a lever arm carrying said worm and pivoted in the socket section of the main limb, means for operating the lever arm to carry the worm to and from the toothed edge of the segmental extension from the shorter limb, and a pin adapted to be passed through the corner apertures in the main limb of the square.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN GUSTAV FEIL.

Witnesses:
JOHN R. PINOVER,
CORNELIUS SEIBERT.