

(No Model.)

2 Sheets—Sheet 1.

J. PAYNE.
DENTAL PROCESS.

No. 474,967.

Patented May 17, 1892.

Fig. 1.

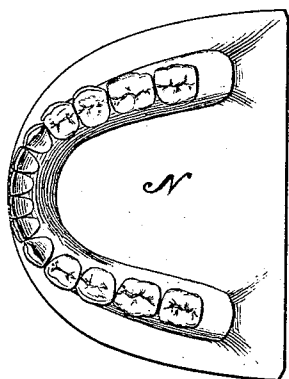


Fig. 2.

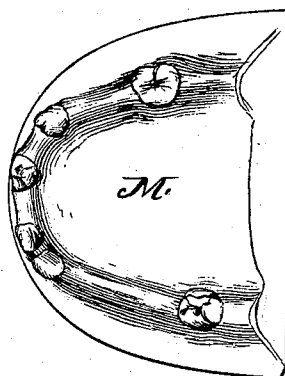


Fig. 3.

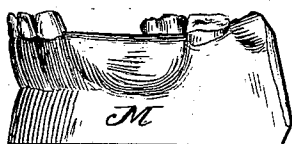


Fig. 4.

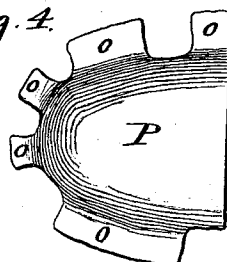
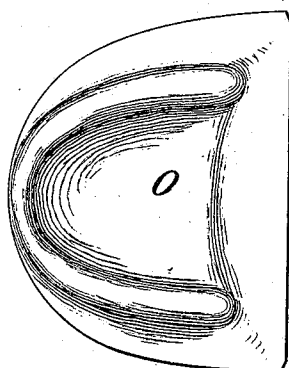


Fig. 5.



Witnesses
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2 Sheets—Sheet 2.

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Fig. 6.

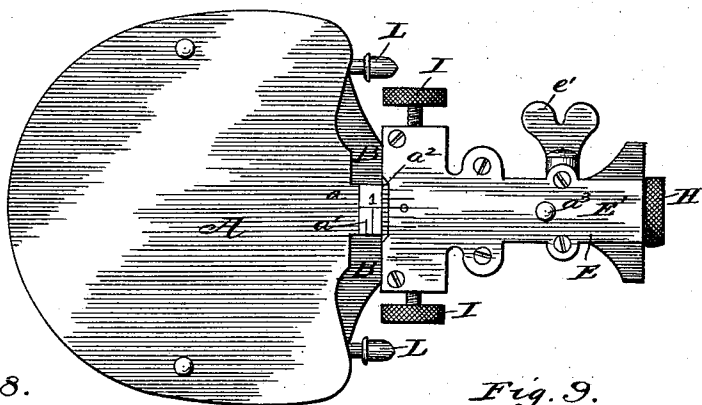


Fig. 8.

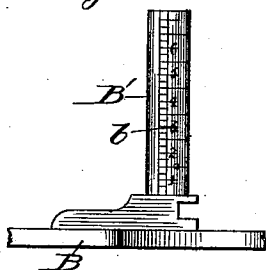


Fig. 9.

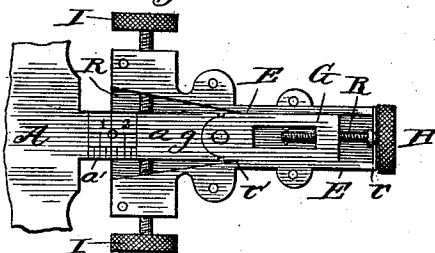
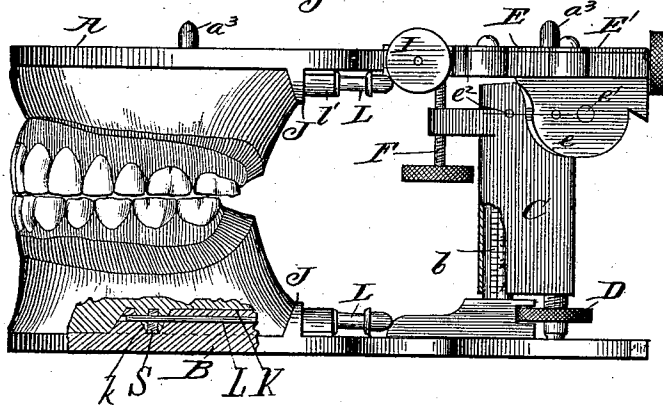


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOSEPH PAYNE, OF DWIGHT, ILLINOIS.

DENTAL PROCESS.

SPECIFICATION forming part of Letters Patent No. 474,967, dated May 17, 1892.

Application filed February 9, 1891. Serial No. 380,733. (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 certain new and useful Improvements in Dental Processes, of which the following is a specification.

In making a full set of teeth for both jaws or for either jaw by most of the old methods the dentist first pulls all the teeth which it is necessary to remove, then waits for the gums to shrink, then takes an impression and makes a cast of the mouth and shrunken gums, and then, with the aid of said cast, endeavors to make a plate or plates fitting the shrunken gums and presenting the teeth in a natural manner. By such process the perfect accomplishment of this object is exceedingly difficult, because the old teeth having been removed and the gums contracted to an abnormal size and form the mouth no longer furnishes the necessary data by which to reproduce the exact size and shape of the original natural gums and teeth. It is of course easy enough to make a plate exactly fitting the surfaces of the sunken gums; but this is only a small portion of the work. The serious difficulty arises when the dentist, without any certain and positive guide and with only the misleading indications of the abnormal cast or plate taken as aforesaid, undertakes to reproduce the exact size and shape of the natural gums and the exact length, inclination, contour, and antagonism of the perfect natural teeth and to adapt the work to the natural articulation of the patient. Unless all these conditions are completely met the artificial set, no matter how perfectly fitted to the cavity of the mouth or to the surface of the shrunken gums, will be uncomfortable to wear by reason of abnormal pressure at some point or points when in use, and will be liable to be kept loose because the pressure is not even on both sides, besides the danger of altering the contour and expression of the face in consequence of the cheeks and lips not being held precisely in their natural position. Hence those skilled in the art have long felt the need of some competent means by which to determine beforehand and permanently record all the peculiar conditions of each case, so that after the teeth are extracted

the subsequent work can be performed with certainty and accuracy. To fulfill the requirements above set forth, I have invented the process hereinafter described, and then definitely claimed.

In carrying out my invention I prefer to use an articulator substantially like that shown in the accompanying drawings, which, to enable those skilled in the art to understand and work, I will briefly describe, and then fully set forth the process.

In the accompanying drawings, Figure 1 illustrates the cast N of the lower jaw; Fig. 2, the cast M of the upper jaw; Fig. 3, cast M with wax-plate P applied; Fig. 4, wax-plate P; Fig. 4, cast of upper jaw after shrinking of gums. Fig. 6 is a top plan of the instrument; Fig. 7, a side elevation with partial sections. Fig. 8 is a detail showing a side elevation of a pivotal post, and Fig. 9 is a plan of a box E with its cover removed.

Referring now to the drawings by letters, and more particularly to Figs. 6, 7, 8, and 9, A and B represent, respectively, the top and bottom plates of my instrument. From the latter rises a pivotal post B', on which is set an adjustable sleeve C, pivotally connected by a removable pivot e' to the ears e of a box E, having a cover E', in which box slides a tongue a of the plate A, pivoted at g to a slide G, set in the box E. Set-screws D, I, F, and G are provided by which various adjustments may be made, and graduated scales a', a'', b, and e'' by which the amount of departure from the normal position may be seen and recorded when necessary. Projections a''' are shown on the plates A and E' by which the upper jaw and its appurtenances may be laid upside down on a table, when required, without interfering with the adjustments. Guides J and K are formed on the plates A B, and the guides K are provided with the notches k to receive eyelets S, which are held by bolts L, as hereinafter explained.

Having thus briefly set forth the construction of the articulator I prefer to use, I will now explain my improved dental process in which said instrument or one capable of performing like functions is employed as an aid. To make the process clear I will describe how to proceed by it in fitting an upper set, a lower set being formed and fitted in substantially

the same manner. At the beginning of the operation there are always some teeth remaining in the jaw which is to be provided with an artificial set. Instead of removing these

- 5 "landmarks," as heretofore, I make use of them to obtain the exact articulation and individual peculiarities that are to be reproduced in the artificial set. This I do substantially in the following manner:
- 10 First, I take an impression of the upper jaw and make plaster casts of both jaws, preferably as follows: Before extracting the teeth I take an impression of the upper jaw in wax, oil the impression, fill it with plaster batter,
- 15 and thus produce the cast of the upper jaw. The cast having been removed from the wax, I then fit closely upon it a thin plate of sheet-wax covered on both sides with tin-foil, and while this sheet is still on the cast I arrange
- 20 a roll of soft wax upon it in such a position that all the teeth of the patient's lower jaw will be able to bite into the roll. The wax plate, with the roll of soft wax attached, is then removed from the cast and placed in the patient's mouth, which it will fit the same as it
- 25 did the cast, and the patient is directed to bite into it till the teeth of the lower jaw strike the antagonizing upper teeth, whereupon the plate is carefully removed from the mouth, readjusted upon the cast, and fastened thereto
- 30 by melting the edge of the wax at two or three points with a hot knife. The impression made by the lower teeth in the roll of wax is then oiled and plaster batter poured into it to form
- 35 a cast of the lower jaw. The cast of the upper jaw is indicated at M and that of the lower at N, Figs. 2 and 1. It will be observed that the cast of the lower jaw is thus formed from the "bite-plate" without taking what is
- 40 technically called an "impression" of that jaw, this mode of procedure being preferable for the purpose of saving labor, (although not absolutely necessary to the process,) because for the making of a full upper set all that is
- 45 essential with regard to the lower teeth is that their cast should show how they strike the upper teeth, and if their points be represented in the plaster cast N it is sufficient for this purpose. With the two casts M N and the
- 50 bite-plate carefully adjusted upon and attached to the cast M, as already described, I can now note the exact articulation of the mouth, and with the aid of the articulator above described I proceed substantially as
- 55 follows: Setting all the scales at zero, if it can conveniently be done, I insert the eyelets S into the notches k and lock them with the bolts L and lightly oil the proximate surfaces of the jaw-plates A B, including the ridges K
- 60 and stops J. Turning the upper jaw A back on its pivot I cover the upper surface of the lower jaw B and its ridges and eyelets in front of the stop J with plaster batter, and then place the united casts on the batter (cast N
- 65 down) and press them down till the back of cast N rests on the sharp edges of the ridges K with its rear edge abutting against the in-

clined front side of the stop and with the median line of the upper cast M coinciding with the median line marked on jaw A. 70 While the batter is still soft jaw A should be shut down on cast M, and if its stop J should not fit down behind the casts the latter must be slid forward till it will. The casts are now known to be in their proper 75 places. I then turn jaw A back from the casts, cover it with batter a little stiffer than in case of plate B, (but not using a surplus,) then place some thin batter on the top of cast M, heaping it up pretty well in the middle, 80 and immediately close down jaw A upon the casts, pressing it down till the box E E' rests on the point of screw F. I then smooth up the edges of the work and let it stand till the plaster sets. On referring now to the scales 85 I can note their indications for use in future operations.

In certain peculiar cases the machine will not admit the casts at zero, and it is then to be properly adjusted by the appropriate 90 screws and the adjustment carefully recorded in the scale-book. In no case should the casts be thus inserted with the machine adjusted to the extreme limits of any of the scales, because in the subsequent operations 95 it may be necessary for it to have a little play in either direction from the adjusted position.

The second step consists in removing the natural teeth from the jaw which is to be 100 treated, then allowing a sufficient time to elapse for the gums to finish shrinking, and then taking an impression and making a plaster cast O of the jaw conforming to the shrunk gums. After this has been done 105 the third step is to supplement the cast M with a wax plate P, which I term the "guide" or "guide-plate," so as to represent the missing teeth and the gums filled out to their natural shape, and thus furnish in connection 110 with the plaster cast M a model of the patient's upper teeth and gums as they existed when complete and perfect in the natural state. To do this I prepare a sheet of wax and fit it to cast M. The roof of the 115 mouth is not affected by the loss of the teeth, and hence the guide-plate, if fitted to the cast M, will fit the roof of the patient's mouth in its present condition. The guide-plate is made to extend well over the roof of the 120 mouth and over all those parts of the alveolar ridge where the teeth were missing before cast M was taken, letting those parts or tongues o, Fig. 4, of the wax plate extend as far over the alveolar ridge as possible and 125 filling them out to conform to the original natural contour of the gums, as indicated by the lines of the unshrunk gums where the natural teeth are represented in the cast. Then where the teeth are gone I arrange wax 130 teeth upon the guide-plate to fill the vacancies, making them come even with the cutting-edges of the teeth of the plaster cast and arranging them in their natural position with

relation to the unshrunk gums. The cast M, with the wax guide P superimposed upon it, furnishes the model required.

The fourth step is to transfer the guide P from cast M to cast O. To do this it is necessary to provide some kind of removable fastening by which the guide can be temporarily secured to either of said casts at will without changing its own relation to the position of the patient's natural teeth and gums. This can be done by means of soft wooden pegs, as follows: Accurately fitting guide P on cast M, I drill two or more small tapering holes, about one-sixteenth of an inch in diameter and one-half of an inch deep, through portions of the wax that lap over the outside of the alveolar ridge into the cast and fit into them pins of pine or other soft wood. If the overlapping wax is too frail to hold, a small piece of sheet metal may be drilled and then embedded into the wax, and the cast then be drilled through this hole. Withdrawing the pins, I then remove the guide from cast M, adjust it carefully upon cast O, and through the holes in the wax drill cast O in the same manner as cast M. The guide is now removed from cast O and again placed upon cast M and fastened thereto by the pins.

I am now ready to make the transfer, which is done as follows: Having carefully adjusted the machine to the scales, as already recorded in the memorandum for this patient, the model M P is applied and secured to jaw A in the manner heretofore explained, the cast N of the lower jaw being also secured in the machine by attaching it to jaw B. The two jaws A B are now carefully closed together to see whether the guides antagonize perfectly with the lower teeth, and if they do not they must be made to do so by trimming the wax guides with a hot knife. The jaw A is then turned back, a small quantity of soft wax melted to the outer sides of the lower cast, the jaw A again closed down till the guide-plate rests upon the soft wax, thus compressing it between the upper and lower jaws. It should now be further softened with a hot knife, so as to attach itself to the outer edges of the guide along the meeting-line. While this is doing, care should be taken that the upper and lower teeth and guides meet and antagonize perfectly. The bolts L of jaw A are now retracted, the pivot *e'* removed, and jaw A detached from the machine, leaving the model M P, attached to cast N, remaining on lower jaw B. The pins are then withdrawn from the model and the cast M detached and removed, leaving the guide P still fastened to cast N. I now take cast O, adjust it in the place just vacated by cast M, and fasten it there by the pins, first trimming it so that when jaw A is shut down upon the point of screw F its stop J will not interfere with the cast and so that a vacant space will be left between the under face of said jaw and the back of the cast. The plate A is then provided with

M and its lower surface properly oiled. It is also best to varnish and oil the outer surface of the alveolar ridges of casts O N. Plaster batter is next spread over the face of jaw A, covering the eyelets, and nearly but not quite even with the top of the ridges K K, after which jaw A is restored to the machine and the pivot *e'* reinserted. The upper surface of cast O is then moistened and spread with thin batter, after which jaw A is let down till the box E E' rests upon the point or screw F. As soon as the plaster has set it may be neatly trimmed and any defects corrected by adding more plaster, and the edge of the guide P should be attached to the cast O at several points by melting with a hot knife. The wax fastenings that hold the guide-plate to the lower cast N should now be carefully severed with a hot knife, and the jaw A, with its connected cast O and guide P, may then be turned back. The transfer of the guide from a cast with teeth to a cast without teeth is now complete and the dentist is able to determine by ocular inspection exactly what changes have been effected in the mouth in consequence of the loss of the natural teeth, and while preparing the artificial set of teeth in the usual way to adjust it accurately to the original conditions of the patient's mouth while fitting it at the same time to the shrunk gums.

Substantially the same mode of procedure, with a little more precision in taking the bite, may be adopted in making a full set of upper and lower teeth; but I prefer to slightly modify the process, as follows: Take impressions of both upper and lower jaws in wax (because now I must have a perfect model of both jaws) and make a cast for each, instead of depending upon the bite-plate for the lower cast, as before. Then make a wax plate for the upper jaw, the same as for an upper set alone, but none for the lower jaw. Then take the bite, precisely as already described. Then remove the work from the mouth and adjust and secure the bite-plate to the upper cast. Then adjust the lower cast in its place in the impression made by the lower teeth in the bite-plate and properly secure it by melting portions of the wax with a hot knife. Then adjust and secure the united casts in the machine and register the articulation and other particulars, as before.

When, by the several steps referred to, the upper set of artificial teeth or the upper and lower sets, as the case may be, have been prepared and are sufficiently complete, their perfect articulation is easily effected by the aid of the machine, which, for this purpose, has the great advantage that plaster casts, with the artificial sets attached, are readily attachable to and detachable from the jaws A B in the manner already described as often as may be desirable during the progress of the work, so that the proper adjustments can be obtained and noted and the teeth then removed, operated upon, replaced to precisely the same

adjustment, and the articulation thus made as perfect as that of the natural teeth. In describing how to do this I will state the preferable mode for a full set, upper and lower, from which description the skilled dentist will readily be able to see how to use the instrument in completing the adjustments of a partial set. After the articulation has, by the steps above described, been made as complete as can be done by any previously-known process, I place both sets in their proper position in the patient's mouth and directing him to hold them tolerably tight together I proceed to fasten the two sets to each other by inserting with a spatula a little plaster batter at the sides of the teeth, leaving the incisors exposed for observation, so that if the patient should accidentally move the sets from their adjustment the fact can be readily detected by the eye. In a few minutes the plaster becomes hard, and then I remove the upper and lower sets of teeth thus fastened securely together. I then place them in the machine, fastening them to the plates A B by a backing of plaster batter in the same way in which the casts M, N, and O were previously fastened. The plaster is then carefully removed from between the teeth and the latter brushed clean, so that the jaws of the machine, with the artificial sets attached, can be opened. Upon now testing the bite of the artificial teeth in the machine by means of a strip of paper it will be probably found that only two or three teeth come in actual contact. To overcome this imperfection I proceed as follows: Having tested the teeth all around and noted those that strike first, I then remove the sets from the machine, grind them, replace them, test them again, and so on till the contacts are perfect, turning the screw F down out of the way while doing this. In this operation I have the great advantage of being able to observe the contacts from front, sides, and rear, the machine readily permitting me to look into the back part of the artificial mouth. During this step, or as an addendum to it, the lateral adjusting-screws I I' should be slightly retracted, so as to permit the upper set to be moved laterally to get the proper grinding-contact with the lower set, which is determined by their action upon

a strip of paper placed between them, as before, and any imperfection corrected by grinding and testing till the work is perfect. It may happen that the back teeth will catch the paper, while the front teeth, in consequence of the overlapping of the upper incisors, will not. In this case the rear screw H should be retracted, so as to bring the edges of the incisors together, and then they should be ground, tested, and adjusted until the contact is perfect all around, so that a woman can bite off her thread with her artificial front teeth as easily as with natural teeth.

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

1. The method or process herein described, consisting, essentially, in the following-named steps, to wit: first, by the aid of the casts M N and an articulator obtaining and noting a complete registry of the patient's mouth; second, removing the natural teeth, allowing the gums to shrink, and then making a plaster cast O, conforming to the shrunken gums; third, constructing and adjusting the guide-plate P to supplement cast M; fourth, transferring guide P from cast M to cast O, and, fifth, using the combined structure O P as a guide for the construction and adjustment of an artificial set of teeth and gums, substantially as described.

2. As a further improvement, adapted more particularly for the perfecting of a full set of upper and lower artificial teeth and gums, the method or process herein described, consisting, essentially, in the following steps, to wit: first, constructing the two sets and preliminarily adjusting them to each other; second, placing them both in the patient's mouth in their normal positions and temporarily fastening them together; third, removing them from the mouth and attaching them while still fastened together to the appropriate jaw-plates of the machine, and, fourth, severing their connection to each other and grinding them to a complete fit, substantially as described.

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Witnesses:

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