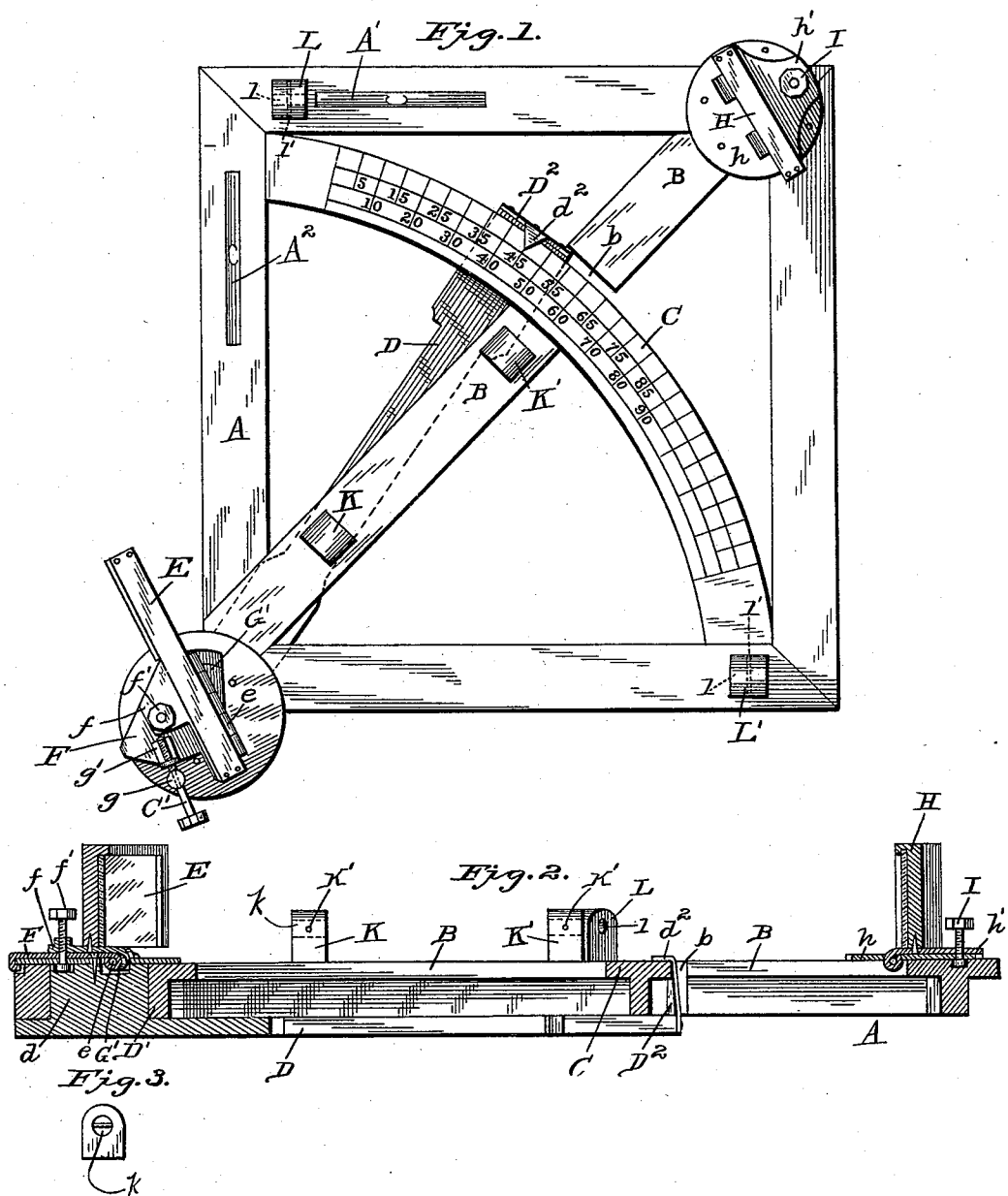


(No Model.)

A. H. EDWARDS & J. HAZARD.
COMBINED SQUARE AND LEVEL.

No. 568,751.

Patented Oct. 6, 1896.



Witnesses
Edwin G. McFee,
K. A. Han.

Inventors
Arthur H. Edwards
and John Hazard.
By John Hedderly,
their Attorney.

UNITED STATES PATENT OFFICE.

ARTHUR H. EDWARDS AND JOHN HAZARD, OF WHEATLAND, MISSOURI.

COMBINED SQUARE AND LEVEL.

SPECIFICATION forming part of Letters Patent No. 568,751, dated October 6, 1896.

Application filed December 10, 1895. Serial No. 571,682. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR H. EDWARDS and JOHN HAZARD, citizens of the United States, residing at Wheatland, in the county of Hickory and State of Missouri, have invented certain new and useful Improvements in a Combined Square and Level; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in devices for squaring and leveling foundations for buildings; and it has for its objects, among others, to provide a simple and cheap instrument which may be used by the mechanic without the necessity of employing a civil engineer, and by means of which he may readily determine any necessary or required angle and at the same time insure a perfectly level foundation.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a plan view of our improved instrument. Fig. 2 is a vertical sectional view through the same from opposite corners through the reflectors. Fig. 3 is a detail.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates a rectangular frame adapted to be mounted in any suitable manner upon a tripod or any other support.

In the upper faces of two right-angled sides of this frame are arranged spirit-levels A' and A², whereby the frame may be leveled in all directions upon the tripod or support.

B is a bar, in two separate parts, extending diagonally from one corner to the other of the frame, and C is an arc joining the other two corners of the frame and graduated upon its upper face in the usual manner. This arc is secured to the bar B, which is cut away to permit of the passage of the same, a curved slot or opening b being left at the outer side of the said arc for the passage of the pointer

on the pivoted indicator-arm. This arm D is pivotally mounted on a suitable pivot d in a circular enlargement D' at one corner of the frame beyond the end of the bar B, and at its free end has secured thereto the vertical arm D², terminating in the pointer d² or index-finger, which extends over and is movable upon the arc, as shown. This pivot or screw is disposed exactly at the center of revolution of the said arm. On this pivot of the indicator-arm is mounted a reflector E, carried in a suitable frame, the said frame being hinged, as at e, to a plate F, carried by the said pivot and movable over the upper face of the circular enlargement. One leaf of this hinge has an extension f, through which passes vertically a set-screw f', by means of which the vertical position of the reflector may be varied, but the fixed and movable plates are slotted to allow of movement of the set-screw f'. This reflector is movable with and by the indicator-arm, and is also mounted for independent movement upon the plate on the upper face of the circular enlargement by means of a thumb-screw C', mounted in a suitable support g on the said plate, and engaging a screw-threaded lug g' on an extension of the lower leaf of the hinge of the reflector.

The upper face of the enlargement, as well as the plate on the upper face thereof, is cut away and is angular in form, as shown at G', to allow of the movement of the hinge and the reflector carried thereby independent of the indicator-arm. At the diametrically opposite corner of the frame from the large reflector is another reflector H, carried by a suitable frame, which is hinged to a plate h on the upper face of the frame, one portion of said hinge being extended, as shown at h', and through which passes a set-screw I, engaging the lower plate and by means of which the position of the reflector with relation to a perpendicular can be readily adjusted.

On the upper face of the bar B, between the arc C and the large reflector, are two sights K K', having an opening k therethrough, which openings are traversed diametrically by the pin k', as shown. At substantially diametrically opposite points on the upper face of the frame A, at the corners opposite

those occupied by the reflectors, are the sights L and L', having openings *l* there-through, which are traversed by the pins *l* as shown.

5 In use the device is placed with the large reflector on the right. The reflectors are turned up and fastened with their set-screws. Now direct the eye through the sight L, which is located between the two levels, and
10 look at the reflector in front of the same. If the two sights standing between the glasses or reflectors on the bar B appear to rise, then the front glass or reflector should be tilted slightly forward; otherwise, it should be tilted
15 backward, this regulation being adjusted by the set-screw hereinbefore described. This should be adjusted until the horizontal wires in the sights on the bar B and in the sight L' are in line with each other. Now bring the
20 index to zero on the arc with the point on the line, and then turn the tangent-screw at the back of the large reflector until the other sight L' is in range with the others; then turn the set-screw until the horizontal wire
25 is also in range. Now, when thus adjusted and placed on the tripod and leveled, turn the instrument so as to bring the known line in range with the sights and the reflected frame. Now by moving the index to ninety
30 degrees on the arc, being careful that the frame does not move, the large reflector will reflect a line at right angles and make it also appear in a straight line with the sights, except the sight L', when looking through them.
35 So by placing stakes on the lines they are seen through the sights, and the horizontal wires will direct to the level on the stakes.

The advantages of such an instrument as is hereinbefore described will be apparent
40 and will be readily appreciated by those having occasion to use such instruments. Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

45 What we claim as new is—

1. A device for the purpose described, comprising a frame carrying an arc, a movable index mounted for cooperation therewith, adjustable reflectors at diametrically opposite
50 corners of the frame and sights on said frame, substantially as and for the purposes specified.

2. A device for the purpose described, comprising a frame carrying an arc, a movable
55 index mounted for cooperation therewith, adjustable reflectors at diametrically opposite corners of the frame and sights on said frame, said frame being provided with levels, substantially as and for the purposes specified.

60 3. A device for the purpose described, com-

prising a frame carrying an arc, reflectors at diametrically opposite corners of the frame, sights, and a pivoted index-arm, mounted to move with one of said reflectors, substantially as and for the purposes specified. 65

4. A device for the purpose described, comprising a frame carrying an arc, reflectors at diametrically opposite corners of the frame, sights, and a pivoted index-arm, mounted to move with one of said reflectors and means
70 for adjusting said reflectors, substantially as and for the purposes specified.

5. A device for the purpose described, comprising a frame carrying an arc, reflectors at diametrically opposite corners of the frame,
75 sights, and a pivoted index-arm mounted to move with one of said reflectors, means for adjusting said reflectors and levels on the upper face of said frame, substantially as and for the purposes specified. 80

6. A device for the purpose described, comprising a frame carrying an arc, a pivoted arm, carrying an index, movable over said arc, sights on said frame, a hinged reflector at one corner and a hinged reflector at the
85 diametrically opposite corner, mounted for movement with said arm, substantially as and for the purposes specified.

7. A device for the purpose described, comprising a frame carrying an arc, a pivoted
90 arm, carrying an index movable over said arc, sights on said frame, a hinged reflector at one corner and a hinged reflector at the diametrically opposite corner, mounted for movement with said arm, and means for moving the last-mentioned reflector, independent of said arm, substantially as and for the purposes specified. 95

8. The combination with the frame carrying an arc and sights disposed as specified, of levels on the upper face of said frame, a pivoted arm, carrying an index, movable over said arc, a hinged reflector at one corner, with means for adjusting it vertically, a reflector at the diametrically opposite corner, movable
105 with said arm, a hinge on which said reflector is mounted, means for adjusting the vertical position of the reflector and means for turning the same about its pivot, independent of said arm, substantially as and for the purposes specified. 110

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

ARTHUR H. EDWARDS.
JOHN HAZARD.

Witnesses:

AMOS M. PAXTON,
JOHN H. MCCASLIN.