March 8, 1932. R. O. PERKINS, SR 1,848,267

DENTAL ARTICULATOR

Filed July 8, 1929 3 Sheets-Sheet 1

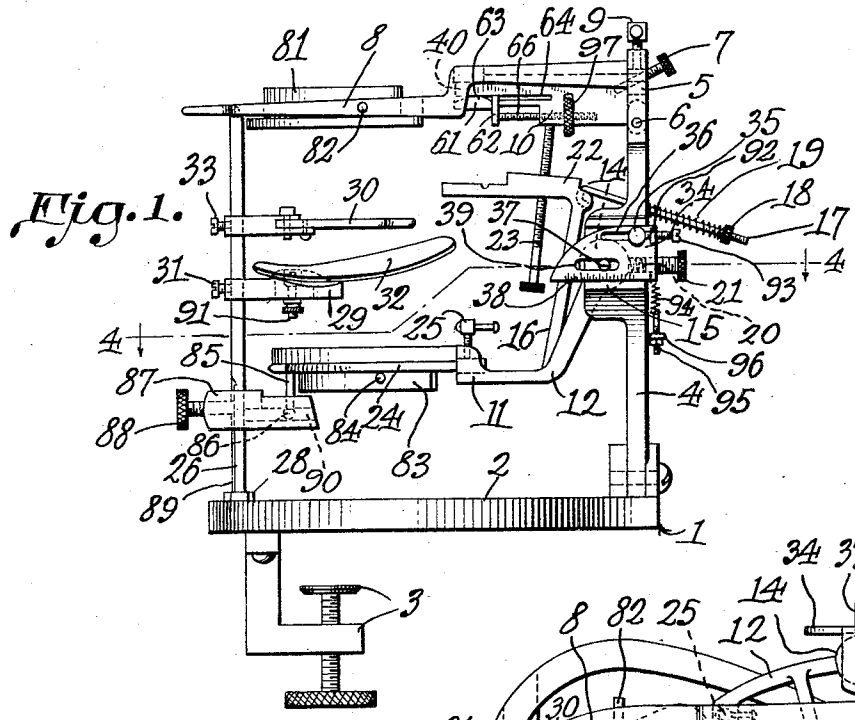


Fig. 1.

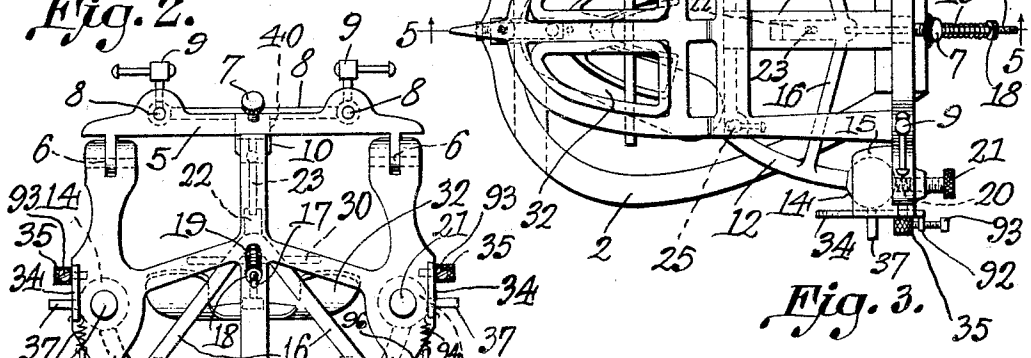


Fig. 3.

Fig. 2.

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DENTAL ARTICULATOR

Filed July 8, 1929 3 Sheets-Sheet 2

Fig. 4.

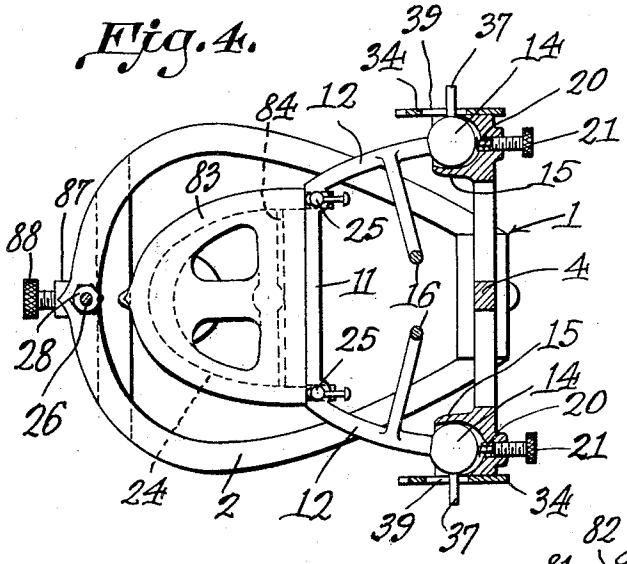


Fig. 5.

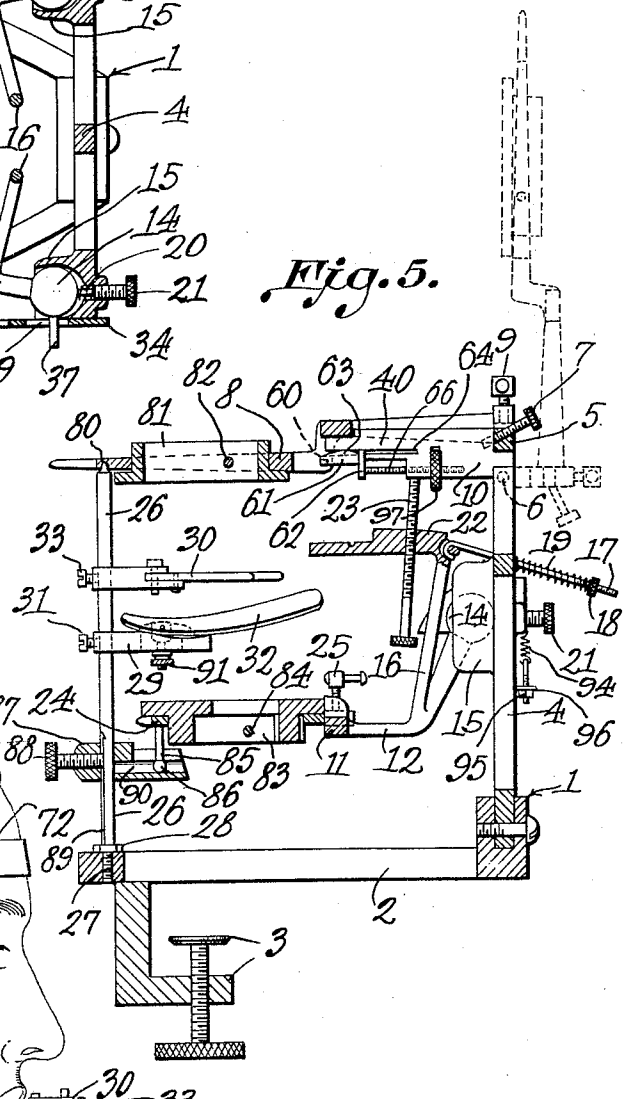
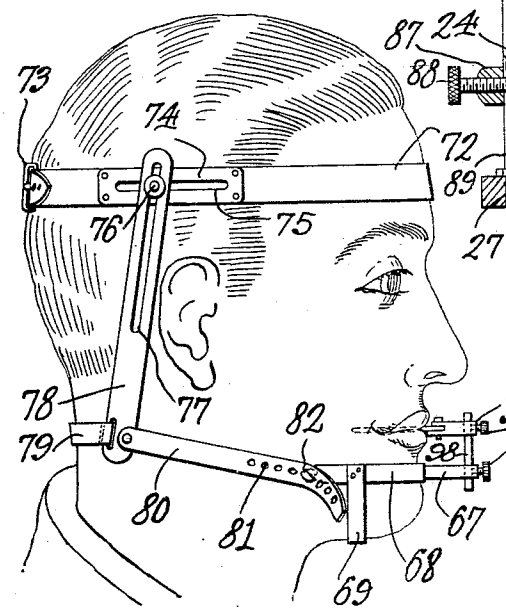


Fig. 6.



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DENTAL ARTICULATOR

Filed July 8, 1929 3 Sheets-Sheet 3

Fig. 7.

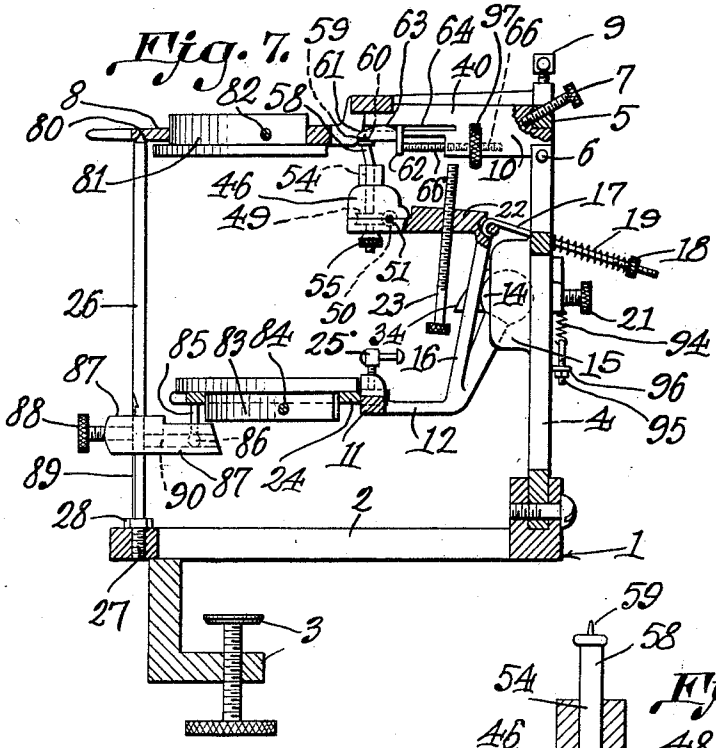


Fig. 10.

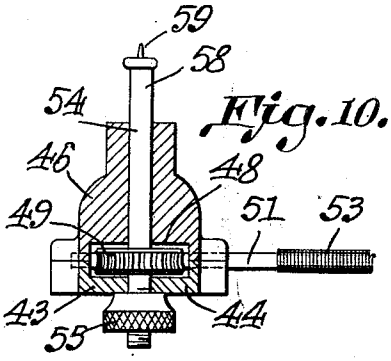


Fig. 8.

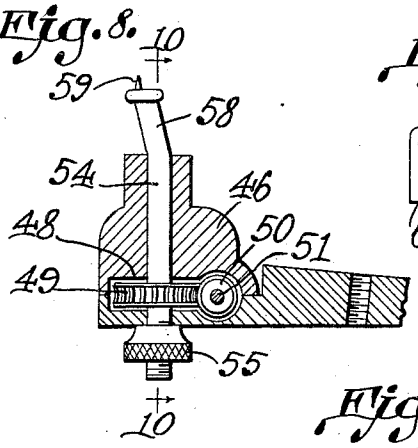


Fig. 14.

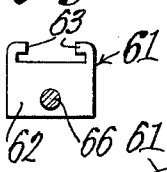


Fig. 11.

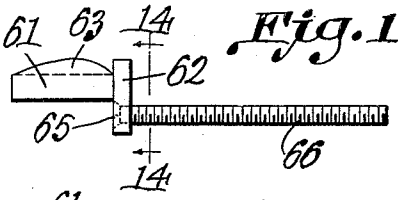


Fig. 13.

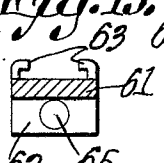


Fig. 12.

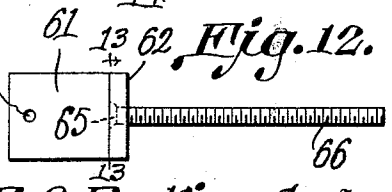
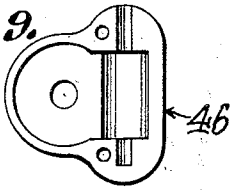


Fig. 9.



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1,848,267

UNITED STATES PATENT OFFICE

ROY O. PERKINS, SR., OF SAN ANTONIO, TEXAS

DENTAL ARTICULATOR

Application filed July 8, 1929. Serial No. 376,591.

This invention aims to provide novel means for setting up an upper denture and a lower denture in the position with respect to each other which they will assume in the mouth of the patient, novel means being provided for mounting the lower denture carrier for movement as the mandible of the patient moves, it being possible to grind down the teeth of the dentures to a proper bearing surface.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that sort to which the present invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes may be made in the precise embodiment of the invention herein disclosed, within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Figure 1 shows in side elevation, a device constructed in accordance with the invention;

Figure 2 is a rear elevation of the structure shown in Figure 1;

Figure 3 is a top plan;

Figure 4 is a section on the line 4—4 of Figure 1;

Figure 5 is a section on the line 5—5 of Figure 3;

Figure 6 is an elevation showing the mechanism whereby the bite plate is held in the mouth of the patient;

Figure 7 is a view similar to Figure 5, but showing sundry parts added to the structure, so that the member which represents the mandible may be power-driven;

Figure 8 is a sectional view illustrating a portion of the driving mechanism;

Figure 9 is a bottom plan showing a portion of the housing of Figure 8;

Figure 10 is a section on the line 10—10 of Figure 8;

Figure 11 is an elevation showing the adjusting screw and attendant parts;

Figure 12 is a view wherein the structure of Figure 11 is seen at right angles to the showing of that figure;

Figure 13 is a cross section on the line 13—13 of Figure 12;

Figure 14 is a section on the line 14—14 of Figure 11.

In carrying out the invention, there is provided a base 2 carrying a clamp 3. A vertical standard 4 is secured to one end of the base 2 and is provided at its upper end with an arm 40 located approximately parallel to the base 2, the arm having a depending lug 10. A cap piece 5 is hinged at 6 (Figure 2) to the upper end of the standard 4. A screw 7 is threaded into the intermediate portion of the cap piece 5 and into the arm 40, so that, if desired, the cap piece may be held against turning on the hinges 6 from the horizontal solid line position of Figure 5 to the vertical dotted line position of that figure.

An upper denture carrier 8 rests on the arm 40, and the forward end portions of the denture carrier are held detachably but securely in the cap piece 5 by means of screws 9 threaded into the cap piece and engaging the upper denture carrier 8, in a way which will be readily understood when Figure 2 of the drawings is noted.

As shown in Figure 7, there is a seat 80 in the lower surface of the upper denture carrier 8, the seat being adapted to receive the upper end of a support 26, in the form of a rod, threaded at 27, for adjustment, into the base 2, the support being held in place by a lock nut 28 threaded on the support and engaging the base 2. The numeral 81 marks a frame which carries the model, the frame being held detachably in the upper carrier 8 by means of a cross pin 82, or by any other suitable means.

A lower denture carrier 11 is located below the upper denture carrier 8 and has arms 12 that extend horizontally, and upwardly, the arms being provided at their ends with balls 14, which are mounted to rock in sockets 15 on the standard 4. The arms 12 are connected by an inverted V-shaped bracket 16, the outline of which is shown in Figure 2. One end of a hook bolt 17 is connected pivotally with the apex of the bracket 16, as shown in

Figure 5. The hook bolt 17 is mounted intermediate its ends to swing in the standard 4. A nut 18 is threaded on the outer end of the hook bolt 17, and a compression spring 19 is mounted on the bolt. One end of the compression spring 19 abuts against the nut 18, and the other end of the spring abuts against the standard 4. Compression springs 20 engage the balls 14, as shown in Figure 4, the compression springs being located in threaded bores formed in the sockets 15. Screws 21 are threaded into the bores, the screws having reduced ends about which the springs are located. The screws 21 are employed to adjust the springs 20, and the screws touch the balls 14, thereby to form an adjustable stop for the balls, it being noted at this point that the balls represent the condyles of the lower jaw.

At the upper end of the bracket 16 there is a table 22 into which a screw 23 is threaded. The screw 23 is adapted to cooperate wtih the lug 10 on the arm 40 of the standard 4.

The lower denture carrier 11 includes a detachable part 24 held in place by a set screw 25 threaded into the member 11 and engaging the part 24, in a way which will be understood clearly when Figures 1 and 5 are compared.

In the detachable part 24 of the lower denture carrier is mounted a frame 83 on which the model is mounted. The frame 83 may be held in place on the part 24, detachably, by means of a pin 84, or in any other suitable way. On the inner end of the detachable part 24 of the lower denture carrier, there is a depending stud 85 carrying a ball 86.

The numeral 87 marks a bracket held on the support 26, for vertical adjustment, by means of a set screw 88 threaded into the bracket 87, and engaged in a longitudinal seat 89 in the support 26. The bracket 87 is provided with a longitudinal slot 90, the lower part of which is wider than the upper part. The stud 85 on the member 24 of the lower denture carrier 11 extends down through the upper part of the slot 90, and the ball 86 can slide and rock in the lower part of the slot 90.

A transverse arm 29 is mounted on the support 26 for adjustment vertically of the support, and is retained by a set screw 31. A set-up plate 32 is held at 91, securely, but for rocking adjustment, on the arm 29. A bite plate 30 is held by a set screw 33 for adjustment vertically on the arm 26.

Gauge plates 34 are held by clamp screws 35 on the sockets 15. The gauge plates 34 have slots 36 for the reception of the clamp screws 35, the slots 36 permitting an adjustment of the gauge plates 34, when the screws 35 are loosened. The balls 14 of the member 11 are provided with lateral projections 37 which move in elongated slots 39 in the gauge plates 34. Scales 38 are inscribed on the gauge plates 34 and extend parallel to the slots 39. The gauge plates 34 have projections 92 into which are threaded screws 93, the screws 93 abutting against the heads of the screws 35. The screws 93 can be shifted in or out to regulate the amount that the gauge plates 34 are adjusted toward the left in Figure 1. Retractile springs 94 are connected to the lower outer corners of the gauge plates 34, and are connected to adjusting devices 95, such as small bolts which are movable lengthwise in ears 96 on the standard 4. By threading the nuts along the bolts 95, some tension may be put into the springs 94, and if the clamp screws 35 are loosened, the lower denture carrier 11 will be yieldably mounted and can swing as does the human mandible.

In the structure hereinbefore described, it has been presupposed that the lower denture carrier 11 is to be moved by hand, but this is not necessary, and when the lower denture carrier is to be power-driven, recourse is had to the rearrangement of parts shown in Figure 7. The screw 23 is shifted and is moved down in the table 22, clear of the lug 10 on the arm 40, and a gear housing 46 is mounted on the inner end of the table 22. The table 22 and the gear housing 46 are recessed, as shown at 48 in Figure 8, to receive a worm wheel 49 and a worm 50 which meshes with the worm wheel 49. The worm 50 is carried by a shaft 51 which is journaled in the gear housing 46 and in the table 22. The shaft 51 may be connected to a flexible shaft 53 which is driven in any suitable way. The worm wheel 49 is attached to a shaft 54 journaled in the housing 46 and in the table 22 and held therein, for rotation, by means of a nut 55, or any other equivalent means.

The shaft 54 includes an exposed eccentric portion 58 carrying an offset projection 59 which is received in an opening 60 formed on the under side of an adjustable bearing or slide 61 having at its inner end a transverse plate 62 provided with inwardly extended fingers 63 mounted to move in guide grooves 64 that are formed in the sides of the arm 40 on the standard 4. One end 65 of a screw 66 is held in the plate 62 of the slide or bearing 61. The screw 66 slides freely in the lug 10 on the arm 40. A small wheel 97 is mounted in a transverse slot in the lug 10 and is threaded on the screw 66.

In Figure 6 of the drawings, there is shown a convenient means for taking the bite, the bite plate mount 30 being secured adjustably to a small post 98 held by a set screw 71, adjustably, in a projection 67 on a U-shaped chin piece 68 provided with a U-shaped member 69 which goes under the chin of the patient. A flexible band 72 extends around the head of the patient, and in the band 72 is interposed an adjustable buckle 73. Plates 74 are mounted on the sides of the band 72 and have elongated slots 75 in which move clamping bolts 76 that are adjusted in longi-

tudinal slots 77 formed in hanger plates 78 connected at their lower ends by a flexible neck strap 79. Jowl straps 80 are connected at their rear ends to the lower ends of the hanger 78, the forward ends of the straps 80 having openings 81 adapted to receive studs 82 on the rear ends of the chin piece 68.

The position of the lower denture carrier 12—24 with respect to the upper denture carrier 8 may be adjusted at any time by threading the screw 23 up and down, the screw being threaded into the part 22 of the lower denture carrier, and bearing against the lug 10 of the arm 40 of the standard 4. The screw 23 can be backed down, clear of the lug 10, and then the lower denture carrier 12—24 can be swung with respect to the upper denture carrier 8, to grind the dentures with respect to each other. The balls 14 rock one at a time in the sockets 15, and the lateral excursions of the mandible are simulated closely. The spring 19 and the hook belt 17 hold the lower denture carrier 11—24. The springs 20 of Figure 4 form yieldable abutments for the balls 14, and the screws 21 stop the backward movement of the balls, and are used to regulate the retrusive bite.

The clamp screws 35 may be loosened and the gauge plates 34 adjusted. The projections 37 on the balls 14 move in the slots 39 of the gauge plates 34, and the movement of the projections may be noted in connection with the scales 38 on the gauge plates 34. The slots 39 limit the swinging movement of the lower denture carrier 11—24, the plates 34 being adjustable to get the lateral bite. The screw 7 may be backed off, and then the cap 5, with the upper denture carrier 8, may be turned up into the dotted line position of Figure 5, thereby affording ample working space whilst the upper denture is being set up.

It has been presupposed that the lower denture carrier was moved by hand, hereinbefore, but this is not necessary, and when the lower denture carrier is to be power-driven, then recourse is had to the rearrangement of parts indicated in Figure 7.

The screw 23 is shifted, in Figure 7, from the position which it occupies in Figure 5, so that it is clear of the lug 10, and by means of the wheel 97, and the screw 66, the slide 61 may be adjusted in and out, it being recalled that the projections 59 of Figure 8 is received in the opening 60 (Figure 12) of the slide 61. The shaft 53 rotates the shaft 51 and the worm 50, the worm turning the worm wheel 49 and the shaft 54, the eccentrically disposed projection 59 turning in the opening 60 of the slide or bearing 61. It will be clear that when the shaft 54 is rotated, as aforesaid, swinging movement will be imparted to the lower denture carrier 11—24. The nature of the movement imparted to the lower denture carrier 11—24 may be regulated and changed by sliding the bearing 61 in and out on the arm 40, through the instrumentality of the screw 66. The bracket 87 cooperates with the ball 86 and the stud 85 on the part 24 of the lower denture carrier 11 to support the end of the carrier 11 that is remote from the standard 4.

What is claimed is:

1. In a device of the class described, a frame having sockets, an upper denture carrier mounted on the frame, a lower denture carrier cooperating with the upper denture carrier and comprising condyle members mounted to rock in the sockets, and adjustable stops mounted in the sockets and engaging the condyle members.

2. In a device of the class described, a frame having sockets, an upper denture carrier mounted on the frame, a lower denture carrier cooperating with the upper denture carrier, and comprising condyle members mounted to rock in the sockets, adjustable stops movable at the will of an operator in the sockets and engaging the condyle members, and springs about the stops and engaging the condyle members.

3. In a device of the class described, a frame having sockets, an upper denture carrier mounted on the frame, a lower denture carrier cooperating with the upper denture carrier and comprising condyle members mounted to rock in the sockets, the condyle members having lateral projections, gauge plates having openings in which the projections move, combined clamping and pivot elements carried by the frame, the gauge plates being slotted to receive the clamping and pivot elements, and adjustable means under the control of an operator and cooperating with the gauge plates and with parts of the condyle members for producing relative adjustment between the condyle members and the gauge plates, when the combined clamping and pivot elements are loosened.

4. In a device of the class described, a frame, an upper denture carrier mounted on the frame, a lower denture carrier including condyle members mounted to rock on the frame, a bracket, means for mounting the lower denture carrier to slide and to rock upon the bracket, means for mounting the bracket for adjustment toward and away from the upper denture carrier.

5. In a device of the class described, a frame, an upper denture carried on the frame, a lower denture carrier mounted to rock on the frame, a driven shaft journaled on the lower denture carrier and including an eccentric, and a bearing on the frame, the eccentric engaging the bearing to impart swinging movement to the lower denture carrier when the shaft is rotated.

6. In a device of the class described, a frame, a bearing mounted to slide on the

frame, means under the control of an operator for sliding the bearing on the frame, an upper denture carrier on the frame, a lower denture carrier mounted to rock on the frame, a shaft journaled on the lower denture carrier, means for driving the shaft, and an eccentric on the shaft and cooperating with the bearing to impart swinging movement to the lower denture carrier.

7. In a device of the class described, a frame, a bearing adjustable on the frame, means under the control of an operator for adjusting the bearing on the frame, an upper denture carrier mounted on the frame, a lower denture carrier cooperating with the upper denture carrier, and mounted to rock on the frame, shafts journaled on the lower denture carrier, a worm and pinion connection between the shafts, means for driving one shaft, and an eccentric on the other shaft and cooperating with the bearing.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

ROY O. PERKINS, Sr.