

Sept. 18, 1928.

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A. GYSI

DENTAL ARTICULATOR

Filed Nov. 2, 1926

3 Sheets-Sheet 1

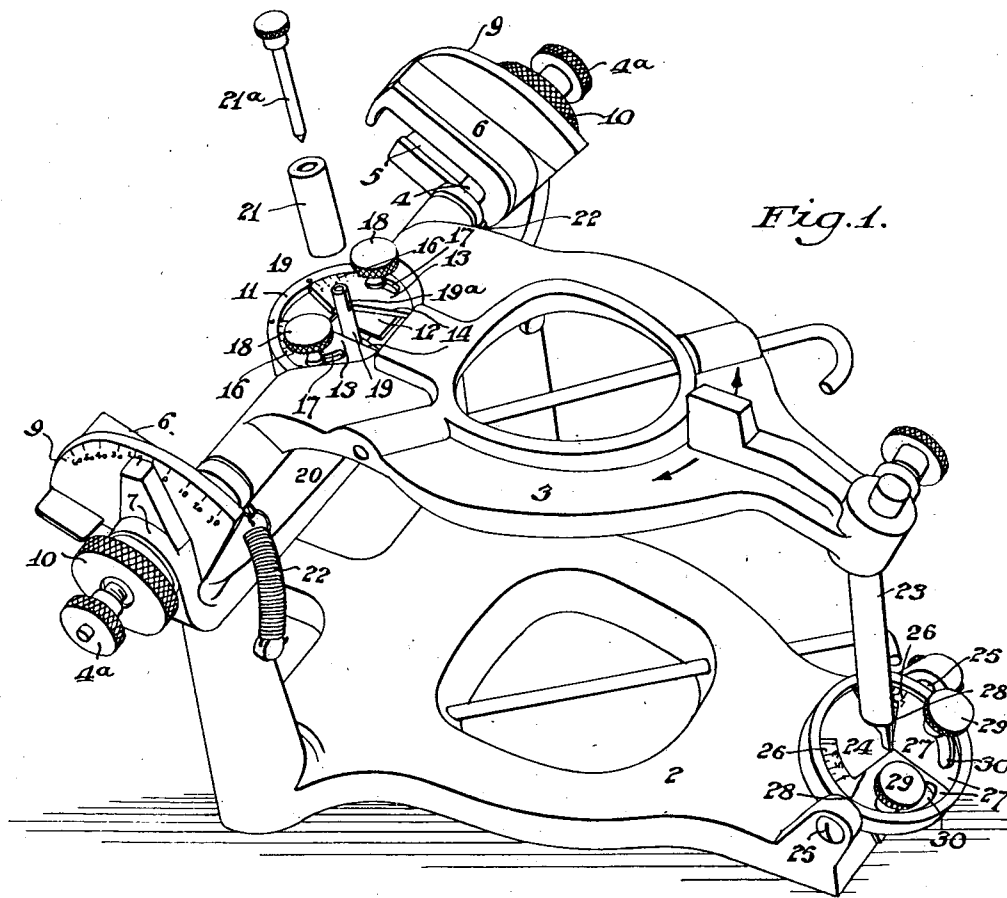


Fig. 1.

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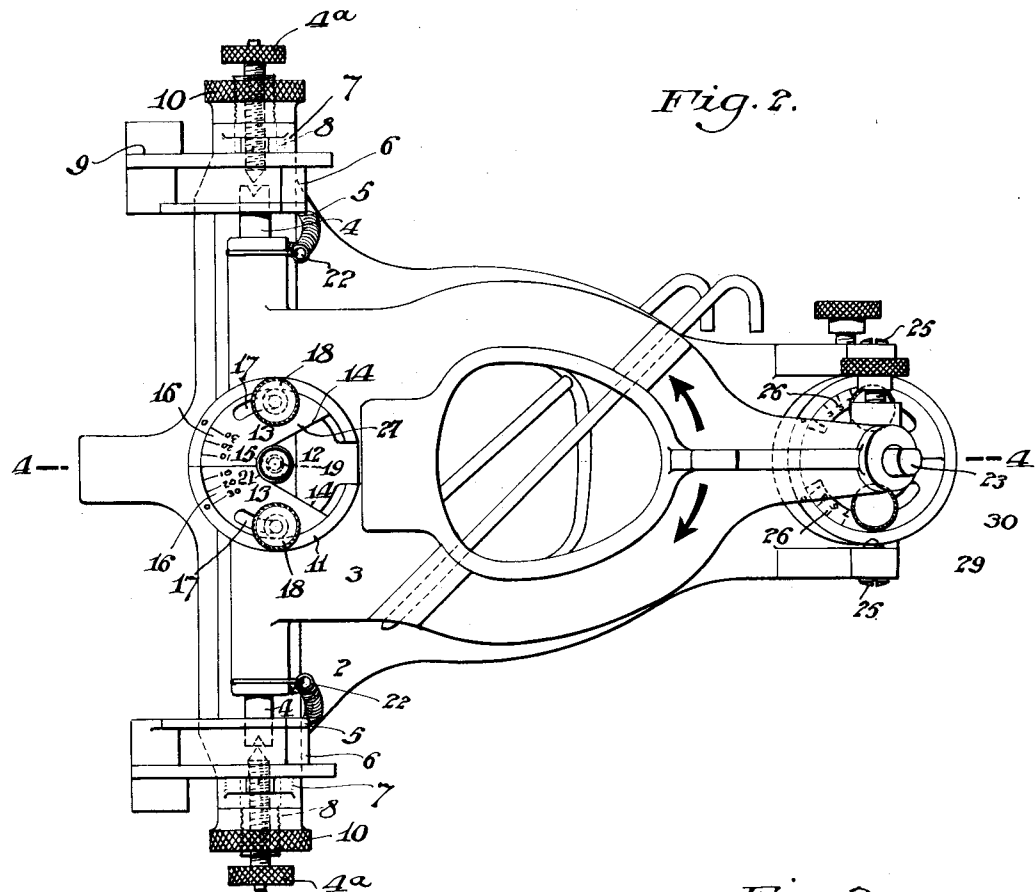
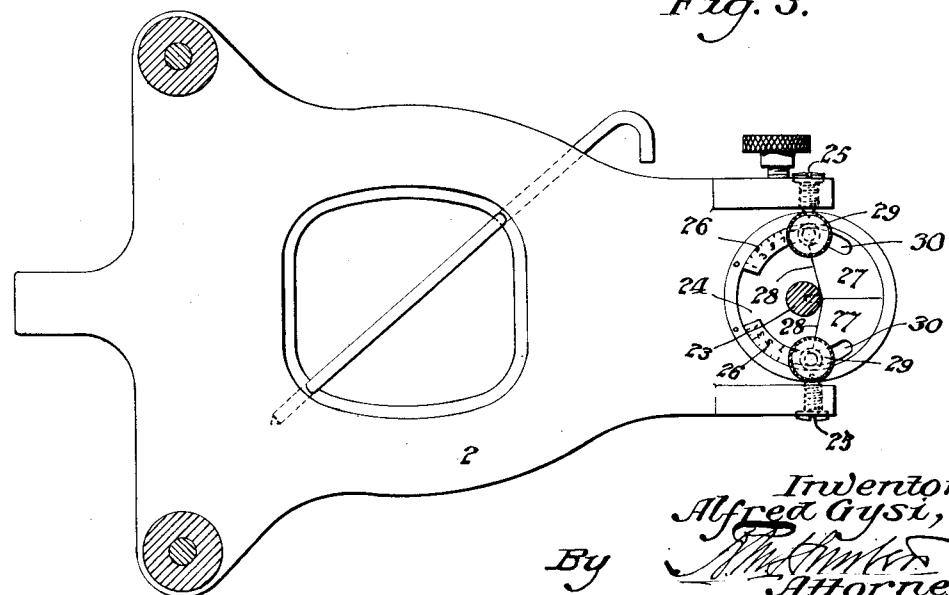
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

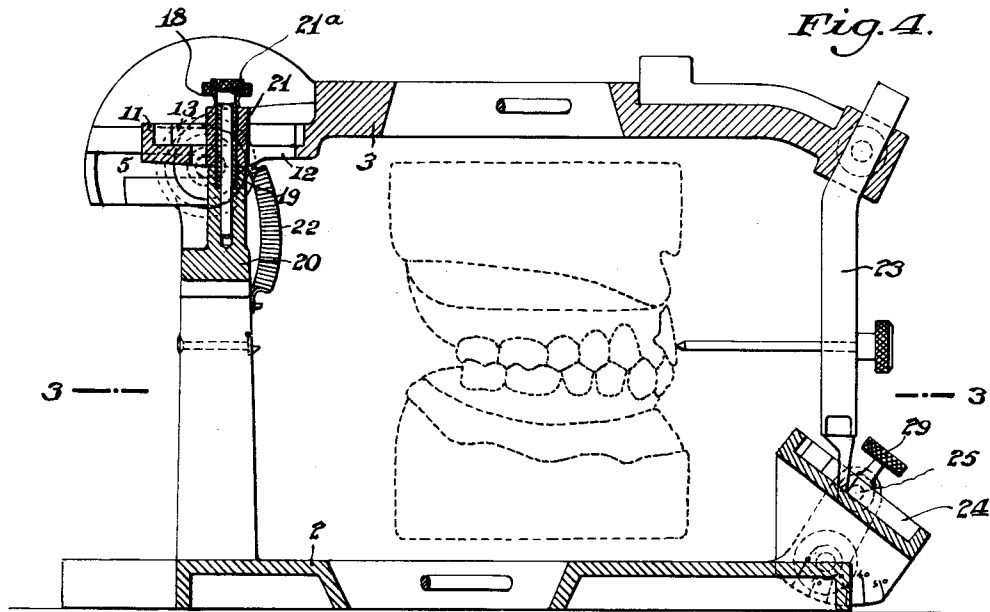
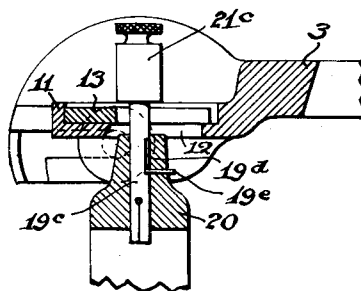


Fig. 5.



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UNITED STATES PATENT OFFICE.

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DENTAL ARTICULATOR.

Application filed November 2, 1926. Serial No. 145,758.

The object of my invention is to provide an articulator for use in setting up artificial teeth in the production of dentures, and, more particularly, in respect to capacity 5 therein for what is known as the "Bennett" movement which, in following the condyle actions of the natural jaw, employs guides in the median line of the articulator, said guiding devices provided with means whereby a retractive movement may be additionally obtained for enabling grinding of the artificial teeth of the dentures arranged in the articulator. Reference to the "Bennett" movement may be found in The Dental Digest, published in New York city by The Dentists' Supply Company, issue of March, 1913, pages 132 and 133.

My invention in its preferred form consists in providing a removable roller for the 20 guiding pin of the "Bennett" movement which has heretofore normally acted as the pivot against which the guides on the adjustable articulator frame travel when producing the condyle movements, said roller in normal operation acting as a roller bearing for said pivot pin and, when removed, providing a space between the pin and the rear or arch portion of the guides for permitting a readjustment of the upper articulator 30 frame member whereby it may be given a protrusive movement.

For the purpose of illustrating my invention, I have shown in the accompanying drawings the embodiment thereof which is at present preferred by me, since the same is in form to give satisfactory and reliable results and will make clear the nature and extent of my improvement.

Fig. 1 is a perspective view of an articulator embodying my improvements; Fig. 2 is a plan view of the same; Fig. 3 is a transverse section on line 3—3 of Fig. 4; Fig. 4 is a vertical section of the articulator on line 4—4 of Fig. 2; and Fig. 5 is a vertical section of a modification of my invention.

As the invention claimed in this application is limited to the modification of the "Bennett" guiding construction when applied to an articulator wherein the lateral inclinations of the respective anatomical glenoid fossa guiding surfaces of an ordinary articulator (such as the well known "Simplex" articulator) are omitted and guiding means in the neighborhood of the condyle region are 55 substituted for insuring the oblique move-

ments only to the movable articulator frame in vertical planes thereat, it will only be necessary to briefly state the general construction of the articulator shown in the drawings preliminary to describing the particular improvements and use thereof forming the present invention.

2 is the lower or base frame of the articulator and upon which the model of the lower jaw is mounted and 3 is the upper or movable 65 frame of the articulator and to which the model of the upper jaw is secured, said models being indicated in dotted lines in Fig. 4. The movable articulator frame 3 at its rear portion is provided with lateral pins 70 4, 4, which are guided in the slots 5 in boxes 6 journaled in the upright arms 7 of the lower frame of the articulator on transverse axes 8, said guide boxes 6, 6, respectively at opposite sides of the articulator and in axial alignment. The boxes 6, 6, are adjustable about their axial bearings to give the proper angle to the guide slots 5 in which the condyle pins 4, 4, operate, and said angle is determined by means of a scale 9. When the guide slots 5, 80 5, of the boxes are properly positioned to suit the requirements of the patient, the boxes are locked in their adjusted position by means of clamping nuts 10, 10.

At the middle portion or median line of 85 the adjustable articulator frame there is provided a circular table 11 having a central opening 12, and said table is fitted with two segmental guide plates 13, 13, each of which is provided with a guiding edge or shoulder 14 normally inclined to the median line and having their adjacent guide edges curved at one end to form a semi-circular socket 15 corresponding in shape to a Roman arch. The said guide plates 13, 13, are each provided with a scale 16 for indicating the extent of adjustment. Furthermore, the guide plates 13 are provided with curved slots 17 through which clamping screws 18 extend for clamping the said plates in relative predetermined angular positions of adjustment. 100

19 is a fixed vertical guide pin projecting upwardly from a cross frame 20 rigidly secured to or forming an integral part of the rear end of the stationary frame 2, said pin 105 19 and a guide roller 21 journaled thereon constituting a roller bearing pivot or fulcrum about and upon which the guiding arch shaped portions 14 and 15 of the adjustable articulator frame 3 are guided. 110

By referring to Fig. 1, it will be seen that while the frame 3 under the action of the coil springs 22 is drawn forward so that the guiding arch 15 thereof seats upon the guide roller 21, said structure permitting lateral oscillation of the frame 3, and, at the same time, causing the condyle pins 4 to be guided in the respective obliquely positioned slots 5 of the boxes 6. By reason of this construction, it follows that while one of the pins 4 may move to a considerable extent on an incline upward and backward, the opposite pin 4 will move on an incline downward and forward to a slight extent until it seats in the bottom of the slot, said movement being modified somewhat according to the adjustment of the boxes 6, 6, and the inclination of their guiding slots 5, 5, to suit the character of side bite required. In this manner, the movable articulator portion 3 is guided as to its condyle action by the "Bennett" movement arranged in the median line, while the lateral pins 4, 4, are guided in the inclined slots 5, 5. It will be manifest, that in the side bite action, when the pins move forward or backward or up and down, the side movements of the frame 3 are controlled by the edge 14 of the arch which bears against the roller 21, the guiding arch in action taking the place of the anatomical glenoid fossa found in the ordinary articulators where the condyles are widely separated as in the natural jaw. The shape of the arch and, therefore, the angle between the guiding edges 14 of the adjustable plates 13 may be changed by the relative adjustment of said plates; and said changes in adjustment will permit the proper lateral movement, according to the requirement of the jaw of the patient for whom the dentures are being made.

At the forward part of the articulator is arranged the incisor guide plane and guide pin therefor, said parts being respectively arranged upon the base and upper adjustable frame of the articulator. As shown, the upper or adjustable frame 3 is provided with the adjustable incisor guide pin 23 whose lower end is guided upon the incisor guide plane 24 which is desirably pivoted upon a transverse axis as at 25 and whose obliquity may be indicated by a suitable scale at 31 of Fig. 4. Moreover, the incisor guide plane is provided with adjustable controls 27 which are adjustably carried by the incisor guide plane so that the angle between their respective guide edges 28 may be varied, the said adjustment being insured by clamping screws 29 extending through slots 30 in the controls 27, very similar in general construction to the adjustable guide portions 13 of the "Bennett" control before described. The point of the incisor guide pin 23 is guided along the edges 28 of the controls 27 when the side bite movement is provided for, and it is due to these guides 28 that the extent of oscillation of the

frame 3 in its movement about the pin 4 and bottom of one of the slots 5 is insured.

The axial portions of the boxes 6 are provided with set screws 4* which may be screwed toward each other until their pointed ends engage socket portions on the ends of the lateral pins 4, 4, whereby the frame 3 may be suspended like a simple hinge movable about the axis of the lateral pins thereof. In this case, there would be no side bite movements.

Referring more specifically to the pivot of the "Bennett" guiding means and especially the construction thereof which constitutes my present invention, the vertical pin 19 is preferably of tubular structure and split longitudinally as at 19* and into this is fitted a headed pin 21* which is held in place by friction. The roller 21 is journaled on the pin 19 and has a radial thickness or diameter such that its thickness from its outer surface to the pin is approximately equal to the length of the protrusive movement of the upper frame 3, so as to permit the seating of the pins 4, 4, in the bottom of the slots 5, 5, of boxes 6, 6. During the normal use of the articulator in setting up the dentures upon the plaster models held in the articulator frames, the roller 21 is held upon the pin 19 by the headed pin 21*, as shown in Fig. 4; and when the dentures are completed and are to be ground to perfect occlusal articulation, the pin 21* is withdrawn and roller 21 removed, so that a clearance space is provided between the fixed pin 19 and the arch 15 of the guides 13. This permits the movable frame 3 of the articulator to move forward whereby it may then be given a protrusive movement as required when grinding the teeth. In Figs. 2 and 4, the roller 21 is in normal position, but in Fig. 1 both it and the retaining pin 21* are shown as temporarily removed and in this condition the articulator is adjusted for grinding under the protrusive movement. As in this condition the Roman arch 15 is out of contact with the pin 19, the springs 22 cause the lateral pins 4, 4, to advance to the bottom of the slots 5, 5, in the boxes 6 and from these as a base, the protrusive movement of the adjustable frame 3 is made, it being understood that guiding action in a vertical plane at the incising bite is governed by the inclined incisor guide plane 24 and guide pin 23, and which together insure the proper inclination or bevel to the facets to be formed on the incising edges of the teeth. The inclination of these facets would also be governed by the inclination of the guide slots 5, 5.

It will be readily understood that while a roller 21 is desirable as constituting a roller bearing pivot for frame 3, my invention broadly considered is not restricted to the use of a roller, as any form of pivoting means which will provide a clearance for the protrusive movement will answer. If the roller 21 fits the pin 19 so tightly or in such manner

that it could not rotate, it would still constitute a guide for the arch and when removed would provide the clearance necessary to provide for the protrusive movement of frame 3.

5 My invention includes any means which at one time provides a pivotal action with the arch 15 and at other times provides a clearance with respect to the arch to provide a positioning of the adjustable frame 3 to permit
10 of a protrusive movement thereto.

In Fig. 5, I have shown a modification in which the removable roller is omitted and the vertical pin 19^c formed with an enlarged diameter 21^c and mounted in the frame 20 so
15 as to be adjustable up or down, the groove 19^d on the pin and limiting pin 19^e engaging the groove to limit the movement of the pin. When the pin is pushed down, the large diameter 21^c cooperates with the guide plates
20 13, to accomplish what is done by the roller 21 in the preferred construction; and when the pin is pulled up as shown, the large diameter 21^c is moved out of contact with the guides 13 and permits the protrusive operation
25 to take place.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable, and while I have in the
30 present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that I do not restrict myself to the details, as the same
35 are susceptible of modification in various particulars without departing from the spirit or scope of the invention.

Having now described my invention, what I claim and desire to secure by Letters Patent
40 is:

1. In an articulator, the combination of two denture carrying frames having a relative pivotal connection whereby one may be adjusted relatively to the other, condyle
45 guides between the frames, pivotal devices having an upright axis and separate from the condyle guides for causing one of the frames to oscillate relatively to the other, and means for putting the pivotal devices into
50 and out of operative action, whereby when the normal pivotal action is put out of operation one of the frames may be given a protrusive movement relatively to the other frame.

2. The invention according to claim 1, wherein further, the pivotal devices consist of a fixed pin on one of the frames, a removable roller journaled on the pin, and guiding
60 means on the other of the frames and spring pressed in movable contact with the roller.

3. The invention according to claim 1, wherein further, the pivotal devices are provided with a removable roller part whose removal eliminates the pivotal action and pro-

vides clearance between the two frames which permit of the protrusive movement of one relatively to the other.

4. The invention according to claim 1, wherein further, the two frames are relatively guided at their free ends by one having an
70 inclined incisor guide plane and the other an incisor guide pin in contact therewith for relatively guiding the frames and dentures carried thereby during the protrusive movements of one of the frames when grinding
75 the teeth.

5. In an articulator, the combination of a base frame having two adjustable condyle guides spaced apart, a movable frame adjustable laterally relatively to the base frame and
80 having lateral condyle pins adjustable in the condyle guides, a removable upright pivot between the two frames intermediate of the two condyle guides whereby the two condyle pins are held out of simultaneous contact
85 with the ends of the condyle guides, and spring means for maintaining the frames in pivotal connection while the removable pivot is in position and whereby when the pivot is removed a protrusive movement of the movable frame is permitted and the condyle pins
90 allowed to yieldingly rest in the ends of the condyle guides.

6. The invention according to claim 5 wherein further, the two frames are relatively guided at their free ends by one having an
95 inclined incisor guide plane and the other an incisor guide pin in contact therewith for relatively guiding the frames and dentures carried thereby during the protrusive movements of one of the frames when grinding
100 the teeth.

7. In an articulator, the combination of a base frame, an adjustable frame movable relatively to the base frame in a more or less
105 horizontal direction, removable means for yieldingly connecting the two frames in pivotal relation whereby they are relatively movable about an upright axis, said means arranged for normally preventing the adjustable frame from having a protrusive movement relatively to the base frame and when removed permitting of protrusive movement.

8. In an articulator, the combination of a base frame, a movable frame, adjustable condyle means between the base frame and movable frame, an upright roller removably pivoted to one of the frames, an adjustable guiding arch on the other of the frames, the edges
115 of which are adjustably in contact with the roller whereby when the roller is present the normal condyle action is permitted and when the roller is removed the movable frame is permitted to have a protrusive movement
120

In testimony of which invention, I hereunto set my hand.
125

ALFRED GYSI.