

April 17, 1951

L. L. SHORE
DENTAL ARTICULATOR

2,549,339

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2 Sheets-Sheet 1

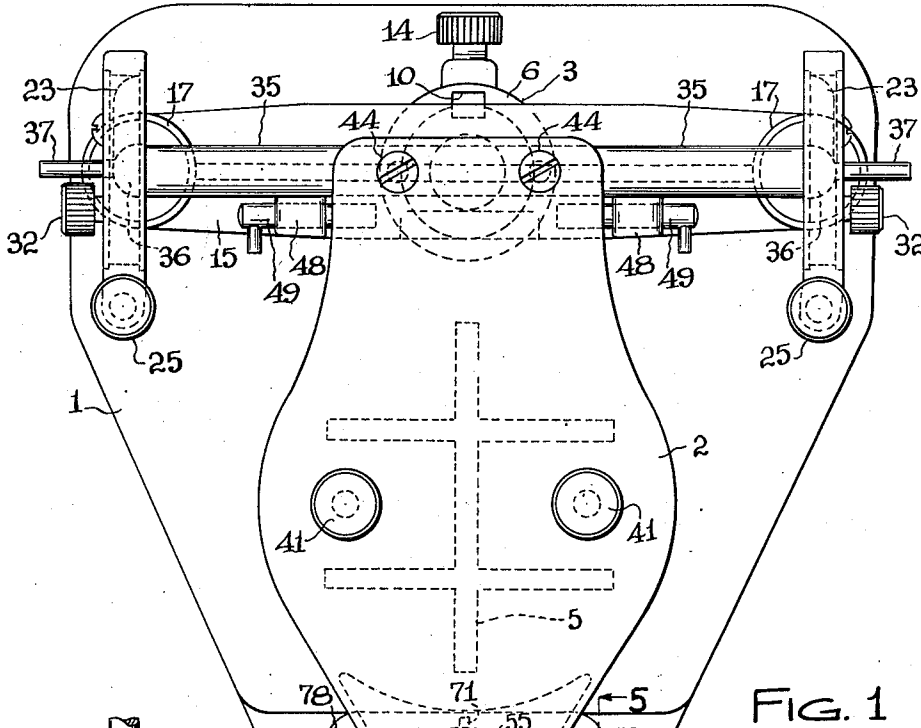


FIG. 1

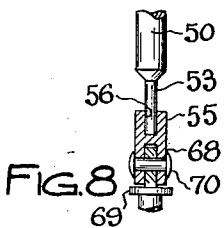
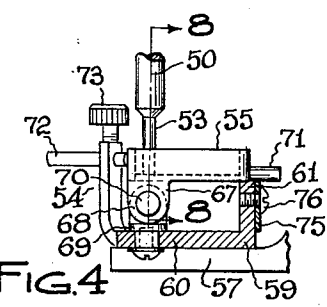
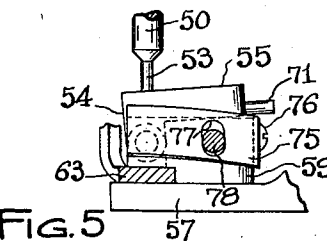
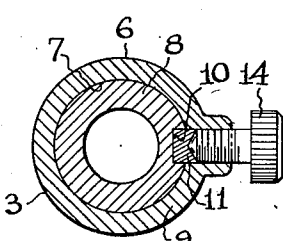


FIG. 6

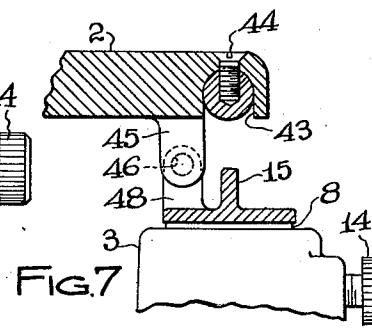


FIG. 7

INVENTOR.
LOUIS L. SHORE
BY
William J. Seler
ATTORNEY

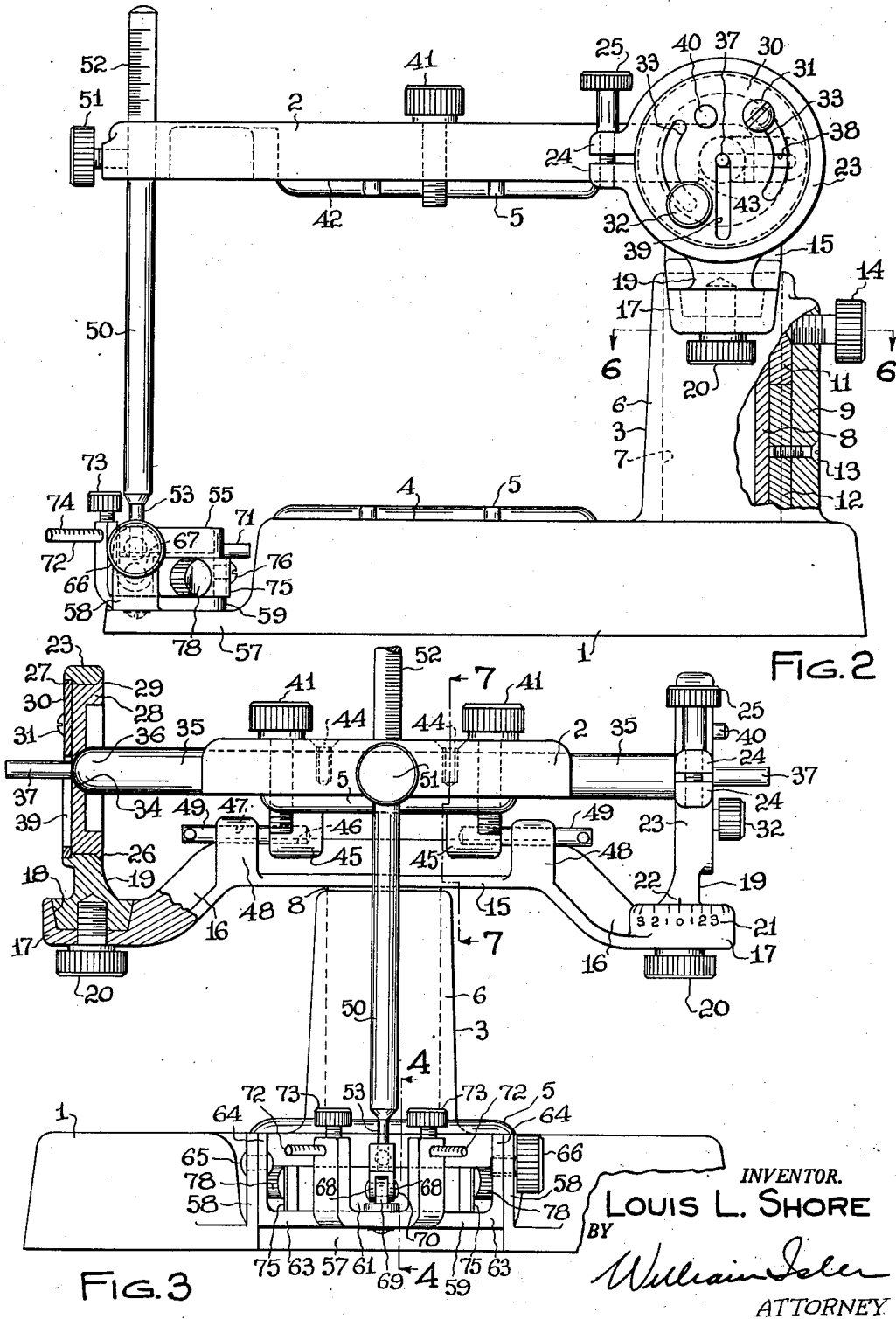
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UNITED STATES PATENT OFFICE

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DENTAL ARTICULATOR

Louis L. Shore, Cleveland, Ohio

Application May 1, 1948, Serial No. 24,457

2 Claims. (Cl. 32-32)

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This invention relates to dental articulators of the type used to simulate jaw movements in the processing of dentures.

It is a primary object of the present invention to provide an articulating device which is also adapted to serve as a duplicator and centriculator, thereby obviating the requirement for several distinct pieces of dental equipment.

Another object of my invention is to provide an articulator which is provided with an adjustable support post, thereby permitting greater accuracy in translating the movement of the patient's jaw to the articulator.

Still another object of my invention is to provide an articulator in which a greater range of adjustment is possible than in presently used devices.

Other objects and advantages of my invention will become apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a top plan view of an articulator embodying the features of my invention.

Fig. 2 is a side elevation of my improved articulator, a portion thereof being broken away to show details of the columnar structure.

Fig. 3 is a front elevation of the articulator, a portion thereof being broken away to show details of the structure.

Fig. 4 is a fragmentary cross-sectional view, taken on line 4-4 of Fig. 3.

Fig. 5 is a fragmentary cross-sectional view, taken on line 5-5 of Fig. 1.

Fig. 6 is a cross-sectional view, taken on line 6-6 of Fig. 2.

Fig. 7 is a cross-sectional view, taken on line 7-7 of Fig. 3, and

Fig. 8 is a cross-sectional view, taken on line 8-8 of Fig. 4.

Referring more particularly to the drawings, the articulator is seen to comprise broadly a base 1, an upper jaw member 2 and a central support column 3. The base 1 is generally triangular in form and is provided with a medially disposed portion 4 which serves as a mounting plate for an artificial denture or model, as is customary in the art. The mounting plate 4 has embossed thereon a series of intersecting ribs 5 which serve to maintain the denture against slippage on the mounting plate and also serve as registration points for accurate replacement of the denture on the plate after it has been removed.

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Extending vertically from the top surface of the rearward portion of the base 1, is a substantially cylindrical embossment 6 provided with a bore 7 which is adapted to slidably receive a post 8 which forms the support for the condylar elements to be hereinafter described. The post 7 and the wall 9 of the embossment 6 are provided with complementary keyways 10 which are adapted to slidably receive keys 11 and 12. The lowermost key 12 is secured against movement by a screw 13. The upper key 11 is held in frictional engagement with the post 8 by means of a thumb screw 14 which is threaded into the wall 9 of the embossment 6 and which bears against the surface of the key 11. It will be apparent that the foregoing arrangement of parts permits the post 8 to be raised or lowered, as desired, and locked at a selected height by proper manipulation of the thumb screw 14. It will also be noted that the keys 11 and 12 prevent the post 8 from rotating about its own axis, thereby maintaining the condylar elements in equilateral relationship to the incisal guide unit.

The upper portion of the post 8 terminates in a cross-piece 15 which, for purposes of rigidity and strength, is formed with a T cross-section, as best seen in Fig. 7. The end portions 16 of the cross-piece project downwardly at an angle and terminate in disc-like portions 17 which are recessed as at 18 to provide sockets for condylar posts 19 which are rotatably mounted therein. A thumb screw 20 extends upwardly into the recess 18 centrally thereof and is threaded into the post 19 thereby permitting the post 19 to be secured against rotation after a desired setting has been obtained. Suitable indicia 21 may be placed around the exterior of the disc-like portion 17 and an indicator mark 22 may be placed on the post 19 so as to indicate the relative angularity through which the posts 19 are rotated.

Each condylar post 19 is surmounted by a condylar head 23 in the form of a split ring having projecting ears 24. An adjusting screw 25, which traverses the ears 24, can be utilized to vary the internal diameter of the head 23 within narrow limits.

The head is recessed circumferentially thereof as at 26 and 27, the recess 26 serving to accommodate a flange 29 on a circular bearing 28 which is rotatably mounted in the head 23. The recess 27 accommodates a flat circular plate 30, the plate 30 and the bearing 28 being joined together by a screw 31 and a thumb screw 32. The screw 31 allows a slight clearance between the parts, so that when the thumb screw 32 is released, the

plate 30 may be rotated relatively to the bearing 28, arcuate slots 33 being provided in the plate 30 to permit such rotation.

An elongated depression 34 of semi-circular cross-section is formed in the bearings 28, which depression is adapted to serve as a bearing surface for the spherical ends 35 of a shaft 35 which extends between the condylar heads 23 and is supported by the bearings 28 mounted therein.

Rigidly secured to each end 36 of the shaft and projecting axially therefrom is a shaft extension 37 of smaller diameter than the shaft 35, which extends through openings in the bearing 28 and the plate 30 and projects laterally of the condylar heads 23. The aforesaid openings comprise a horizontally disposed slot 38 in the bearing 28 and a corresponding slot 39 in the plate 30, the slot 39 being rotatable from an aligned position with the slot 38 to a position substantially vertical or normal to the slot 38. It will be apparent (see Fig. 2) that when the slot 39 coincides with the position of slot 38, the shaft 35 is free to move along the slots in a horizontal plane. However, when the plate 30 is rotated so that the slot 39 is disposed vertically, the shaft 35 will be locked against displacement and will be free to move only about its own axis. Likewise, if the condylar heads 23 be rotated about the axis defined by the screws 20 so as to be disposed at an angle other than normal to the longitudinal axis of the shaft 35, the shaft can again be locked against displacement by rotation of the plate 30 and its slot 39 to a position which, under these circumstances, is intermediate the horizontal and vertical positions. Thus at any selected position of angularity of the heads 23, the shaft 35 is either free to move back and forth in the depressions 34 or is locked in centric relation in the articulator, depending upon the setting of the plate 30. A pin 40 is secured to the surface of the plate 30 for convenience in effecting rotation of the plate.

The upper jaw member 2, just as the base 1, is of a generally triangular form, but is of somewhat smaller proportion. Its undersurface is provided with the pattern of raised ribs 5, previously mentioned, which serves as a mounting plate 42 for an artificial denture or model. Two laterally spaced thumb-screws 41 extend from the upper surface of the member 2 into the mounting plate area and are normally threaded into nuts (not shown) which are imbedded in the denture. The screws 41 serve to secure the denture to the mounting plate and also assist in assuring accurate registry of the denture when it is replaced after removal.

The undersurface of the rearward portion of the member 2 is provided with a groove 43 of semi-circular cross-section, in which the shaft 35 may lie. The jaw member 2 is rigidly secured to the shaft 35 by two screws 44.

Two spaced ears 45 depend from the jaw member 2, these ears having bores 46 extending there-through. When the upper jaw member is parallel to the base 1, the bore 46 is in alignment with a bore 47 in spaced ears 48 which project upwardly from the cross-piece 15 in proximity to the ears 45. A locking pin 49 extends through the ears 45 and 48 and thereby locks the member 2 and the shaft 35 against rotation relative to the base 1.

The forward extremity of the member 2 has slidably mounted therein an incisal stem or post 50 which is secured at selected positions of height by means of a screw 51 which bears against it.

Suitable indicia 52 are scored on the post 50 to provide reference marks for the settings of the post.

The lower portion of the incisal post 50 terminates in a rounded stub or finger 53 which rests in a narrow groove 56 in a support member 55 which forms part of the incisal guide assembly indicated generally by the numeral 54 and to be more fully described below.

The forward portion of the base 1 is formed as a low flat platform 57 with upstanding spaced ears 58 between which the incisal guide assembly 54 is pivotally suspended.

The incisal guide 59 is in the form of a semi-circular base 60 having an upstanding flange 61 around the arcuate periphery thereof and two upstanding posts 62 along the diametrical edge thereof. Extending laterally from the incisal guide, co-planar with the base 60, are narrow extensions 63 which are upturned at their ends to form ears 64. The ears 64 nest between the ears 58 on the platform 57 and are pivotally secured to the ears 58 by means of a rivet 65 and a thumb screw 66. The incisal guide 59 may thus be tilted or pivoted to selected positions of inclination and may be secured in such positions by means of the screw 66.

The support member 55, previously mentioned, is formed with a depending bifurcated portion 67 at the forward end thereof and the ears 68 which are thus formed straddle a swivel pin 69 which is pivotally secured to the base 60 of the incisal guide 59. The support 55 is in turn pivotally secured to the swivel 69 by means of a rivet 70 or the like which extends through the ears 68 and the swivel 69. A projecting pin 71 extends from the rearward portion of the support member 55 and is adapted to overlie the flange 61 and maintain the support 55 in a substantially horizontal position, except as will hereinafter appear.

Adjustable stops 72 are slidably mounted in the posts 62 and are frictionally secured against movement by thumb screws 73 which are threaded vertically into the posts 62 and bear against the stops 72. When manipulating the articulator, the arc traversed by the support 55 may be limited in either direction by proper setting of the stops 72, the ends of the stops thereby abutting the sides of the support member 55 when the desired limit of pivotal movement is reached. Suitable indicia 74 may be provided on the stops 72 to serve as memoranda of the settings.

Two arcuate spring-metal leaves 75 are pivotally secured to the flange 61 by a common screw 76. The spring leaves conform substantially to the shape and height of the flange 61. Each leaf 75 is provided with a slot 77 through which extends a thumb screw 78 which bears against the leaf. As best seen in Fig. 5, the leaves 75 may be pivoted about the screw 76 so as to create an incline upon which the pin 71 will ride during manipulation of the articulator. The leaves 75 can, of course, be secured in position by the thumb screws 78.

The arrangement of the parts of the incisal guide assembly 54 thus permits universal movement of the incisal post 50 to accurately simulate the jaw movements of the patient. The settings of the various parts are easily and quickly made and, by means of the indicator markings, may be accurately duplicated whenever desired.

The manner of using the articulator and the method of translating the patient's jaw move-

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ments into the mechanical movements of the device is well known to those skilled in the art and need not be repeated herein. It may be pointed out, however, that the centers of the condylar heads may be compared with the condyle socket centers of the human maxillae and when the shaft 35 is held in locked position, the dentures which are secured to the mounting plates are in centric relation to the articulator. The adjustability of the central support column 3 permits the condylar heads to be raised or lowered in conformity with the actual anatomical structure which is being duplicated, thereby insuring accuracies in simulation which have heretofore been unavailable to the dental practitioner. This also permits a greater degree of accuracy in the setting up and articulation of finished and unfinished dentures than has heretofore been possible.

The novel means for locking the entire upper jaw member against movement also permits the articulator increased usefulness in processing dentures and models, and in duplicating and other uses.

It is to be understood that the form of my invention, herein shown and described, represents a preferred example of the same and that various changes in the shape, size and arrangement of the parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a dental articulator, a base member, an upper jaw member and vertically adjustable

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means for supporting said upper jaw member, said means comprising a hollow column provided on said base member, a supporting post vertically slidable in said column, vertically extending keyways provided in said post and said column, a key connecting said keyways, and a set screw extending radially through said column into engagement with said key whereby to frictionally secure said post against sliding movement.

2. In a dental articulator, a base member, an upper jaw member and vertically adjustable means for supporting said upper jaw member, said means comprising a hollow column provided on said base member, a supporting post vertically slidable in said column, vertically extending keyways provided in said post and said column, a key immovably secured to said column and connecting said keyways, a second key slidably mounted in said keyways, and locking means provided on said column for engaging said second key whereby to frictionally secure said post against sliding movement.

LOUIS L. SHORE.

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