(No Model.) 2 Sheets—Sheet 1.

W. E. WALKER.

DENTAL FACIAL CLINOMETER.

No. 566,948. Patented Sept. 1, 1896.

Fig. 1.

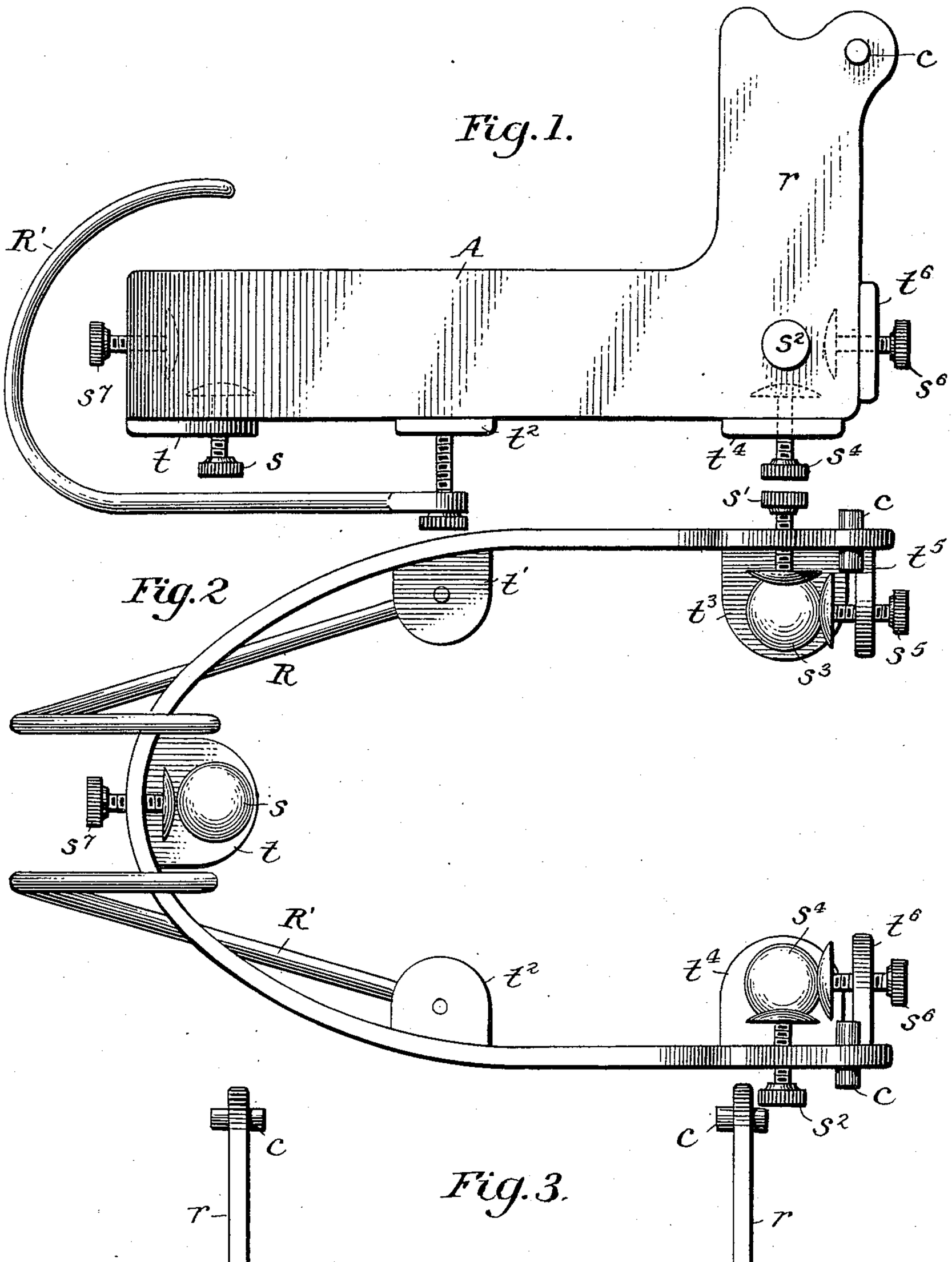

Fig. 2.

Fig. 3.

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Fig. 4.

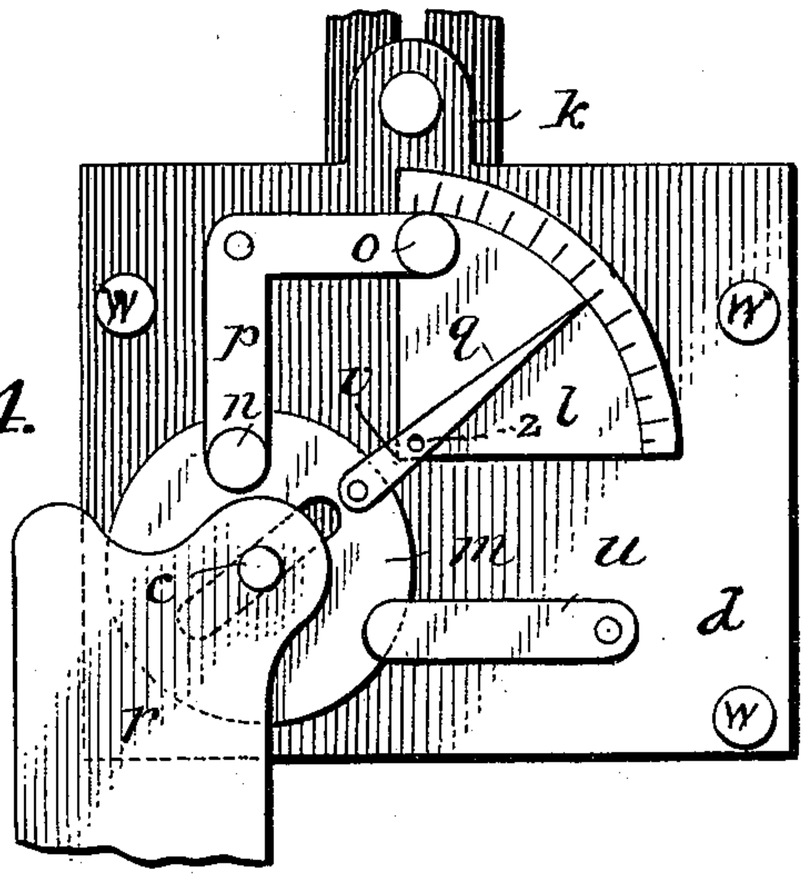
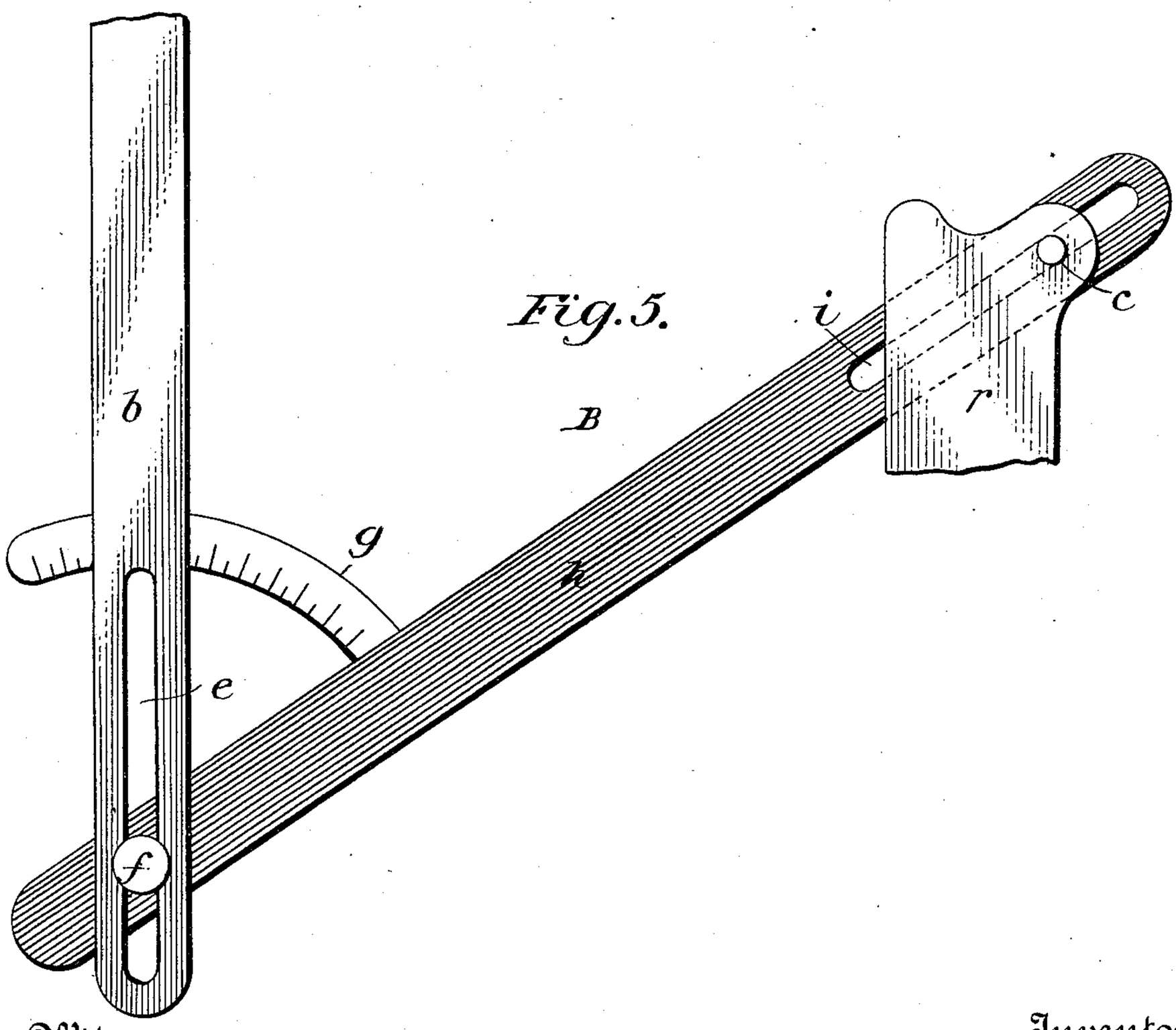


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM E. WALKER, OF PASS CHRISTIAN, MISSISSIPPI.

DENTAL FACIAL CLINOMETER.

SPECIFICATION forming part of Letters Patent No. 566,948, dated September 1, 1896.

Application filed November 25, 1895. Serial No. 570,112. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. WALKER, a citizen of the United States, residing at Pass Christian, in the county of Harrison and State of Mississippi, have invented certain new and useful Improvements in Dental Facial Clinometers; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

In my application for patent, Serial No. 568,146, for an improved dental articulator I have stated that when the human mandible is in action, either in opening or closing, in biting or in chewing, the condyles move forward and backward in the glenoid fossæ at an angle with the mean of the curved line of occlusion of the teeth; and I have also stated that not infrequently that angle varies in the two sides of the jaw of the same person, that it ranges (in my experience) from fifteen to forty-five degrees in different persons, that it governs the articulation of the natural teeth, and that a knowledge of it will enable the dental prosthetist to naturally articulate artificial teeth.

My present invention relates, primarily, to the ascertainment of the course traversed by the human condyles in the glenoid fossæ; and it consists in the hereinafter-described device for measuring the length and incline of said course, said incline determining the angle made by the condyle with any predetermined line, and which I call a "facial clinometer." It may be adapted to measure any other angular movement of the jaw or any angle of the face.

Figures 1, 2, and 3 are respectively a side, plan, and front view of my clinometer; and Figs. 4 and 5 illustrate two descriptions of gages which may be employed with it.

In general it is a light and elastic frame of metal or other suitable material, conforming in outline to that of the human mandible, and furnished with attachments for fitting it snugly to the jaw and holding it there and for ascertaining and measuring the angle made by the condyle when in motion.

A is the frame of the clinometer, having the upright *r*, corresponding to the ramus of the human jaw, on which at either side is fixed pin *c*, which indicates the condyle. A tongue *t* is attached to the lower edge of the frame in front, and on either side tongues t' and t^2 are attached, tongues t^3 and t^4 near either end, and back of the upright *a* tongues t^5 and t^6, said tongues being designed to pass under the jaw and back of the ramus when the clinometer is in position. Tongues *t*, t^3, t^4, t^5, and t^6 are provided with thumb-screws *s*, s^3, s^4, s^5, and s^6, on the upper ends of which are swivel-jointed buttons or pressure-pads, whereby the clinometer may be fitted snugly under the mandible. Thumb-screws s^7, s', and s^3, similarly provided with pressure-pads, pass through the frame at its front and rear ends and adjust it snugly to the sides of the mandible. To hold the frame more securely in position, two J-shaped elastic clamping-rods R and R′ have their longer legs attached by adjustable screws to tongues t' and t^2, their shorter legs entering the patient's mouth. When required, the mouth may also be provided with upper and lower impression-trays, (not shown in the drawings,) in which impression material may be placed if desired. When frame A is thus secured to the mandible, any movement that it may make causes pin *c*, which is placed opposite the corresponding condyle, to follow the course traversed by the condyle in the glenoid fossa. To determine this course, there may be employed any suitable means of recording it, or of measuring the angle which it makes with the mean of the curved line of occlusion of the teeth, which in the typical face makes an angle of seventy-five degrees with the facial line. For this purpose pin *c* is made hollow, and the simplest method of ascertaining the course of the condyle's movement is to insert a pencil in it as a socket and let it trace its course on a piece of stiff paper held against the side of the face; and if the edge of the paper is straight and is held in a vertical position, or vertical or horizontal lines are drawn upon it, the angle of its course may be approximately measured.

Fig. 5 shows a more accurate measuring device B, which consists of the bar *b*, having slot *e* in its lower end, through which passes

set-screw *f*, adjustably holding bar *h*, having slot *i* at its upper extremity, engaging with tube *c*, and carrying gage-plate *g*, bar *b* being held by any suitable means parallel with the facial line. As the patient's jaw is opened and closed pin *c* slides up and down in slot *i*, and when it does so without friction against either side thereof gage-plate *g* marks the angle between bars *b* and *h*, which is the angle which the course of the condyle in the glenoid fossa makes with the facial line.

Fig. 4 shows a measuring device C of scientific accuracy, which is carried by the adjustable head-piece *k*, adapted to pass over or around the head, as desired, said head-piece being arranged so as to carry gage B, if desirable, or other similar attachment for indicating the facial line or any other line of the head with which it is desired to compare the course traversed by the condyle, including the mean of the curved line of occlusion. Plate *d* is adapted to be fitted to the side of the head by adjusting-screws *w*, carrying buttons or pressure-pads on their inside invisible ends, and carries gage-plate *l* and slotted disk *m*, adapted to be clamped to plate *d* by set-screws *n* and *o*, passing through arm *p*. Disk *m* is normally held under a gentle pressure by spring *u* and carries needle *q*, and when the line of motion has been ascertained needle *q* is fixed in place by a pin (not shown) passing through pin-hole *z* into plate *l*, said needle being fixed to disk *m* in line with the slot, which is adapted to engage with pin *c*. When the course of the condyle is ascertained by the direction of the slot, in which pin *c* freely moves as the mandible is moved, the corner *v* of gage-plate *l* is moved under the center of needle *q*, and the needle then indicates on the gage the size of the angle made by the line traversed by the condyle with the facial line. By means of scale *y* the distance traversed by the condyle is ascertained.

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

1. A device for ascertaining the course in the glenoid fossa pursued by the condyle of the human jaw when in motion, consisting of a frame conforming to and fixed upon the jaw and means whereby said course is made apparent to the observer, substantially as described.

2. The combination of an adjustable frame conforming to and adapted to be fixed upon the lower jaw, and having an indicator representing the condyle, with means for ascertaining the course traveled by said indicator when the jaw is moved, substantially as described.

3. The combination of an adjustable head-piece and frame conforming to and adapted to be fixed upon the lower jaw with a pin representing the condyle and a gage-plate for recording the angle between any predetermined line and the course traveled by the pin when the jaw is in motion, substantially as described.

4. The combination of an adjustable head-piece, jaw-piece, and appliances carried thereby for registering the lines and angles of the face and the moving jaw, substantially as described.

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

WILLIAM E. WALKER.

Witnesses:
K. L. THORNTON,
ROBERT CAMBEL.