A. L. LUCAS.

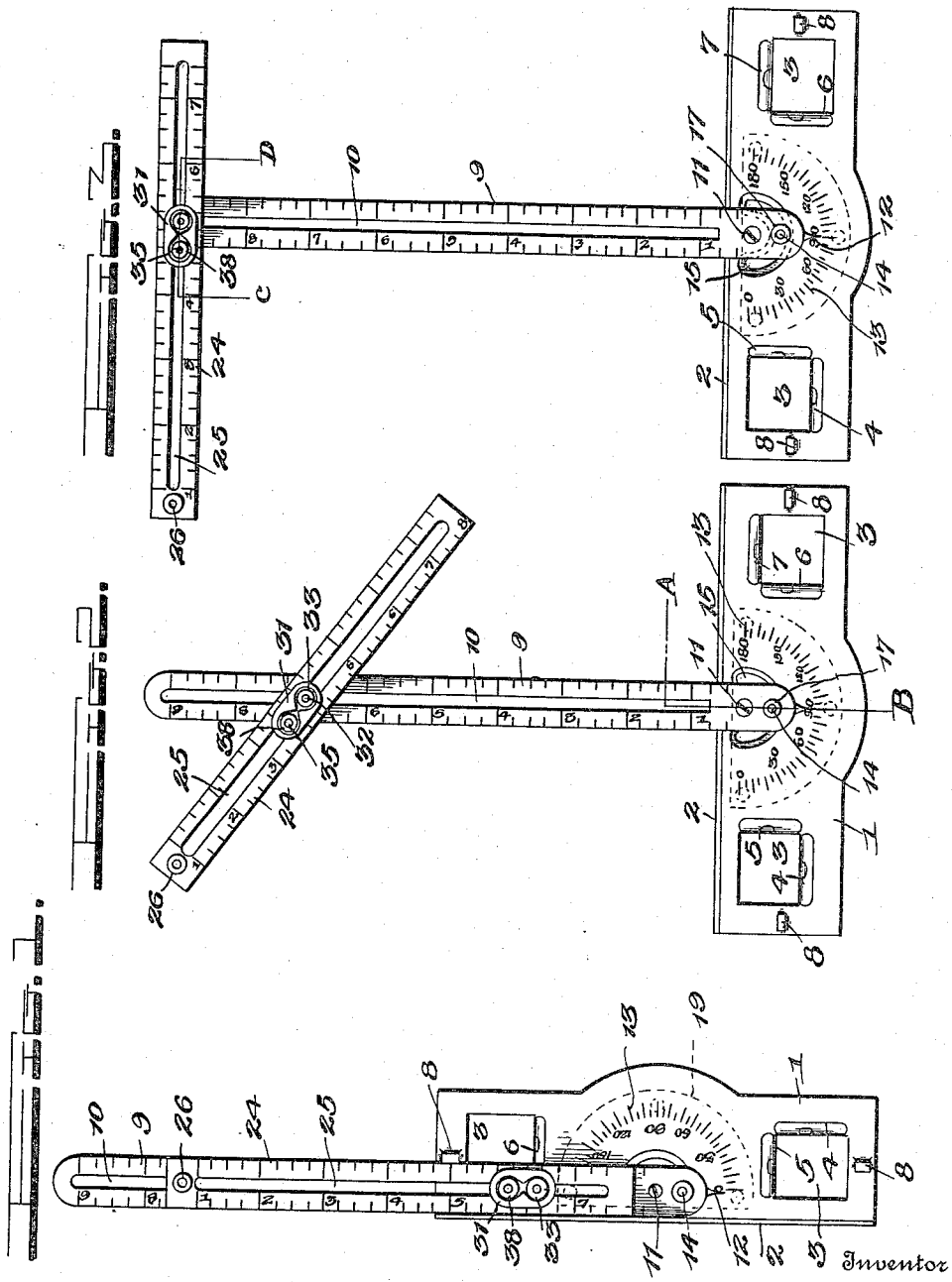
TOOL.

APPLICATION FILED MAR. 8, 1915.

1,160,920.

Patented Nov. 16, 1915.

2 SHEETS—SHEET 1.



Witnesses

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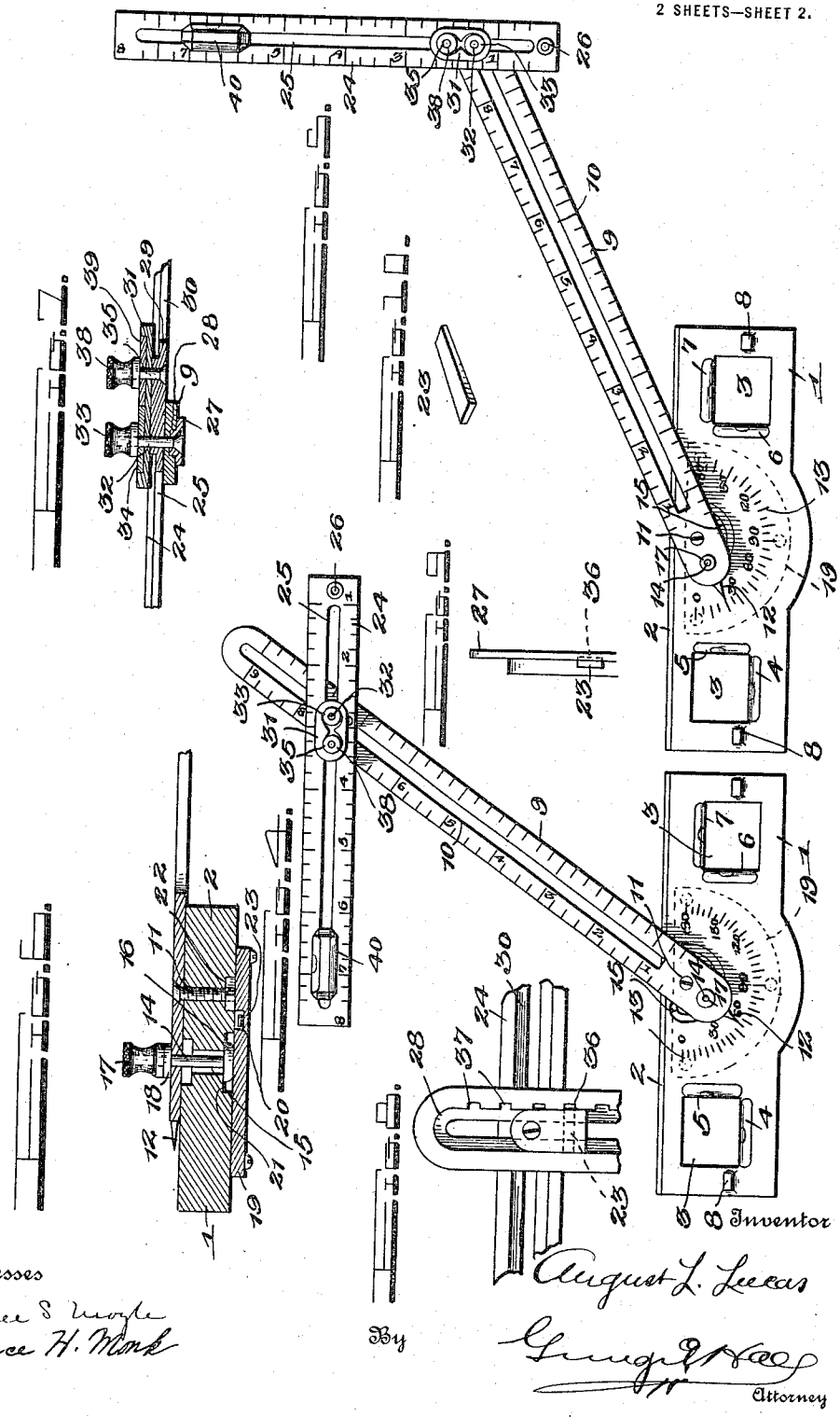
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UNITED STATES PATENT OFFICE.

AUGUST L. LUCAS, OF NEW HAVEN, CONNECTICUT.

TOOL.

1,160,920. Specification of Letters Patent. Patented Nov. 16, 1915.

Application filed March 8, 1915. Serial No. 12,950.

To all whom it may concern:

Be it known that I, AUGUST L. LUCAS, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Tools, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a new and improved tool of the type generally known as a combined protractor and square.

It is the object of my invention, among other things, to produce a tool of this character that can be utilized in determining any level or angle, as well as to determine straight edges, describe circles, etc.

To these, and other ends, my invention consists in the tool, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures; Figures 1 to 5, inclusive, illustrate in plan views the device with varying positions of the arms in relation to the head member; Fig. 6 is a sectional view of the parts, taken upon line A—B of Fig. 2; Fig. 7 is also a sectional view of the parts, taken upon line C—D of Fig. 3; Fig. 8 is an enlarged fragmentary rear view of the arms, showing the method of locking the reciprocating plate; Fig. 9 is a side view of the clamp plate; and Fig. 10 is a perspective view of the key.

In the embodiment of my invention I provide a head member 1, having a straight edge 2 upon one side thereof, with openings 3—3 therethrough, within the edges of which are the levels 4, 5, 6 and 7. Upon one side of the head are the stop lugs 8.

The numeral 9 designates the long arm which is provided with a slot 10 therein and pivotally secured to the head 1 by the screw 11. A pointer 12 at the end adjacent to the screw 11 moves in the path of the head graduations 13 concentric with the axis of said screw. This arm is secured in any of its adjusted positions by a bolt 14 which passes through a circular slot 15 in the head member with a head 16 thereon within a recess 21, and a thumb nut 17 upon the other end of the bolt contacting with the washer 18. By loosening the nut 17, the arm 9 is free to be moved about the axis of the screw 11 and is secured in any of its intermediate positions by again tightening the nut. The stop lugs 8 limit the movement of the long arm 9 at the opposite ends of a 180° movement.

Secured to one side of head 1 is a plate 19 having a pocket 20 therein which covers the nut 22 upon the bolt 11, the recess 21 and bolt head 16, as well as providing a pocket within which the key 23 is kept when not in use.

The numeral 24 designates the short arm which is provided with a slot 25 and an opening 26 in one end thereof, for a purpose hereafter to be described. Both the long and short arms are graduated on both edges and are pivotally and rigidly secured to each other by means of the clamp plate 27, which travels within the recess 28 in the back of the arm 9, the clamp plate 29, which travels in the recess 30 in the back of the short arm 24, the clamp plate 31 which bears against the face of the short arm 24, the bolt 32, which passes through all of said plates and having a nut 33 upon the outer end thereof with the washer 34 under said nut, bolt 35 which passes through the clamp plates 31 and 29 having a nut 38 thereon and a washer 39 thereunder.

Extending transversely through the clamp plate 27 is an opening 36 of substantially the same size as the cross section of the key 23, which when it lies therein abuts against one edge of the recess 28 at one end and projects into any one of the notches 37 at the opposite end.

By tightening the thumb nut 38 the short arm 24 is secured against endwise movement in relation to the clamp plate 31, and by tightening the thumb nut 33 the arms are rigidly secured together against movement in any direction.

If it is desired to rotate the short arm 24 so as to describe a circle, the key 23 is inserted in the clamp plate 27 and engages one of the notches 37, which prevents endwise movement of said clamp plate in relation to the long arm 9, and the short arm 24 is secured to the clamp plate 31 through the tightening of the thumb nut 38, after which a pencil point is passed through the opening 26 in the end thereof. The short arm can now be moved in a circular path without relative endwise movement upon the long arm 9.

Separably secured by any convenient

means to the short arm 24 is a detachable level 40 that determines the horizontal or vertical position of the said short arm when the same is at a point distant from the head.

1. With this device any angle or combination of angles may be obtained in relation to the head member. Within a limited range, circles may be drawn at any point or at any angle, the edges of both arms may be used as a straight edge, the location of the levels is such that the parts may always be arranged in true horizontal or vertical positions, and in various other ways, too obvious to mention, the device has a substantially unlimited scope and range wherever a square or protractor may properly be used.

There are minor changes and alterations that may be made within my invention, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of my invention, as set forth in the appended claims.

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

1. In a device of the character described, the combination with a head member; of a slotted arm pivotally connected therewith; a second arm slidably and separably secured to said first arm; a clamp plate, having a slidable and non-rotatable connection with one of said arms; a plate, having a slidable connection with the other of said arms; and an adjustable connection between said plates.

2. In a device of the character described, the combination with a head member, having levels connected therewith; of a slotted arm pivotally connected with said head member; means for securing said arm to said head member in any of its intermediate positions; means connected with said head for limiting the movement of said arm; a second slotted arm, having a connection with said slotted arm; means for rigidly and pivotally securing said arms together, said means comprising a clamp plate connected with one of said arms; a second clamp plate connected with the other of said arms; threaded means for securing said latter plate to the arm with which it is connected; and threaded means for securing all of said plates and arms together.

3. In a device of the character described, the combination with a head member; of a slotted arm provided with recesses pivotally connected with said head member; means for securing said arm to said head member in any of its intermediate positions; means connected with said head for limiting the movement of said arm; a second slotted arm, having a connection with said slotted arm; means for rigidly and pivotally securing said arms together, said means comprising a clamp plate connected with one of said arms; a second clamp plate connected with the other of said arms; threaded means for securing said latter plate to the arm with which it is connected; threaded means for securing all of said plates and arms together; and means for securing one of said clamp plates to the first named arm, comprising a key member separably mounted in one of said clamp plates and projecting into said recesses in said arm.

4. In a device of the character described, the combination with a head member; of a slotted arm pivotally connected with said head member, having a recess in one face thereof and a plurality of notches in the edge of said recesses; means for pivotally securing said arm to said head member; means for securing said arm against movement in any of its intermediate positions; a second slotted arm, having connection with said slotted arm; a clamp plate connected with each of said arms; a key separably mounted within one of said clamp plates and projecting into any one of said notches; a bolt with a nut thereon passing through both of said clamp plates and arms for the purpose of securing said members together.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUST L. LUCAS.

Witnesses:
GEORGE E. HALL,
FLORENCE H. MONK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."