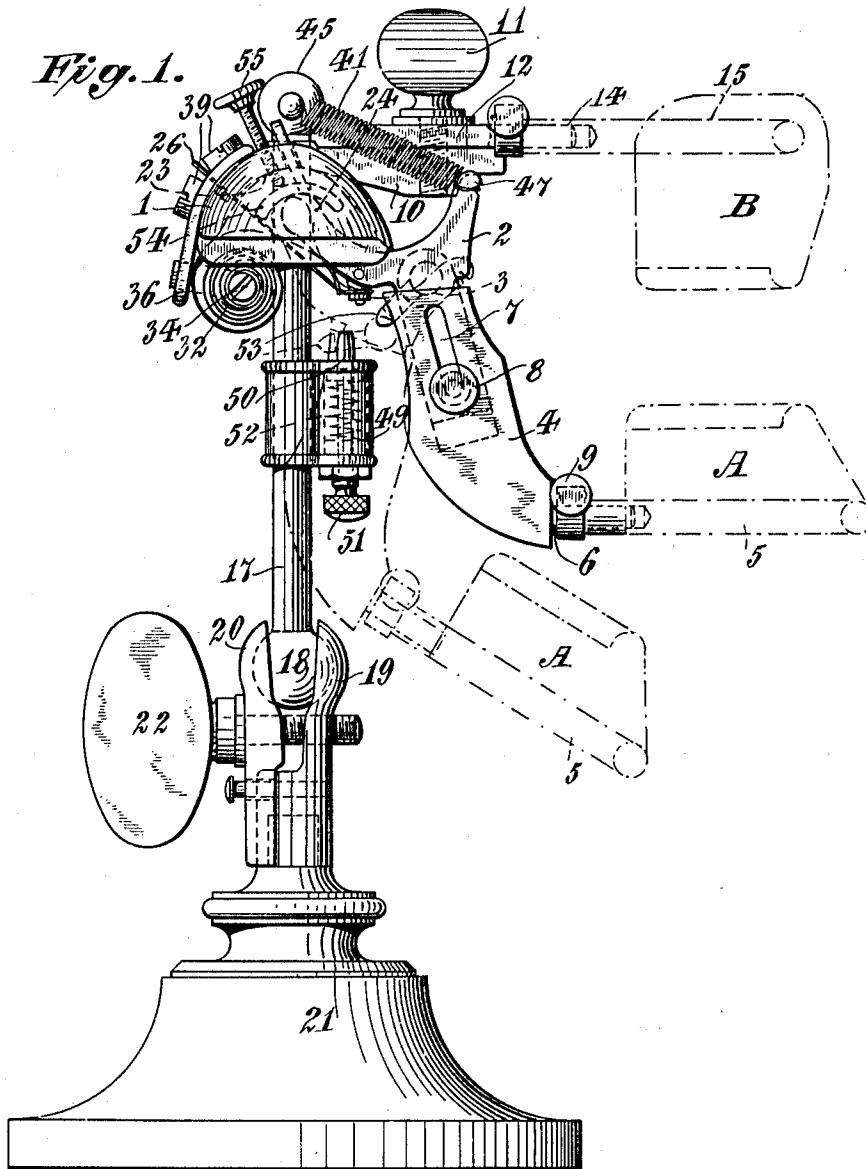


M. WEISS.  
ARTIFICIAL TEETH ARTICULATOR.  
APPLICATION FILED JULY 19, 1911.

1,022,055.

Patented Apr. 2, 1912.  
3 SHEETS-SHEET 1.



Witnesses:  
*Geoffrey*  
*Anna Hoyet.*

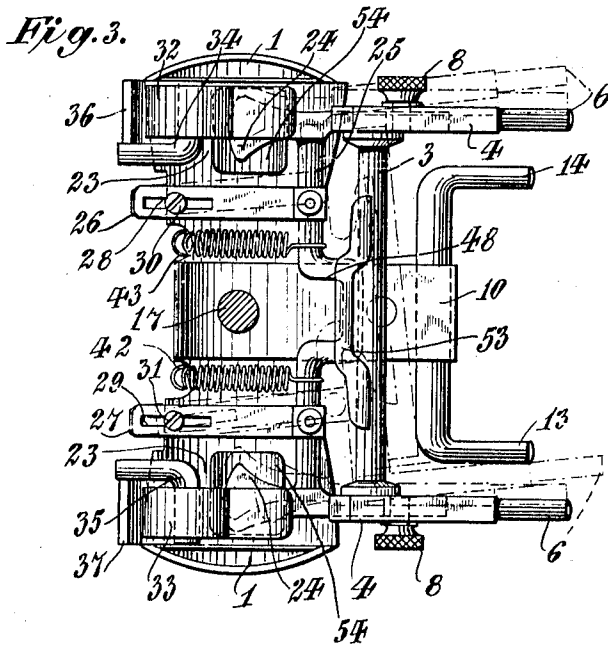
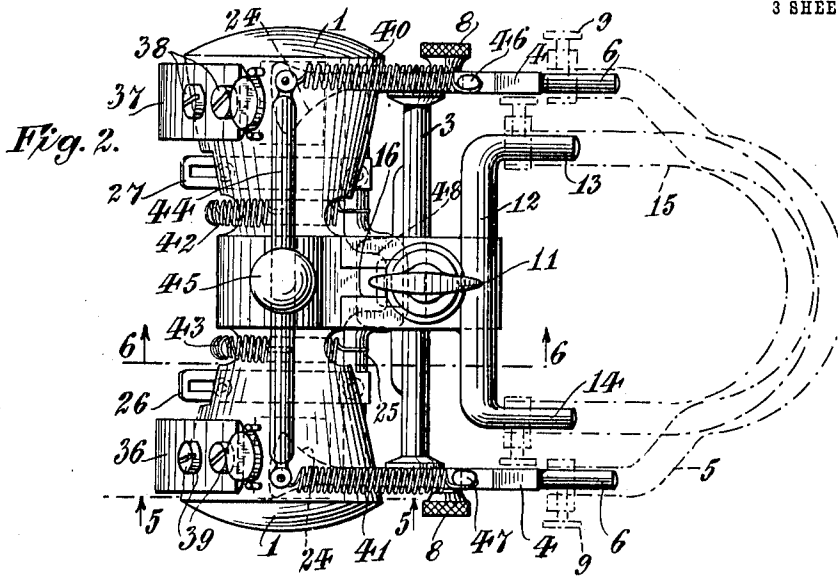
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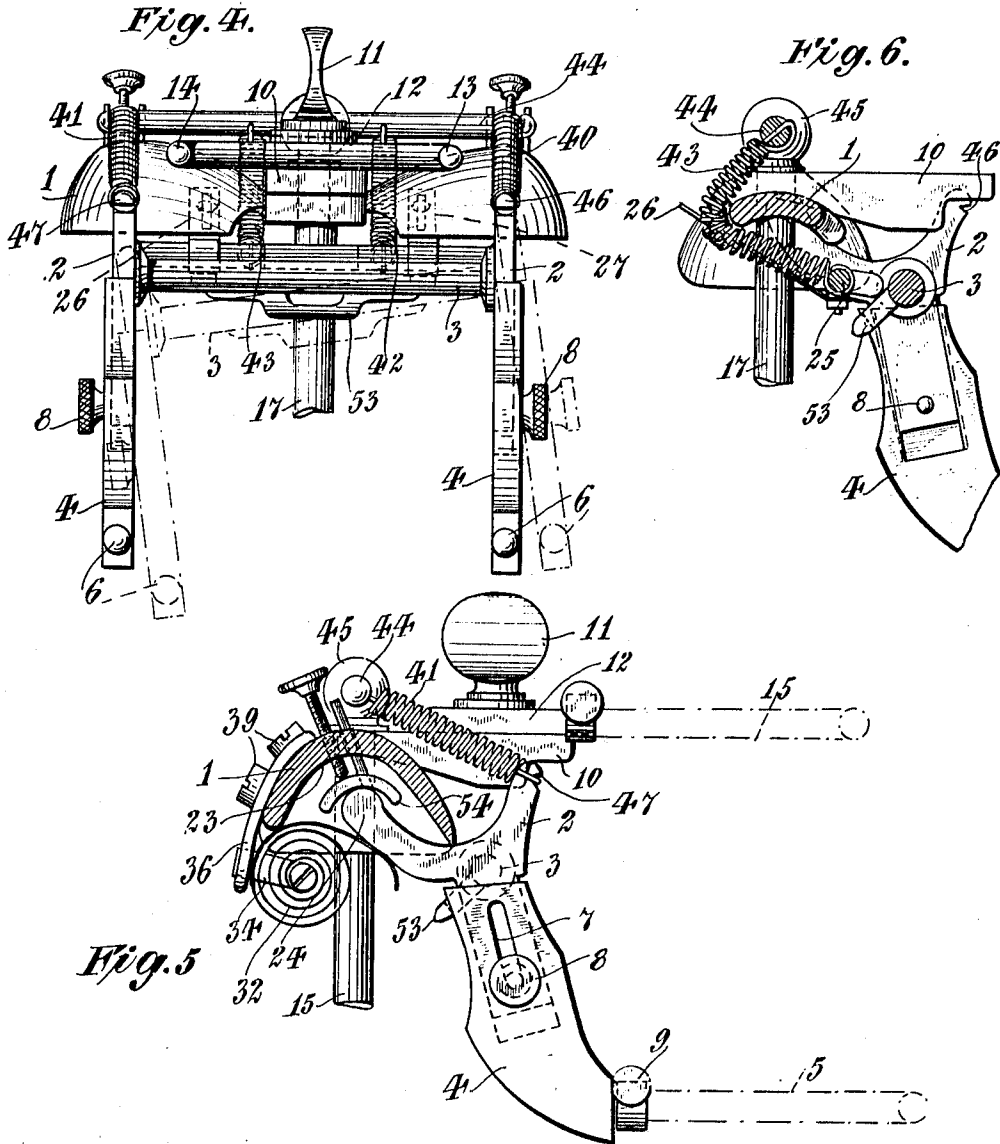
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# UNITED STATES PATENT OFFICE.

MARCELINO WEISS, OF HABANA, CUBA.

ARTIFICIAL-TEETH ARTICULATOR.

1,022,055.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed July 19, 1911. Serial No. 639,274.

*To all whom it may concern:*

Be it known that I, MARCELINO WEISS, a citizen of the Republic of Cuba, residing at Habana, Island of Cuba, have invented certain new and useful Improvements in Artificial-Teeth Articulators, of which the following is a specification.

My invention relates to dental articulators, and the object of my invention is to provide an instrument of this kind, in which all the natural movements of the human lower jaw relative to the upper jaw, including the movement of semi-rotation, can be easily performed.

To this end my new apparatus is so constructed that it consists of two main parts, one part being stationary and representing the upper jaw, and the other part being movable and representing the lower jaw, the two parts being yieldingly connected by resilient means so that the movable part can easily perform all the natural movements of the lower jaw relative to the upper jaw. To these two parts holding members for the plaster casts are removably secured, and means are provided whereby the movable part can be temporarily fixed in a position representing the maximum opening of the jaws, which will permit the dentist to use both his hands freely in working on the plaster casts.

In order to give a better conception of my invention, I have illustrated an embodiment thereof in the annexed drawings in which—

Figure 1, is a side view of my new apparatus showing the part representing the lower jaw in two different positions; Fig. 2 is a top view showing also the exchangeable holding members intended to carry the plaster-cast; Fig. 3 is an under view of the two main parts of my apparatus; Fig. 4 is a front view showing the part representing the lower jaw in two different positions; Fig. 5 is a section taken in the plane of the line 5—5 of Fig. 2 and Fig. 6 is a section taken in the plane of the line 6—6 of Fig. 2.

In all the figures the same reference numerals are used to designate like parts.

The two principal parts in my apparatus are marked 1 and 2 respectively. 1 is a fixed or stationary part representing the upper jaw, the part being shown in the drawings as one piece. 2 is the movable part representing the lower jaw, shown in the drawing as comprising two arms rigidly connected by a cross piece 3, whereby the arms

are held in fixed relative positions. To the arms of the movable part 2, are removably secured brackets 4, intended to hold an exchangeable arch-shaped member 5, (Fig. 2), which member is supposed to hold the plaster-cast for the lower set of teeth, the said plaster-cast representing the lower mandible. The member 5, is provided in its ends with sockets to fit the studs 6, formed on the lower ends of the brackets 4. The latter are recessed on the inner sides to receive the arms of the part 2, which arms act as guides for the brackets, as the latter are adjusted along the arms. For the purpose of adjustment, the brackets are provided each with a slot 7, through which passes a clamping screw 8, which is screwed into each arm of the movable part 2. After the loosening of the screws 8, the brackets 4 can be easily adjusted along their respective arms and when the screws 8 are entirely unscrewed, the brackets 4 can be removed. The arch-shaped member 5, supported by the brackets 4, is removably secured in place by clamping screws 9, so that it can be easily taken off and replaced or exchanged.

Projecting from the part 1, and connected therewith, is a fixed support marked 10, which is tapped to receive a thumb-screw 11, intended to clamp to said support a yoke 12, provided with two fingers 13, 14, which are shaped to fit into sockets of an arch-shaped member 15, (Fig. 2) which is supposed to hold the plaster-cast for the upper set of teeth the said plaster-cast representing the upper mandible. The yoke 12 has an open slot 16, which permits the yoke to be adjusted back and forth on its fixed support 10. The plaster-cast carried by the lower holding member 5, is marked A and the plaster-cast carried by the upper holding member 15, is marked B.

The fixed or stationary part 1 is carried on a stem 17, which, at its upper end, passes through the center of the part 1 and at its lower end is provided with a ball 18. The ball may be clamped between two clamping jaws 19, 20 on the base 21, shown in Fig. 1. The jaw 19 is a fixed and the jaw 20 a movable jaw as clearly seen in Fig. 1. The movable jaw 20 is clamped around the ball 18, by means of a thumb screw 22, which passes through the shaft of the movable jaw and is screwed into the lower portion of the fixed jaw 19. Both jaws are provided with

spherical cavities to fit the shape of the ball 18 on the lower end of the stem 17. It is clear that when the movable jaw 20, is released by the unscrewing of the thumb screw 22, the stem 17 can be easily tilted in all directions at any desired angle relative to the horizontal, as will be most convenient to the dentist.

The most important feature of my new apparatus lies in the construction, arrangement and coöperation of the two principal parts 1 and 2, so that all the natural articular movements including the movements of ante-version and retro-version can be easily imitated and thus the correct mutual relationship of the teeth of the upper and lower jaw and their true equilibrium established. This object I attain in the manner hereafter described.

As best seen in Fig. 3, the fixed part 1, is provided at both ends with a cavity 23, which is supposed to represent the glenoid cavity of the temporal bone and which represents the so-called superior articular surface of the temporo-maxillary articulation. To fit these cavities, the upper extremities of the two arms of the movable part 2 are each formed like a knuckle 24, which knuckle represents the condyle of the inferior maxillary bone. The condyle is the so-called articular surface of the inferior temporo-maxillary articulation. Consequently, any desired up and down, sidewise and rotative movement, as well as a slight back and forward movement can be imparted to the movable part 2, relative to the fixed part 1.

In order to guide the movements of the movable part 2, and hold the latter in its normal position, after it has been previously adjusted, as will be later described, the following means are provided. In addition to the cross-piece 3, the two arms of the movable part 2 are connected by a second cross-piece 25, which has fastened to it two narrow guide plates 26, 27, each provided with a slot 28, 29 respectively, through each of which slots passes loosely a pin or screw 30, 31 respectively, secured in the fixed part 1. (See Figs. 2 and 3).

In order to hold the movable part 2, in its normal position there are provided two coiled steel springs 32, 33, which are fastened to and coiled around angular studs 34, 35, secured to lugs 36, 37, fixed by screws 38, 39, on the fixed part 1. The free ends of these coiled springs bear against the two arms of the movable part 2, tending to hold the latter in its normal position relative to the fixed part 1. By "normal position", I means the position in which both sets of teeth supported by the holding members 5 and 15 occupy their proper relative positions as the real teeth would in the mouth of the wearer. The action of the coiled steel

springs 32, 33, is assisted by two pairs of tension springs 40, 41 and 42, 43 respectively. The springs 40, 41 are fastened with their one end to the ends of a rod 44, which is secured in a knob 45, formed integral with, or secured to the fixed part 1. With their other end the springs 40, 41 are hooked to prongs 46, 47, projecting from the two arms of the movable part 2. The other two springs 42 and 43 are fastened with their one end to the said rod 44, and their other end to the cross piece 25. To permit the latter to keep clear of the stem 17 during the various movements of the movable part 2, it has an off-set 48 intermediate its ends, as clearly seen in Figs. 2 and 3.

From the foregoing description it will be seen that the movable part 2, can be easily moved in all directions, as the knuckle-shaped upper extremities of the two arms of the movable part 2, move in the cavities 23, at the ends of the fixed part 1, on the principle of the ball and socket joint. The springs including the coiled steel springs 32, 33, are not strong enough to interfere with the easy movements of the part 2, but are strong enough to normally hold it in the position shown in full lines in Fig. 1.

In order to hold the movable part 2, against the action of the springs in the position indicated in Fig. 1 by the dash and dot lines, which position allows the dentist to work freely with both hands in the arrangement of the teeth on the plaster-cast A, there is fastened to the stem 17 a small bushing 49, through which passes a pin 50, projecting with its free tapered end beyond the upper end of the bushing 49 in which it is held in this position by a spring 52, surrounding the pin inside the said bushing. At its lower end the pin is provided with a knurled button 51, whereby it can be retracted against the action of the spring. In the position of the movable part 2, indicated by the dash and dot lines in Fig. 1, the projecting tapered end of the pin 50 can be seen to enter a yoke-shaped part 53, formed on, or secured to the cross-piece 3, connecting the two arms of the movable part 2. The latter is thus held against the action of the springs. This position is the maximum opening of the part 2, relative to the fixed part 1.

Another important feature of my apparatus is the means which allow for an adjustment of the movable part 2 for the different angles at which the frontal teeth in the upper and lower jaws meet in the mouth of different people. If a set of artificial teeth is to fit perfectly a true equilibrium of the teeth in the mouth of the wearer must be obtained, to enable him to properly masticate. With this end in view, there is placed in each cavity 23, of the fixed part 1, a plate 54, of concave or convex shape so

as to fit the shape of the cavity. These plates 54, form the actual bearing surfaces for the knuckles at the upper ends of the two arms of the movable part 2. Against the backs of said plates 54, bear the ends of set-screws 55, which are screwed into the ends of the fixed part 1, as clearly seen in Fig. 1. By the turning of these screws, therefore, the plates 54 can be moved away from the bottom of the cavities 23 in which they are placed, and as the knuckles shaped ends of the two arms of the movable part 2 bear against the plates 54, the angle at which the teeth arranged on the two plaster-casts A and B meet can be changed, and all irregularities occurring in the jaws of the person for whom the artificial teeth are intended, can be accurately taken care of. Thus, a perfect fit of the artificial teeth can be secured.

As indicated by the dash and dot lines in Figs. 3 and 4, the movable part 2, carrying the brackets 4, for supporting, by means of the holding member 5, the plaster-cast A, can be shifted at will in all directions and also backwardly and forwardly, as actually occurs with the under jaw, when a person is eating. These movements are permitted by the fact that the two arms of the movable part 2, are provided at their upper ends with knuckles corresponding in shape to the condyles of the inferior maxillary bone, which knuckles move easily and freely in the cavities 23 of the fixed part 1, which cavities correspond in shape to the glenoid cavities in the temporal bones in the skull of the human being. In my apparatus, the articular movements of the lower jaw relative to the upper jaw are perfectly reproduced, true to nature. Hence a set of artificial teeth can be accurately and exactly fitted in a manner which has never been accomplished before.

The base 21 which carries the clamping jaws 19, 20 and clamping screw 22, for holding the stem 17, is made heavy so that it will form a secure support.

While I have described my new apparatus in connection with all the details shown in the drawings, I expressly state that I do not intend to be limited to the exact construction as shown and described, as obviously many modifications can be made without departing from the scope of my invention.

I claim:

1. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities and freely movable therein, resilient means yieldingly connecting said two parts, and means on said parts adapted to hold the plaster casts.

2. In a dental articulator, a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting said two parts, a holding member removably secured to said stationary part, brackets adjustably secured to said movable part, and a holding member removably secured to said brackets, both said holding members adapted to hold the plaster casts.

3. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting the said two parts, a support adjustably secured to said stationary part, brackets adjustably secured to said movable part, and a holding member fitted to each said support and said brackets for carrying the plaster casts, and means for removably securing said holding members to said support and said brackets.

4. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, and helical springs connecting said two parts, and means on said two parts for holding the plaster casts.

5. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting said two parts, means on said two parts for holding the plaster casts, and coiled springs arranged on said stationary part and bearing against said movable part to hold the same in its normal position relative to said stationary part.

6. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting the said two parts, holding members on said parts for carrying the plaster casts, small curved plates loosely mounted in said cavities and forming the articular bearing surfaces for the knuckle-shaped ends of said movable part.

7. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting the said two parts, holding members on said parts for carrying the plaster casts, small curved

plates, loosely mounted in said cavities and forming the articular bearing surfaces for the knuckle-shaped ends of said movable part, and means for varying the position of said curved plates in said cavities, at a greater or smaller distance from the bottom thereof.

8. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting said two parts, holding members, adapted to be attached to said parts to carry the plaster casts, small curved plates loosely mounted in said cavities and forming the articular bearing surfaces for the knuckle-shaped ends of said movable part, and set screws passing through said stationary part and bearing against the back of said curved plates for varying the position thereof, at a greater or smaller distance from the bottom of said cavities.

9. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends to fit said cavities, resilient means yieldingly connecting said two parts, holding members adapted to be attached to said parts for carrying the plaster casts, and means independent of the said two parts for securing the said movable part in a position corresponding to the maximum opening of the jaws.

10. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting said two parts, holding members adapted to be attached to said parts for carrying the plaster casts, a base, and a stem extending therefrom for supporting said stationary part.

11. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part rep-

resenting the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting said two parts, holding members adapted to be adjustably attached to said parts for carrying the plaster casts, a base, a stem extending therefrom for supporting said stationary part, and means for securing the stem to said base at any desired angle thereto.

12. In a dental articulator a stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and provided with knuckle-shaped ends fitting said cavities, resilient means yieldingly connecting said two parts, a stem for supporting said stationary part and provided at its lower end with a ball, a base carrying said stem, jaws provided on said base to receive the ball at the lower end of the stem and means for clamping said jaws around said ball.

13. In a dental articulator an integral stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and composed of two arms each provided with a knuckle-shaped end fitting one of said cavities, a cross-piece rigidly connecting the said arms, resilient means yieldingly connecting said two parts, and holding members adapted to be attached to said parts for carrying the plaster casts.

14. In a dental articulator an integral stationary part representing the upper jaw and provided with two cavities, a movable part representing the lower jaw and composed of two arms rigidly connected, each arm having a knuckle-shaped end fitting one of said cavities and freely movable therein, guiding plates provided on said movable part and pins on said stationary part passing loosely through slots in said guide plates.

In testimony whereof I affix my signature in presence of two witnesses.

MARCELINO WEISS.

Witnesses:

ALFRED MULLER,  
A. HOYER.