June 8, 1926. 1,588,091

R. W. BURCH

DENTAL ARTICULATOR

Filed March 24, 1923

Fig. 1.

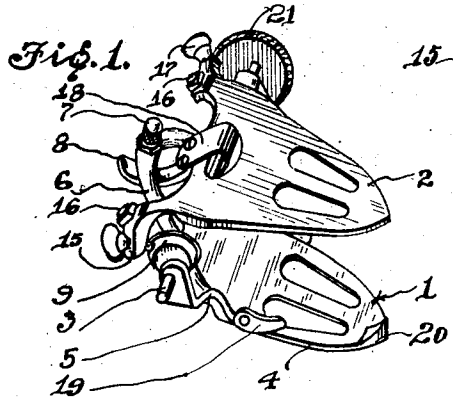


Fig. 2.

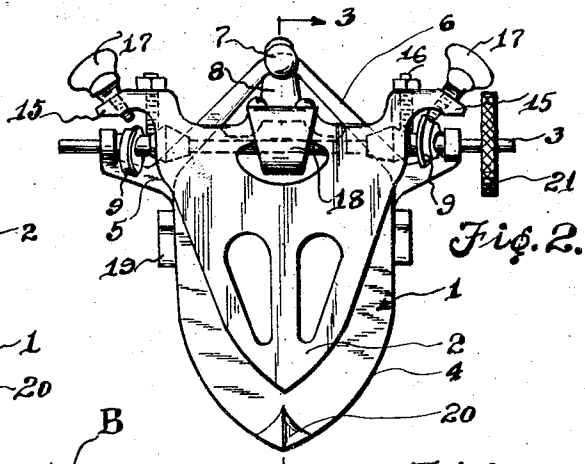


Fig. 3.

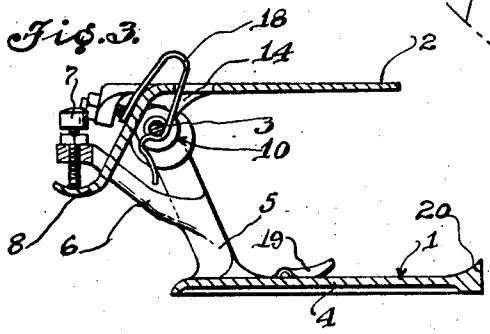


Fig. 4.

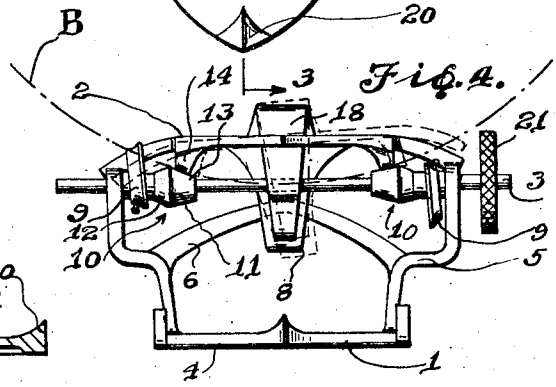


Fig. 5.

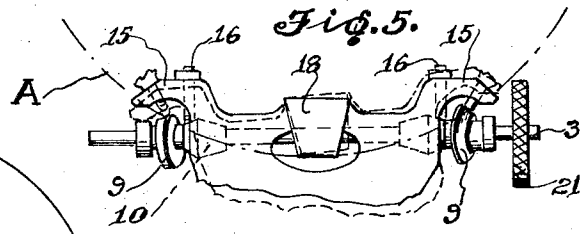


Fig. 7.

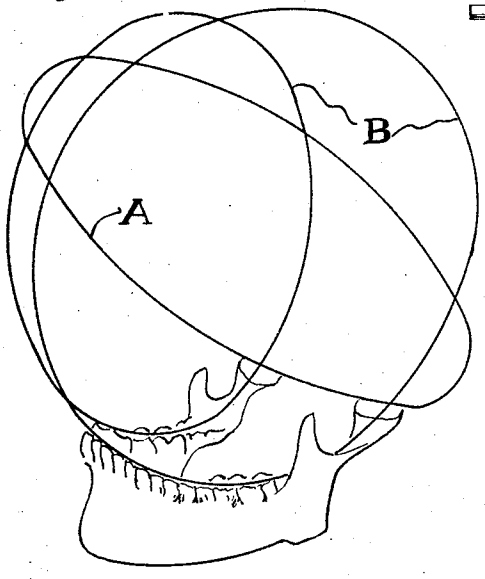
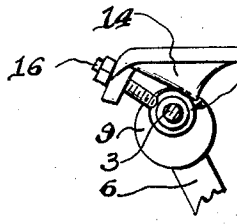


Fig. 6.



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UNITED STATES PATENT OFFICE.

RAY W. BURCH, OF FORT LAUDERDALE, FLORIDA.

DENTAL ARTICULATOR.

Application filed March 24, 1923. Serial No. 627,520.

This invention relates to dental articulators and more particularly to a device which will reproduce the articulatory movements of the human jaws.

The principal object of the invention is to provide a device of this character in which plaster casts having artificial teeth therein can be mounted and means to speedily grind the teeth in order to permit the natural functioning of the mouth.

The operation of this articulator is based largely on the theory that the path of the articulatory moving mandible is determined as though it moved on the outer surface of an eight inch sphere; that is the two condyles and the cusps of the teeth contact as if on the surface of the sphere during all the articulatory movements.

When the articulator is manipulated the upper plate holding the mandible cast will move forward and then execute a lateral chewing movement thereby producing a spiral action of the plate.

This spiral movement acting in combination with the interlocking of the cusps will produce a milling action and reproduce the articulatory movements of the human jaw and grind the artificial teeth in the proper and correct manner for the efficient crushing of the food.

For a more detailed understanding of the invention attention is now called to the drawings in which a preferred embodiment is shown illustrated. In these drawings like parts are designated by like reference characters in all the views.

Fig. 1 is a perspective view of the dental articulator.

Fig. 2 is a top plan view thereof.

Fig. 3 is a section on line 3—3 of Fig. 2.

Fig. 4 is a front view.

Fig. 5 is a fragmentary top view.

Fig. 6 is a detail of the eccentric and cam construction.

Fig. 7 is a diagrammatic view showing the motion the human jaw describes.

Referring now to the drawings in detail, numeral 1 designates the base, 2 the upper plate member and 3 the shaft. The base 1 is composed of a base plate 4 having side arms 5 which form bearings for the shaft 3.

Integral with the arms 5 is a V shaped member 6 having a set screw 7 at the apex which co-operates with an arm 8 of the upper plate member for limiting one of the movements of the said plate member.

Fastened to the shaft 3 adjacent the bearings 5 are eccentrics 9 parallel to each other and at an angle to the shaft 3 and with their limit of throw reversely arranged. Integral with the eccentrics are cams 10 having a ridge 11 in the center and sloping sides 12 and 13.

As noticed in Fig. 6 underneath the upper plate member 2 and coacting with the cams 10 are projections 14 which bear against the surfaces 13 of the cam. Integral with the said plate member are arms 15 having screws 16 therein which bear against the surfaces 12 of the cam. Adjacent the screws 16 are wing nuts 17 which alternately bear against the periphery of the eccentric 9. Attached to the arm 8 as noted in Fig. 3 is a flat spring 18 which bears around the shaft 3 and resiliently forces the upper plate member 2 against the cams 10.

Numeral 19 represents a pair of arms and 20 a ridge on the tip of the bottom plate for supporting the cast.

The operation of this device is as follows. The casts having the teeth imbedded are fastened to the upper and lower plates respectively and the knob 21 turned. This will cause the shaft 3, eccentric 9 and cams 10 to revolve. The eccentrics coming in contact with the wing nuts 17 alternately will impart a circular movement in a horizontal plane of the casts supported by the upper plate member which corresponds to the circle A in the diagram shown in Fig. 7. This motion can be increased or decreased by adjusting the set screws 16. At the same time a rocking motion will be imparted to the cast which corresponds to the circle B and is at right angles to the circle A. This last movement is caused by the lugs 14 alternately moving upward and downward on the slope 13 of the cams 10.

Having thus described my invention what I desire to secure by Letters Patent is:

1. In a dental articulator, upper and lower plate members, a common shaft, means to move the upper plate member in a horizontal plane so the said member will describe a circle and means to move said plate member for describing a circle in a plane substantially at right angles to the first mentioned circle, the said means including eccentrics and cams on the said common shaft and means coacting with the said eccentrics and cams.

2. In a dental articulator a base, an upper

plate member, a common shaft, a common means for moving the upper plate member so the said plate member will describe a circle in both a horizontal and vertical plane, the said means including eccentrics and cams on the said common shaft, and means coacting with the said eccentrics and cams.

3. In a device of the class described in combination, a base, side arms, a shaft, an upper plate member, means for moving said upper plate member so the said member describes a circle simultaneously in a vertical and horizontal plane, the said means including eccentrics and cams on the said common shaft, and means coacting with the said eccentrics and cams.

4. In a device of the class described in combination, a base, side arms forming a bearing, a shaft, eccentrics and cams fastened to said shaft, a movable upper plate member, lugs on the said upper plate member coacting with the said cams and means resiliently forcing the said lugs and cams in contact with each other.

5. In a dental articulator, the combination of a base, side arms forming a bearing, a shaft, eccentrics and cams on said shaft, a movable upper plate member, lugs on the said plate member coacting with the said cams and a spring for resiliently forcing the said lugs against the said cams.

6. In a device of the class described in combination, a base, side arms forming a bearing, a shaft, eccentrics and cams on said shaft, an upper plate member, side arms integral with the said plate member, set screws in said side arms and a spring resiliently forcing the said upper plate member against the said shaft.

7. In a dental articulator having a base, side arms forming a bearing, a shaft, eccentrics on said shaft, the said eccentrics being parallel to each other and at an angle to the said shaft, cams on said shaft, an upper plate member, a V shaped element integral with the said side arms and means for limiting one of the downward movements of the said upper plate.

8. In a dental articulator, a stationary lower member, arms integral with the said lower member eccentrics and cams on said shafts, lugs on the said upper plate member coacting with said cams, and resilient means for forcing the said cams and lugs in contact with each other, a movable upper member, a shaft passing through the upper part of the said arms, a ridge at the toe of the said stationary lower member, adjustable side arms attached to the said stationary member, the said ridge and side arms adapted to hold plaster casts in definite relation to the said lower member and means to move the said movable upper member.

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