

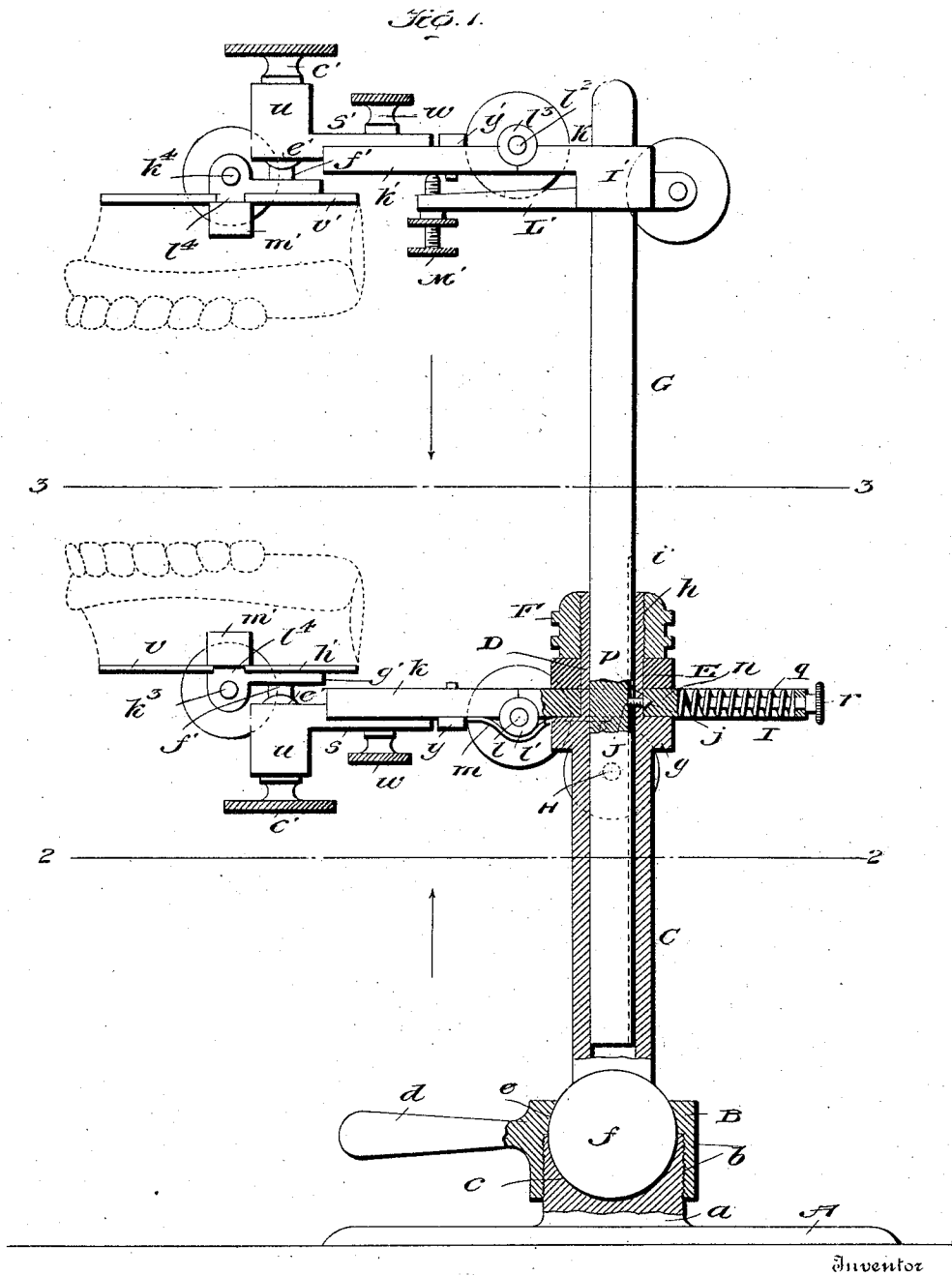
No. 772,304.

PATENTED OCT. 11, 1904.

F. L. WILLIAMS.
DENTAL ARTICULATOR.
APPLICATION FILED JULY 25, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Inventor

Witnesses

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By

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No. 772,304.

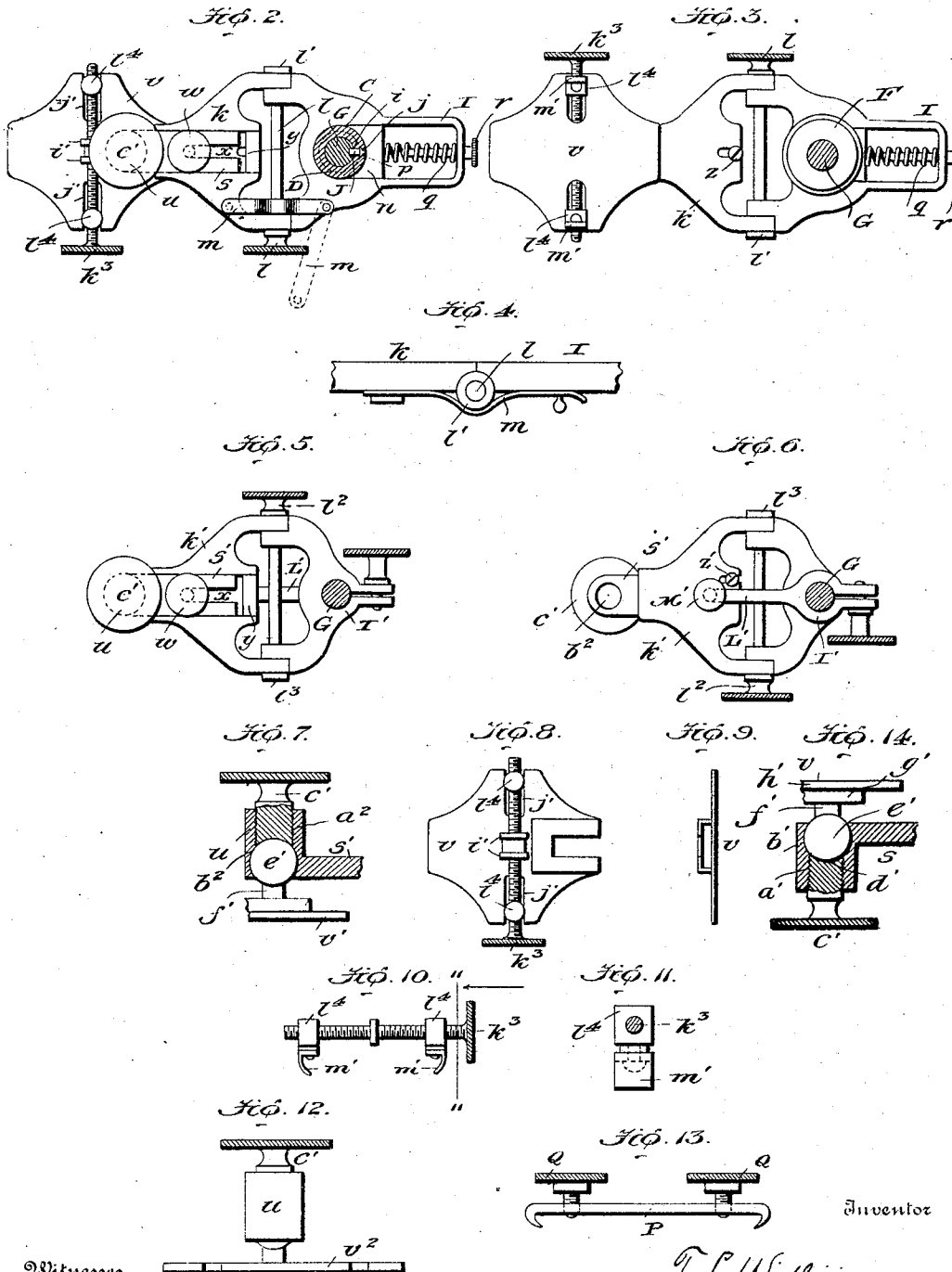
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Inventor

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UNITED STATES PATENT OFFICE.

FRANK L. WILLIAMS, OF FLORENCE, COLORADO.

DENTAL ARTICULATOR.

SPECIFICATION forming part of Letters Patent No. 772,304, dated October 11, 1904.

Application filed July 25, 1904. Serial No. 218,070. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. WILLIAMS, a citizen of the United States, residing at Florence, in the county of Fremont and State of Colorado, have invented new and useful Improvements in Dental Articulators, of which the following is a specification.

My invention pertains to dental articulators; and it contemplates the provision of an articulator of such construction that the models may be quickly and easily adjusted to any shape of bite and when once adjusted on the bite may be removed from the articulator and replaced therein in such manner as to assure their being in adjustment and one adapted to hold the models without the aid of plaster-of-paris or other substance and also adapted to be manipulated in such manner as to permit of the models being operated on to the best advantage.

Other advantageous features of the invention will be fully understood from the following description and claims when taken in connection with the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of the dental articulator constituting the present and preferred embodiment of my invention complete, the same being shown with two models in position. Fig. 2 is a horizontal section taken in the plane indicated by the line 2 2 of Fig. 1 looking upwardly and showing the lower-plate holder of the articulator in inverted plan. Fig. 3 is a horizontal section taken in the plane indicated by the line 3 3 of Fig. 1 looking downwardly and showing the lower-plate holder in top plan. Fig. 4 is a detail section illustrative of the arrangement of the spring for holding the outer section of the lower-plate holder against casual downward movement. Fig. 5 is a view illustrative of the upper side of the upper-plate holder of the articulator. Fig. 6 is a view showing said plate-holder in inverted plan. Fig. 7 is a detail section illustrative of the ball-and-socket joints of the plate-holders. Fig. 8 is a view of one of the model-plates of the articulator and the appurtenances thereof; Fig. 9, an

edge elevation of the plate alone, taken at right angles to Fig. 8; Fig. 10, a view of the double screw and model clamps carried by each of the model-plates, and Fig. 11 a detail section taken in the plane indicated by the line 11 11 of Fig. 10. Figs. 12 and 13 are views illustrative of a modified model-plate and model-holding means hereinafter referred to. Fig. 14 is a detail section illustrating elements of the lower-plate holder.

Referring by letter to the said drawings, and more particularly to Figs. 1 to 11 thereof, A is a plate adapted to be secured to a table or other support and equipped with a pedestal *a*, exteriorly threaded, as indicated by *b*, and having a concave socket *c* in its upper end. B is a nut screwed on said pedestal and having a handle *d* and also having the upper portion of its interior rounded, as indicated by *e*, and C is a hollow shaft which terminates at its lower end in a ball *f* and which is hollow and has a collar *g* secured on its upper end. The ball *f* is seated in the socket *c* of pedestal *a* and interposed between said socket and the interior *e* of nut B, and hence it follows that the shaft C, on which the plate-holders are supported, may be swung in any direction, also that by tightening the nut B, so as to bind the ball *f* between the same and the pedestal *a*, the operator is enabled to adjustably fix the models in such positions that he can work on them to the best advantage. D is a hollow tube secured to and extending upwardly from the collar *g* and exteriorly threaded at its upper end, as indicated by *h*. E is a collar mounted on tube D above the collar *g*; F, a milled nut arranged above the collar E and engaging the threaded upper end of tube D; G, a shaft, preferably of circular form in cross-section, extending downwardly through the tube D and into the hollow shaft C and having a longitudinal key-seat *i*; H, a set-screw bearing in the shaft C and arranged to engage the shaft G, so as to hold the latter against casual movement; I, the inner section of the lower-plate holder, which section surrounds the tube D and is interposed between the collars E and *g*, and J

is a screw bearing in the tube D and entering the key-seat *i* of the shaft G, so as to hold the latter shaft against axial movement, while permitting it to move vertically, and having a V-shaped outer head *j*, Fig. 3, for a purpose presently set forth.

In addition to the inner section I the lower-plate holder of my novel apparatus comprises the following elements, all of which are clearly shown in Figs. 1 to 4—viz., an outer section *k*, hinged, through the medium of a bolt *l*, to the section I and arranged to swing downwardly from a horizontal plane thereon; a nut *l'*, mounted on one end of the bolt *l* and designed when tightened to fix the section *k* with respect to the section I; a bowed spring *m*, Figs. 2 and 4, pivoted to the under side of the section *k* and adapted in the position shown by full lines in Fig. 2 to yieldingly hold the section *k* against downward movement and in the position shown by dotted lines in said figure to permit of such movement of the section *k*; a follower *n*, guided in the section I and having a seat *p* in its forward side corresponding in shape to and receiving the head *j* of the screw J; a coiled spring *q*, interposed between the rear end of the section I and the follower *n*; a screw *r*, bearing in the rear end of the section I and extending a considerable distance through the spring *q*; a slide *s*, dovetailed in the outer section *k*, Fig. 2, and having a socket *u* at its forward end; a model-plate *v*, connected with the said slide *s* in a manner hereinafter specifically described; a screw *w*, extending through a slot or bifurcation *x* of the slide *s* and having a head arranged to bind against the under side of said slide, and a shank bearing in the section *k*, and an adjustable stop *y*, also dovetailed in the section *k* in rear of the slide *s* and designed to be adjustably fixed to the said section *k* through the medium of a screw *z*, the shank of which is adapted to move in a slot in the section *k*, as shown in Fig. 3. The slide *s* enables the operator to adjust the model on plate *v* backward or forward with respect to the section *k*, and the screw *w* admits of the said slide being adjustably fixed to the section. It will also be observed that subsequent to the adjustment of the slide *s* and the fixture of the stop *y* to section *k* in rear of the slide *s* the slide, together with the parts and the model carried thereby, may be removed from the section *k*, and yet when the slide is put back in the section *k* the stop *y* will position the model so that it will be in the same adjustment as to the shape of bite as it was previous to the removal of the slide from the section *k*. From this it follows that a model and its complementary slide *s* may be removed from the section *k* and replaced with another model and complementary slide and that the latter may be removed and those first mentioned put in the section *k* and quickly

and easily adjusted to their original position. In virtue of the V-shaped head on the set-screw J, the follower *n* and its V-shaped seat *p*, the coiled spring interposed between and connected to the follower and the rear end of the section I, and the screw *r*, bearing in the rear end of said section and extending a considerable distance through the spring, it will be observed that when the screw *r* is turned outwardly the operator is enabled to swing the lower-plate holder and the lower-jaw model thereon a slight distance to the right or left and that when the said holder is released the spring *q* will serve to return the same to its original position. It will also be observed that the follower *n* will serve to hold the holder in its said original position and against casual movement to either the right or left, and it will further be observed that while the operator is enabled to move the holder and the lower-jaw model forwardly on the tube D the spring *q* will serve when the holder is released to return it to the position illustrated relative to the tube D. At its forward end the slide *s* of the lower-plate holder is provided with a vertically-disposed socket, which is interiorly threaded, as indicated by *a'*, and is provided at its upper end with an interior rounded portion *b'*. In the lower threaded portion of the said socket bears a screw *c'*, having a concave upper end *d'*, between which and the rounded portion *b'* of the socket is interposed a ball *e'*, which carries a stem *f'*, on which is a plate *g'*. The plate *g'* is designed to rest in flanges *h'* on the model-plate *v*, and hence it will be observed that by adjusting and adjustably fixing the ball the said model-plate may be adjustably fixed in a great variety of positions to position the model thereon and facilitate work on said model. In addition to the flanges *h'* the model-plate *v* is provided with lugs *i'* and slots *j'*. Journalled in the lugs *i'* is a screw *k'*, which has a right-hand thread at one side of the lugs and a left-hand thread at the other side thereof and also has an enlargement interposed between the lugs, and mounted on the threads of the screw and guided in the slots *j'* of the model-plate are nuts *l'*, on which are swiveled clamps *m'* for engaging the model to be held at opposite sides thereof. By reason of the construction thus described it will be readily observed that when the screw *k'* is turned in one direction the clamps *m'* will be set against the model, while when the screw is turned in the opposite direction the clamps will be moved in opposite directions and out of engagement with the model.

The upper-plate holder K, which is best shown in Figs. 1, 5, 6, and 7, comprises an inner section I', clamped on the shaft K and having a forwardly-reaching arm L'; a section *k'*, hinged to the section I' in the same

manner that the section *k* is hinged to the section I, except that said section *k* is arranged to swing upwardly instead of downwardly; a screw *M'*, bearing in the arm *L'* and engaging the under side of the section *k'*, so as to effect fine vertical adjustment of the said section *k'* and the parts carried thereby; a slide *s'*, similar to the slide *s*, except that it is arranged at the upper side of the section *k'*; a stop *y'*, similar to the stop *y*, except that it is also arranged at the upper side of the section *k'*, and its screw *z'* is arranged out of the longitudinal center of the section *k'*, so as to be out of the way of the arm *L'*, before described; a screw *w'*, similar to the screw *w*, but differently disposed; a bolt *l'*, similar to the bolt *l*; a nut *l'*, similar to the nut *l*; a socket on the slide *s'*, similar to the socket on the slide *s*, except that it has a rounded portion *b'* at its lower end and threads *a'* above said rounded portion; a model-plate *v'*, which is similar to the model-plate *v*, except that it is carried at the lower end of the ball-stem; a screw *K'*, which is similar to the screw *K*, but which is arranged above the model-plate *v'*; nuts *l'*, similar to those before described, and clamps *m'*, similar to the clamps before described. It will be appreciated from this that so far as the connection of the upper-jaw model to the section *k* is concerned and the removal and replacing of the upper-jaw model the upper-plate holder is possessed of all of the advantages hereinbefore ascribed to the lower-plate holder.

It will be gathered from the foregoing that with my novel apparatus the lower-jaw model and the upper-jaw model may be easily and expeditiously adjusted to any shape of bite, and when so adjusted on the bite the models may be removed from the plate-holders, and yet when they are replaced in the plate-holders they will be in the same adjustment as to bite as originally. It will also be gathered that the clamps for holding the models obviate the necessity of employing plaster-of-paris or similar substance and that the plate-holders and the models carried thereby are susceptible of being opened and closed after the manner of human jaws with a view of facilitating the adjustment of the models to a particular shape of bite.

In Figs. 12 and 13 of the drawings I have shown a modified model-plate *v'*, a clamp *P*, and screws *Q*, which are adapted to be employed on either of the plate-holders in lieu of the model-plate, double screw, and clamps and nuts thereof. The model-plate *v'* has notches in its forward edge to receive the shanks of the screws *Q*, on which the clamp *P* is mounted, and hence it will be seen that the said clamp may be readily fixed to the model-plate. It will also be observed that the claws at the ends of the clamp *P* are adapted to be embedded in the plaster-of-paris

on the back of a model while the plaster is in a plastic state, with a view of effecting secure connection of the model to the model-plate.

I desire it distinctly understood that when desired the model-plate and model-engaging means shown in Figs. 12 and 13 of the drawings may be used in lieu of the model-plates and model-engaging means shown in Figs. 1 to 11 of the drawings without involving a departure from the scope of my invention.

I have entered into a detailed description of the construction and relative arrangement of the parts embraced in the present and preferred embodiments of my invention in order to impart a full, clear, and exact understanding of the said embodiments. I do not desire, however, to be understood as confining myself to such specific construction and relative arrangement of parts, as such changes or modifications may be made in practice as fairly fall within the scope of my invention as claimed.

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

1. In a dental articulator, the combination of a pedestal having a concave seat in its upper end, and also having an exterior thread, a nut mounted on said pedestal and having an interiorly-rounded upper portion, a ball interposed between the seat of the pedestal and the rounded portion of the nut, an upright fixed with respect to and movable with the ball, and lower and upper plate holders connected and movable with the upright.

2. In a dental articulator, the combination of a pedestal having a concave seat in its upper end, and also having an exteriorly-threaded upper portion, a nut mounted on the threaded portion of the pedestal and having an interiorly-threaded upper portion, a ball interposed between the seat of the pedestal and the rounded portion of the nut, a tubular upright or shaft fixed with respect to the ball and having a collar at its upper end, and a tube extending upwardly from said collar and exteriorly threaded, a lower-plate holder surrounding said tube and bearing on the collar, a collar surrounding the tube, above the plate-holder, a nut mounted on and engaging the tube above the latter collar, a set-screw bearing in the tubular upright or shaft, a shaft extending down through the nut and the tube and into the tubular upright or shaft so as to be engaged by the set-screw, and an upper-plate holder carried by the latter shaft.

3. In a dental articulator, the combination of a support of circular form in cross-section, a key fixed with respect to said support and having a beveled head, a plate-holder mounted and adapted to swing laterally on the support, a follower movable in the plate-holder and having a beveled seat receiving the head of the key, and a spring backing the said fol-

lower and interposed between the same and the plate-holder.

4. In a dental articulator, the combination of a support of circular form in cross-section, a key fixed with respect to said support and having a beveled head, a plate-holder mounted and adapted to swing laterally on the support, a follower movable in the plate-holder and having a beveled seat receiving the head of the key, a spring backing the said follower and interposed between the same and the plate-holder, and a screw bearing in the plate-holder and extending through the spring.

5. In a dental articulator, the combination of a tube, a shaft extending loosely through the tube and having a key-seat, an upper-plate holder on said shaft, a lower-plate holder mounted on the tube and arranged to swing laterally, a key extending through the tube and into the key-seat of the shaft, and having a beveled head, a follower movable in the lower-plate holder and having a beveled seat receiving the head of the key, a coiled spring interposed between the follower and the lower-plate holder and backing said follower, and a screw bearing in said plate-holder and extending through the spring.

6. In a dental articulator, the combination of a plate-holder, a slide movable thereon, means for adjustably fixing the slide with respect to the plate-holder, and a stop adjustably connected to the plate-holder and arranged to determine the position of the slide in the event of the latter being removed from and replaced in the holder.

7. In a dental articulator, the combination of a plate-holder, a slide movable thereon, means for adjustably fixing the slide with respect to the plate-holder, a socket carried by the plate-holder and having an interior rounded portion and an interior thread, a nut or screw bearing in said socket and having a concave inner end, a ball interposed between said concave end of the screw and the rounded portion of the socket, and having a stem, and a model-plate carried by the stem of the ball.

8. In a dental articulator, the combination of a plate-holder, a slide movable thereon, means for adjustably fixing the slide with respect to the plate-holder, a socket carried by the plate-holder and having an interior rounded portion and an interior thread, a screw bearing in said socket, and having a concave inner end, a ball interposed between said concave end of the screw and the rounded portion of the socket and having a stem and a plate thereon, and a model-plate having flanges arranged to receive the plate on the stem, and also having means for engaging and holding a model.

9. In a dental articulator, a plate-holder comprising an inner section, an outer section hinged to the inner section and arranged to

swing downwardly thereon, and a bowed spring pivoted to one section and arranged in one position to yieldingly hold the outer section against downward movement and in another position to permit of downward movement of said outer section.

10. In a dental articulator, a plate-holder comprising an inner section having an outwardly-reaching arm, an outer section hinged to the inner section and arranged to swing vertically thereon, and a screw bearing in the arm of the inner section and engaging the under side of the outer section.

11. In a dental articulator, the combination of an upright hollow shaft having a collar at its upper end and a tube extending above said collar, a key arranged in the tube, a shaft having a longitudinal key-seat receiving the key, a screw bearing in the hollow shaft and arranged to engage the last-mentioned shaft, a lower-plate holder comprising an inner section mounted on the tube and yieldingly engaging the key, an outer section hinged to the inner section, means for yieldingly holding the outer section against downward movement, a slide movable in the outer section, means for adjustably fixing the slide thereto, a stop adjustably connected to the outer section and adapted to position the slide therein, and a model-plate carried by the slide and provided with means for engaging and holding a model, and an upper-plate holder comprising an inner section fixed on the shaft and having an outwardly-reaching arm, an outer section hinged to the inner section so as to swing upwardly, a screw bearing in the arm and engaging the under side of the outer section, a slide movable in the outer section, means for adjustably fixing the slide with respect to said section, a stop adjustably connected to the outer section and arranged to position the slide, and a model-plate carried by the slide and provided with means for engaging and holding a model.

12. In a dental articulator, the combination of a model-plate having opposite slots and lugs situate between the slots, nuts movable in the slots, clamps carried by said nuts, and a screw having oppositely-threaded portions bearing in the nuts, and also having an enlargement interposed between the lugs of the model-plate.

13. In a dental articulator, the combination of a model-plate having notches, a clamp having model-engaging claws, and screws bearing in the clamp and arranged in the notches of the plate.

14. In a dental articulator, a plate-holder comprising an inner section, an outer section hinged to the inner section, a slide movable outwardly and inwardly in the outer section, means for adjustably fixing the slide to the outer section, a stop adjustably connected to

the outer section and arranged to position the
slide, a model-plate adjustably connected with
the slide, means for adjustably fixing the
model-plate with respect to the slide, and
5 means on the model-plate for engaging and
holding a model.

In testimony whereof I have hereunto set

my hand in presence of two subscribing witnesses.

FRANK L. WILLIAMS.

Witnesses:

J. W. RAMBO,
M. E. LEWIS.