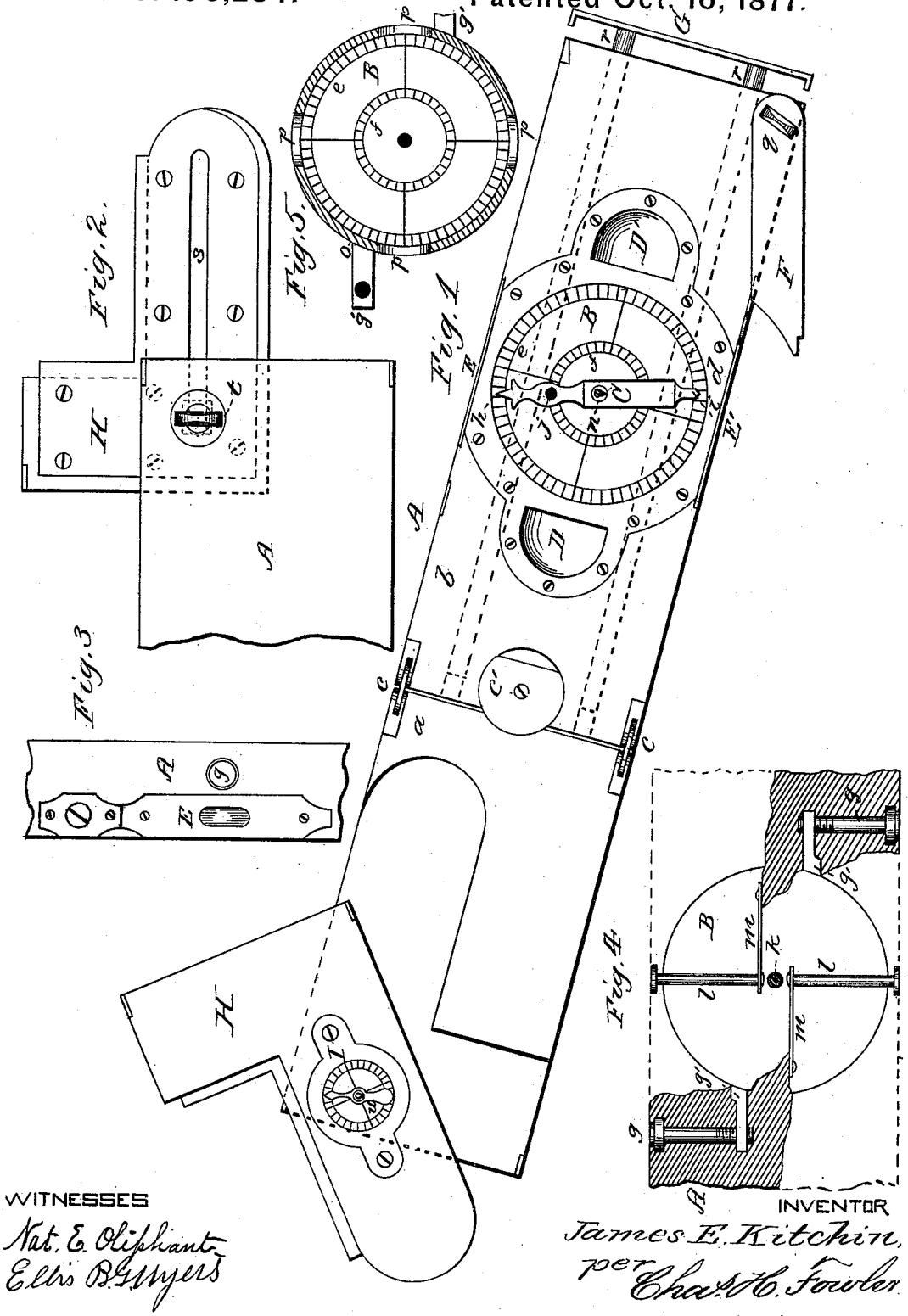
J. E. KITCHIN.

Combined Spirit Level and Square.

No. 196,234. Patented Oct. 16, 1877.



WITNESSES

Nat. E. Oliphant.
Ellis B. Myers

INVENTOR

James E. Kitchin,
per Chas. H. Fowler
Attorney.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES E. KITCHIN, OF HURFFVILLE, NEW JERSEY.

IMPROVEMENT IN COMBINED SPIRIT-LEVEL AND SQUARE.

Specification forming part of Letters Patent No. **196,234**, dated October 16, 1877; application filed September 17, 1877.

To all whom it may concern:

Be it known that I, JAMES E. KITCHIN, of Hurffville, in the county of Gloucester and State of New Jersey, have invented a new and valuable Improvement in Combined Level, Square, &c.; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a side elevation of my invention. Fig. 2 is a similar view of the back of the adjustable square. Fig. 3 is a broken section, showing the top of the rectangular block. Fig. 4 is a back view, partly in section, showing the annulus, with its regulating mechanism. Fig. 5 is a section view of the annulus detached from the block.

The object of the present invention is to provide an instrument that will take the angles for patterns, and which may also be used for setting and truing squares, and for various other purposes to which it may be adapted, the construction and arrangement of the same being hereinafter described, and subsequently pointed out in the claims.

In the accompanying drawings, A represents a rectangular block, of any suitable material, which, if desired, may be made into two sections, *a b*, and connected together by hinges *c*, so that said sections may be folded upon each other to protect the several devices connected thereto from injury when not desired for use, the sections being held open by a suitable spring-catch at the back, and a segmental plate, *c'*, at the front side thereof. Near one end of the block A is formed a recess, around which is secured a metallic plate, *d*, for holding therein an annulus, B, having near its outer circumference graduations *e*, numbering three hundred and sixty degrees, extending around the entire length thereof, and between these graduations and the center of the annulus is a second series of graduations, *f*, corresponding in number to the graduations *e*. The annulus B is suspended within the recess formed in the block A by screws *g*, passing through ears *g'* upon the annulus. By this construction the annulus is set or regulated by simply turning the screws in the proper direction, which will cause the ears to traverse the screw-threads upon the screws, thereby bringing the annulus either to the right or left of the index-hand C, as required. The index-hand C is weighted to serve the purpose of a plumb in all directions, and has pointers *h i* and a sight-opening, *j*, the pointer *i* and opening *j* serving to prove the correctness of the pointer *h*. The hand C has upon its under side a pin, *k*, which passes through an opening in the annulus, and when it is desired to stop the vibrations of said hand it is accomplished by pressing down upon a rod, *l*, until the lower end thereof comes in contact with the pin *k*, which prevents the same from rotating. When the pressure is relieved from the rod *l*, a spring, *m*, throws it back from contact with the pin, and allows it to freely vibrate. Upon the upper face of the hand C is formed a knife-edge journal, *n*, which rests upon a glass bearing formed upon the inner side of the glass plate secured over the annulus B.

In order to see the hand at different directions from the outside of the instrument without the necessity of looking at the face of the annulus, the rim *o* of the annulus has openings *p*, four in number, at equal distances from each other, and the block is recessed to form sights D D' upon its front side, and upon its edges sights E E'.

A blade, F, is secured to one end of the block A, by which device any angle for a pattern may be taken, the blade being adjusted and held at the required angle to the block A by a set-screw, *q*. The block A has openings passing through its entire length, or a portion thereof, to receive one or more sliding rods, *r*, the outer ends of said rod or rods being connected to a bar, G, which, after being drawn out, is held at the desired distance from the end of the block by a set screw or screws, or other suitable means. The purpose thereof is to lengthen the block, when required, in taking the angles of hollow surfaces.

One end of the block A is recessed to receive a square, H, having upon its back an elongated slot, *s*, to receive a nut upon the end of a set-screw, *t*, by which construction the square may be drawn out to the end of the block, and set at any angle thereto, when it is desired to true a

square, and by which, also, in connection with the blade F and block A, three different angles may be obtained, when required. The square H has upon its face an annulus, I, and weighted hand *u*, the construction of said annulus, with its several connecting parts, being similar in form to that upon the block A.

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

1. The rectangular block A, provided with the annulus B, having upon its face graduations *e f*, in combination with the weighted index-hand C, formed with pointers *h i* and sight *j*, substantially as and for the purpose set forth.

2. The annulus B, having rim *o* and ears *g'*, and the adjusting-screws *g*, by which the annulus is regulated, substantially as and for the purpose specified.

3. The combination, with the index-hand C and pin *k*, of the rod or rods *l* and springs *m*, substantially as and for the purpose described.

4. The annulus B, constructed as described, and formed with rim *o* and openings *p*, in combination with the block A and sights D D' E E', substantially as and for the purpose set forth.

5. The combination, with the block A and annulus B, with index-hand C, of the bar G and sliding rod or rods *r*, substantially as and for the purpose described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JAMES E. KITCHIN.

Witnesses:

NAT. E. OLIPHANT,

JONATHAN L. PIERSON.