



A. GYSI.  
DENTAL ARTICULATOR.  
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3 SHEETS—SHEET 2.

Fig. 2

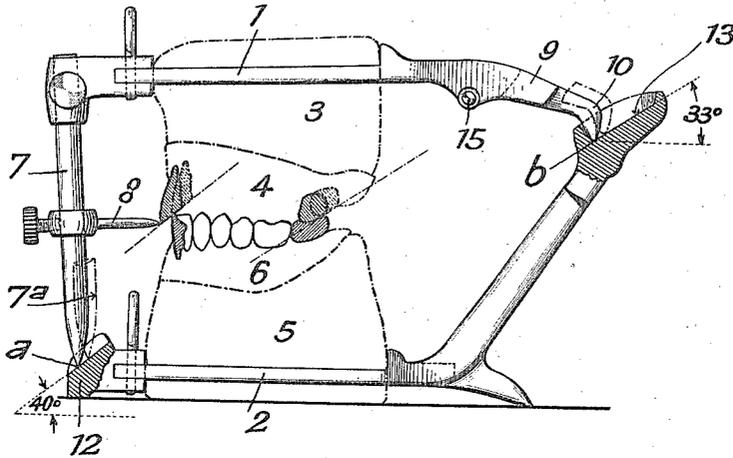
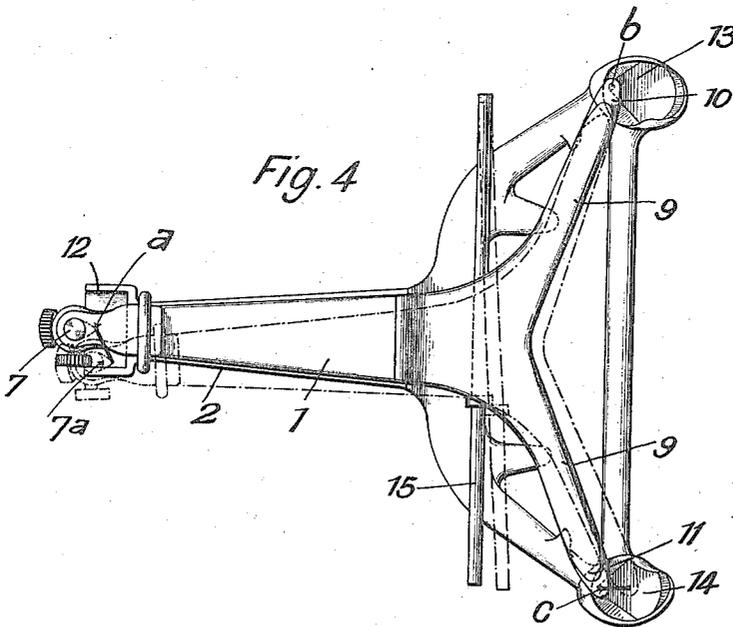
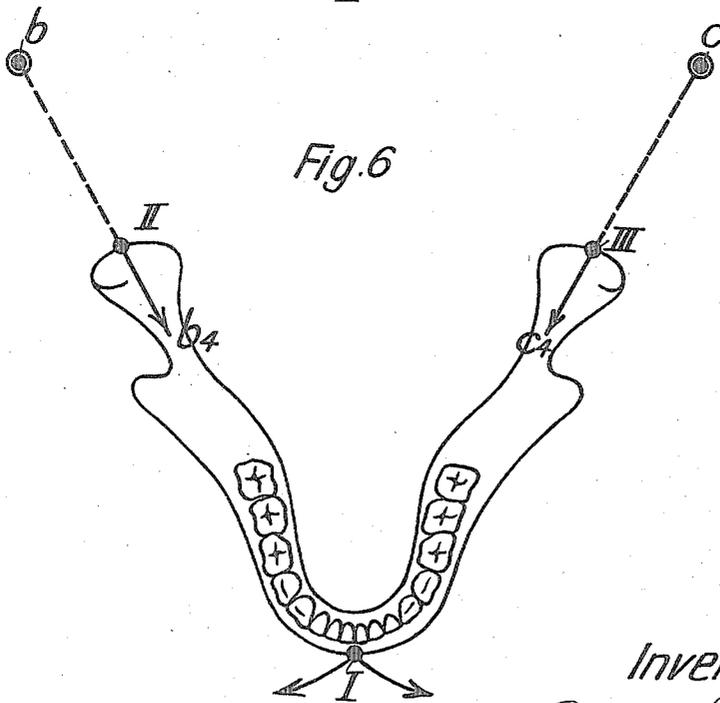
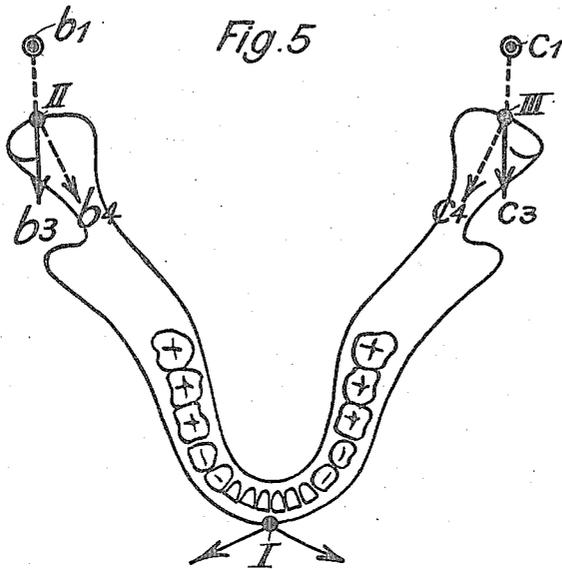


Fig. 4



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# UNITED STATES PATENT OFFICE.

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## DENTAL ARTICULATOR.

1,228,667.

Specification of Letters Patent.

Patented June 5, 1917.

Application filed May 10, 1916. Serial No. 96,542.

*To all whom it may concern:*

Be it known that I, ALFRED GYSI, professor, a citizen of the Republic of Switzerland, residing at Obere Zäune 10, Zurich, Switzerland, have invented new and useful Improvements in or Relating to Dental Articulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

In my earlier United States Patent 1041270 I have disclosed an articulator for artificial teeth, in which the upper part rests with its rear end on two guide-sockets arranged behind the points that correspond to the natural jaw hinges. As hereinafter shown and described, it is necessary, in using this prior articulator for reproducing the lateral masticating or grinding movement, to exert upon it, by hand, a lateral pressure in order to obtain the correct inward movement corresponding to the forward movement.

According to the present invention, the guide-sockets are arranged in the common geometrical centers of the opening angle and the angle of lateral grinding movement of the set of teeth. The result of this is, that the hinge points perform in a positive manner, and without any special pressure, a natural inward movement in addition to their forward movement. Thus, the present articulator is a simpler construction and is easier to handle.

A construction according to this invention is illustrated, by way of example, in the accompanying drawing, in which

Figure 1 is a perspective view of the articulator, the lower jaw being shown in dot-and-dash lines.

Fig. 2 is a vertical section, the dot-and-dash lines representing a set of teeth mounted in the articulator and the upper set of

these teeth being shown in its foremost position.

Fig. 3 is a corresponding section, the dot-and-dash lines illustrating the lower jaw.

Fig. 4 is a plan and

Figs. 5 and 6 show the difference in the manner of operation during the lateral masticating or grinding movement between my older articulator and the articulator forming the object of this invention.

In Figs. 1 to 4, 1 denotes the upper and 2 the lower part of the articulator. 3 (Fig. 2) denotes the gypsum block to which is attached the wax plate 4 carrying the set of teeth intended for the upper jaw. 5 is the gypsum block to which is attached the wax plate 6 carrying the set of teeth intended for the lower jaw.

The part 1 is supported at the front by means of a pin 7 adjustable in a vertical direction and having a vertically adjustable cross pin 8 adapted to fix the front cutting tooth edge I. At its rear end, the upper part 1 is provided with diverging arms 9, which end in downward bent points 10 and 11 constituting the rear supports of the upper part 1. The pin 7 rests on an inclined plate 12 that forms an angle of 40° with the horizontal grinding plane A—B. The points 10 and 11 rest in guide sockets 13 and 14, the guiding surfaces of which have an average inclination of 33° to the grinding plane A—B.

The upper part 1 is further provided with an interchangeable, horizontal pin 15, mounted in such a way, that, as shown in Fig. 1, points of this pin 15 fall into the line connecting the natural jaw hinges 16 of a lower jaw supposed to be placed in the articulator.

The points II and III on the pin 15 form with the front cutting tooth edge I an equilateral triangle (Fig. 1).

In the older type of articulator before mentioned, the point of support —a— had the same position as in the present articulator, while the points of support —b— and —c— were so situated as shown by the point

— $b^1$ — in Fig. 3, so that the guide-sockets were also placed behind the points corresponding to the natural jaw hinges 16.

According to the present invention, the 5 points — $b$ — and — $c$ — are arranged still farther backward and outward, so that they coincide with the common geometrical centers of the opening angle and the angle of lateral grinding movement of the set of 10 teeth.

Strictly speaking, — $b^1$ — would be the correct geometrical opening center, to which correspond the paths of the opening movement — $d$ — of the molars, the paths — $d^1$ — 15 of the incisors and the path — $d^2$ — of the front supporting point — $a$ —. In Fig. 3 it will be seen, however, that in shifting this center to — $b$ — or — $c$ —, respectively, the resulting paths of the opening movement 20 — $f$ —, — $f^1$ —, — $f^2$ — are practically identical with the paths — $d$ —, — $d^1$ —, — $d^2$ —, so that the new articulator will work with the required exactness in the case of normal sets of artificial teeth.

25 On the other hand, quite a new effect is obtained with regard to the lateral masticating or grinding movement. In the older type of articulator, where the centers of rotation — $b^1$ —, — $c^1$ — were situated midway 30 between the hinges 16 and the plane of the teeth A—B, and about one centimeter behind 16 (Figs. 1 and 3), it will be seen in Fig. 5, that upon a rotation about — $c^1$ —, the joint II moves toward — $b^2$ —, while upon 35 a rotation about — $b^1$ —, joint III moves toward — $c^2$ —. In order, however, to correspond to the natural grinding movement, the joint II should move toward — $b^4$ — and the joint III toward — $c^4$ —. To attain this latter 40 movement in my older type of articulator it was necessary to provide an inward directed vertical guiding wall in order to obtain a positive inward movement toward — $b^4$ — and — $c^4$ —, respectively. This latter 45 movement was then attained by exerting a hand-pressure on the articulator.

According to the present invention the points of articulation — $b$ — and — $c$ — are 50 situated, as shown in Fig. 6, about four centimeters behind the hinges 16, *i. e.* the points II and III, and are moreover farther apart than these latter points. Upon a rotation of the jaw about — $b$ — or — $c$ —, the joints II or III are not only moved forward in a 55 direct manner, but also inward and directly toward the points — $b^4$ — and — $c^4$ —, respectively, so that no hand pressure has to be exerted upon the articulator.

In the case of such lateral grinding movement, the pin 7 (Figs. 2 and 4) slides upward, in one of the two lateral positions 7<sup>a</sup> 60 (Figs. 2 and 4), along one of the paths

shown in Fig. 1 in dotted lines and having an inclination of about 40°, while the point — $b$ — or — $c$ —, respectively, slides upward 65 along the guiding surface of one of the guiding-sockets having an average angle of inclination of 33°. The same movements occur in the case of the forward grinding movement. The effect thus obtained is, as shown 70 in Fig. 2, that the incisors move at a different angle than the molars, which movement corresponds to the natural movement of the set of teeth.

Having now particularly described and 75 ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. An articulator for artificial sets of teeth, comprising a lower articulator part 80 provided with two guide-sockets integral with the uprights of the lower frame and arranged behind the points corresponding to the natural jaw hinges and lying in common geometrical centers of the opening angle and 85 the angle of lateral grinding movement of the set of teeth and an upper articulator part, the downward bent rear end of which rests on said guide-sockets, substantially as described. 90

2. An articulator for artificial sets of teeth, comprising a lower articulator part provided with two guide-sockets integral with the uprights of the lower frame and arranged behind the points corresponding to 95 the natural jaw hinges and lying in common geometrical centers of the opening angle and the angle of lateral grinding movement of the set of teeth, said sockets being provided with a guiding surface having an angle 100 of inclination of 33° to the grinding plane, a front guiding surface on said lower articulator part having an angle of inclination of 40° to the grinding plane and an upper articulator part provided with rear supports resting with their bent ends on said 105 inclined surfaces of the guide-sockets and a front support resting on the inclined front guiding surface of the lower articulator part, the rear supports of this upper articulator 110 part being moved during the lateral grinding movement upward and rearward along the inclined surfaces of the sockets, while the front support is moved in the same way along its guiding surface, substantially as 115 described.

3. An articulator for artificial sets of teeth, comprising a lower articulator part having two guide-sockets integral with the uprights of the lower frame and arranged behind the points corresponding to the natural jaw hinges and lying in common geometrical centers of the opening angle and the angle of lateral grinding movement of the set 120

of teeth and an upper articulator part, the downward bent rear end of which rests on said guide sockets, and a horizontal pin interchangeably mounted at the upper articulator part in such a way that points of the pin fall into the line connecting the natural jaw hinges of a lower jaw placed in the articulator, substantially as described.

In testimony that I claim the foregoing as my invention, I have signed my name in 10 presence of two subscribing witnesses.

ALFRED GYSL.

Witnesses:

CARL GUBLER,  
ARNOLD LEHNER.