G. S. DAVIDSON.

BITE TAKING DEVICE.

APPLICATION FILED DEC. 16, 1919.

1,385,070.

Patented July 19, 1921.

2 SHEETS—SHEET 1.

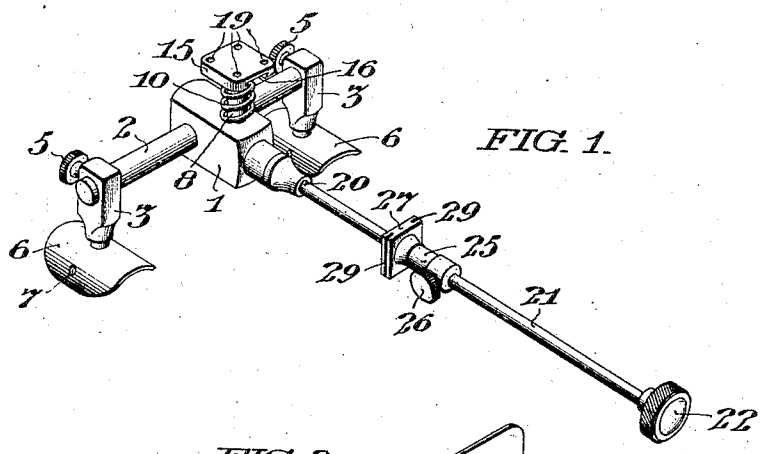
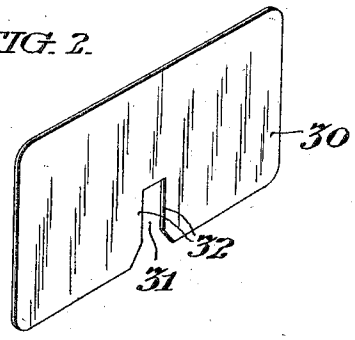


FIG. 1.

FIG. 2.



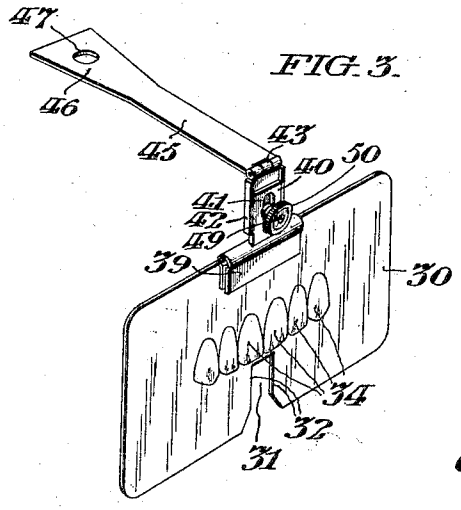


FIG. 3.

Witness

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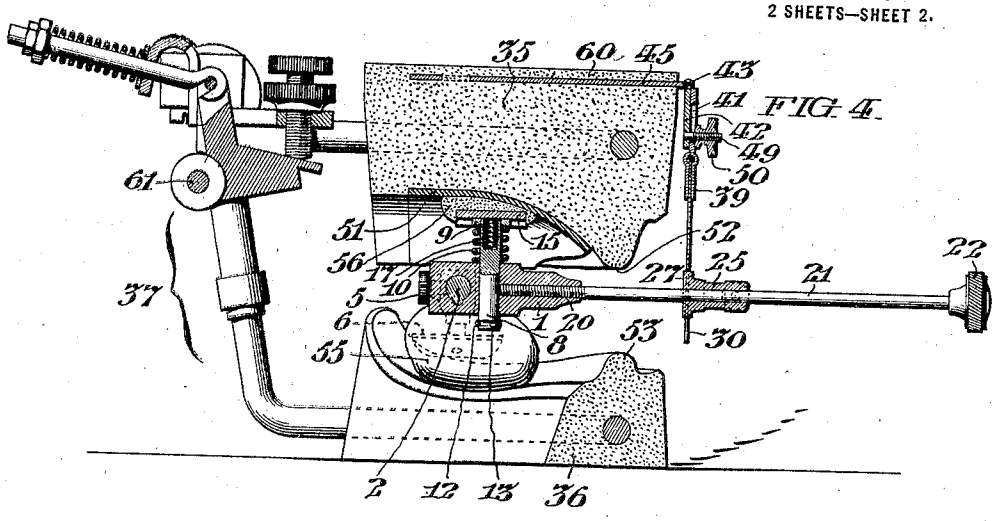


FIG. 4.

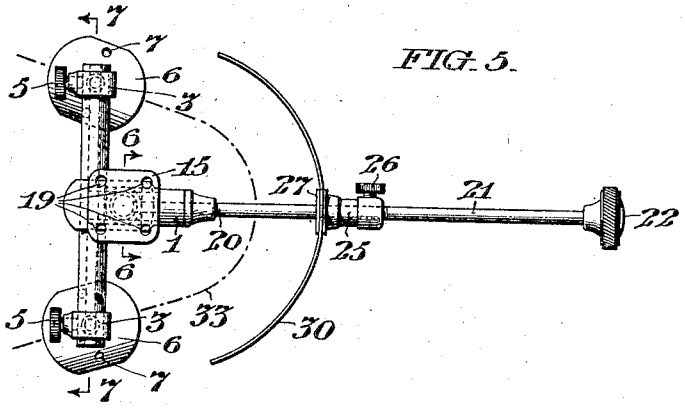


FIG. 5.

FIG. 6.

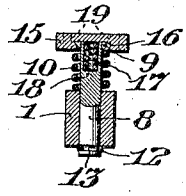
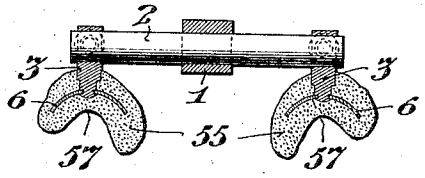


FIG. 7



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UNITED STATES PATENT OFFICE.

GORDON S. DAVIDSON, OF SYDNEY, NEW SOUTH WALES, AUSTRALIA.

BITE-TAKING DEVICE.

1,385,070. Specification of Letters Patent. Patented July 19, 1921.

Application filed December 16, 1919. Serial No. 345,255.

To all whom it may concern:

Be it known that I, GORDON S. DAVIDSON, a subject of the King of England, and a resident of Sydney, New South Wales, Australia, have invented certain new and useful Improvements in Bite-Taking Devices, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates particularly to devices for determining the natural occlusion and proper position of the human jaws, so as to facilitate the preparation of artificial dentures adapted to replace natural teeth in the human mouth.

The success, comfort and usefulness of artificial dentures depend upon their proper occlusion, and, therefore, in the operation of taking the bite, it is highly essential that the operator see that the patient causes the jaws to approach naturally and in correct symmetry. The common or usual method of determining the proper movement and distance between the upper and lower jaws and of ascertaining whether the lower jaw is closed without protrusion or lateral motion is to conform a piece of softened wax to the arch of the mouth and place it between the gums of the patient upon which to bite. This method, however, so obscures the interior of the patient's mouth from view of the operator, that it is impossible to ascertain whether the patient is protruding the lower jaw or affecting a lateral motion incident to the act of chewing, or whether the patient is causing the jaws to approach too closely for the inter-position of artificial teeth of the proper length and style to correspond with the patient's natural appearance. Consequently, the operator often finds that after he has made dentures, that the bite taken by this method was so unnatural and incorrect as to render the dentures worthless.

The principal object of my invention is to obviate the difficulties and uncertainties attending the method of operation above described, by providing a bite-taking device which is so constructed and arranged that the operator may have an unobstructed view of the interior of the patient's mouth while taking the bite, and may observe the relative position and proximity of the upper and lower jaws and their gum ridges, and the patient may without effort cause the lips to assume their natural position and thereby afford an accurate guide to facilitate the operation of obtaining the correct bite.

Other objects of my invention are to provide a bite-taking device by which the bite may be determined with a minimum amount of material in the patient's mouth, so localized as to not only permit free breathing and avoid discomfort, but to leave the gum ridges free for observation, and which affords yielding means which may be locked in adjusted position to record the proper distance between and relative position of the gum ridges of the upper and lower jaws.

My invention also comprehends a bite-taking device having an attachment for holding tooth models in proximity to the lips of the patient for determining the size, style, shade and position of teeth best adapted to the general appearance and characteristics of the patient under operation.

Specifically stated, the form of my invention as hereinafter described, comprises a bite-taking device having a supporting frame-block or body provided with a vertically movable plunger adapted to engage the palate of a base-plate in the upper jaw; a laterally movable shaft providing arms carrying saddles adapted to rest upon the lower gum ridge; and an outwardly extending stem in threaded engagement with said frame-block or body, rotatably adjustable to lock said plunger in different vertically adjusted positions. Said stem conveniently carries a longitudinally adjustable holder for a preferably transparent card, which may be adjusted in close proximity to the lips of the patient, and upon which tooth models, preferably forms of paper or similar sheet material, may be secured in any position to satisfy the artistic ideas of the operator.

My invention also includes all of the various novel features of construction and arrangement as hereinafter more definitely specified.

In the accompanying drawings, Figure 1 is a perspective view of a bite-taking device constructed in accordance with my invention; Fig. 2 is a perspective view of the transparent card for holding tooth models; Fig. 3 is a perspective view of said card having tooth models attached thereto and showing the hinged support by which it is connected with the denture model; Fig. 4 is a longitudinal sectional view of an articulator carrying models of the upper and

lower jaw, and showing the bite-taking device applied thereto; Fig. 5 is a plan view of the bite-taking device as applied to the gum ridge of the lower jaw; Fig. 6 is a transverse sectional view of said device taken on the line 6—6 in Fig. 5; and Fig. 7 is a transverse sectional view taken on the line 7—7 in Fig. 5, and showing plaster impression thereon.

In said figures, the device comprises a frame-block or body 1 carrying a laterally adjustable shaft 2 upon the opposite ends of which are mounted for longitudinal adjustment thereon, slide-blocks 3 arranged to be engaged therewith, in any desired position, by set-screws 5. Said slide-blocks 3 carry rotatably supported saddle-plates 6, curved to substantially conform in concentric relation to the lower gum ridge of the human mouth, and having perforations 7 therein, providing securing means for plaster which may be engaged therewith in plastic state and caused to form sectional impressions of localized regions of said lower gum ridge.

Said frame-block carries a vertically adjustable plunger 8 having a head 9 whose lateral walls are beveled and inclined upwardly and said plunger is normally thrust upwardly by the spiral spring 10, disposed between said frame-block 1 and head 9, and is limited in its upward movement by the stop comprising the annular abutment 12 which is disposed in the groove 13 in the lower end of said plunger and which is arranged to abut against the lower wall of said frame-block 1. The plunger 8 carries the slide-plate 15 having the dove-tail slot 16 engaged with the inclined walls of the head 9, and arranged for adjustment forwardly and backwardly; the inclined walls of the slot in said plate being maintained in frictional engagement with the inclined walls of the head 9 by the spiral spring 17 disposed in the socket 18 in the upper end of the plunger 8. Said slide-plate 15 is provided with perforations 19 so that plaster may be tenaciously engaged with said plate. The plunger 8 may be locked in different adjusted positions in the frame-block 1 by the set-screw 20, having the stem 21 extended forwardly and provided with a knurled-thumb-knob 22.

The device thus described may be inserted in the patient's mouth for determining the relative position of the upper and lower jaws in the operation of taking the bite, for the purpose of providing artificial dentures, in a manner hereinafter more specifically described.

While taking the bite it is desirable to determine the size, style, shade and position of the tooth best adapted to the general appearance of the patient under operation. For this purpose, the stem 21 is provided with a bracket 25 arranged for longitudinal adjustment on said stem and arranged to be locked thereon in different adjusted positions by the thumb-screw 26. Said bracket 25 comprises a rectangular plate 27 having grooves 29 in its lateral edges arranged to receive and support the preferably elongated card 30 shown in Fig. 2, formed of celluloid or other transparent flexible material, and having a slot 31 centrally disposed and extending from the lower edge of said card 30, affording opposed edges 32 arranged to be slid into the respective grooves 29 of the rectangular plate 27 for supporting the card in proximity to the lips of the patient under operation, and said card may be flexed to conform concentrically to the gum ridges indicated by the dot and dash line 33, as best shown in Fig. 5.

As shown in Fig. 3, tooth models 34 preferably formed of sheet material, such as paper, may be secured to the card 30 by adhesive or otherwise as desired, and be formed of different shapes, sizes, shades, and disposed in any position on said card 30 to suit the artistic ideas of the operator.

Said card 30 may be suspended in such approximate relation to the models of the upper and lower jaws 35 and 36, respectively, held by a suitable articulator 37, as best shown in Fig. 4, as to facilitate the setting up of teeth on said models. For convenience of operation, the suspending means is so formed that the card may be hingedly supported and be thrown back out of its dependent position to permit the operator to view the teeth which he has set up.

The card-suspending means comprises a clip 39 having a lug or hanger 40 provided with a slot 41, and slidably engaged with the hinge-leaf 42 of the hinge 43, whose other hinge-leaf 45 is broadened laterally as at 46, and provided with a perforation 47 for its convenient attachment to the upper jaw model 35, as shown in Fig. 4. The hinge-leaf 42 is provided with a threaded stud 49 extending through the slot 41 in the hanger 40, and provided with a thumb-nut 50, arranged to engage the lug 40 and its clip 39 in different vertical positions, thus affording an adjustment for the card 30 with respect to the occlusal plane.

The operation and adaptation of my invention is as follows:—

Assuming the patient under operation to have edentulous gum ridges, the impression of the upper and lower gum ridges may be taken in any well-known manner, and the denture models cast therefrom. The upper base-plate 51 may be formed by covering the entire palate and that portion of the ridges from the regions of the third molar to the second bicuspid of the model,

thereby affording an unobstructed view of the central portion of the upper gum ridge 52.

The heels of the gum ridge 53 of the lower denture model 36 may be coated with vaseline to insure easy parting of the model from the impression to be taken thereof. The bite-taking device may now be adjusted to fit the lower gum ridge by spacing the slide-blocks 3 over the crest of the lower gum ridge 53 and rotating the saddle-plates 6 into axial alinement with said crest, as shown in Fig. 5; the crest of the gum ridge being indicated by the dot and dash line 33 for convenience of illustration.

Having thus adjusted the saddle-plates, the device may be removed from the lower denture model 36, and the regions previously coated may each be covered by a gob of plastic material 55, such as plaster of Paris, or other suitable impression material, and while yet moist and soft, the saddle-plates 6 may be rested upon said plastic gobs and settled therein until well covered thereby, with the stem 21 parallel with the plane of the bench upon which the denture model rests, so that when dried and hardened they may be removed from the denture model 36 intact with the bite-taking device, and having the impressions of the localized regions of the heels of the lower gum ridges 53 formed in their lower surface.

The bite-taking device having been removed from the lower denture model 36, it may now be inserted in the mouth of the patient and fitted to the correct position on the natural gum ridges, preferably after the upper base plate 51 shown in Fig. 4 has been adjusted to the roof of the upper jaw of the patient and the plunger 8 has been locked by the set-screw 20 in its lowermost position in opposition to the spring 10.

The frame-block 1 may now be shifted laterally to such position that the stem will protrude from between the lips of the patient in a central position, and if the patient has a normal or symmetrical mouth, said frame-block will occupy a position equally spaced between the slide-blocks 3, but on the other hand, should the patient have an abnormal mouth and the dental arch be unsymmetrical, then the centralizing of the stem 21 with respect to the lips of the patient will cause the frame-block to occupy a position nearer one or the other of the said slide-blocks.

In this position, a small gob 56 of plastic material may be placed upon the slide-plate 15, and the plunger released by loosening the set-screw 20, whereupon the spring 10 will force the slide-plate 15 upwardly to engage the plastic material carried thereby, with the palate of the base-plate 51 in the roof of the mouth, in the same manner as illustrated in connection with the denture models 35 and 36 in Fig. 4.

It may be here noted that it might be found desirable or necessary to adjust the slide-plate 15 either forwardly or backwardly on the head 9 of the plunger 8 to best accommodate its adaptation to the palate of the base-plate 51 to which it is attached by the gob 56 of plastic material.

The patient may now close the mouth until the gum ridges approach to the natural position to which they approached before the natural teeth were extracted, and owing to the fact that the central portions of the upper and lower gum ridges are left uncovered, the operator may have free vision to inspect the position of the gum ridges, so that the patient may not cause them to approach too closely or to cause the lower ridge to be abnormally extended or be retracted backwardly or forwardly, or laterally from their normal closed position. Having determined this position, the plunger 8 may be locked by the rotation of the thumb-knob 22 and the consequent rotation of the set-screw 20.

The bite-taking device thus described will now be in a position in the mouth of the patient substantially as shown in connection with the upper and lower dental models 35 and 36, respectively, on the articulator 37, shown in Fig. 4.

The bite of the patient having been thus determined, the card 30 may be engaged with the plate 27 of the bracket 26 by slipping the opposed edges 32 into the grooves 29 of said plate 27, and then adjusting the bracket 26 into the desired proximity to the lips of the patient.

The operator may now select from his stock of tooth models 34, the size, shape and shade which he believes best adapted to the characteristics of the patient under operation, and place them in position on the tooth card 30, which, as best shown in Fig. 5, may be flexed into concentric relation to the dental arch, as indicated by the dot and dash line 33 in said figure.

Having so placed the tooth models on the card, the whole device may now be removed from the mouth of the patient and placed upon the lower jaw model 36, seeing that the impression 57 of the lower gum ridge 53 formed in the lower surface of the gobs 55 of plastic material rests in its proper position upon said lower jaw model, as shown in Fig. 4. The upper jaw model may then be placed in position upon the base-plate 51 in the position shown in Fig. 4, and the two models thus disposed may then be mounted on the articulator 37.

It may be here noted that the operator may devise any suitable means to hold the upper and lower jaw models in strict rigidity while mounting them upon the articulator. One method might be sug-

gested which has been found to be effective: This is to seal short sticks of wood, such as match sticks, to the sides of the jaw models to hold them in proper position while mounting in the articulator.

The hinged support for the card 30 may now have its clip 39 engaged with the upper margin of said tooth card 30 in the manner shown in Figs. 3 and 4, and the hinge-leaf 45 may be laid flat upon the upper surface of the upper jaw model 35, adjustment being effected between the hinge-leaf 42 and the lug or hanger 40. When thus adjusted, a coating of plaster 60 may be placed over the hinge-leaf 45, as shown in Fig. 4, and the same sealed thereby to the upper jaw model 35 as shown in said figure. The upper jaw model may now be raised upon the articulator hinge 61 to withdraw the card 30 from its engagement with the grooves 29 of the plate 27, and the bite-taking device may be removed from the articulator, leaving the jaw models with the crest of their gum ridges properly spaced from each other, and ready to receive the mountings for the artificial teeth to be set thereon, it being noted that the card 30 having the tooth models 34 thereon may be swung upon the hinge 43 upwardly and out of the way for the inspection by the operator of the artificial teeth which he may be setting up, or may be swung down into position as a guide for setting said teeth, as may be desired.

I do not desire to limit my invention to the precise details of construction and arrangement as herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention as defined in the appended claims.

Having thus described my invention, I claim:—

1. A bite-taking device comprising a frame having separate means adjustable to engage the roof and lower gums of the human mouth.

2. A bite-taking device comprising a frame having means arranged to effect a three-point contact with the jaws of the human mouth.

3. A bite-taking device comprising a frame having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw and vertically adjustable means arranged to engage the upper jaw.

4. A bite-taking device comprising a frame having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, and vertically adjustable means adapted to be securely engaged with a base plate in the upper jaw, said adjustable means being adapted to carry impression material.

5. A bite-taking device comprising a frame having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, and vertically adjustable means including a plunger carrying a slide plate arranged to be adjustable forwardly and backwardly, and be secured to a base plate in the upper jaw.

6. A bite-taking device comprising a frame having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, and vertically adjustable means including a plunger yieldingly forced upwardly and adapted to be securely engaged with a base plate in the upper jaw.

7. A bite-taking device comprising a frame having means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, yielding means including a plunger adjustable to engage a base plate in the upper jaw, and means arranged to lock said plunger in variably adjustable positions.

8. A bite-taking device comprising a frame having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, and including rotatably adjustable members arranged to be alined with said gum ridge, and vertically adjustable means arranged to engage the upper jaw.

9. A bite-taking device comprising a frame-block having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, and including saddle-plates curved to substantially conform concentrically to the gum ridge, and rotatably adjustable to aline with the general direction of said gum ridge, and vertically adjustable means tending to yieldingly engage the upper jaw.

10. A bite-taking device comprising a frame-block having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, and including saddle-plates curved to substantially conform concentrically to the gum ridge, and rotatably adjustable to aline with the general direction of said gum ridge, and vertically adjustable means adapted to be securely engaged with a base-plate in the upper jaw, and including a yielding plunger having a slide-plate adjustable forwardly and backwardly.

11. A bite-taking device comprising a frame-block having laterally adjustable means arranged to engage relatively spaced regions of the gum ridge of the lower jaw, and including saddle-plates curved to substantially conform concentrically to the gum ridge, and rotatably adjustable to aline with the general direction of said gum ridge, vertically adjustable means adapted to be securely engaged with a base-plate in

the upper jaw, and including a yielding plunger having a frictionally-engaged slide-plate adjustable forwardly and backwardly, and means arranged to lock said plunger in different vertical positions.

12. A bite-taking device comprising a frame-block, a transversely disposed shaft laterally adjustable in said frame-block, slide-blocks laterally adjustable on said shaft toward and from said block, curved saddle-plates rotatably carried by said slide-blocks about a vertical axis, a vertically adjustable plunger in said frame-block, a spring tending to force said plunger upwardly, a perforated slide-plate carried by said plunger adjustable thereon forwardly and backwardly, and a rotatable stem extending forwardly from said frame-block in threaded engagement therewith, and arranged to lock said plunger in different vertical positions.

13. A bite-taking device comprising a frame-block, a transversely disposed shaft laterally adjustable in said frame-block and having means thereon to prevent its rotation, slide-blocks laterally adjustable on said shaft toward and from said frame-block, curved saddle-plates rotatably carried by said slide-blocks about a vertical axis, means for locking said slide-blocks in relatively spaced relation, a vertically adjustable plunger in said frame-block, a spring tending to force said plunger upwardly, a perforated slide-plate carried by said plunger adjustable thereon forwardly and backwardly, and a rotatable stem extending forwardly from said frame-block in threaded engagement therewith, and arranged to lock said plunger in different vertical positions.

14. A bite-taking device having means arranged to hold a transparent support to which tooth models may be attached and supported in such approximate relation to the gum ridges of the human mouth that the operator may determine the size, shape, shade and position of teeth best adapted to the characteristics of the patient under operation.

15. A transparent support for the attachment of tooth models, arranged to be held in such approximate relation to the human dental arch that the operator may determine the characteristics of teeth best adapted to the patient under operation, in combination with means arranged to effect attachment of said support to a denture model in position to provide a guide for setting up teeth on the denture plate or mounting carried by said model.

16. A transparent flexible support to which tooth models may be attached, and having means whereby it may be held in proximity to the human dental arch, in combination with means arranged to hingedly attach said support to a denture model.

17. A support for tooth models, comprising a transparent card to which said tooth models may be attached, in combination with a hinged member arranged to hold said card in an operative relation to a denture model.

18. A support for tooth models, comprising a transparent card to which said tooth may be attached, and a hinged member arranged to hold said card upon a denture model, and having means arranged to permit adjustment of said card toward and from the occlusal plane of said denture model.

In witness whereof I have hereunto set my hand this 13th day of December, A. D. 1919.

GORDON S. DAVIDSON.

Witnesses:
WILLIAM J. RUSSELL,
CLIFTON C. HALLOWELL.