

No. 678,642.

Patented July 16, 1901.

J. E. CHAMBERS.
STANDARD FOR OPTICAL INSTRUMENTS.

(Application filed Mar. 8, 1901.)

(No Model.)

Fig. 1.

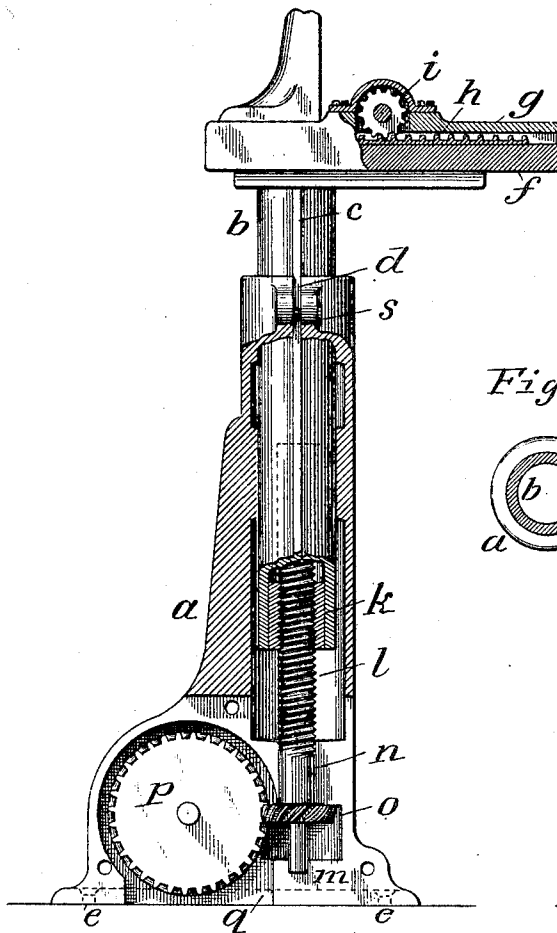


Fig. 2.

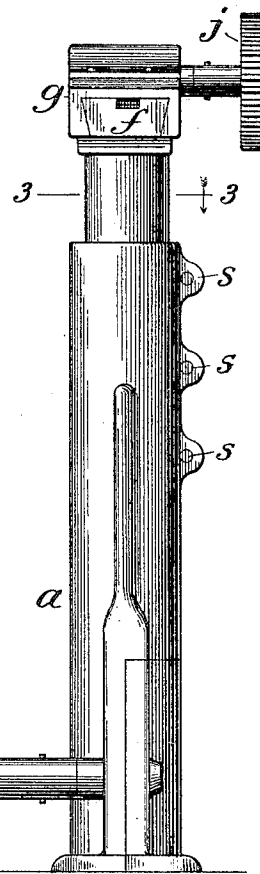
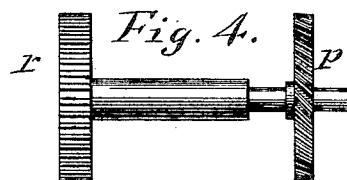
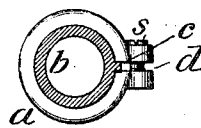


Fig. 3.



Witnesses
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By

UNITED STATES PATENT OFFICE.

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STANDARD FOR OPTICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 678,642, dated July 16, 1901.

Application filed March 8, 1901. Serial No. 50,374. (No model.)

To all whom it may concern:

Be it known that I, JOHN EDGERLY CHAMBERS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Standards for Optical Instruments; and I 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.

My invention relates to standards for optical instruments, such as those employed for the inspection of the human eye, and other similar instruments which are supported on a vertical pillar or column provided with means for accurate vertical, horizontal, and rotary adjustments of the observing instrument.

My present improvement consists in improved means for positively raising and lowering the instrument on its base by a single movement to any degree of precision required without lost motion or danger of the sudden fall of the instrument and in other details hereinafter specified.

In the drawings forming a part of this specification, Figure 1 is a side elevation, partly in section, showing the improved standard and the internal mechanism for obtaining the vertical extension of the pillar, showing also the means for horizontal or focal adjustment mounted on the pillar. Fig. 2 is a rear elevation of the same standard. Fig. 3 is a horizontal section of the extension-column on line 3 3 of Fig. 2, showing the means for preventing the rotation of the column. Fig. 4 is a side view of the skew-gear for operating the extension-column and its hand-wheel and shaft.

a is the fixed member or casing of the standard, recessed for the reception of the operating mechanism.

b is the tubular extension-column, fitted accurately within the member *a* for vertical movement and provided with a spline *c*, moving in a slot *d* in the fixed member for preventing rotary movement of the column. The member *a* is provided with screw-holes *e* as a means of attachment to a suitable base.

The optical instrument is designed to be mounted on top of the extension-column, the

latter being preferably provided, as shown in the drawings, with a means for horizontal adjustment of the instrument, consisting of a fixed piece *f*, a sliding piece *g*, a rack *h*, and pinion *i*, with hand-wheel *j* for operating the adjusting means.

In the bottom of the tubular extension-column is sweated or otherwise firmly secured a threaded portion or nut *k*, in which rotates a screw *l*, stepped into the member *a* at *m*. By this screw and the spline *c* the extension-column is effectually locked against any vertical movement, except by the rotation of said screw.

On the shaft *n* of the screw is secured a skew-pinion *o*, with which engages and intermeshes the skew-gear *p*, set in the recess *q* of member *a*. This gear is operated by the hand-wheel *r*, which when turned effects the revolution of the screw *l*, and thus raises or lowers the column *b*.

s s s are screws for adjusting the degree of friction to be exerted on the column *b* and its spline *c*, movable in the member *a*.

The vertical screw as a means of elevating and lowering the instrument, as above stated, forms a positive lock against any accidental movement and also does away with the lost motion incident to rack-and-pinion movements, and therefore imparts a distinct superiority to an instrument of precision of the above class, although not new as an elevating means. It would not, however, be available in an optometer if the ordinary means for operating the screw—namely, toothed gearing, either spur or bevel—were employed, both on account of the large and cumbrous amount of space required to insert such gears, making an unsightly piece of mechanism having no commercial value and also by reason of the defective performance of such gears in exact work, which involve a certain amount of play not consistent with the highest degree of precision in operation. By adopting the skew-gear to operate the screw I not only get the mechanism into an exceedingly compact form, occupying no more room in the standard than the ordinary rack and pinion, (the operating-gear being in both cases in the axial plane of the screw,) but from the fact that the skew-teeth being always in contact at some point the motion is perfectly smooth

and uniform and the parts move as completely in unison as though in one piece.

I claim and desire to secure by Letters Patent—

- 5 An improved standard for optical instruments, consisting of a fixed vertical casing, an extension-column sliding vertically therein, a spline for preventing rotation of the extension-column, a vertical screw, stepped in
10 said casing, working within said extension-column, a screw-threaded terminal to said extension-column, engaging said screw, a skew-

pinion on said screw, a skew-gear mounted in the casing in the axial plane of said screw, engaging said skew-pinion, and means for 15 operating the said skew-gear, to elevate and lower the extension-column, as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN EDGERLY CHAMBERS.

Witnesses:

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EB INSKEEP.