

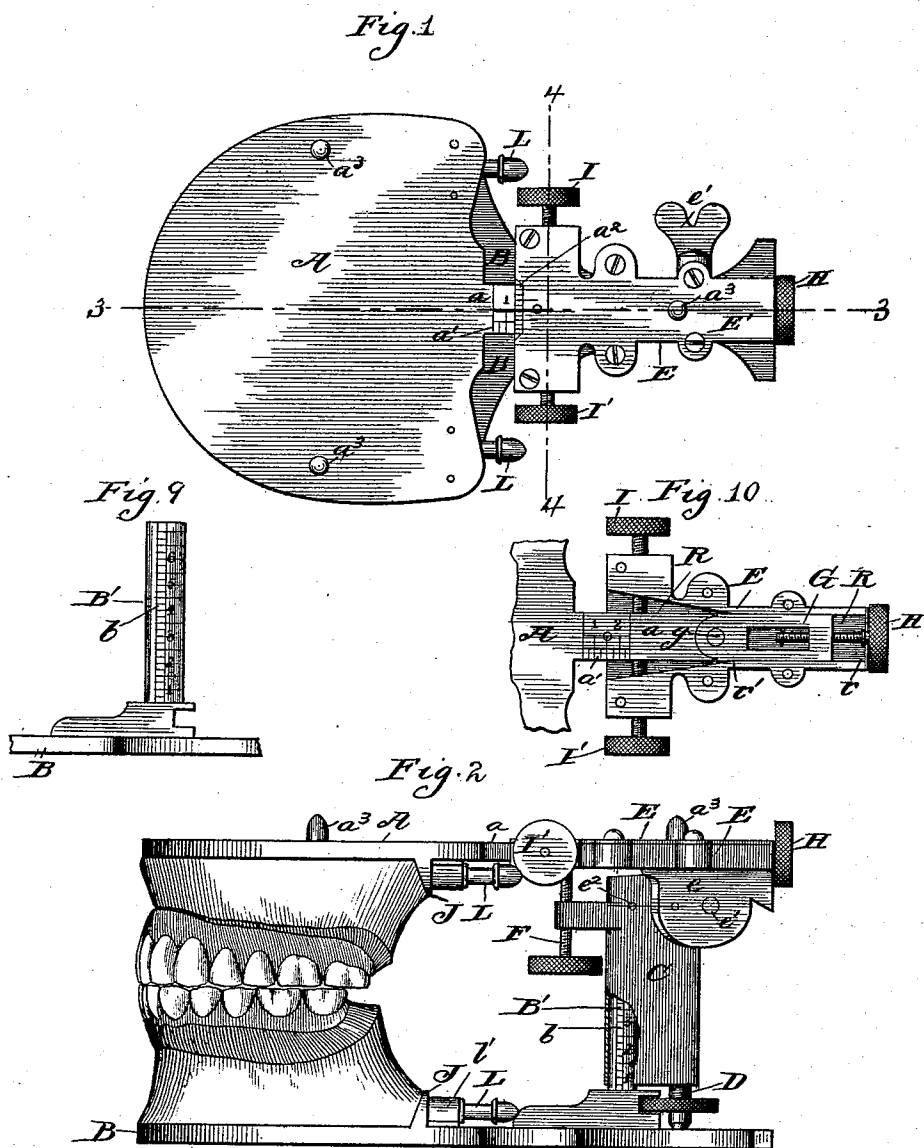
(No Model.)

2 Sheets—Sheet 1.

J. PAYNE.  
DENTAL ARTICULATOR.

No. 474,968.

Patented May 17, 1892.



Witnesses  
W. C. Corlies  
Martin H. Olsen

Inventor  
Joseph Payne  
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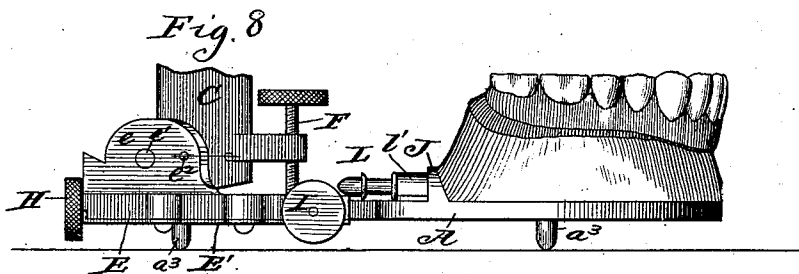
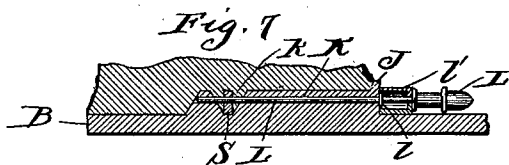
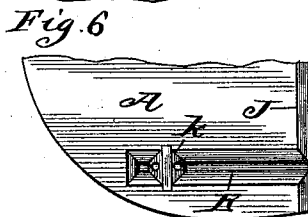
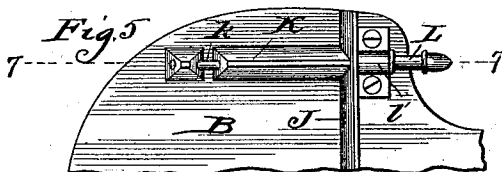
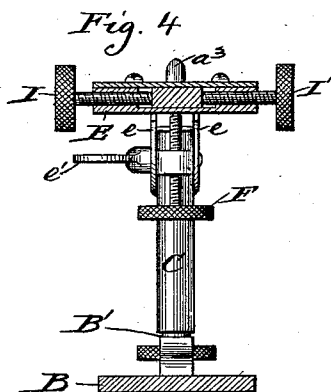
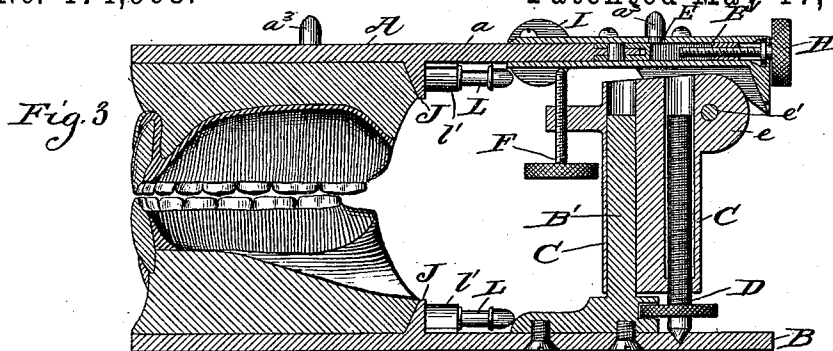
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

JOSEPH PAYNE, OF DWIGHT, ILLINOIS.

## DENTAL ARTICULATOR.

SPECIFICATION forming part of Letters Patent No. 474,968, dated May 17, 1892.

Application filed February 9, 1891. Serial No. 380,734. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH PAYNE, dental surgeon, of Dwight, in the county of Livingston and State of Illinois, have invented a certain new and useful Improvement in Articulators, of which the following is a specification.

This improvement is designed to provide a convenient instrument for dental use; and the invention consists in the peculiar construction, arrangement, and combinations of parts hereinafter more fully described, and then definitely claimed.

In the accompanying drawings, wherein like reference-letters indicate like parts, Figure 1 is a top plan of said instrument; Fig. 2, a side elevation with partial sections; Fig. 3, a section in line 3 3 of Fig. 1; Fig. 4, a section in line 4 4 of Fig. 1; Fig. 5, a partial plan of the upper face of the lower jaw; Fig. 6, a similar plan of the lower face of the upper jaw; Fig. 7, a section in line 7 7 of Fig. 5; Fig. 8, a side elevation of the upper jaw detached and resting over the knobs; Fig. 9, a side elevation of the pivot-standard, and Fig. 10 a top view of the plate or box E with its cover removed.

Referring now to the details of the drawings, B is the bottom plate or lower jaw provided near its rear end with an upright post B', having a graduated scale *b* marked on one side.

C is a sleeve fitting the post B' and sliding vertically thereon, but feathered to the post to prevent turning.

D is a screw working in a rear extension of the sleeve to raise and lower the sleeve upon the post. The scale *b* enables the elevation of the sleeve upon the post to be determined and recorded, so that whenever desirable it can, in any subsequent operation, be set to precisely the same elevation.

E is a recessed plate provided with dependent lugs *e* at or near its rear end, through which it is pivoted to the rear edge of the sleeve C by a removable pivot *e'*, so as to be capable of oscillating in a vertical plane. The lugs *e*, embracing the sides of the sleeve, hold the plate E from lateral deflection. A graduated scale *e* on the lug (or the sleeve) registering with an index-line on the sleeve (or the lug) enables the angle at which the

plate E is held on its horizontal pivot *e'* to be noted, so that it can be restored to the same position at any time afterward. A screw F, passing through a lug at the front edge of the sleeve and bearing upward against the under side of the pivoted plate E near the front edge of the latter, may be employed for adjusting the inclination of said plate.

The plate E is recessed, preferably, in its upper side and the recess covered by a top plate E', so as to form a box open at its front edge. The recess R from the point *r* to the point *r'*, Fig. 10, is narrowed with parallel sides, and from the point *r'* to the front end of the box widens out, the front end of the box being preferably widened to accommodate it. A sliding bar G fits closely in the rear or narrow portion of the recess, so as to be guided thereby, and can be moved forward and backward by an adjusting-screw H. The top plate or upper jaw A of the transfer is provided at the middle of its rear part with a tongue *a*, which extends back into the box E E' and is secured to the sliding bar G by a vertical pivot *g*, so as to permit the upper jaw A to swing laterally, but not vertically, with relation to the sliding bar and the box. Lateral adjusting-screws I I' regulate and limit the lateral swing referred to. It will be seen therefore that the jaw A and box E E' swing together in a vertical plane on the pivot *e'* as a center, so that the inclination of the box determines that of the jaw; secondly, that the jaw can be adjusted forward and backward with reference to the box by means of the screw H; thirdly, that the jaw can be deflected laterally with relation to the box by means of the screws I I'; fourthly, that the box and jaw can be raised and lowered together by the screw D, and, fifthly, that the screws D H I I' not only adjust the jaw but serve to lock it in its adjusted positions. A graduated scale *a'* on the tongue *a*, acting in connection with the front edge of the box, enables the operator to note the exact position to which the jaw-plate A is projected forward or drawn back by the screw H, and a graduated scale *a''* on the front edge of the box acting in connection with an index-line on the tongue *a* enables him to note the lateral deflection of the plate by the screws I I', so that he can at any time afterward, by ref-

erence to his memorandum-book, ascertain and reproduce both adjustments as well as the vertical inclination of the jaw A (shown by the scale or index-line  $e^2$ ) and its elevation above plate B. (Shown by the scale  $b$ .) By removing the pivot  $e'$  the jaw A and box E E' can be detached together from the sleeve C and removed from the machine.

It will of course be understood that the plaster casts of the mouth are to be attached to the two jaw-plates A B, which have flat smooth proximate faces, imperforate, and preferably silvered or nickel-plated to prevent corrosion. The continuous flat smooth surfaces are employed to enable soft-plaster batter to be placed upon them and hardened or "set," as it is technically termed, and afterward removed without cutting or breaking. The top or back of a cast being placed upon the soft batter and suitably pressed into it, adheres to the latter when set, and the cast thus becomes attached to the jaw-plate and is afterward, with its hardened plaster backing, capably of easy removal from the flat smooth jaw. In fact, it would be liable to drop off accidentally were not some adequate provision made for temporarily securing it in a more effective manner than by the mere adhesion of the plaster to the jaw. Hence to this end I combine with the jaw a suitable locking device, by which the cast, with its backing of hardened plaster, may be locked to and unlocked from the plate at will. Such a locking device may be constructed in many different ways, all more or less practical equivalents of each other for the purpose; but the construction which I have found to be the most effective, convenient, and desirable, is as follows: At about the line where the rear edge of the cast is expected to come when attached to the jaw-plate I provide the smooth inner face of the jaw with a raised transverse flange or rib J, having its front face preferably inclined, as shown in the drawings. This rib or flange I term the "stop." At an angle to this stop (preferably a right angle) I also raise from the surface of the jaw one or more V-shaped ridges K, each abutting against the stop and each having at some suitable point in its length a V-shaped notch  $k$ . Preferably I use two of these ridges parallel to each other arranged near the opposite lateral edges of the jaw, as shown. A hole passes transversely through the stop and longitudinally into and preferably through each ridge K to accommodate a sliding lock-bolt L, the forward end of which extends through the open notch  $k$  and preferably into or through that portion of the ridge which lies in front of said notch. I also prepare staples or eyelets S, Fig. 7, adapted to fit into the notches  $k$  and having an eye, through which, when the eyelet is fitted into the notch, the bolt L will extend if pushed forward, thus locking the eyelet to the jaw. The eyelets are so formed as to allow the plaster to flow around them, and thus embed them in the plaster when the

backing above referred to is placed upon the jaw, and when the plaster is hardened they thus become permanently attached thereto. Preferably the ridges K are slightly lower than the stop J and the eyelets should never extend above the ridges. For convenience, the bolts L should slide only far enough to lock and unlock the eyelets; and to limit their movement I make on each of them a slight projection  $l$ , working in a recess under a saddle-plate  $l'$ , which is placed over each bolt at the rear side of the stop J and fastened to the jaw-plate with screws. The collar or projection  $l$  allows the bolt to slide the length of the recess in the saddle-plate but no more.

In operating the machine the jaw A and its connected box E E' are sometimes removed together from the machine when all the screws may have been carefully adjusted, and when it is desirable that the adjustment should not be disturbed. To prevent them from injury and disturbance when the removed jaw and box are laid upon a table, I provide the top surface of the jaw and box with bosses  $a^3 a^3 a^3$ , forming together a sort of tripod, upon which said parts may safely rest, as shown in Fig. 8. It is best, also, to make a mark or marks on the rear end of the jaws A B to indicate their median line. The notches  $k$  are cut or formed in the ridges K at those points where the lock will act most effectively to hold the casts firmly to the jaw-plates, points about in line transversely with the middle of the cast being the best. The V shape is given to the notches, ridges, and front side of the stop, to enable the casts to be readily separated from the jaws and also to aid as guides in bringing the casts to their proper position on the plate. In adapting a cast to one of these jaws I set the several scales, insert eyelets S into notches K, and lock them with the bolts L, lightly oil the surface of the jaws, including the ridges and the front side of the stop, and cover the smooth flat surface of the jaw and its ridges and eyelets back to the stop J with soft plaster batter, such as is employed for making the casts, heaping up the batter at the middle, so as to have a sufficient surplus of batter on the jaw. I then place the top or back of the cast on the batter and press it down till it rests on the ridges K with its rear edge abutting against the higher stop J and with the median line of the cast coinciding with that marked on the exposed rear surface of the jaw or its stop. When the plaster hardens, the embedded eyelets act as staples, through which pass the bolts L, locking the cast and jaw securely together. By retracting the bolts these parts are unlocked and can easily be separated, and at any time when it may be desirable they may be placed together again in precisely the same relative position, as before, and again securely locked. At any time, when necessary, the plaster cast supporting the artificial teeth can be removably attached to the jaw-plate A or B in the same general manner.

It is often desirable to remove a cast from the machine and afterward restore it, with the machine adjusted precisely as before. By noting and recording the readings of the several scales before removing the cast, the machine can at any time afterward be restored to precisely the same adjustment.

The great practical advantages of the machine arise from its simple, positive, and easy adjustments, the provision of scales for noting and afterward reproducing these adjustments, and the provision of convenient and effective means for enabling the "work" to be inserted and removed whenever desirable and without any mutilation of any portion of it.

A locking device constructed on the general principle herein shown and described has the important practical advantage that it leaves nothing projecting from the back of the casts when the latter are removed from the machine, the ridges K acting to produce grooves in which the eyelets S lie below or even with the surface of the casts, leaving the latter flat with no projecting part to break off or become accidentally injured in handling.

Having thus described my invention, what I claim in this specification as new, and desire to secure by Letters Patent, is—

1. In an articulator, a mechanical jaw constructed in the form of a plate flat and imperforated on its inner surface and provided with a notched projection adapted to form in the surface of the cast a depression to receive the eyelet and with a hole to accommodate a locking-bolt, substantially as described.

2. In an articulator, a mechanical jaw constructed in the form of a plate flat and imperforate on its inner surface and provided with a longitudinal ridge or ridges K, having notches *k* and with a hole to accommodate a locking-bolt L, substantially as described.

3. In an articulator, a mechanical jaw constructed in the form of a plate flat and imperforate on its inner surface and provided with a transverse flange or stop J, and a longitudinal ridge or ridges K, bored and notched, substantially as described.

4. In an articulator, the combination of a jaw provided with a vertical post and a graduated scale *b*, a feathered sleeve capable of sliding vertically on said post, another jaw pivoted to the sleeve so as to be capable of rocking thereon in a vertical plane of movement, and a screw D for vertically adjusting the position of the sleeve on the post, substantially as described.

5. In an articulator, the combination of a

jaw provided with a vertical post, a feathered sleeve capable of sliding vertically on said post, another jaw pivoted to the sleeve so as to be capable of rocking thereon in a vertical plane of movement, a screw F to rock and adjust the pivoted jaw, and a graduated scale *e*<sup>2</sup> to indicate the degree of inclination at which the pivoted jaw may at any time be adjusted, substantially as described.

6. In an articulator, the combination of the rocking plate E, the sliding bar G, the jaw-plate A, pivoted to the bar G, so as to swing laterally thereon, the adjusting-screw H, and a graduated scale *a'* to indicate the extent to which the plate A and bar G may be at any time adjusted forward or back upon the plate E, substantially as described.

7. In an articulator, the combination of the rocking plate E, the jaw-plate A, supported by said rocking plate and adapted to be moved forward and backward and to swing laterally thereon, means for locking it in its forward and backward adjustment, and a graduated scale *a'* to indicate the degree of such adjustment, substantially as described.

8. In an articulator, the combination of the rocking plate E, the jaw-plate A, supported by said rocking plate and adapted to be moved forward and backward and swing laterally thereon, the screws I I' for laterally adjusting and locking the jaw-plate, and a graduated scale *a*<sup>2</sup> to indicate the degree of such lateral adjustment, substantially as described.

9. The improved machine herein described, consisting, essentially, of two flat-surfaced imperforate jaw-plates provided with means for detachably locking the casts thereto, a post and sleeve to connect the jaws and enable them to be adjusted in parallel planes at greater and less distances apart, a plate pivoted to the movable element of the post-and-sleeve device, so as to be capable of rocking thereon in a vertical plane of movement and supporting the movable jaw-plate, means for moving the movable jaw-plate back and forth longitudinally and swinging it laterally upon its said pivoted supporting-plate, adjusting-screws to effect the described adjustments of the movable jaw-plate, and graduated scales to mark the degrees of the several adjustments, said parts being combined to operate substantially as described.

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