

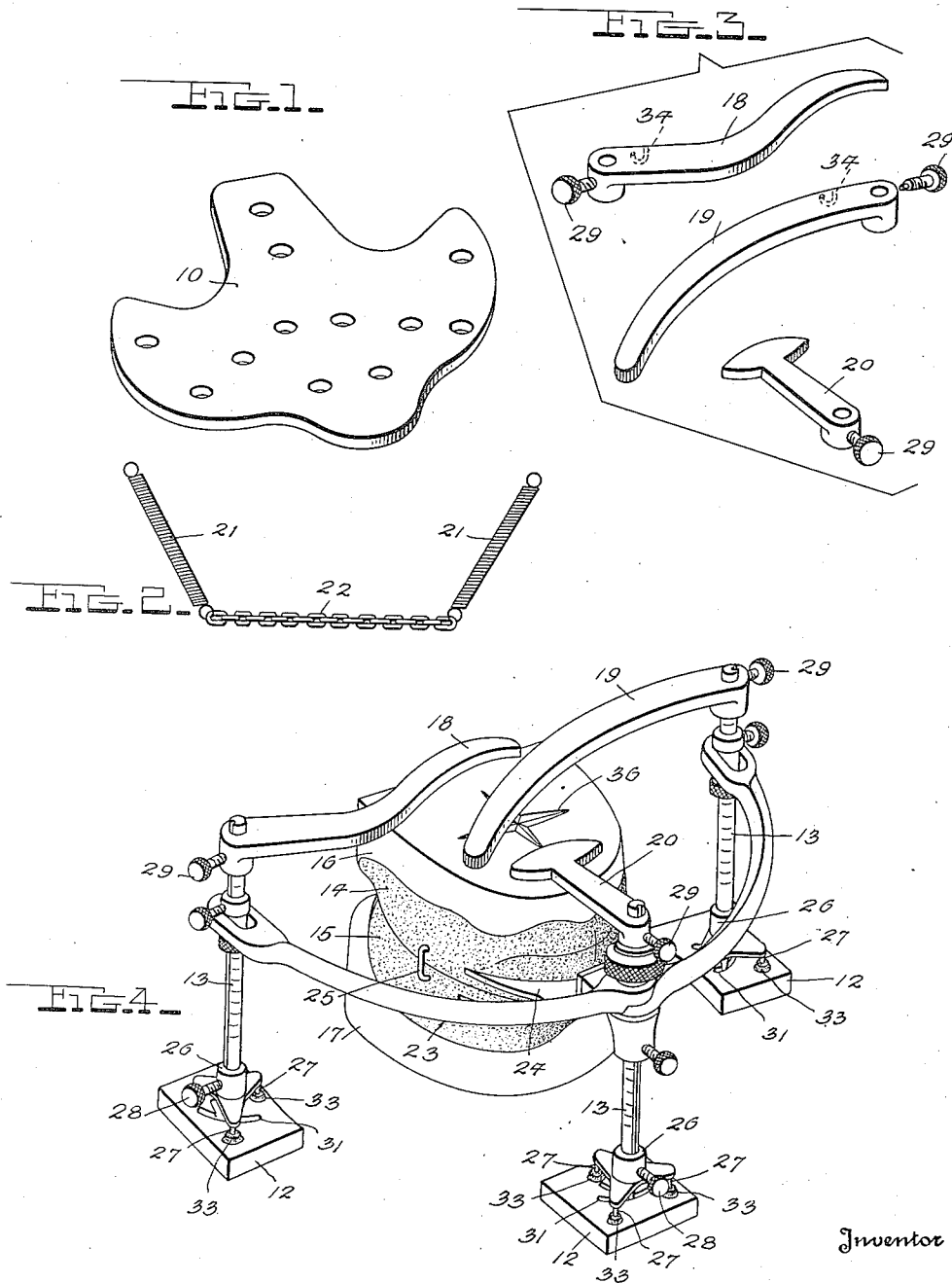
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2,434,415

DENTAL ARTICULATOR AND METHOD OF PRODUCING SAME

Original Filed Oct. 13, 1943 2 Sheets-Sheet 1



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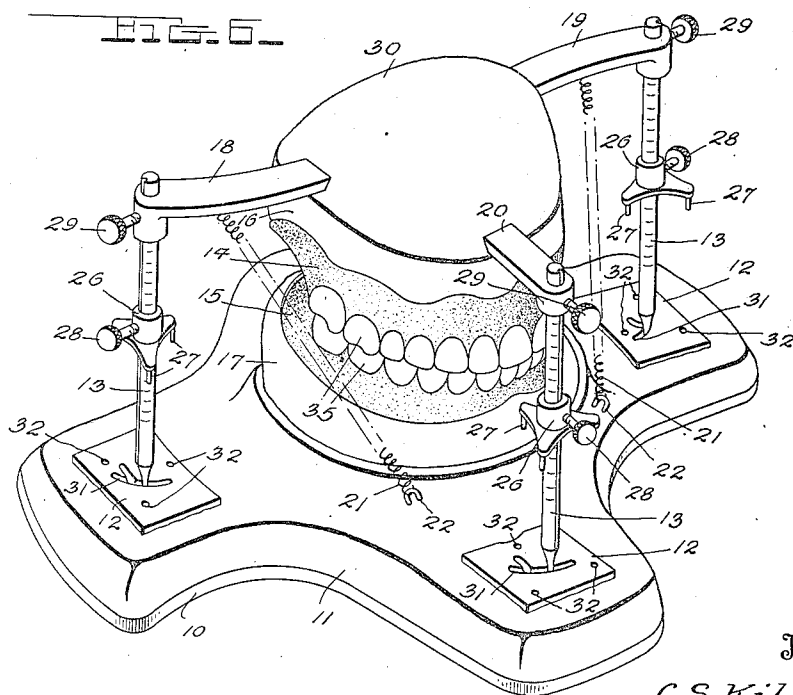
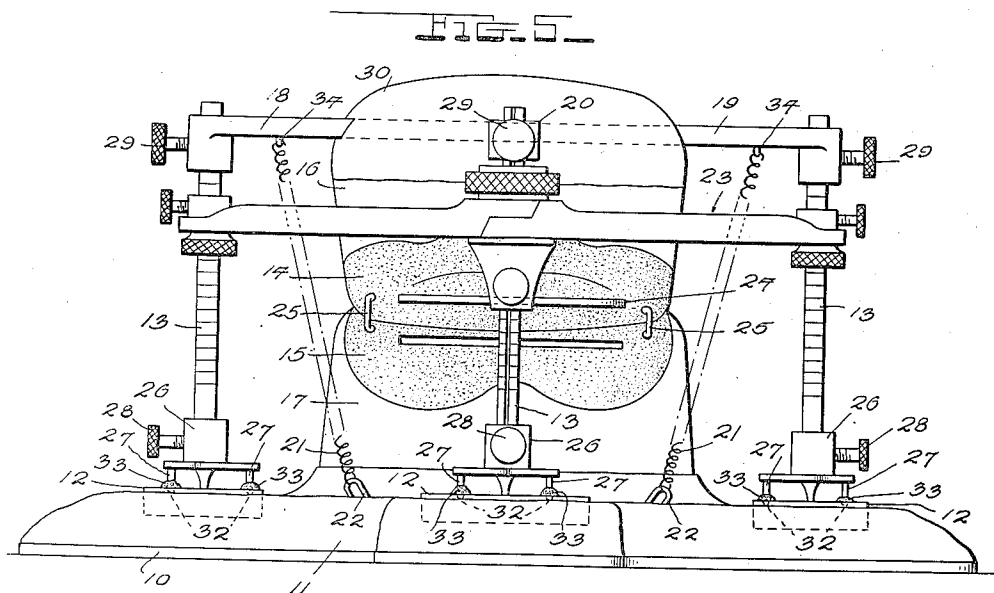
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## UNITED STATES PATENT OFFICE

2,434,415

## DENTAL ARTICULATOR AND METHOD OF PRODUCING SAME

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Original application October 13, 1943, Serial No. 506,099. Divided and this application January 8, 1945, Serial No. 571,842

6 Claims. (Cl. 32-32)

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This application is a division of my parent U. S. application Serial No. 506,099, filed October 13, 1943, now Patent Number 2,418,648.

The invention aims to provide a novel dental articulator with the aid of which correct disposition of the masticating surfaces of artificial dentures may be attained, to unobstructedly permit all natural jaw movements, particularly when chewing.

The articulator is of a type in which guide pins are cooperable with jaw-movement-records to guide the movements of the articulator, and a further object of the invention is to provide a novel method for producing said articulator with said pins and records and all other necessary elements in strictly correct relation with each other.

Figures 1, 2 and 3 of the accompanying drawings, disclose certain elements to be embodied in the construction of the articulator.

Fig. 4 is a perspective view of the articulator partly constructed with the aid of a U-shaped frame which is later removed.

Fig. 5 is a front elevation of the complete articulator, prior to removal of the aforesaid U-shaped frame.

Fig. 6 is a perspective view of the complete articulator in use.

In the drawings, 10 denotes a base plate upon which to form the plaster base 11 shown in Figs. 5 and 6; 12 denotes hard jaw-movement-records to be embedded in the plaster base 11; 13 has reference to guide pins for cooperation with said records 12 in guiding the articulator movements; 14 and 15 refer to upper and lower bite plates; 16 and 17 denote upper and lower jaw models, and 18, 19 and 20 refer to three arms which are instrumental in connecting said pins 13 with the upper jaw model 16. At 21, two light coiled springs are shown connected with the endmost links of a chain 22 for a purpose to appear, and at 23 a U-shaped frame is disclosed non-rotatably holding the aforesaid pins 13 in predetermined spaced relation with each other, said frame having a plate 24 rigidly carrying the upper bite plate 14 to which the lower bite plate 15 is secured at 25. At 26, slides are shown non-rotatable on the pins 13 and having downwardly projecting pins 27 and set screws 28.

The pins 13 are preferably the same pins previously forming parts of an apparatus which was used in making wax jaw-movement-records used as patterns in constructing the hard records 12, from artificial stone. The U-shaped frame 23 also preferably formed part of said apparatus. This frame was connected by the plate 24 with the upper bite plate 14 during the making of the aforesaid wax records. During the making of these records, they were held by a frame (similar to frame 23) connected with the lower bite plate 15 by a plate (similar to plate 24), the two bite plates 14 and 15 were in the patient's mouth,

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the frame-carried records and pins were at the exterior of the mouth, and the patient was caused to chew normally, causing the pins 13 to record the patient's natural jaw movements. When the jaw movements were well recorded, the bite plates were secured together in centric position while in the patient's mouth, by staples or the like 25. Before taking the apparatus from the patient's mouth, the exact relation of the wax records with the pins 13 was recorded in said records by downwardly pushing the slides 26 on said pins 13 until the pins 27 of said slides made depressions in the wax. These slides were then locked in lowered position by means of the screws 28 and the apparatus was removed from the patient's mouth and partly disassembled leaving the pins 13 non-rotatably held by frame 23, leaving the slides 26 locked in lowered position, leaving the frame 23 secured to the upper bite plate 14 and leaving the two bite plates 14 and 15 secured together in centric position by the staples or the like 25. Then, the hard records 12 were constructed, using the soft wax records as patterns.

The procedure, above briefed, is disclosed in the above mentioned parent application and forms no part of the invention claimed in this divisional case, except that the act of securing the two bite plates 14 and 15 together may be considered as one step in the production of the precision articulator of the present case. All other steps will now be described.

While the pins 13 are non-rotatably held in proper relation by the frame 23 and the latter carries the connected bite plates and jaw models, the arms 18, 19 and 20 are attached to said pins and locked thereon by means of the set screws 29, said arms overlying the upper jaw model 16 as seen in Fig. 4. Plaster 30 is now used to secure these arms to the jaw model 16 as seen in Figs. 5 and 6. Either before or after these steps, the jaw models 16 and 17 are secured to the bite plates 14 and 15, and the records 12 are temporarily connected with the pins 13 in co-operative relation with said pins. This pin and record connecting operation is accomplished by placing the ends of the pins 13 in the grooves 31 of the records, placing the pins 27 of the slides 26 in the depressions 32 of said records corresponding to the depressions previously made by said pins 27 in the wax records, and securing said records 12 to said pins 27 by means of wax 33, as seen in Fig. 4. A single rigid unit is thus formed embodying the bite plates 14 and 15, their attaching means 25, the jaw models 16 and 17, the arms 18, 19 and 20, the pins 13, the slides 26, the records 12, the frame 23, and the plaster 30.

After completing the rigid unit just described, the plaster 11 is placed on the base 10, the aforesaid unit is placed on said plaster (see Fig. 5), and by means of this plaster the records 12 and

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the lower jaw model 17 are solidly mounted while said unit is intact. Either before or after this, the chain 22 is embedded in the plaster 11. After the plaster 11 sets, the pins 27 are freed from the records 12 and the slides 26 are slid up and locked, thus freeing the guide pins 13 from said records, and the bite plates 14 and 15 are freed from each other by pulling the staples or the like 25. Then, sufficient disassembly is effected to remove the frame 23, and reassembly is carried out to produce the complete articulator shown in Fig. 6, the springs 21 being connected at their upper ends with hooks 34 on the arms 18 and 19 to yieldably connect the upper and lower members of said articulator.

It will be seen from the foregoing that the hard records 12 and the pins 13 may accurately guide all relative movements of the two bite plates 14 and 15 during application of the teeth 35, and that said relative movements of said bite plates will exactly duplicate the patient's relative jaw movements when making the wax records which formed patterns for making said records 12. Therefore, when the final dentures are constructed, with the teeth 35 in the identical relation in which they were set in the bite plates, the dentures will permit all natural jaw movements without interference and will, therefore, be greatly superior to other dentures heretofore produced.

After forming the permanent plates carrying the teeth 35, these plates may be placed in the articulator in accordance with the usual procedure for check grinding of the teeth. The models 16 and 17 are so shaped and prepared that they are easily removable from and replaceable on the articulator without any deviation from their original positions. On reference to Fig. 4, it will be noted that a four-pointed star design 36 is cut in the back of the model 16, and the same is done in the model 17. These designs or "keys" on the models permit the latter to be replaced on the articulator (after the case is cured) in their original positions.

From the foregoing, it will be seen that novel provision has been made for attaining the desired ends. While preferences have been disclosed, variations may of course be made within the scope of the invention as claimed.

While I have stated that the hard records 12 were made with the aid of wax records, by the use of a plastic which would set very hard in a few minutes, instead of using wax, the original records could be used in the articulator.

I claim:

1. In combination, a dental articulator guide pin for coaction with a jaw-movement-record, a record-positioning member carried by and shiftable longitudinally of said pin for movement from an idle position to an operative position in which it may be temporarily connected with the record to aid in assembly of the articulator, and means for holding said record-positioning member in either of said positions.

2. A dental articulator guide pin having an end for coaction with a jaw movement record, a slide mounted non-rotatably on said pin between the ends of the latter, releasable means for holding said slide in selected position upon said pin, and record-positioning pins rigidly mounted on said slide in outwardly spaced relation with said guide pin and projecting toward said end of said guide pin for temporary connection with the record to aid in assembly of the articulator.

3. In a method of producing a dental articula-

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tor in which an upper unit having guide pins, is manually movable with respect to a base having individual guiding records for said pins; the steps of positioning each record in operative relation with its cooperating pin, separately attaching each individual record temporarily to its cooperating pin while positioned as aforesaid, placing said upper unit upon said base while said records are attached to said pins of said unit, rigidly securing said records to said base while they are attached to said pins, and freeing said pins from said records.

4. In a method of producing a dental articulator in which an upper unit embodying an upper jaw model and guide pins spaced around said upper jaw model, is manually movable with respect to a lower unit embodying a base, a lower jaw model, and pin-guiding records spaced around said lower jaw model for cooperation with said pins; the steps of positioning each record in operative relation with its cooperating pin, separately attaching each individual record temporarily to its cooperating pin while positioned as aforesaid, temporarily attaching said lower jaw model to the jaw model of said upper unit, placing said upper unit upon said base while said records are attached to said pins and said jaw models are attached to each other, rigidly securing said records and said lower jaw model to said base, freeing said records from said pins, and freeing said upper jaw model from said lower model.

5. A unitary assemblage for use in constructing a dental articulator, comprising upper and lower jaw models detachably attached to each other in cooperative relation and carrying bite plates, arms secured to and projecting horizontally from said upper jaw model, guide pins secured to and projecting downwardly from the outer ends of said arms, pin-guiding records in cooperative relation with the lower ends of said pins, and releasable means rigidly attaching each record individually to its cooperating pin, whereby said records and said lower jaw model may be properly located upon and secured to a base.

6. A dental articulator guide pin having an end for coaction with a jaw movement record, a slide mounted nonrotatably on said pin between the ends of the latter, releasable means for holding said slide in selected position upon said pin, and record-positioning means rigidly mounted on said slide in outwardly spaced relation with said guide pin and projecting toward said end of said guide pin for temporary connection with the record to aid in assembly of the articulator.

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