

No. 715,582.

Patented Dec. 9, 1902.

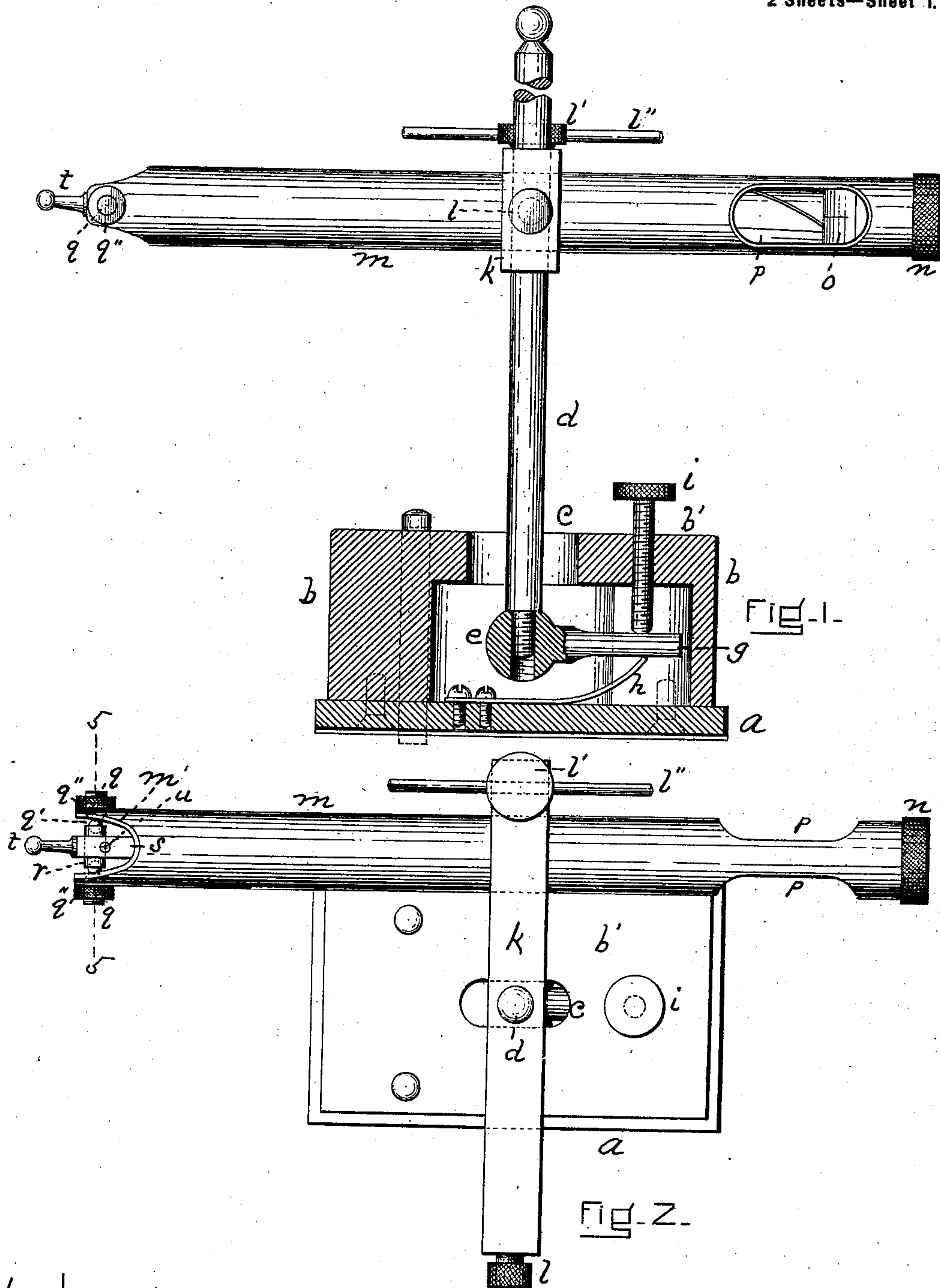
F. B. JACOBS & H. D. WATERHOUSE.

TEST INDICATOR.

(Application filed Oct. 9, 1902.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES=

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A. K. Hood.

INVENTORS=

Frederic B. Jacobs  
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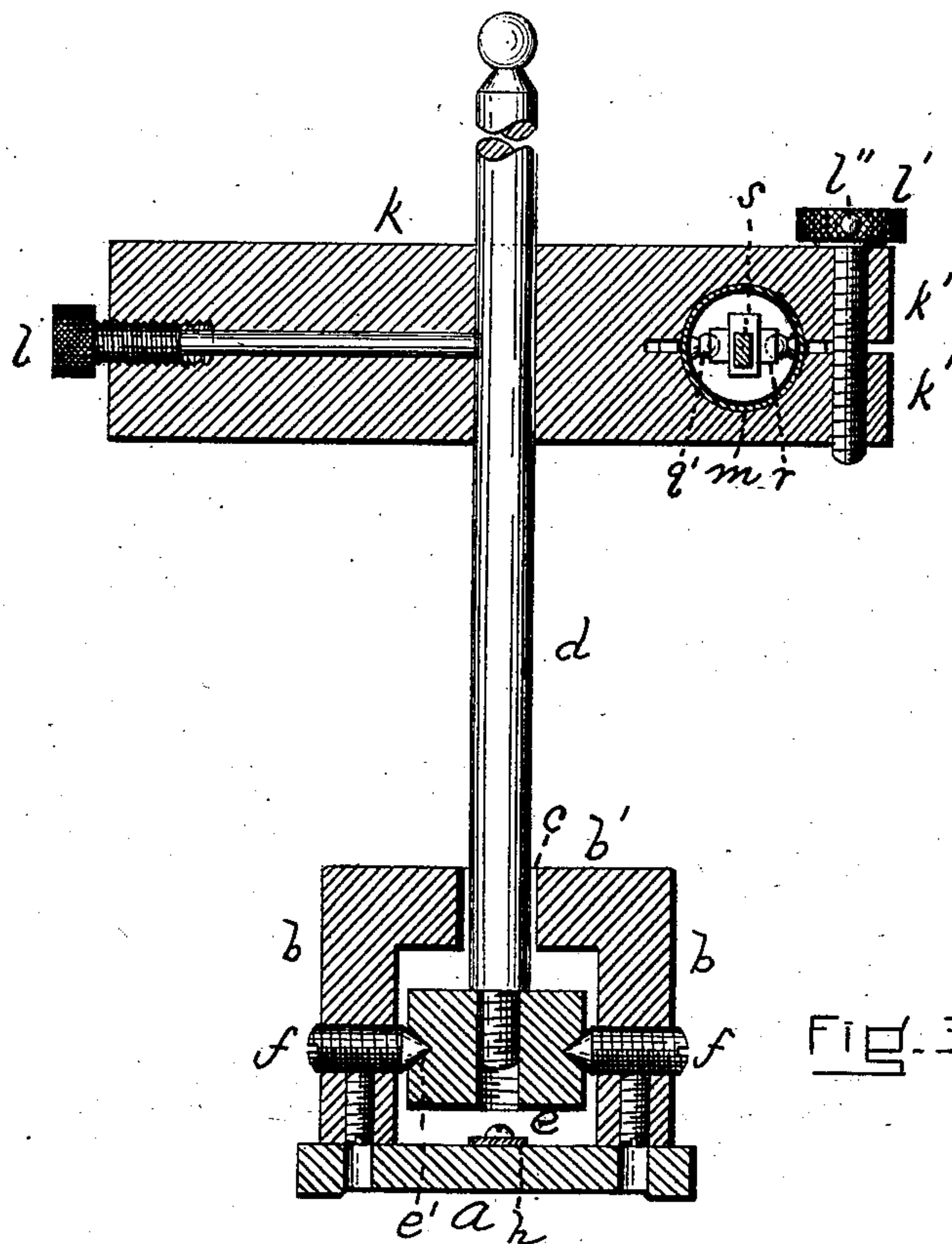


Fig. 3.

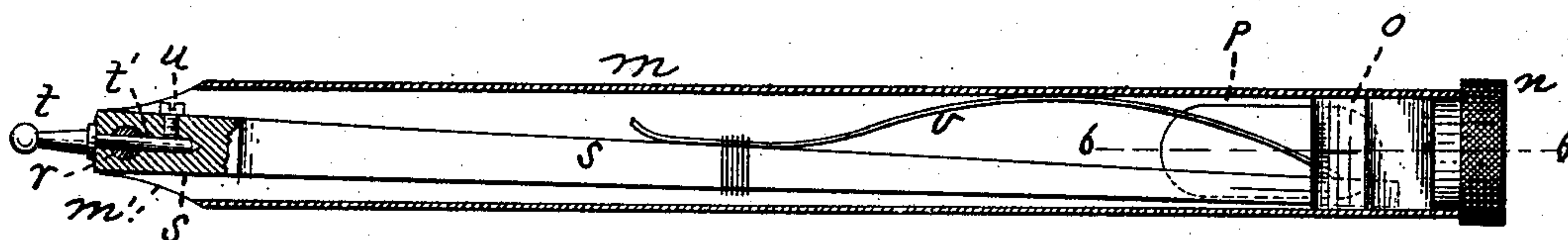


Fig. 4.

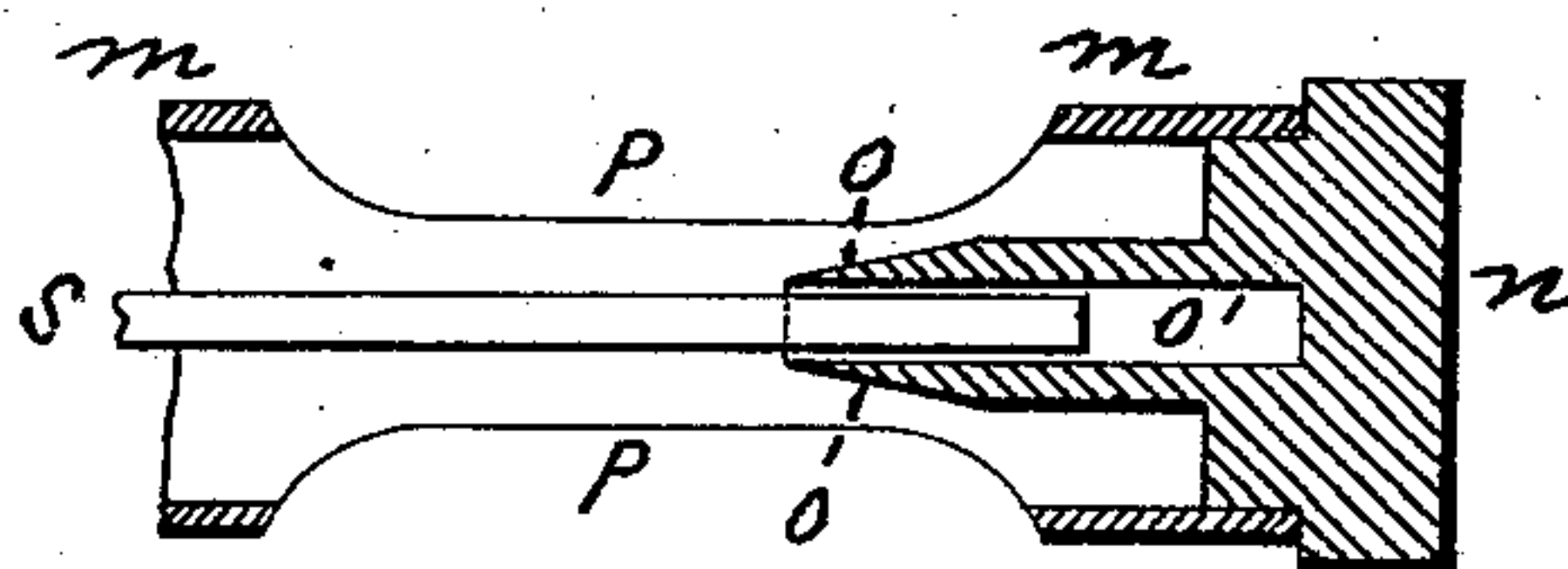
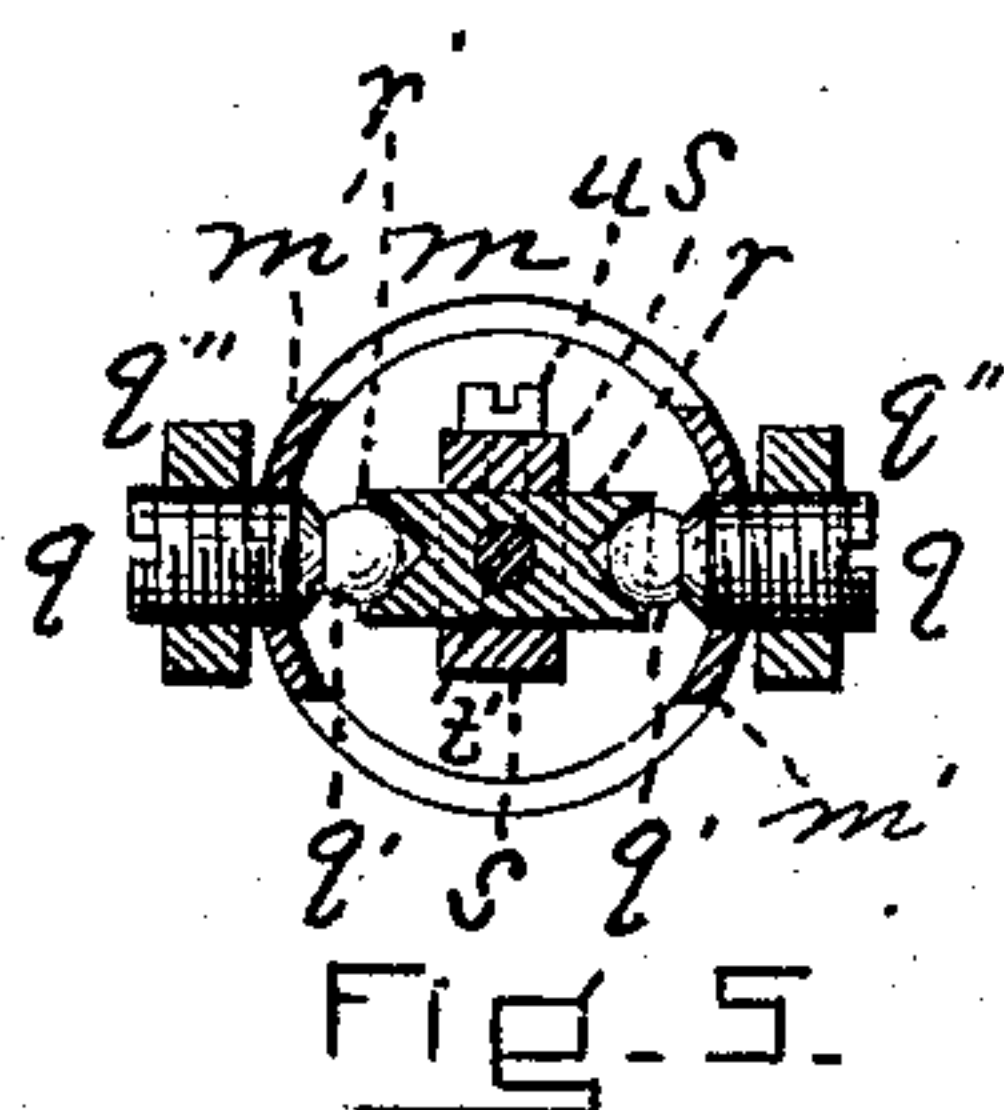


Fig. 6.

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# UNITED STATES PATENT OFFICE.

FREDERIC B. JACOBS AND HAROLD D. WATERHOUSE, OF QUINCY,  
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## TEST-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 715,582, dated December 9, 1902.

Application filed October 9, 1902. Serial No. 126,573. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERIC B. JACOBS and HAROLD D. WATERHOUSE, citizens of the United States, residing in Quincy, in the  
5 county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Test-Indicators, of which the following is a specification.

This invention relates to test-indicators  
10 adapted to readily determine the degree of inaccuracy of a plane surface on the top, bottom, side, or inner edge of a piece of work; to easily ascertain the amount of end movement, as for a spindle; the variation out of  
15 true of the running of a spindle, and for various other testing purposes—such as testing cylinder-bores, locating buttons on jigwork, testing arbors, vises, &c.

Our invention relates to certain improvements relative to the horizontal adjustment and rotation of the tube, to the protection of the indicator-needle, to the protection of the adjusting mechanism at the lower end of the spindle or post, and to other details of construction whereby greater efficiency is produced, all as fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a view, partly in elevation and  
30 partly in vertical section, of a test-indicator embodying our improvements. Fig. 2 is a plan view of the same. Fig. 3 is a central cross vertical section of the same. Fig. 4 is a longitudinal vertical section of the tube and  
35 its contents, the indicator-needle and the end plug being shown in elevation. Fig. 5 is a cross-section taken on line 5, Fig. 2. Fig. 6 is an enlarged horizontal section taken on line 6, Fig. 4.

40 Similar letters of reference indicate corresponding parts.

*a* represents the base, to which are screwed the walls *b* of a box or case, whose top *b'* is provided with an elongated slot *c*, through  
45 which the spindle or post *d* extends, the slot being made of sufficient length to allow a swinging adjustment of the said spindle or post and the box itself constituting a protecting-case within which is inclosed the adjusting mechanism at the lower end of said spindle or post. The lower end of the spindle is

screwed into a lug or hub *e*, which is pivotally suspended horizontally and allowed to rotate on a vertical plane by means of the pivot-screws *f*, Fig. 3, which extend into corresponding depressions in the lug. From  
55 this lug there extends an integral arm *g*, Fig. 1, which is held normally up by a spring *h*, whose opposite end is secured to the base *a*. A regulating-screw *i* is located in the portion  
60 *b'* of the box and, in connection with the spring *h*, regulates the height of the arm *g*, and hence the position of the spindle *d*. Thus the base entirely incloses the adjusting mechanism and protects it from injury such as is liable  
65 to occur in a machine-shop. The spindle-lug is hung on centers, Fig. 3, thereby allowing side play and wear to be taken up, and the arm *g* being between the adjusting-screw and a spring friction is lessened and adjustment  
70 made easier.

*k* represents a horizontal holder adjustably secured as to height on the spindle by means of the screw *l*, whose plain inner end sets against the spindle, as shown in Fig. 3. The  
75 opposite end of the holder *k* is horizontally bored to receive the horizontal tube *m* and bifurcated, as shown, in order to form spring-jaws *k'*, whereby by means of a screw *l'* the said tube may be held tightly and adjustable  
80 both rotatively and longitudinally in the holder.

The indicator-tube *m* is round and is provided at one end with a plug *n*, from which there extends inward centrally a dial *o*, horizontally slotted at *o'*, so as to form a double  
85 dial. The plug closes the end of the tube, so that no dirt or foreign substance can enter at that end, and the double dial extends between two windows *p*, so that there are practically  
90 two dials, one of which is visible through one window and the other through the window on the opposite side, as shown in Figs. 1, 4, and 6. Extending into the slot *o'* is the free end of the indicator-needle *s*. The opposite end  
95 of this needle is bored to receive rigidly a hub *r*, formed with opposite sockets *r'*, whereby it is supported at its opposite ends by the ball-shaped ends *q'* of the screws *q*, which are adjustably secured by nuts *q''* in the extensions  
100 *m'* of the tube *m* at that end. The contact-point *t* extends longitudinally into the pivoted



end of the needle *s*, its shank *t'* extending through the hub *r*, whereby said hub is held in rigid connection with the needle, and the shank and point are held in position by a suitable set-screw *u*, all as shown in Figs. 4 and 5. A spring *v* has one end secured to the indicator-needle and bears against the inner surface of the tube *m*, holding the needle normally at one end of the slot *o'* next the tube. Thus the indicating end of the needle and the double dial are both protected inside of the tube. When the contact-point *t* is moved over a surface or a surface moved under the contact-point, said surface is of course on the same side as the spring *v*, and the inequalities or inaccuracies of the plane surface are made apparent by the free end of the indicator and the dial, as shown through either window *p*. To test an upper surface, the contact-point *t* is of course placed upon such surface. To test the under surface or the inner surface of the same article, the screw *l* is loosened, preferably, by means of a suitable bar or lever *l''* and a half-rotation given to the tube *m*, and as the contact-point *t* is moved along the under or inner surface the indicator and dial are seen through the opposite window. Thus the tube containing the indicator-needle may be rotated in either direction, slid back and forth, raised and lowered by means of the holder *k*, and moved on an arc by means of the pivoted spindle *d*.

The free end of the indicator-needle is prevented from lateral movement by the slot *o'*.

The manner in which the contact-points are held renders them easily and quickly removed, reapplied, or exchanged for others.

By pivoting or swiveling the spindle *d* at its lower end instead of sliding it in a groove a long clumsy base is done away with and we are enabled to employ a small base, as well as to protect the connections or adjusting mechanism at the lower end of the spindle.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a test-indicator of the character described, the base; the box or housing *b, b'* secured to said base and provided with the slot *c*; the lug *e* sustained at its opposite ends by adjustable pivotal supports and provided with the substantially horizontally extending arm *g*; a spring pressing the arm normally upward; a regulating-screw bearing downward against the arm; and the spindle *d* extending from said lug up to the slot, substantially as described.

2. In a test-indicator of the character described, an upwardly - extending spindle; means for supporting the same at its lower end; a substantially horizontal holder adjustably supported by the spindle; the tube *m* extending substantially horizontally through said holder; mechanism for securing said tube tightly in the holder and loosening it for the purpose of allowing rotation of the tube; a double or two-faced dial extending longitudinally in the tube; windows located in the tube opposite each other and facing the two faces of the dial; and an indicator-needle pivotally secured at one end in the tube and with its free end extending to the dial and windows, substantially as set forth.

3. In a test-indicator of the character described; an upwardly - extending spindle; mechanism for supporting the same at its lower end; a holder adjustably supported by the spindle; the tube *m* horizontally and rotatively supported by the holder; the plug *n* secured to and inclosing one end of the spindle; the double dial *o* centrally slotted at *o'* and extending from said plug; windows located in the tube opposite the dial; and an indicator-needle pivotally secured at one end in the tube and with its free end extending into said slot in the dial, substantially as described.

4. In a test-indicator of the character described, an upwardly - extending spindle; mechanism for pivotally supporting the same at its lower end; a holder supported by the spindle; the tube *m* horizontally and rotatively supported by the holder, closed at the indicating end and provided with suitable windows and with dials visible through said windows; an indicator-needle with its free end extending to the dial and windows; the hub *r* extending through the indicator-needle at its opposite end and provided with the end sockets *r'*; the screws *q* formed with the ball-shaped ends *q'* and extending through the tube into the sockets in the hub; and the point *t* extending adjustably longitudinally into the needle at its pivoted end, substantially as set forth.

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

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Witnesses:

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