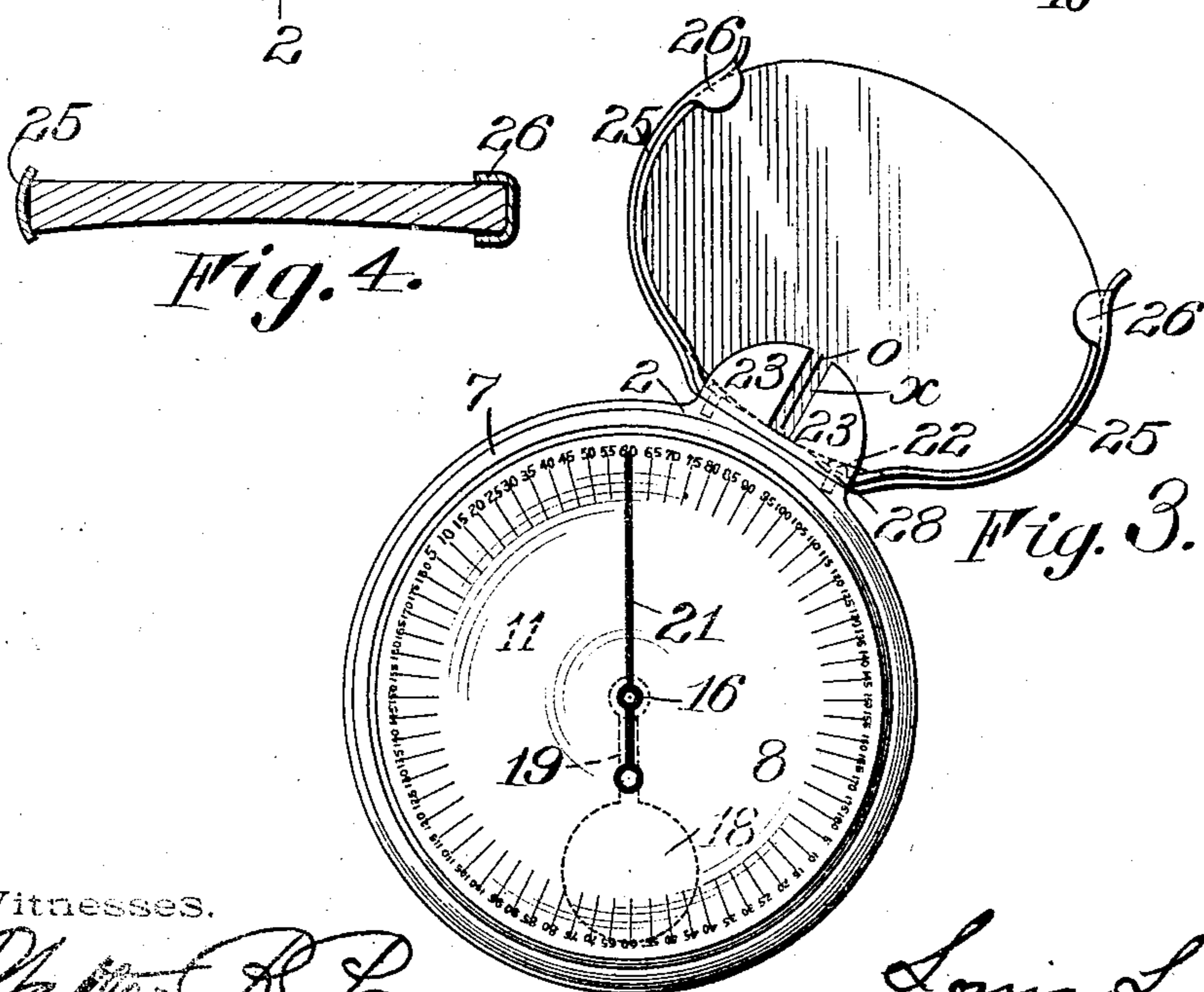
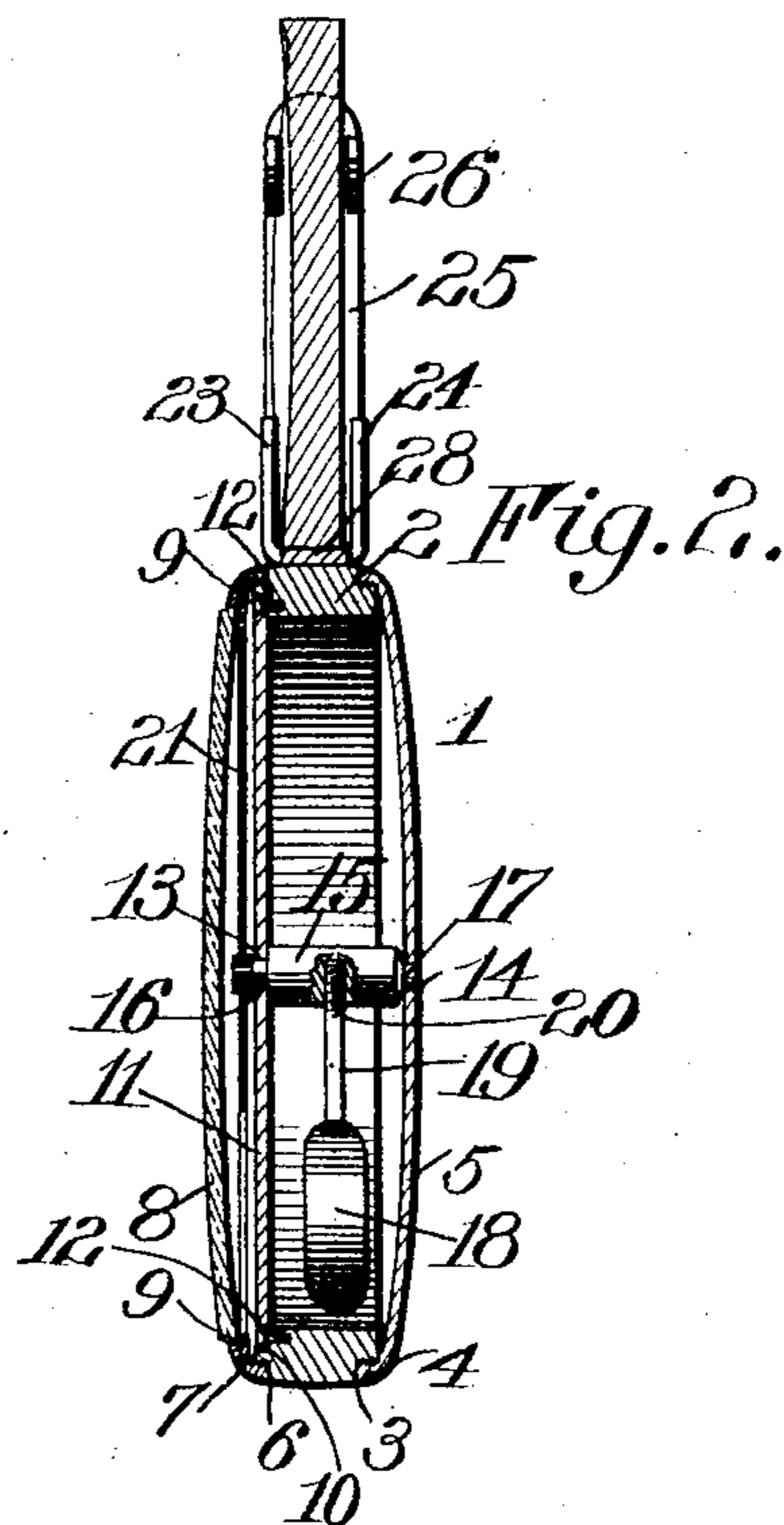
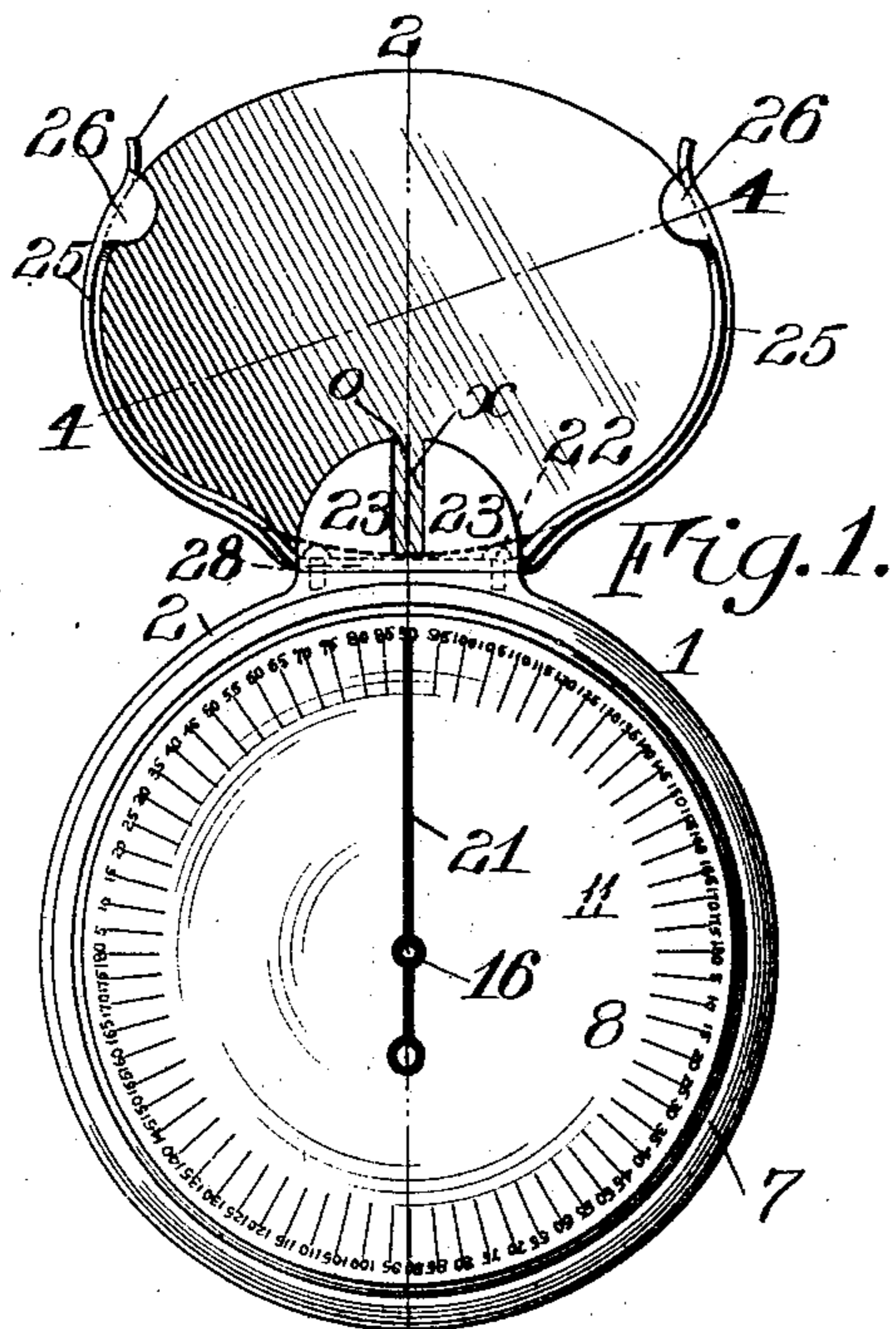


No. 765,188.

PATENTED JULY 19, 1904.

L. L. MINCER.
AXIS FINDER FOR LENSES.
APPLICATION FILED MAY 29, 1903.

NO MODEL.



Witnesses.

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UNITED STATES PATENT OFFICE.

LOUIS L. MINCER, OF ROCHESTER, NEW YORK.

AXIS-FINDER FOR LENSES.

SPECIFICATION forming part of Letters Patent No. 765,188, dated July 19, 1904.

Application filed May 29, 1903. Serial No. 159,278. (No model.)

To all whom it may concern:

Be it known that I, LOUIS L. MINCER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Axis-Finders for Lenses; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference characters marked thereon.

My present invention relates to devices particularly adapted for use in determining the axes of cylindrical lenses, and has for its object the production of a device of this character whereby the axis of a lens may be readily and accurately located and wherein the extremely delicate nature of instruments of this character is avoided.

It is also one of the objects of my invention to produce such a device wherein convenience and simplicity in manipulation and minimum cost in manufacture are advantageous features.

Other features of novelty and advantage will be hereinafter more fully described, and pointed out in the claims hereunto annexed.

In the drawings, Figure 1 is a front elevation of an instrument embodying my improvements. Fig. 2 is a central vertical sectional view thereof on the line 2 2, Fig. 1. Fig. 3 is a view similar to Fig. 1, the device being shown in a position similar to that assumed in determining the axis of a lens; and Fig. 4 is a transverse sectional view through the lens and retaining-clip, taken on the line 4 4, Fig. 1.

In the views the same characters of reference designate similar parts.

In the present embodiment of my invention 1 designates a clinometer inclosed within a casing comprising an annular ring 2, recessed at 3 to receive the internally-screw-threaded flange 4 of the back 5 of the casing. A similar recess 6 is formed upon the opposite side of the ring 2, and into this recess is fitted the internally-screw-threaded ring 7. This ring 7 carries the glass dial, cover, or crystal 8, retained in position in any suitable manner—such, for instance, as by the retaining-ring 9. However, if preferred, other means may be

adopted for securing the parts 5 and 7 to the ring 2, it being understood that I do not limit myself to the structure shown.

Into an annular groove 10, formed in the inner periphery of the ring 2 adjacent the dial-glass 8, the dial-plate 11 is fitted and secured in position in any desired manner, such as by the screws 12 12. This dial is made of any suitable material to present a neat appearance and is provided upon its face with a protractor-scale indicating the degrees of a circle. In the center of the dial-plate 11 is provided an aperture 13 in alinement with an aperture 14 in the rear plate 5, and journaled in said apertures is an arbor 15, having reduced portions 16 17, forming bearings. Depending from this arbor 15 is a pendulum or counterweight 18, shown in the present embodiment as provided with a supporting-stem 19, secured by screw-threads 20 or the like to the pivot 15. The reduced portion 16 of the pivot 15 extends through the dial-plate 11 and is provided with an indicator 21, so disposed upon the arbor 15 relatively the pendulum or counterweight 18 that it will normally extend in a vertical direction irrespective of the degree of inclination of the casing.

In the present embodiment of my invention the lens-holder is attached to the casing 2 and illustrated as made in a single piece punched out or otherwise formed from sheet metal or other suitable material. This lens-holder is preferably provided with a flattened portion 28, through which pass the screws 22 or other means for securing the holder to the casing. Extending upwardly from the portion 28 and adapted to rest at each side of a lens in the holder are pairs of retaining-lugs 23 23 and 24 24, respectively, which are provided with slits *x*, forming slight apertures, the purpose of which will be further explained. Bowing outwardly and upwardly from the lower portion 28 of the holder are a pair of retaining clips or arms 25 25, shown in the illustration as having approximately the contour of the edge of an eyeglass-lens and provided with guiding-lugs 26 26 at the ends of the arms 25 25 for retaining the lens in its proper position while in the holder. These retaining clips or arms 25 25 are preferably made of spring ma-

terial and in the present embodiment surround the lens a distance greater than half its periphery to insure the proper seating of the lens in the holder and to prevent its accidental displacement. The extremities of these clips are curved outwardly, as shown, to facilitate the insertion of a lens. Instead of forming the casing in a complete circle and attaching the lens-holder to the periphery thereof, as shown, I may cut away a portion of the casing and dial and secure the lens-holder in the cut-away portion, thereby materially reducing the dimensions of the instrument without affecting its utility.

To facilitate an understanding of the operation of the device, let it be assumed that the angle of inclination of the axis of a lens relative to its geometrical axis is to be found. Before the lens is placed in position on the instrument it is first laid upon a form or pattern conforming to the outline of the lens, which is provided with the major and minor geometrical axes, one or both of which may be marked on the lens. In the present instance I employ the minor axis, (indicated by o ,) forming an index which when the lens is adjusted in position on the instrument occupies a position centrally of the sight-aperture x . The instrument may now be held in an upright position, and a card or other object having intersecting lines may be sighted through the lens. The operator's eye will be kept upon the intersecting lines, while the instrument is tilted or inclined until the image thus seen is undistorted, when the optical axis of the lens under test will be indicated directly upon the dial by the indicator 21. Axes of lenses having similar or different contours may be found in a similar manner, and it will of course be understood that the contour of the lens-holder may be varied to accommodate lenses of different outlines. Thus it will be seen that an instrument of this character is produced wherein the axis of a cylindrical lens may be readily determined and in which simplicity and convenience in manipulation are secured in a device wherein the axis of the lens under test is directly indicated upon the dial. As no readjustment of the instrument is necessary in testing lenses having different axes, it will be readily apparent that the utmost rapidity in the manipulation of the instrument may be secured.

While I have shown my invention as embodied in but one form, it will of course be understood that I do not so limit myself, as many modifications and changes may be suggested to those skilled in the art which do not depart from the spirit of my invention.

I claim as my invention—

1. In a device of the character described the combination with a lens-holder for receiving a lens, of a device having a freely-movable pointer for indicating the degree of inclina-

tion of the lens when tilted edgewise in a substantially vertical plane.

2. In a device of the character described, the combination of a lens-holder adapted to center a lens therein, and a device having an automatically-operated pointer for indicating the degree of inclination thereof, to determine the axis of the lens in the holder.

3. The combination with a device having a gravity-operated pointer for indicating the degree of inclination thereof, of a lens-holder attached thereto and adapted to center a lens therein in such a manner that the axis thereof will be indicated by said pointer when the device has been tilted to the proper degree.

4. The combination with a lens-holder adapted to center a lens therein, of a device attached to said holder carrying an automatic indicator adapted to indicate the angle of inclination of the lens when tilted edgewise to determine the axis thereof.

5. In a device of the character described, the combination with a clinometer; of a lens-holder attached thereto having retainers, engaging the periphery of a lens, to support it in such a manner that the angle of inclination thereof will be indicated by said clinometer, lens-guiding devices upon said retainers, and a means for centering a lens in said holder.

6. In a device of the character described, the combination with a clinometer; of a lens-holder, having lens-retainers adapted to support a lens in such manner as to permit a reading of said clinometer and an observation through said lens, lens-guiding devices upon said retainers and devices adapted to cooperate with an index-mark upon a lens to center it in the holder.

7. In a device of the character described, the combination with a clinometer having a scale thereon, and an indicator for said scale, of a lens-holder attached thereto and adapted to support a lens in such a manner that the angle of inclination thereof will be indicated upon said scale.

8. In a device of the character described, the combination with a clinometer having a protractor-scale, and an indicator for said scale; of a lens-holder attached to said clinometer, and a lens-centering device for said holder.

9. The combination with a lens-holder, of a clinometer carrying said holder and having a protractor-scale, an arbor having a pointer thereon, and a device upon said arbor causing said pointer to indicate the degree of inclination of said holder.

10. The combination with a lens-holder, of a clinometer carrying said holder and having a protractor-scale, an arbor having a pointer thereon and a pendulum upon said arbor.

11. The combination with a lens-holder and a device for centering a lens therein, of a clinometer having a protractor-scale, an indicator for said scale, and means for causing said

indicator to indicate the degree of inclination of said lens-holder.

12. The combination with a lens-holder, a device for centering a lens therein and lens-
5 retainers upon said holder, of a clinometer having a protractor-scale, an indicator for said scale, and means for causing said indica-

tor to designate the degree of inclination of said holder upon said protractor-scale.

LOUIS L. MINCER.

Witnesses:

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