

(No Model.)

T. B. WILLIAMS.

BEVEL PROTRACTOR.

No. 323,009.

Patented July 28, 1885.

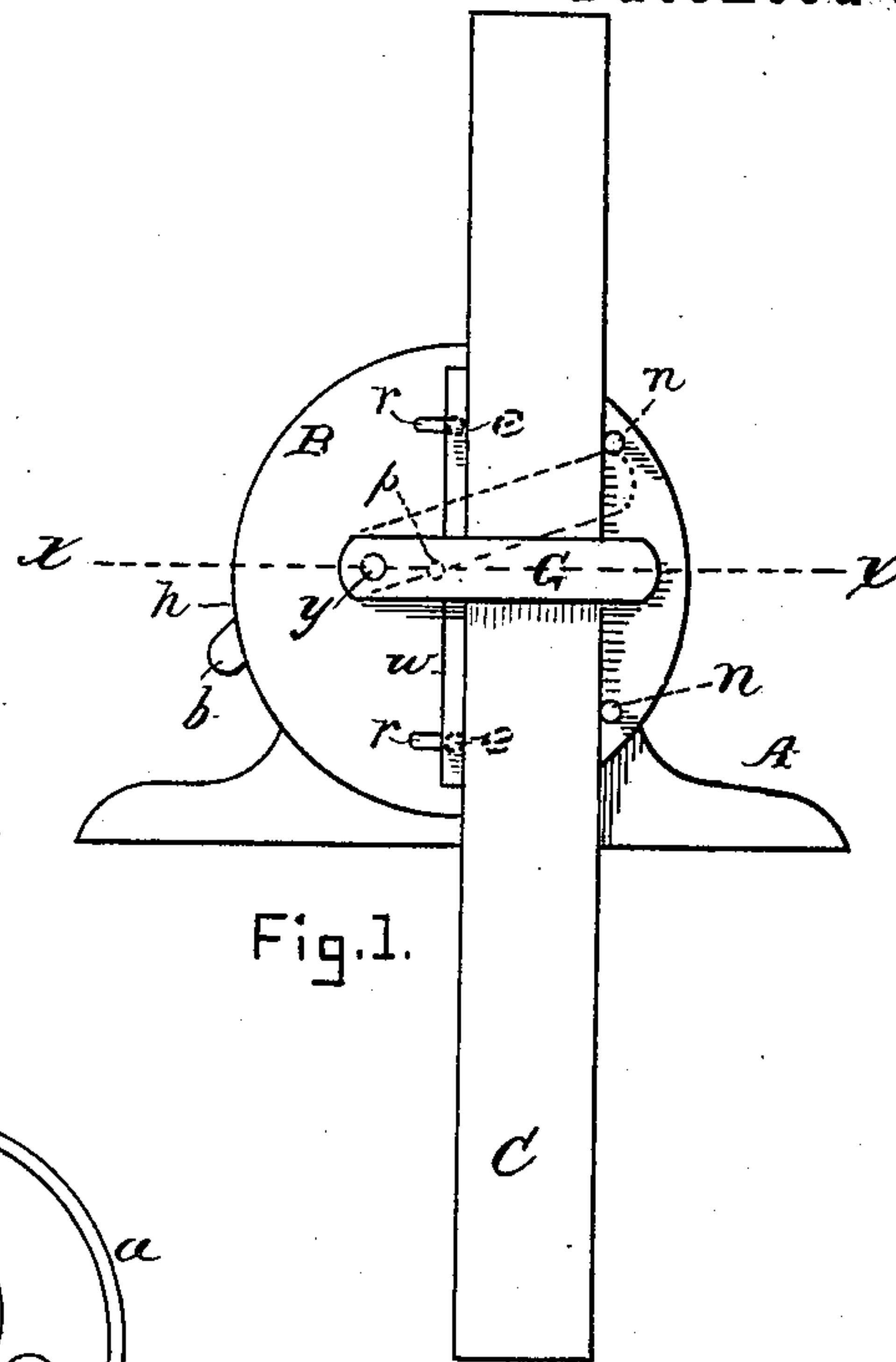


Fig. 1.

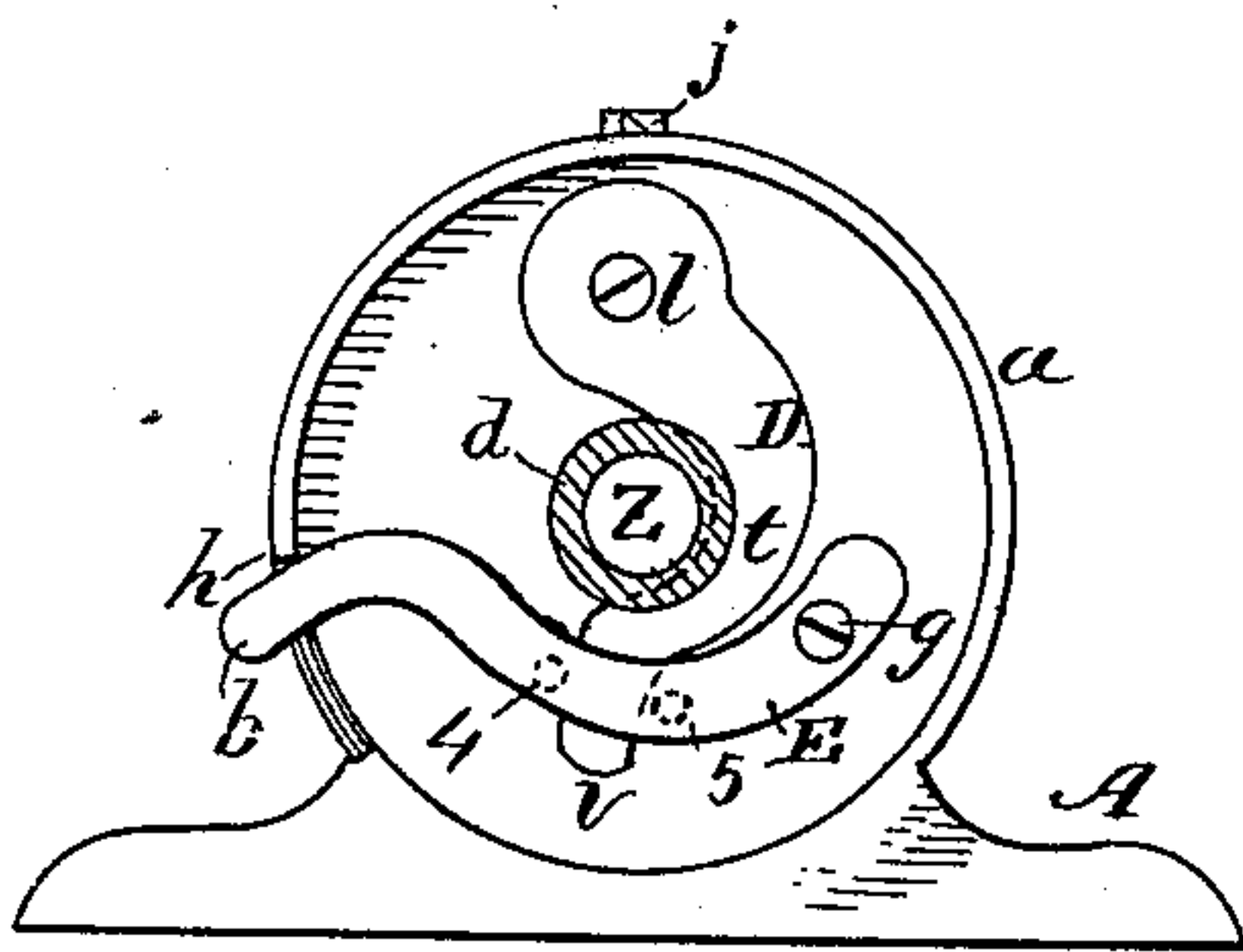


Fig. 2.

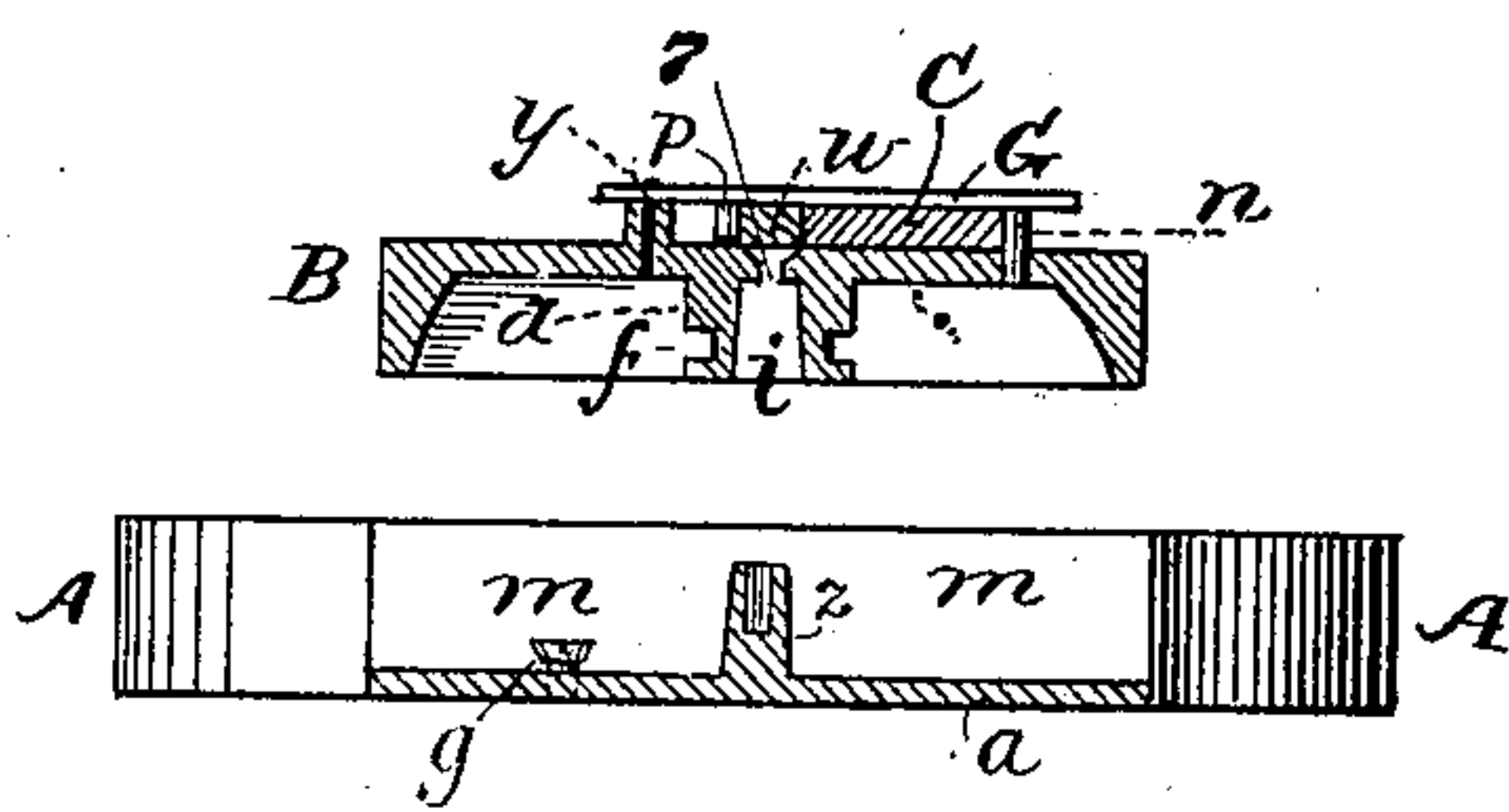


Fig. 3.

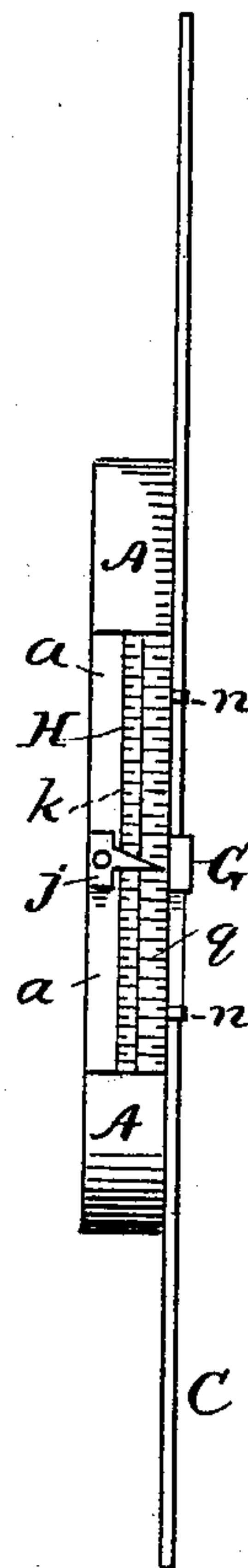


Fig. 4.

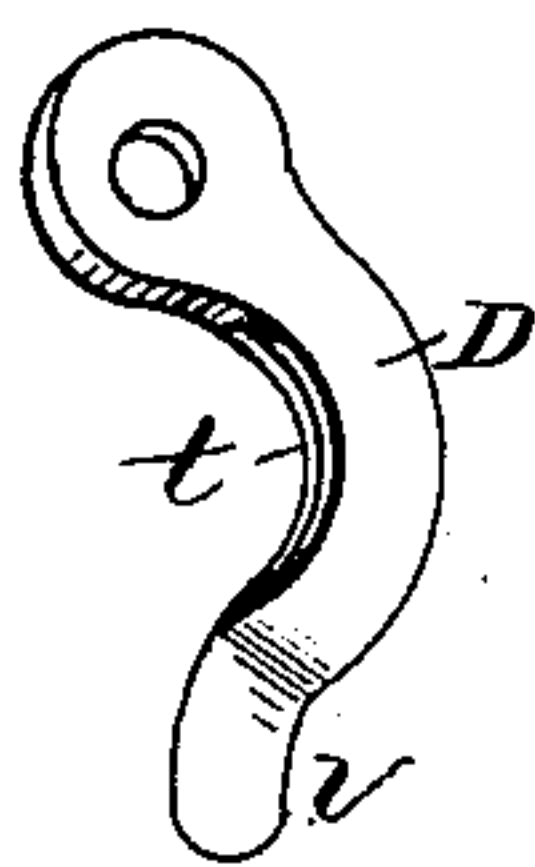


Fig. 5.

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## BEVEL-PROTRACTOR.

SPECIFICATION forming part of Letters Patent No. 323,009, dated July 28, 1885.

Application filed February 23, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS B. WILLIAMS, of Orange, in the county of Franklin, State of Massachusetts, have invented a certain new and useful Improvement in Bevel-Protractors, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top plan view of my improved protractor; Fig. 2, a view showing the method of securing the disk to the body; Fig. 3, a view showing the disk detached from the body, the parts being represented in transverse section taken on the line *x x*, in Fig. 1; Fig. 4, an edge view showing the scale and index, and Fig. 5 a view of the levers detached.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of protractors which are provided with bevel gages or rules; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more desirable and effective device of this character is produced than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation:

In the drawings, A represents the body; B, the disk, and C the rule. The body is straight on the base, as best seen in Figs. 1 and 2, and is provided with the circular back *a*, disposed centrally and standing at a right angle to the base. The disk is circular in form, as best seen in Fig. 3, and is provided on its inner face with the stud *d*, having the annular groove *f* near its outer end. A chamber, *m*, is formed in the body A to receive the disk B, and disposed centrally in this chamber there is a conical stud, *z*, adapted to fit a correspondingly tapered hole, *i*, in the stud *d*, the hole being shorter and slightly smaller at its upper end than the stud *z*, so that when the disk is inserted in the chamber it will be prevented from

coming into contact with the floor of the same, thereby enabling it to be readily turned or swiveled on the stud.

Pivoted by the screw *l* to the bottom or floor of the chamber *m* there is a bent lever, D, provided with an inclined end, *v*, and wedge-shaped edge *t*, adapted to enter the groove *f*. A bent lever, E, is also pivoted to the floor of the chamber at *g*, the body of this lever resting on the inclined portion *v* of the lever D, and its end *b* protruding through an elongated vertical slot, *h*, formed in the side of the instrument, between the back *a* and disk B.

Mounted on the face of the disk there is a flat bar or rule, C, adapted to slide longitudinally thereon, the rule abutting on one side against the pins, *n*, and on the other against the key-bar *w*, this bar being provided with inwardly-projecting pins *e*, which enter slots *r*, formed in the face of the disk, and thereby keeping it in place, or from moving longitudinally. A lever, G, is disposed on the face of the disk, this lever being pivoted at *y*, and provided with an inwardly-projecting pin, *p*, which presses against the bar *w* when the lever is swung around at right angles to the rule C, thereby forcing the bar *w* against the rule and the rule against the pins *n*, and securely holding it in any desired position. A scale, H, consisting of two sections, *q k*, arranged in parallelism, is formed on the edge of the disk, each section of the scale being divided into degrees and fractional parts of degrees, the dividing lines or marks on either section standing opposite the spaces or blanks in the other, thereby rendering the division-lines more easily discernible than they would be if they were all placed on one section. An index-finger, *j*, having one of its sides straight, as shown in Fig. 4, is attached to the back *a*, being so arranged as to project over both sections *q k* of the scale.

Projecting downwardly from the lever E there are two pins, 4 and 5, one on either side of the inclined end *v* of the lever D, the pins being so arranged that when the end *b* of the lever E is depressed in the slot *h*, as shown in Fig. 2, it will move the edge *t* out of the groove *f*, and when elevated will move it into said groove.

The levers being in the position shown in



Fig. 2, the two principal members of the instrument may be connected by placing the disk in the chamber *m*, the stud *z* entering the hole *i*, and being secured therein by a screw, (not shown,) which is inserted through the hole 7 and enters a threaded hole in the top of said stud. The disk may then be turned into any desired position, after which the end *b* of the lever *E* is elevated, thereby moving the edge *t* into the groove *f*, and at the same time causing the body of said lever to ride up the incline *v* and press the lever downwardly or inwardly and lock the disk in a manner which will be readily understood without a more explicit description.

To move the rule *C* longitudinally, the lever *G* is swung into the position indicated by the dotted lines 22 in Fig. 1, thereby releasing the key-bar *w* and permitting the rule to slide freely on the face of the disk, the rule being again fastened when adjusted as desired, by turning the lever until it stands at right angles thereto.

It will be obvious that the rule may be readily placed at any desired angle with respect to the base-line 24 of the body *A* by means of the index-finger *j* and scale *H*, and secured by the levers *D E*.

Having thus explained my invention, what I claim is—

1. In a protractor, the body *A*, provided with the chamber *m*, conical stud *z*, and index *j*, and the disk *B*, provided with the scale *H* and stud *d*, having the tapering hole *i*, in combination with the rule *C*, means for rendering said rule longitudinally adjustable on the disk, and means for locking the disk in any desired position, substantially as set forth.

2. In a protractor, the pivoted levers *D E*, in combination with the hollow grooved stud *d*, and conical stud *z*, substantially as and for the purpose specified.

3. In a protractor, the combination of the disk *B* provided with stop-pins *n*, the lever

pivoted to said disk and provided with pin *p*, the key-bar *w*, and the rule *C*, substantially as described.

4. In a protractor, the key-bar *w*, having the pins *e*, working in the slots *r*, in combination with the lever *G*, rule *C*, and pins *n*, substantially as set forth.

5. The improved protractor herein described, the same consisting of the body *A*, having the chamber *m*, stud *z*, back *a*, and index *j*, the disk *B*, having the scale *H*, pins *n*, hole 7, slots *r*, and stud *d*, provided with the groove *f* and hole *i*, the pivoted lever *G*, provided with the pin *p*, the key-bar *w*, provided with the pins *e*, the lever *E*, provided with the pins 5, and the lever *D*, provided with the edge *t* and incline *v*, constructed, combined, and arranged to operate substantially as specified.

6. The combination, in a protractor, of the back *a*, provided with an index, *j*, and a revolving disk, *B*, provided with a scale on its periphery, composed of two parallel alternating graduating sections; the dividing lines or marks of either section standing opposite the spaces between the dividing-lines of the other section, and half-length semi-space marks extending from the outside toward the center, substantially as described.

7. The combination, in a protractor, of the back *a*, provided with an index, *j*, and a revolving disk *B*, provided with a scale on its periphery, composed of two parallel alternating graduated sections, the dividing lines or marks of either section standing opposite the spaces between the dividing-lines of the other section, and half-length semi-space marks extending from the outside toward the center, said index *j* extending across both said sections, and having one straight and one beveled edge, substantially as described.

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Witnesses:

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