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Patented Sept. 17, 1901.

W. M. BRUCE.
DENTAL ARTICULATOR.

(Application filed Feb. 7, 1901)

(No Model.)

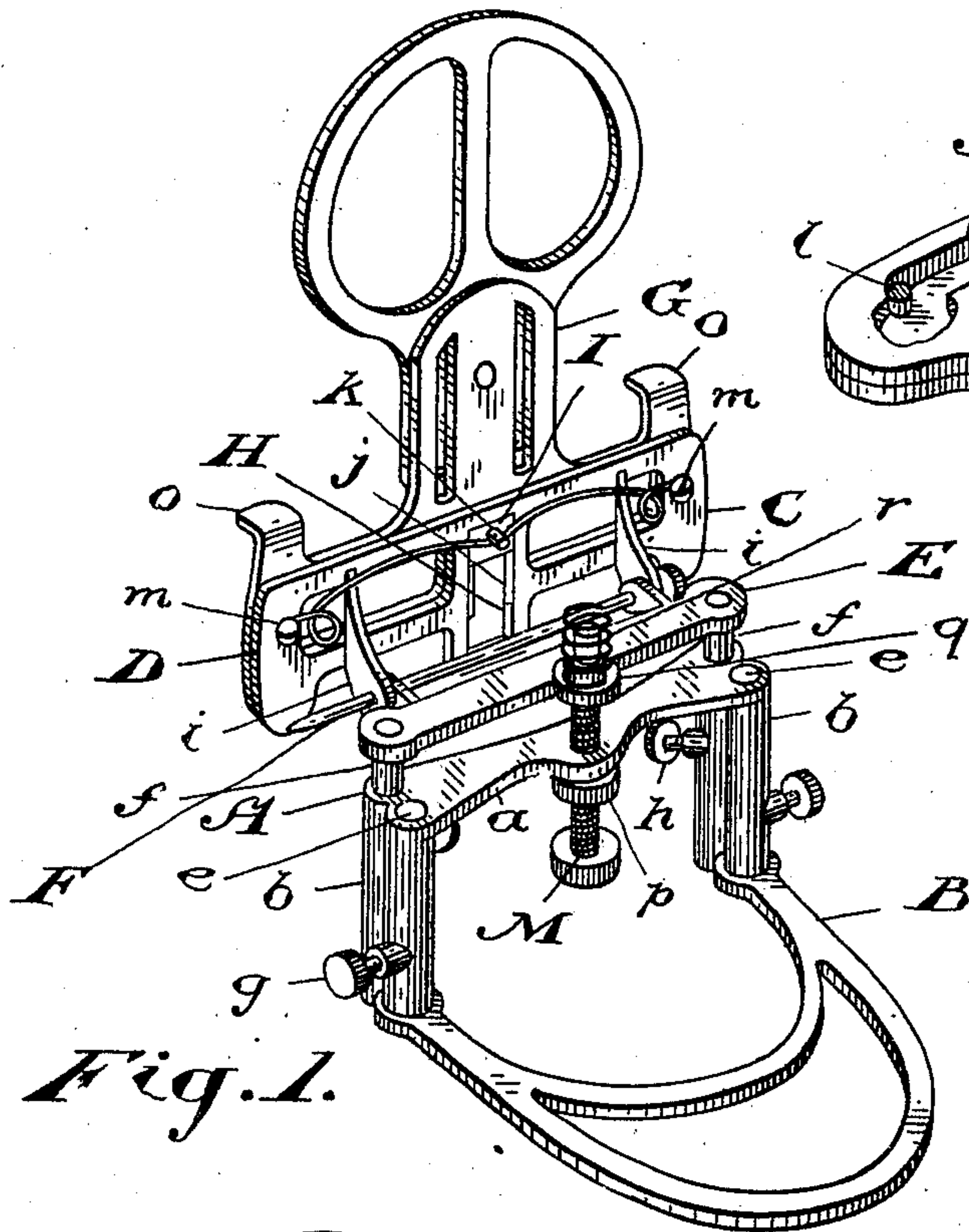


Fig. 1.

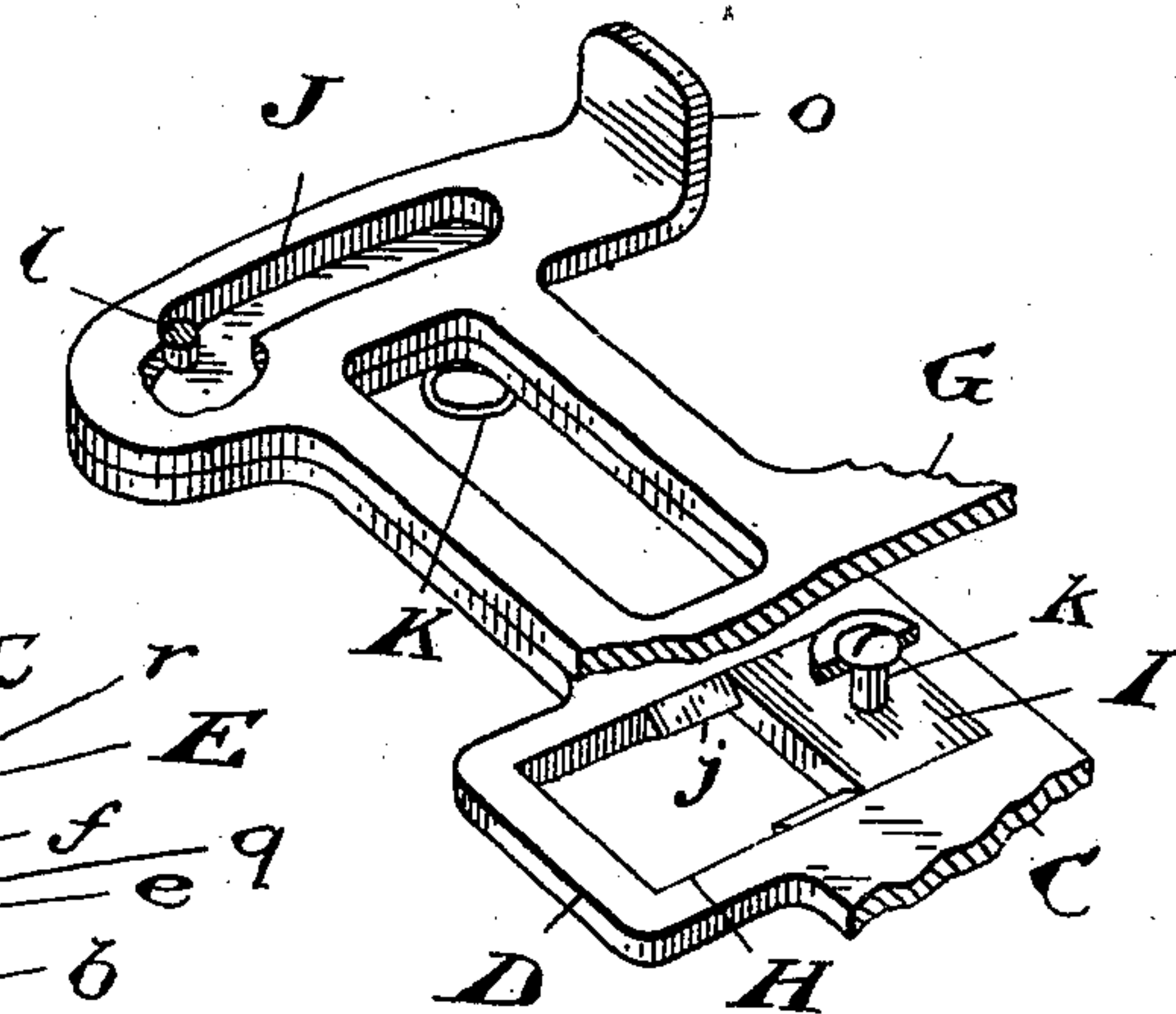


Fig. 3.

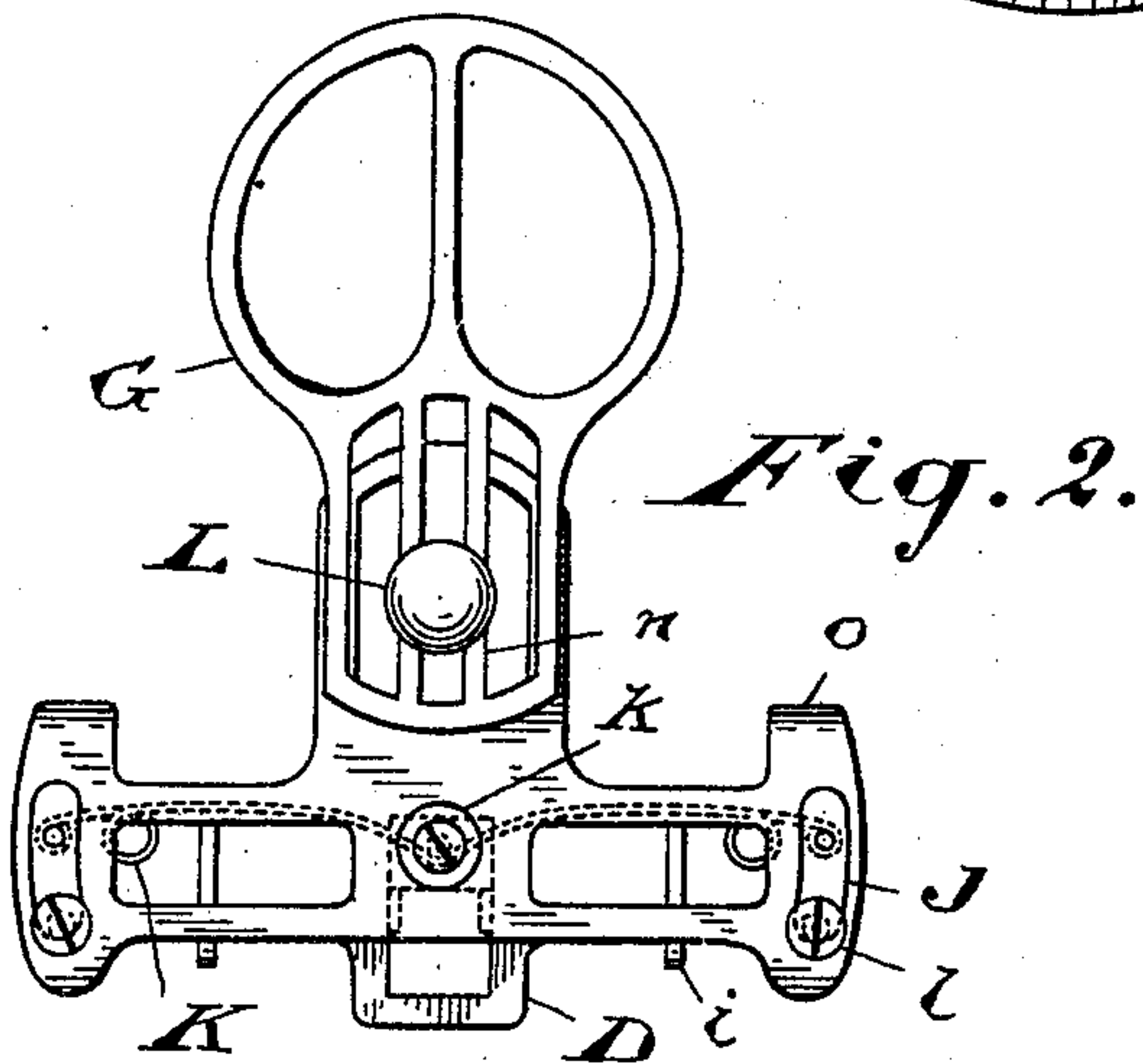
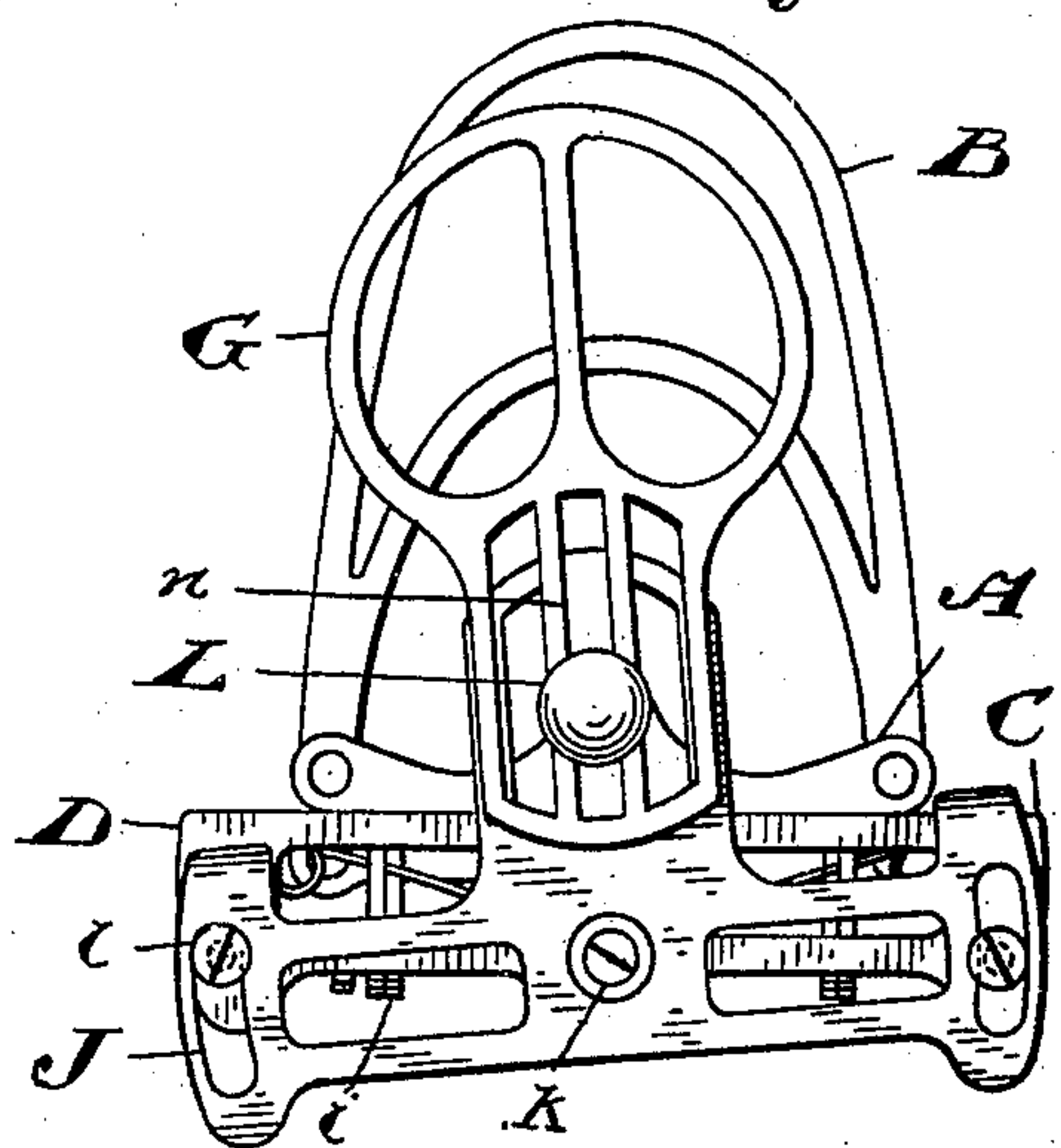


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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DENTAL ARTICULATOR.

SPECIFICATION forming part of Letters Patent No. 682,668, dated September 17, 1901.

Application filed February 7, 1901. Serial No. 46,432. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. BRUCE, L. D. S., of the city of Toronto, in the county of York, Province of Ontario, Canada, have invented certain new and useful Improvements in Anatomical Dental Articulators, of which the following is a specification.

The object of my invention is to devise a dental articulator which will accurately reproduce the movements of the natural jaw; and it consists, essentially, in pivoting the upper jaw-plate on a pivot movable backward and forward in the median plane of the jaw-plates.

My invention also includes the means employed for cushioning the hinged upper jaw-plate to prevent the breakage of casts by the sudden fall of the jaw-plate after it has been swung back, the means employed to secure a maximum range of vertical adjustment for the jaw-plates, and the method of making the upper jaw-frame detachable, substantially as hereinafter more specifically described and then definitely claimed.

Figure 1 is a perspective view of my articulator with the upper jaw-plate thrown back. Fig. 2 is a plan view of the upper jaw-plate and jaw-frame. Fig. 3 is a plan view of the articulator, showing the upper jaw-plate pushed back and swung to one side. Fig. 4 is a perspective detail, partly broken away, illustrating the connection between the upper jaw frame and plate.

In the drawings like letters of reference indicate corresponding parts in the different figures.

A is the articulator-frame, comprising the cross-bar *a* and vertical standards *b*. These standards are bored to receive the posts *e* and *f*, connected, respectively, with the lower jaw-plate B and the plate E of the upper jaw-frame C. Set-screws *g* and *h* are provided, whereby the posts may be clamped within the vertical standards *b*.

The upper jaw-frame C comprises the two plates D and E, hinged together by means of the lugs *i*, through which is passed the hinge-pin F. Upon the upper plate D the upper jaw-plate G is supported. At the center of the plate D is formed a fore-and-aft guideway H. The sides of this guideway H have V-shaped ribs *j* formed thereon to engage the

similarly-recessed sides of the pivot-block I. At the rear end of the guideway H the ribs *j* are omitted to permit of the pivot-block I being removed. On this pivot-block I the jaw-plate G is pivoted by means of the pivot-pin *k*. It will be noted that this pivot-pin is located in the median plane of the upper and lower jaw-plates, and as the guideway H runs parallel to the median plane the pivot-pin *k* is always in the median plane, no matter at what point in the guideway the pivot-block may be. Hence the upper jaw-plate may be swung from side to side from a center located in the median plane, no matter whether in its normal forward position, as shown in Figs. 1, 2, and 3, or pushed back, as shown in Fig. 4. I claim this as a great point of advantage of my articulator. In the ordinary articulator, in which the upper jaw-frame has a swinging lateral motion, the swing takes place either from one side or the other and not from the center, thus incorrectly representing the natural movement of the jaw when swung from side to side.

Through the ends of the upper jaw-plate I form wide slots J. Through these slots pass the large headed studs *l*, their lower ends being screwed into or otherwise secured to the upper plate D of the jaw-frame. The heads of these studs serve to retain the upper jaw-plate in working position on the jaw-frame. At the same time the slots, being wide, permit the jaw-plate to swing freely without the sides of the slots engaging the shanks of the studs. The rear ends of the slots coming in contact with the shanks of the studs indicate the normal position of the jaw-plate, in which position it is normally retained by the spring K. This spring is secured to studs *m*, secured on the under side of the plate D, and its center is engaged with the end of the pivot-pin *k*, which projects through the under side of the pivot-block I. Of course other arrangements might be used, but that described is found very satisfactory in practice.

The upper jaw-plate is preferably formed in two parts in the ordinary manner, the two parts being connected by means of the clamping-screw L working through a slot *n* in the front part of the jaw-plate. At each side of the rear portion of the jaw-plate I preferably form the thumb-pieces *o*, which may be en-

gaged by the thumbs to rock the upper jaw-plate G upon the pivot-pin *k*.

From the construction described it will be seen that the upper jaw-plate may be swung
5 completely back, so as to lie on the table when desired, making it very convenient to work at a cast on either jaw-plate from all sides, and may quickly be detached from the articulator by removing the hinge-pin F.
10 When the parts are assembled again and the hinge-pin placed in position, it will be found that the two jaw-frames are again brought into exactly the same relative position, which is not the case if the jaw-frame and the casts
15 which may be attached to it are removed by unscrewing the clamp-nut L, as is usually necessary.

Screwed through the cross-bar *a* of the articulator-frame is a leveling-screw M, provided with the clamp-nut *p*. Upon the upper
20 end of this leveling-screw I screw the nut *q*. This nut is preferably formed with a sleeve, as shown, around which is secured a short section of coil-spring *r*. By adjusting the nut upon
25 the leveling-screw a greater or lesser portion of this coil-spring may be caused to project above the end of the leveling-screw. The leveling-screw is of course used in the ordinary way to regulate the downward movements of
30 the upper jaw-plate. The coil-spring forms a spring-cushion, which eases the shock caused if the upper jaw-plate be allowed to fall down when plaster casts are in position on the articulator. The danger of breaking casts in
35 this manner is thus largely obviated. The spring-cushion being vertically adjustable permits of the amount of the spring-cushioning being accurately regulated to suit the operator's requirements. The spring which
40 thus automatically cushions the fall of the upper jaw-plate serves also another purpose. When testing casts as to the correct position of the teeth, the casts are opened and closed as in the natural action of biting. After the
45 casts have been brought together by the operator the spring *r* separates the jaw-plates as soon as the operator releases them and so separates the casts. This is a great convenience, as the operator is saved the trouble of
50 making the double movement. As the spring is connected to the leveling-screw, it follows the latter as it is adjusted to suit the adjustment of the upper jaw-plate by means of the posts *f*.

55 From the above description it will be seen that I have devised an articulator which will completely reproduce all the movements of the natural jaw—the opening and closing movement, the backward and forward move-
60 ment, and the lateral swing from a point located in the median plane of the jaws. I have provided an articulator in which the maximum range of vertical adjustment for the jaw-plates is secured owing to the independent vertical adjustment provided for the
65 posts *e* and *f*. The construction of the articulator-frame is such as to leave almost en-

tirely unobstructed the view from the rear of the articulator through to the inner sides of any casts connected to the jaw-plates. De- 70 tachability of the upper jaw-plate without destroying the adjustment is provided for and the possibility of breakage by the sudden fall of the upper jaw-plate is obviated.

What I claim as my invention is— 75

1. In an articulator provided with upper and lower jaw-plates, a pivot located in the median plane of the jaw-plates, said pivot being mounted in a support adapted to move
backward and forward, combined with the 80 upper jaw-plate adapted to swing on said pivot and extend laterally on each side of the same whereby the sides of the said upper jaw-plate swing backward and forward when the front of the jaw-plate swings laterally 85 and means for limiting the backward and forward swing of the sides of the said jaw-plate, substantially as described.

2. In an articulator provided with upper and lower jaw-plates, a pivot located in the 90 median plane of the jaw-plates and so mounted that it may be moved backward and forward in combination with the upper jaw-plate adapted to swing on said pivot; and a spring tending to maintain the said pivot in its for- 95 ward position, substantially as described.

3. In an articulator provided with upper and lower jaw-plates, the combination with one of the jaw-plates adapted to have an end-
wise motion and also a lateral swing from a 100 movable center located in the median plane of the jaw-plates; of a spring having its ends attached to the upper jaw-frame and intermediate its ends bearing directly upon the
pivot of the upper jaw-plate adapted to re- 105 turn the said jaw-plate to its normal position, substantially as described.

4. In an articulator, upper and lower jaw-plates adapted to have an endwise motion relative to one another and also a simultane- 110 ous lateral swing from a movable center located in the median plane of the jaw-plates, substantially as described.

5. In an articulator upper and lower jaw-plates adapted to have an endwise motion 115 relative to one another and also a simultaneous lateral swing from a movable center located in the median plane of the jaw-plates, in combination with a spring adapted to re-
turn the jaw-plates to their normal position, 120 and a cushioning device for the upper jaw-plate, substantially as described.

6. In an articulator, the articulator-frame comprising a cross-bar and vertical standards at each side, each having two vertical holes 125 bored therein, in combination with a lower jaw-plate, provided with two vertical posts adapted to fit two of the said holes; an upper jaw-plate connected with two vertical posts adapted to fit the other two holes in the 130 standards; and set-screws adapted to clamp the said posts, substantially as described.

7. In an articulator, an articulator-frame, in combination with an upper jaw-plate hav-

ing a hinged and vertically-adjustable connection therewith; a leveling-screw screwed through the frame and adapted to engage the under side of the upper jaw-plate; a nut
5 screwed on the upper end of the leveling-screw; and a spring-cushion carried by the said nut, substantially as described.

8. In an articulator, an articulator-frame, in combination with an upper jaw-frame
10 formed in two parts detachably hinged together the lower part being vertically adjustable on the articulator-frame; and an upper jaw-plate connected with the upper part of the said upper jaw-frame, substantially as
15 described.

9. In an articulator, an upper jaw-frame connected with the articulator-frame and having a central fore-and-aft guideway formed therein, in combination with a pivot-block
20 adapted to slide in the said guideway; and an upper jaw-plate mounted to swing laterally upon a pivot carried by said block and adapted for simultaneous backward-and-forward opening and closing and lateral move-
25 ments, substantially as described.

10. In an articulator, an upper jaw-frame connected with the articulator-frame and having a central fore-and-aft guideway formed therein, in combination with a pivot-block
30 adapted to slide in the said guideway; an upper jaw-plate pivoted thereon; and headed studs connected to the upper jaw-frame and passing through wide slots in the jaw-plate, substantially as described.

35 11. In an articulator, an upper jaw-frame connected with the articulator-frame and having a central fore-and-aft guideway formed therein, in combination with a pivot-block adapted to slide in the said guideway; an up-
40 per jaw-plate pivoted thereon; headed studs connected to the upper jaw-frame and passing through wide slots in the jaw-plate; and a spring engaging the pivot-block and the upper jaw-frame and tending to maintain the

pivot-block in its normal position, substantially as described. 45

12. In an articulator, an upper jaw-frame connected with the articulator-frame and having a central fore-and-aft guideway formed therein, in combination with a pivot-block
50 adapted to slide in the said guideway; an upper jaw-plate pivoted thereon to swing laterally simultaneously with its sliding movement; means limiting the swinging movement of the jaw-plate and a spring normally main-
55 taining the jaw-plate in its forward position, substantially as described.

13. In an articulator, an articulator-frame, in combination with an upper jaw-frame formed in two parts hinged together, the lower
60 part being connected to the articulator-frame; and an upper jaw-plate connected with the upper part of the said upper jaw-frame by a vertically-disposed pivot in the median plane of the jaw-plates, substantially as described. 65

14. In an articulator provided with upper and lower jaw-plates, a pivot located in the median plane of the jaw-plates and mounted for movement backward and forward and interrupted guideways for said pivot whereby
70 it may be removed when desired, combined with an upper jaw-plate mounted to swing laterally on said pivot, and a spring acting directly upon said pivot, substantially as described. 75

15. An articulator provided with upper and lower jaw-plates, one of which is adapted to have a bodily endwise motion from a movable center located in the median plane of the jaw-plates, a guide for said center having portions
80 adapted to permit of the bodily removal of said center, and a spring acting directly upon said center, as and for the purpose specified.

Toronto, January 24, 1901.

WILLIAM M. BRUCE.

In presence of—

J. EDW. MAYBEE,

A. J. COLBOURNE.