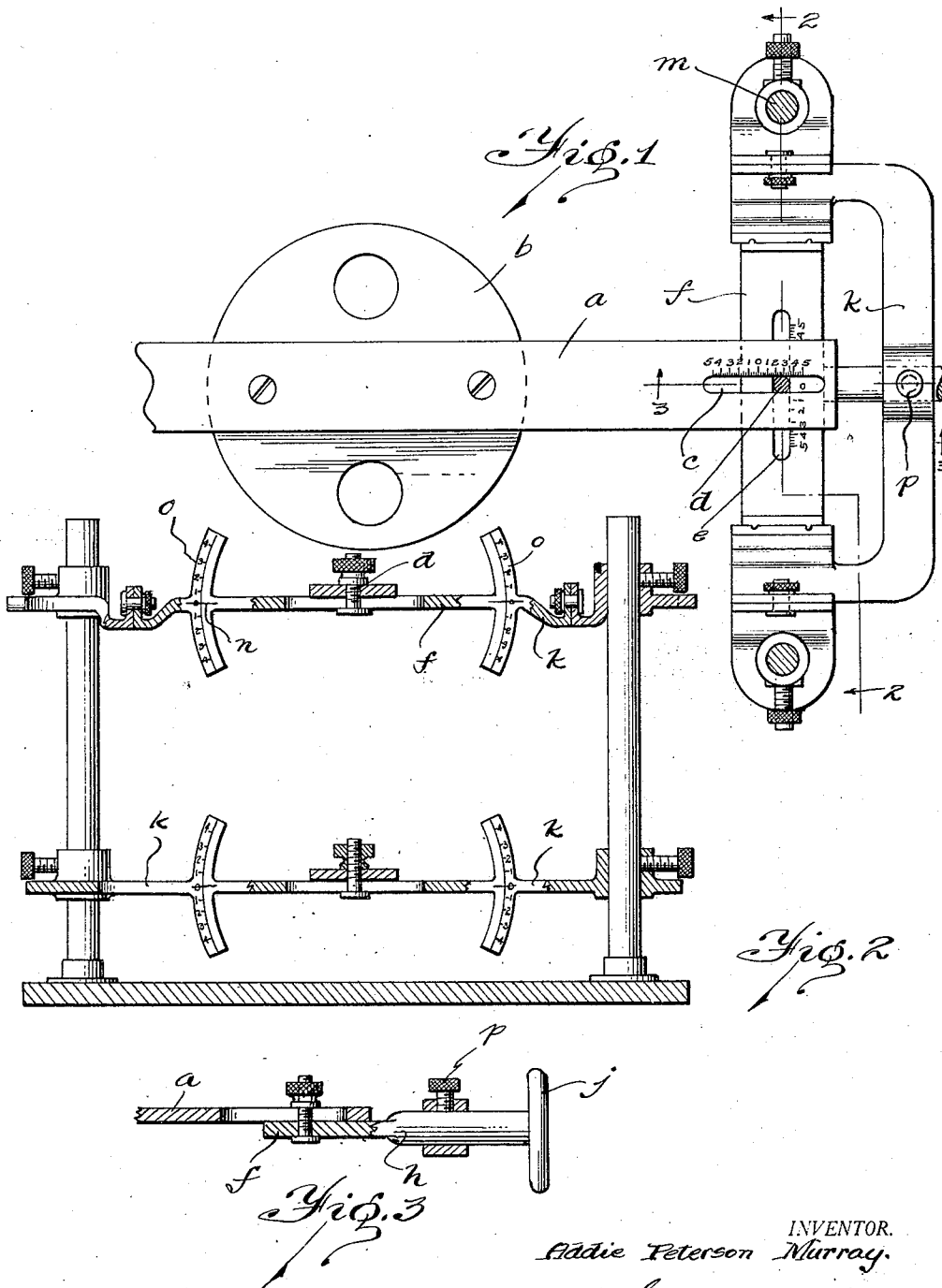


July 30, 1929.

A. P. MURRAY
METHOD OF MAKING AND FITTING ARTIFICIAL
DENTURES AND ARTICULATOR THEREFOR
Filed Sept. 22, 1927

1,722,306

3 Sheets-Sheet 1



INVENTOR.
A. P. MURRAY

BY

STUART B. BARNEO
ATTORNEY.

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3 Sheets-Sheet 2

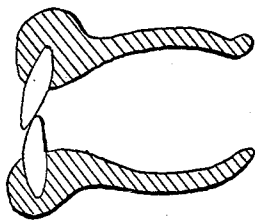
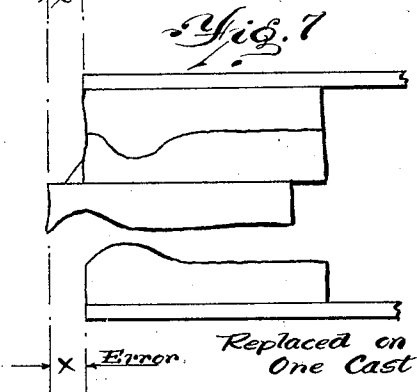
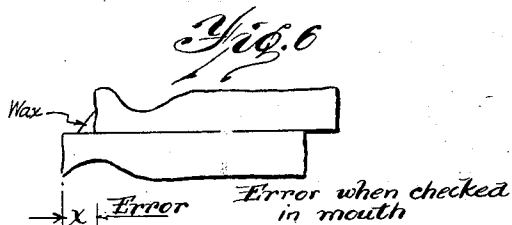
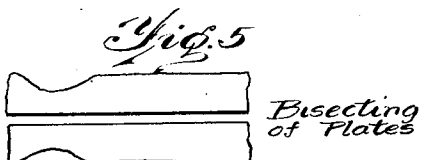
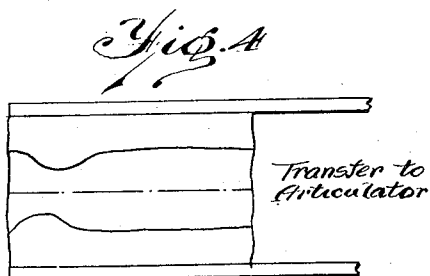


Fig. 11

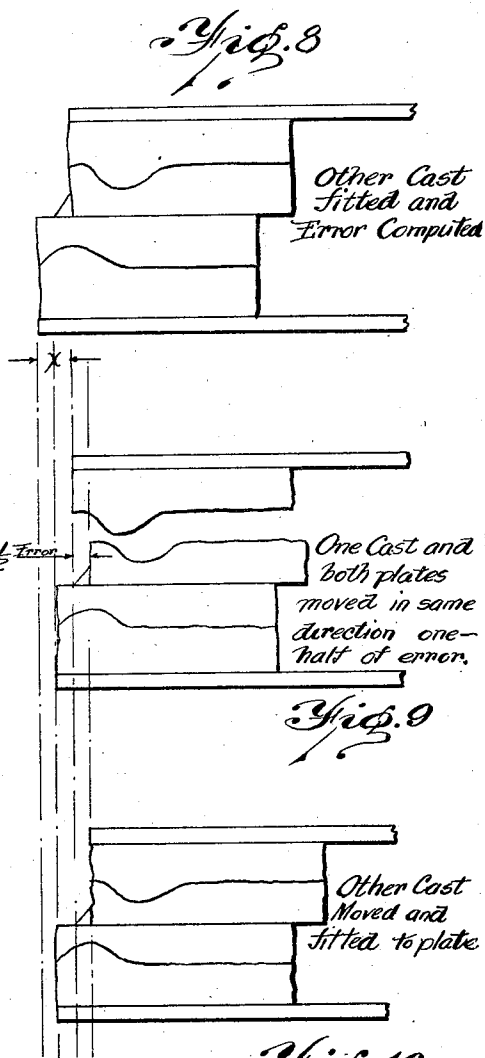


Fig. 10

INVENTOR.

Addie Peterson Murray

BY

Stuart C. Barnes
ATTORNEY.

July 30, 1929.

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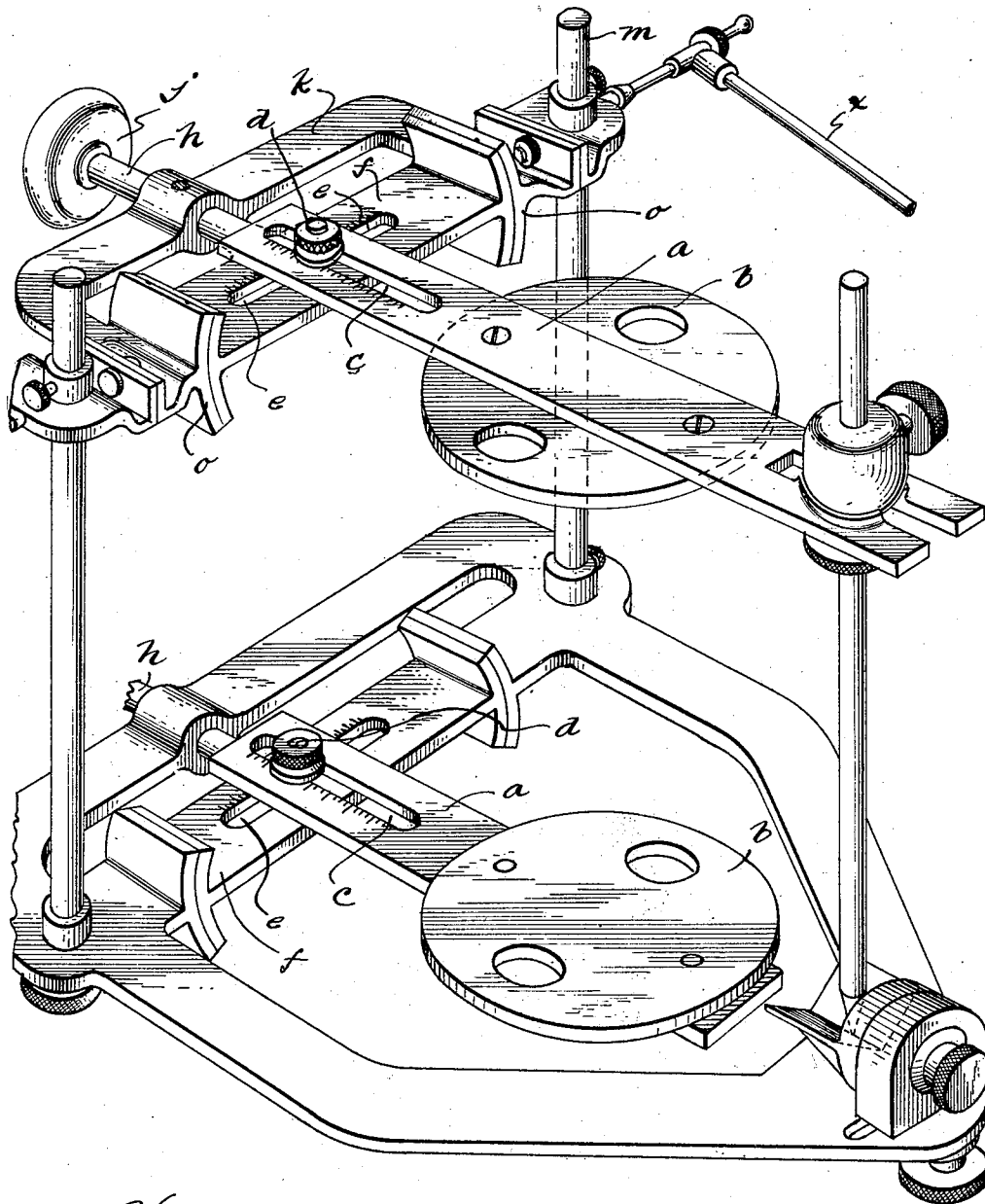


Fig. 12

INVENTOR.
Addie Peterson Murray.

BY

Stuart B. Banno
ATTORNEY.

Patented July 30, 1929.

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UNITED STATES PATENT OFFICE.

ADDIE PETERSON MURRAY, OF DETROIT, MICHIGAN.

METHOD OF MAKING AND FITTING ARTIFICIAL DENTURES AND ARTICULATOR THEREFOR.

Application filed September 22, 1927. Serial No. 221,212.

This invention relates to a new method of making and fitting artificial dentures and articulator therefor to establish central occlusion. It also relates to a new and improved articulator which has a mold carrying arm or structure for both the upper and lower frame, angularly, longitudinally and laterally adjustable for the purpose of practicing and carrying out my process.

10 In all the articulators with which I am familiar, it is not possible to get substantially perfect central occlusion. This, I believe, is due to errors in obtaining a proper face bow transfer. That is to say, error is usually introduced in applying the face bow to the hinging line or axis of the jaws. When the face bow is clamped to the face not exactly on the true axis of the jaws, this error is carried onto the articulator and results in a bad misarrangement of the denture. This condition is extremely discomfoting, and often is very painful to the patient.

It is the object of my improved method and my improved articulator for practicing this method, to obviate these difficulties and to provide a substantially perfect articulation.

Referring to the drawings:

Fig. 1 is a plan view of my improved articulator.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary section taken on the line 3—3 of Fig. 1.

Figs. 4 to 10 inclusive are diagrammatic sections of the plates applied to the casts or moulds of the upper and lower arms of the articulator. More particularly, Fig. 4 shows the plates after they have been applied to the articulator arms in the usual way by means of the bow transfer.

Fig. 5 shows the plates after they have been bisected by one step in my improved process.

Fig. 6 shows the plates after they have been fitted back into the mouth and illustrates exaggeratedly the error that frequently occurs.

Fig. 7 shows the step wherein the plates are cemented together in this erroneous relation and applied to the upper articulator arm.

Fig. 8 shows the lower articulator arm adjusted to fit over the lower plate in this erroneous relationship.

Fig. 9 shows the plates moved to their

proper position by reason of moving the lower cast and both plates back through one-half the error.

Fig. 10 shows the upper cast again fitted to its plate.

Fig. 11 is a section showing the plates in their correct position of central occlusion.

Fig. 12 is a perspective of my improved articulator.

Articulators are in common use among dentists for the purpose of fitting plates so that there will be a proper relationship between the upper and lower plates, which relationship is called "central occlusion". However, these articulators are built on the principle of securing an absolutely correct transfer from the face by means of the well known face bow *a*, but as a matter of fact it is a rare thing that these face bows are fitted accurately to the face so as to make a correct transfer. Consequently this error is carried into the plates that are positioned with respect to each other by means of the articulator and the well known ways now in use.

My method is to proceed as is the usual practice, namely: I use an articulator having an upper and lower frame which are secured together in the usual way. However, I employ both in the upper frame and the lower frame an arm which carries the cast which is made of plaster of Paris in the mounting 9, plate *b*. This arm is arranged to give a minute adjustment longitudinally, laterally and also angularly with respect to the remainder of the frame.

Referring to Fig. 1, *a* represents the upper cast carrying arm; *b* the mounting plate. This upper cast carrying arm *a* is slotted as at *c* and the space along the slot graduated. This slot fits around a lock screw and nut *d*. This screw passes through a second slot *e* in a member *f* which, as shown, is a sort of fragment of a wheel. This is carried on the axle *h*, which is provided with a hand wheel *j*. This axle passes through the frame member *k* which hinges to the uprights *m* in the usual way to articulate the entire upper frame with respect to the lower frame. It will be seen (Fig. 2) that the rotatable wheel fragment *f* has on its periphery a pointer mark *n*. The wheel segment with the mark is arranged to swing over the graduations *o* on a similar segment that is attached to the frame part *k*. Hence, by loosening the lock screw *p* it is possible to turn the hand wheel *j* and secure an

angular adjustment of the mold-carrying arm, together with the mounting plate, with respect to the remainder of the upper frame. Furthermore, by loosening the lock screw and nut *d*, it is possible to shift the upper mold carrying arm longitudinally thereof, or laterally with respect to the wheel fragment *f*, or both laterally and longitudinally for a purpose now to be described. Exactly the same form of adjustments can be secured with respect to the lower mold carrying frame and mounting plate.

As explained heretofore, the transfer is made from the face to the articulator by means of the usual face bow. It is almost impossible to line the face bow up exactly on the hinging line of the jaw. Dentists do the best they can but errors almost always arise, by the inability to determine just where the hinge axis is. Obviously this error is carried into the articulator after the face bow is mounted on the articulator, exactly on the hinging line of the articulator.

The base plates are vulcanized rubber plates, with which everyone is familiar. These are previously prepared and fitted to the mouth. The upper plate is fastened to the face bow by means of wax while the bow is on the face and the upper plate is in the mouth. The bow, together with the upper plate, is then fitted onto the articulator and the upper plate secured to the mounting plate by means of a plaster of Paris cast which has previously been molded to fit the plate. When this is hardened, the upper plate is removed from the cast and fitted into the mouth together with the lower plate. When the correct relationship between the two plates has been established in the mouth, these are cemented together by wax. They are then removed and placed on the upper mold. The lower cast is then positioned on the lower mounting plate of the articulator by fitting the same in the lower plate. This practice, so far, is the common every-day way of making plates among high grade practitioners. The resulting relative positions of the casts would be substantially perfect if the face bow has been clamped with absolute accuracy on the hinging line of the jaw, but as already explained, this rarely happens. However, the relative positions of the plates are substantially correct.

The condition of the upper and lower plates and casts cemented together is graphically depicted in Fig. 4. My process consists in correcting the misarrangement of casts made in this or similar ways. While the plates are on the plaster casts and cemented together, I divide them through the wax on a line between the two plates (Fig. 5), substantially parallel to the line of axis of the articulator. This I call bisecting. Several ways of doing this may be used. One way that I find substantially accurate is to place the apparatus

together with the casts and the plates on an absolutely flat surface. Then I run a pair of calipers, one point along the flat surface and the other point around the wax covered plate. This forms a line in the wax, and this is cut through with a knife, endeavoring, as well as may be to keep the knife horizontal. I bisect the plates in this way in a horizontal plane which is substantially parallel with the axis of the articulator.

I then remove the plates from the plaster of Paris casts and place the two plates in the mouth (Fig. 6) and put them on the gums, covering the meeting edges of the plates with a soft modeling compound. The jaws are permitted to assume a position of rest. The plates are then inspected and it will be found often that there is considerable error in the meeting of the bisected surfaces of the wax. For instance, the lower one may be undershot with respect to the upper one, as is shown exaggeratedly in Fig. 6. This error would have been carried into the artificial teeth according to the old practice, and it is just this error that it is the purpose of my method and apparatus to correct. Also there will usually be an error laterally and angularly. The plates are then cemented together by cementing wax, establishing these errors. They are then taken out of the mouth and the upper one is fitted back onto the upper plaster cast, as shown in Fig. 7.

In this situation my improved articulator comes into use. In Fig. 7 the lower cast will be seen to be out of registry with the lower plate. The locking nut and screw *d* and locking screw *p* can be loosened and the lower cast adjusted until it fits exactly on the lower plate as shown in Fig. 8. Readings are now taken on the several lines of graduations and the exact errors thus ascertained in fractions of an inch, and degrees of angularity. These readings are noted and the exact errors are established.

The upper cast is now disconnected from the upper plate, and the lower cast together with both plates is shifted back longitudinally, laterally, and angularly, one-half the distance it was advanced in fitting it into the lower plate. In other words, the lower cast and both plates are shifted back in all three directions just one-half the amount of error in each direction. The upper cast is now shifted, by means of loosening of the several set screws on the articulator, so as to fit it into the upper plate. The amount of this shift is just one-half of the total error of all three measurements namely; longitudinally, laterally, and angularly.

When the upper cast is placed on the articulator by means of the face bow, and when the lower cast is placed on the articulator by cementing the plates together while in the mouth, and then retransferring the plates to the articulator, the casts are in proper posi-

tions with relation to the unknown line of axis through the head of the patient as determined by the position of the face bow. It is the usual happening that this line of axis does not correspond to the mechanically correct axis of the articulator, because the face bow is incorrectly placed. Thus it is that the casts are not in proper positions with regard to the line of axis of the articulator.

10 According to my method, I remove both plates from the articulator by severing the wax on a line substantially parallel with the axis of the articulator, and when the plates are in the mouth they are working from the true hinge line in the head of the patient. They are then brought to a position of rest and cemented with wax. The error between this true hinge line and the mechanical hinge line is indicated by the erroneous meeting of the bisected wax surfaces. By then placing the plates, as cemented together, back into the articulator as above described and adjusting both the lower and upper casts in accordance with the positions dictated by the two plates cemented together, the casts are brought into correct positions relative to the articulator axis.

The casts are now properly positioned and central occlusion is established. It now remains to set in the teeth and this may be carried out in the usual manner.

Claims:

1. In the method of making and fitting artificial dentures consisting of transferring denture plates to an articulator and fitting casts for these plates from the mouth of a patient on the articulator, the steps of establishing central occlusion which comprises, severing the denture plates on a line parallel to the line of axis of the articulator, transferring the plates into the mouth of the subject, securing the plates together to establish the errors, if any, which exist between the true axis in the head of the patient and the axis of the articulator, retransferring the plates to the articulator, and adjusting the casts on the articulator to the plates to bring the articulator axis and casts into relative positions which approximate the relative positions between the guns and true axis in the head of the patient.

2. In the method of making and fitting artificial dentures consisting of transferring denture plates from the mouth of a patient to an articulator and fitting casts for these plates on the articulator, the steps of establishing central occlusion which comprises, severing the dentures on a line parallel to the line of axis of the articulator, transferring the plates into the mouth of the subject, securing the plates together to establish the errors, if any, which exist between the true axis in the head of the patient and the axis of the articulator, retransferring the plates to the articulator, adjusting the casts on the ar-

ticator to the plates to position the casts in such positions relative to the axis of the articulator as dictated by the plates whereby such relative positions of the casts and articulator axis correspond to the same relative positions of the guns and true axis in the head of the patient.

3. In the art of making and fitting artificial dentures, the method of establishing central occlusion which comprises, transferring denture plates from the mouth of the subject to an articulator with the denture plates sealed together, severing the denture plates in a line substantially parallel with the line of axis of the articulator, replacing the dentures in the mouth of the subject where they work on the axis in the head of the subject, again sealing the denture plates together to fix the error, if any, between the axis in the head of the subject and the axis of the articulator, again placing the dentures on the articulator and adjusting the same to the sealed together plates to bring the casts and articulator axis into substantially the same relative positions as exist between the guns and true axis in the head of the patient.

4. In the art of making and fitting artificial dentures, the method of establishing central occlusion which comprises, transferring denture plates to an articulator by means of a face bow and forming casts on the articulator for both upper and lower plates with the plates sealed together, severing the plates on a line substantially parallel to the axis of the articulator, placing the plates in the mouth of the subject where they work on a true axis in the head of the subject, sealing the plates together at the bisected edges while in position of rest to establish the error, if any, existing between the axis in the head of the subject and the axis of the articulator, retransferring the plates to the articulator and adjusting the same to the plates.

5. In the art of making and fitting artificial dentures, the method of establishing central occlusion which comprises, transferring denture plates to an articulator by means of a face bow and forming casts on the articulator for both upper and lower plates with the plates sealed together, severing the plates on a line substantially parallel to the axis of the articulator, placing the plates in the mouth of the subject where they work on a true axis in the head of the subject, sealing the plates together at the bisected edges while in position of rest to establish the error, if any, existing between the axis in the head of the subject and the axis of the articulator, retransferring the plates to the articulator and adjusting the articulator to the plates by shifting each cast a distance equal to substantially one-half of the total error.

6. In the art of making and fitting artificial dentures, the method of establishing central occlusion which comprises, trans-

ferring denture plates to an articulator by means of a face bow and forming casts on the articulator for both upper and lower plates with the plates sealed together, severing the
5 plates on a line substantially parallel to the axis of the articulator, placing the plates in the mouth of the subject where they work on a true axis in the head of the subject, sealing the plates together at the bisected edges while
10 in position of rest to establish the error, if any, existing between the axis in the head of the subject and the axis of the articulator, retransferring the plates to the articulator, securing one plate to its respective cast, ad-
15 justing the second cast into its respective plate by movement thereof equal to the error, removing the first mentioned cast from its plate, adjusting the second mentioned cast together with the two plates sealed together
20 back through a distance equal to one-half the error, then adjusting the first mentioned cast again to its respective plate to establish central occlusion.

7. In the art of making and fitting artificial dentures, the method of establishing
25 central occlusions which comprises fitting denture plates in the mouth of a patient transferring denture plates to an articulator having an axis of movement designed to correspond to the true axis of movement in the
30 head of the patient, calculating and correcting such errors, if any, which exist between the articulator axis and the true axis by sev-

ering the dentures on a line substantially parallel with the axial line of the articulator, 35 replacing the dentures in the mouth of the patient where they work on the true axis, allowing the dentures to come together in a position of rest, and securing them together to fix the error, or errors, retransferring the
40 dentures to the articulator, securing one cast of the articulator to the dentures and then adjusting the articulator to the dentures in such manner as will bring the dentures and the articulator's axis in substantially the
45 same relative positions as that which existed between the dentures and true axis when the dentures were in the mouth of the patient.

8. In the art of making and fitting artificial dentures, the method of establishing
50 central occlusion which comprises, transferring denture plates to an articulator and forming casts on the articulator for the denture plates with the casts and plates positioned to work on the axis of the articulator, 55 replacing the plates in the mouth of the subject where they work on the true axis in the head of the subject, sealing the plates together to fix the error between the axis in the articulator and the axis in the head of the sub-
60 ject, replacing the plates on the articulator and adjusting the articulator to the plates by movement of each cast through one-half the distance of the error.

In testimony whereof I affix my signature.
ADDIE PETERSON MURRAY.