

No. 654,346.

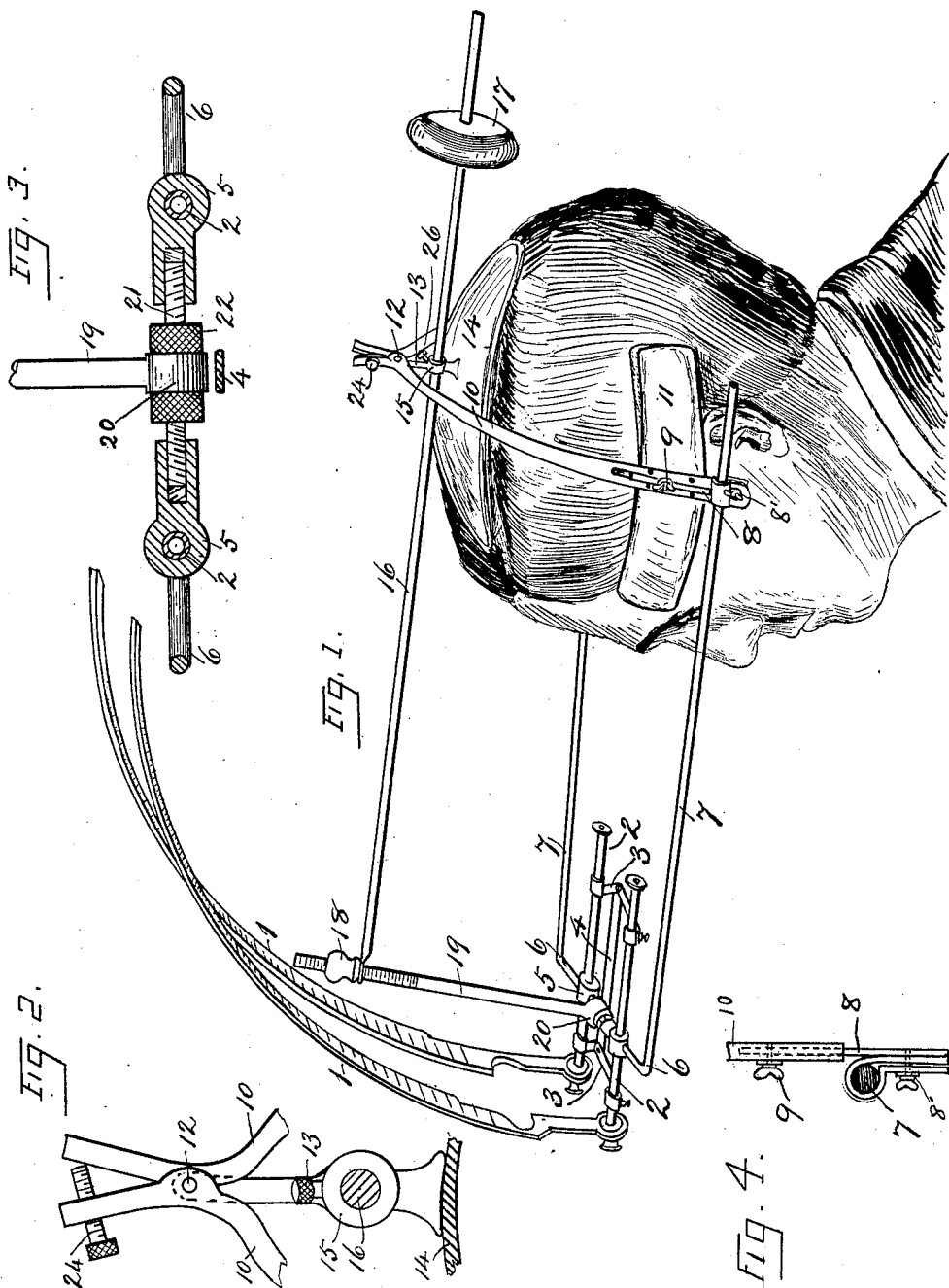
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F. M. GRAHAM.

INSTRUMENT FOR DETERMINING AMPLITUDE OF VISION.

(Application filed Oct. 5, 1899.)

(No Model.)



Witnesses

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FRANCIS M. GRAHAM, OF SAN JOSÉ, CALIFORNIA.

INSTRUMENT FOR DETERMINING AMPLITUDE OF VISION.

SPECIFICATION forming part of Letters Patent No. 654,346, dated July 24, 1900.

Application filed October 5, 1899. Serial No. 732,734. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. GRAHAM, a citizen of the United States, residing at San José, in the county of Santa Clara and State

of California, have invented certain new and useful Improvements in Instruments for Determining the Amplitude of Vision, of which the following is a specification.

My invention relates to improvements in instruments termed "tropometers," used by oculists to determine the angular extent of vision of either eye; and the object of my invention is to provide an instrument of this character which can be so adjusted to the head of the patient as to be independent of any movement thereof.

My invention also resides in the novel construction, combination, and arrangement of parts hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved device in position, and Figs. 2 and 3 are detail views. Fig. 4 is a detail view showing the slide 8.

Referring to the drawings, the arcs 1, of any suitable metal, are pivotally mounted on the end of the tubes 2, which are maintained always in parallelism by pairs of jointed links 3, connecting the tubes at their ends, and the rod 4, connecting the joint of one pair of links with that of the other pair, forming the well-known parallel movement. Said tubes are mounted in collars 5, supported by the bent ends 6 of rods 7, the rear ends of said rods 7 being adjustably supported in the slides 8 by means of the clamp 8'. Said slides 8 are vertically adjustable, as shown at 9, in the curved arms 10, secured upon the clamp-pieces 11 (one not shown) and pivoted at their upper end, as at 12, on a standard 13, rising from a headpiece 14. Through a bearing 15 in said standard passes a rod 16, carrying a counterweight 17 on its rear end and at its forward end being adjustably secured by a nut 18 on a threaded hanger 19. The lower end of said hanger 19 has a collar 20, in which is mounted a rod 21, having at its ends right and left hand threads. Milled collars 22, one on each side of the collar 20,

are provided to turn the threaded rod 21. Said ends screw into internally-threaded sleeves extending from the collars 5.

The headpiece 14 having been first placed on the head, the device is first adjusted to the width of the head, and for this purpose the adjusting-screw 24, situated at the upper extremity of the arms 10, is turned to force outward the upper ends of the said arms 10 and inward their lower ends, and thus compresses the clamp-piece 11 against the sides of the head. Next it is adjusted for the depth of the head, and for this purpose the slides 8 are moved up or down and clamped in such a position that when the rods 7 are horizontal they shall be on a level with the central axis of vision. The device is then adjusted for different lengths of heads. It is necessary that the eye shall be in the center of a circle of which the arc 1 is a part. The rods 7 are therefore moved in or out until the farther end of the tube or director 2 is at a distance from the eye equal to the radius of this arc. The rod 16 is also correspondingly moved in or out and secured by the set-screw 26. The device is now adjusted for different widths between the eyes by turning the screw-rod 21. The tubes 2 should now be approximately in such a position that the patient can see through each tube with the corresponding eye. However, if the distance from the nut 18 of the screw-rod 21 be too great or too small the tubes 2 will be below or above the level of the eye and will be out of the line of vision, since the rear ends of the rods 7 are behind the eye. Further adjustment for this purpose may be made by the nut 18. The device will now be clamped in such a position on the head of the wearer that the line of vision of each eye when directed through the corresponding tube will be the central or axial line of vision, and this independently of any movement of the head. Therefore the extent of vision in any meridian through the end of the tube may be very accurately determined. For this purpose the arcs 1 are graduated in degrees of angles, and in order to ascertain the extent of vision of either eye in any meridian—as, for in-

stance, the vertical meridian—the corresponding arc is turned to point upward and the patient reads the marks thereon as far as he can, and then it is pointed downward and the reading is repeated.

I claim—

1. In a device of the character described, the combination of a tube, means for adjustably supporting it on the head of a patient so as to be in the central or axial line of vision, and an arc pivotally mounted on the tube as an axis, substantially as described.

2. In a device of the character described, the combination of a graduated arm, an axis around which said arm swings, means for supporting said axis on the head of the patient, means for adjusting it to be in a line from the eye, and means for adjusting the distance from the eye of the pivotal point of the arm, substantially as described.

3. In a device of the character described, the combination of a central director or axis, means for securing it to the head of the patient, adjusting devices for bringing said director in a line with the eye, and means car-

ried by said director, for determining the amplitude of vision, substantially as described.

4. In a device of the character described, the combination of directors, one for each eye, means for securing them upon the head of the patient, means for separating them to a distance equal to that between the eyes, adjusting devices for bringing said directors in line with the eye, and means carried by each director for determining the amplitude of vision of the corresponding eye, substantially as described.

5. In a device of the character described, the combination, with a graduated scale for ascertaining the amplitude of vision, of means for securing said scale to the head of the patient at a point behind the eyes, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FRANCIS M. GRAHAM.

Witnesses:

B. F. GARRISON,
N. V. GREENE.