No. 874,179. PATENTED DEC. 17, 1907.

J. F. FORTH & E. J. LANGLEY.

OPTICAL TESTING APPARATUS.

APPLICATION FILED MAR. 31, 1906.

Fig. 4.

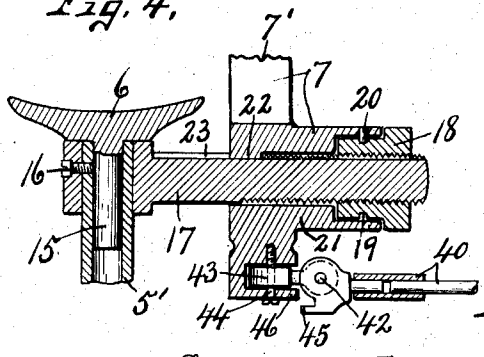


Fig. 1.

Fig. 2.

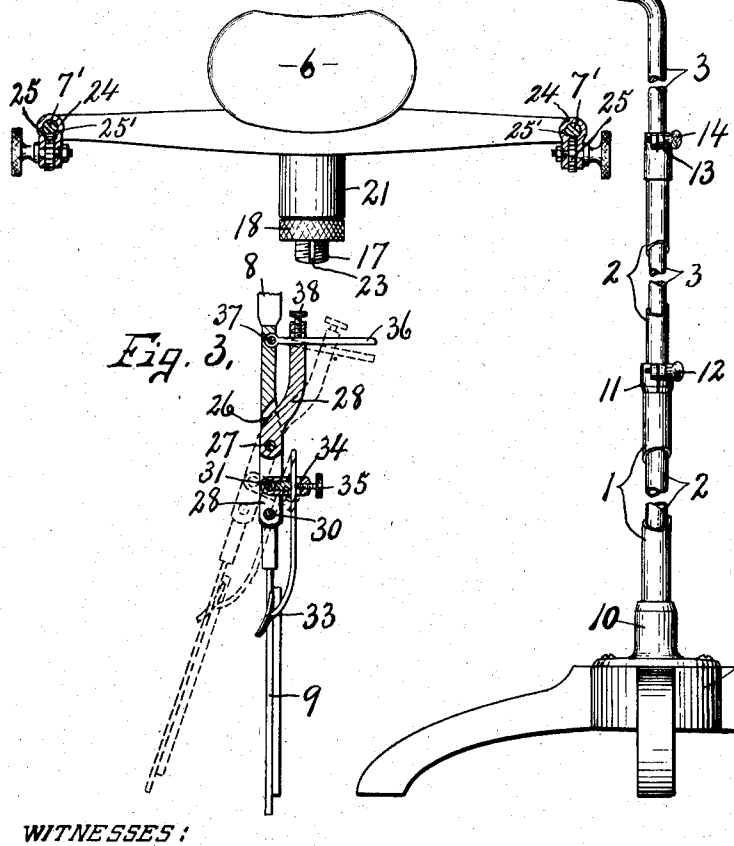
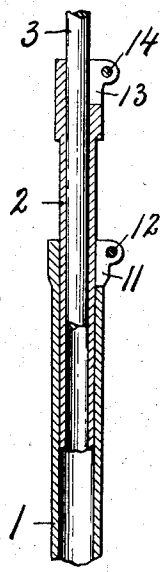


Fig. 3.

Fig. 5.



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OPTICAL TESTING APPARATUS.

No. 874,179. Specification of Letters Patent. Patented Dec. 17, 1907.

Application filed March 31, 1906. Serial No. 309,235.

To all whom it may concern:

Be it known that we, JOHN F. FORTH and EDWARD J. LANGLEY, both of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Optical Testing Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in optical testing instruments in which the lens-testing frames are mounted upon a portable vertically adjustable standard having a suitable chin-rest to support the head with the eyes in registration with the lenses of the testing-frame during the testing operation.

The essential purpose of my invention is to provide an extensible portable standard having at its upper end a chin-rest and a vertically slidable support for the testing frame.

A further object is to enable the lens-holding frame to be tilted to different angles to increase the range of vision, or rather, to throw the line of vision or focal axis up or down as the optician may desire.

Other more specific objects will be brought out in the following description.

In the drawings—Figure 1 is an elevation of an optical testing-instrument embodying the various features of my invention, portions of the standard being broken away. Figs. 2, 3 and 4 are sectional views taken respectively on lines 2—2, 3—3, and 4—4, Fig. 1. Fig. 5 is a longitudinal sectional view through a portion of the standard showing the telescoping parts, and means for clamping them in their adjusted position.

In carrying out the objects of this invention, I provide a portable frame or standard, consisting of in this instance, a series of upright telescoping sections —1—, 2—, and —3—; the lower section —1—, which is tubular, being permanently secured to a suitable supporting-base —4—, while the upper section —3— is provided with a lateral U-shape offset —5—, the upper end of which is adapted to receive a chin-rest —6—, and a U-shape frame or yoke —7— having opposite upwardly projecting parallel arms —7′— for receiving a vertically slidable yoke —8— which carries the lens-supporting frames, as —9—.

The lower end of the upright tubular standard section —1— is permanently secured in an upwardly projecting boss —10— on the base —4— and terminates at its upper end in a split hub —11— having suitable ears at opposite sides of the division for receiving a clamping screw 12—.

The upright tubular section —2— has its lower end inserted through the split hub —11— and into the section —1— in which it is adjustable, and is held in its adjusted position by the tightening of the clamping screw —12—, and the upper end of this section —2— also terminates in a split hub —13—, similar to the hub —11—, and is provided with a clamping screw —14— for tightening the hub 13— upon the adjacent end of the section —3—. This latter section —3— forming the upper section of the standard has its lower end inserted through the hub —13— and into the tubular section —2 and is clamped in its adjusted position through the medium of the split hub 13— and its clamping-screw 14—. This standard is, therefore, extensible vertically, that is, the tubular section —2— is adjustable vertically in the section —1—, and the section —3— is adjustable vertically in the section —2— to enable the support for the testing frames to be brought on a level with the eyes of the patient in either a sitting or standing position, and held at such level by tightening the clamping screws 12— and 14—, according to the degree of extension required.

The U-shape extension —5— is offset to one side of the vertical axis of the standard and its upper arm extends some distance beyond the opposite side of said axis, and terminates in an upright tubular elbow —5′—.

The chin-rest —6— is adjustable vertically and for this purpose is provided with a depending shank —15— seated in the tubular elbow 5′— and held in its adjusted position by suitable fastening means, as a set-screw —16—. Screwed to the upper end of this elbow —5′—, by the set-screw —16—, is a laterally projecting threaded stud —17—, upon which the U-shape frame having the upwardly projecting arms —7′— is adjustably mounted, such adjustment being effected by means of a nut —18— screwing upon the threaded end of the stud —17— and having an annular groove —19— in which is seated a pin —20— on the hub, as 21, of the U-shape frame. This U-shape frame is preferably arranged in a vertical

plane a sufficient distance at the rear of the chin-rest —6— so that when the chin rests upon the support —6— the eyes will be in close proximity to the lens-supporting-frames —9—.

The hub —21— and its upright arms —7′— are held in an upright position against rotation by means of a key or fin —22— which rides in the key-way —23— in the stud 17—, and it is evident that, by rotating the nut —18—, the hub —21— and its arms —7′— may be adjusted toward and from the chin-rest —6—, although any other means of adjustment may be employed for the same purpose without departing from the spirit of my invention.

The arms —7— are substantially parallel and are connected by the yoke —8— which is provided with split hubs —24— fitted upon and slidable along the arms —7′— and provided with hand-rotated pinions —25— meshing with toothed racks 25′ on the upright arms —7′—.

The central portion of the yoke —8— is bifurcated forming opposite pendent arms 26— receiving a pivotal pin —27— upon which is centrally hinged a tiltable test-frame-support —28—.

The lens supporting frames —9— are mounted as usual upon right and left-hand screws —30— and a guide-rod —31—, both of which are mounted in suitable apertures, one above the other in the lower end of the rocking support —28— below the pivot —27—, the screws —30— being provided with hand-pieces —32— by which they may be rotated to adjust the lens frames —9— to and from each other.

The nose-piece —33— is vertically adjustable in a suitable clamp —34— on the lower end of the rocking support —28— and is held in its adjustable position by a clamping screw —35—, as best seen in Fig. 3.

The rocking finger —36— is pivoted at —37— to the yoke —8— some distance above the pivot —27— and projects through an aperture in the upper end of the rock-arm —28— which is provided with a clamping screw —38— for engaging the finger —36— and holding the rock-arm —28— in its adjusted position.

It will be seen from the foregoing description that the essential features of my invention are the extensible standard mounted on a suitable supporting base and having the upper end of its upper section offset laterally at one side of the axis of the standard forming a U-shape extension which is returned some distance beyond the opposite side of said axis of the standard and supports at its free end, a vertically adjustable chin-piece —6—, a laterally adjustable U-shape frame having parallel vertical arms —7— upon which is mounted a vertically adjustable yoke —8— carrying a tiltable lens frame support —28— together with clamping devices for holding the adjustable frames in their adjusted positions.

The object of locating the lens-testing frames and their immediate supports some distance beyond one side of the standard is to enable the patient to sit or stand in a natural position with the eyes close to the lenses in the frames —9— without material interference with the standard or base so that the patient will not be required to get in any cramped position during the testing operation, and in order that this may be done without over-balancing the standard, the upper-section is offset to opposite sides of the standard to bring the strain more nearly directly over the center of the base.

The apparatus thus far described is for testing the eyes at long range, and in order that they may be tested by the same apparatus, at shorter range, I provide a vertically and laterally swinging arm —40— with a suitable sliding frame —41— adapted to receive and retain a printed card or plate containing test characters. This card supporting bar or rod —40— is hinged at one end upon a suitable pivot —42— on a horizontal swinging member —43—, which latter is pivoted at —44— to the underside of the hub —21—, the swinging axis of the bar —40— and member —43— being disposed at right angles to the other to allow the bar —40— to swing vertically and horizontally. The hinged end of the bar —40— is provided with a shoulder —45— adapted to engage an abutment —46— on the underside of the hub —21— to limit the downwardly tilting movement of the free end of the bar —40—, such tilting movement being necessary to support the card below the lens-holders —9— without obstructing the long distance view, and still permit the focusing of the eyes upon the card in the holder 41— by simply tilting the lens-holders —9—.

What I claim:

1. An optical testing apparatus comprising an upright standard and a supporting base therefor, said standard being composed of sections adjustable lengthwise of each other, means for clamping said sections in their adjusted positions, the upper section having a lateral return bend, the upper part of which lies in a substantially horizontal plane and intersecting the axis of the standard, upright arms mounted upon the free end of said horizontal portion, a yoke mounted upon said arms, and a trial frame mounted upon said yoke.

2. In an optical testing instrument, a pair of upright arms spaced apart and a support therefor, a yoke slidable vertically upon said arms and means for clamping the yoke in its adjusted position and a trial frame pivotally mounted upon said yoke between said arms.

3. In an optical testing instrument, a pair

of upright arms spaced apart and a support therefor, a vertically adjustable chin-rest on the support, a yoke adjustable vertically upon said arms toward and from the chin-rest and a trial-frame pivotally mounted upon the yoke between said arms.

4. In a device of the class described, an upright frame, a yoke adjustable vertically thereon, means to clamp the yoke in its adjusted position, and a testing frame mounted on the yoke.

5. In an optical testing instrument, a vertically adjustable yoke and supporting means therefor, a trial-frame and a support therefor pivotally mounted upon the yoke.

6. In a machine of the class described, a standard having a laterally projecting arm, a chin-piece mounted on the standard, a frame adjustable along said arm toward and from the chin-piece, and lens-holders mounted on the frame.

7. In an optical testing instrument, an upright standard having a horizontal projecting arm, a laterally projecting stud secured to said arm, a chin-piece mounted upon said arm, a stud projecting laterally from the chin-piece, a frame slidably mounted upon said stud to and from the chin-piece, means for adjusting said frame, a trial-frame and a support therefor mounted upon the first named frame.

8. In an optical testing instrument, a chin-piece, a frame adjustable toward and from the chin-piece, a support for said frame, a yoke adjustable vertically on said frame toward and from the chin-piece, and a trial-frame mounted upon said yoke.

9. In an optical testing instrument, a chin-piece, a frame adjustable toward and from the chin-piece, a support for said frame, a yoke adjustable vertically on said frame toward and from the chin-piece, and a trial-frame pivotally mounted upon the yoke to permit said trial-frame to be tilted relatively to the first named frame.

10. In an optical testing instrument, a chin-piece, a frame adjustable toward and from the chin-piece, a support for said frame, a yoke adjustable vertically on said frame toward and from the chin-piece, and a trial-frame pivotally mounted upon the yoke to permit said trial-frame to be tilted relatively to the first named frame, and means for holding the trial-frame in its tilted position.

11. In a device of the class described, a U-shape frame and supporting standard therefor, a yoke slidable vertically on the frame, means to clamp the yoke in its adjusted position, and tiltable lens holders mounted on the yoke.

12. In a device of the class described, a frame having upwardly projecting parallel arms, a yoke slidable along said arms, a rock-arm mounted on the yoke, and a testing-frame mounted on the rock-arm.

13. In a device of the class described, an upright bar, a rock-arm, a support for said rock-arm slidable upon the bar, means for clamping said support in its adjusted position, and a testing frame mounted upon the rock-arm.

14. In a device of the class described, a supporting standard having a laterally projecting arm, lens-holders, and a support for said lens-holders mounted upon said arm, and means for adjusting said support along the arm.

15. In an optical testing instrument, an upright standard having its upper end offset laterally in one direction and returned in a horizontal position in the opposite direction across the vertical axis of the standard forming a horizontal supporting arm, a frame mounted upon the free end of said arm, a chin-piece also mounted upon said arm at one side of the frame, a yoke vertically adjustable upon said frame toward and from the chin-piece, a trial-frame pivotally mounted upon said yoke, a nose-piece adjustably mounted upon said trial-frame, and means to hold the trial-frame in its tilted position.

In witness whereof we have hereunto set our hands this 28 day of March 1906.

JOHN F. FORTH.
EDWARD J. LANGLEY.

Witnesses:
H. E. CHASE,
MILDRED M. NOTT.