

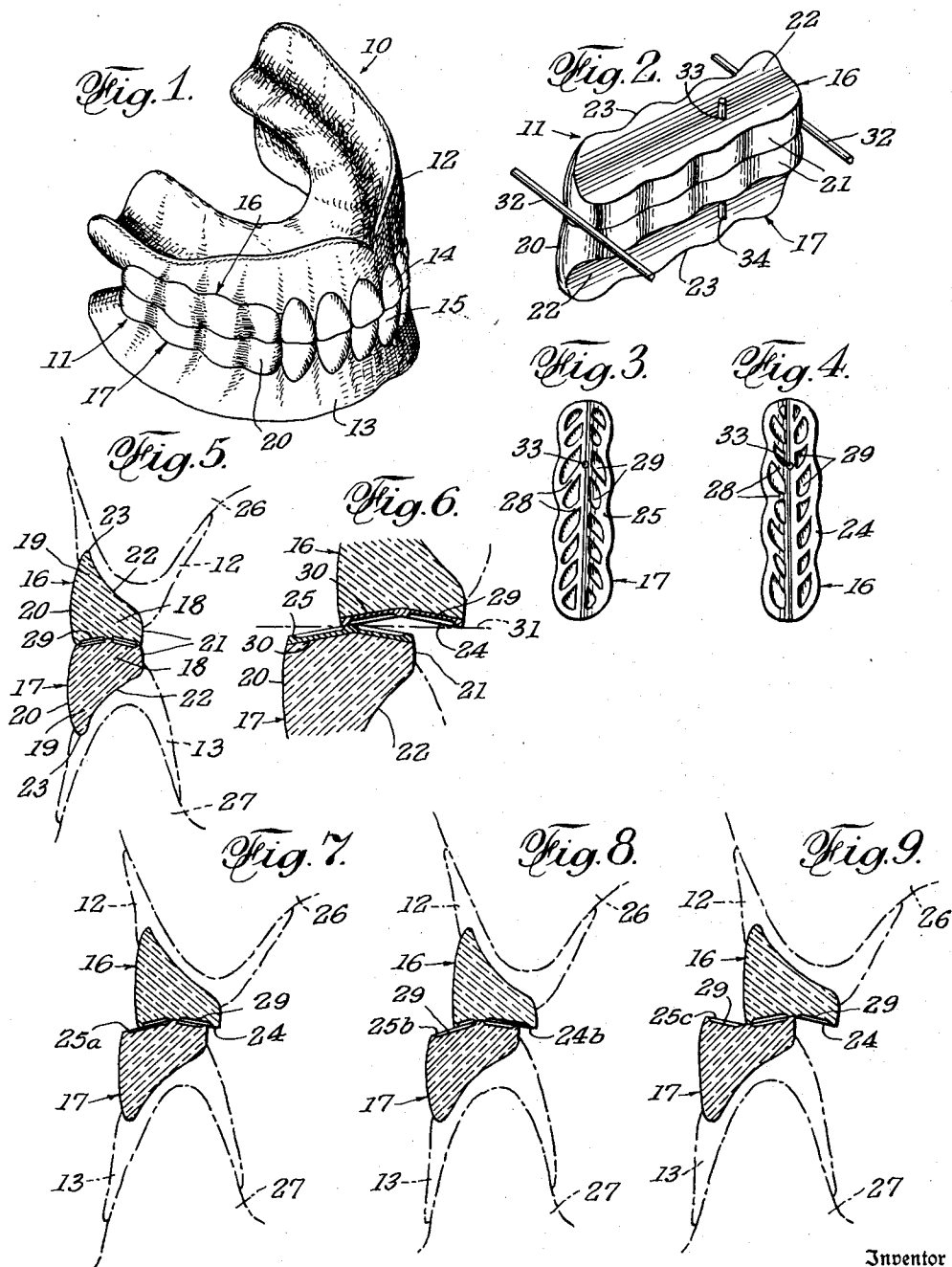
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MATING TOOTH BLOCKS

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## MATING TOOTH BLOCKS

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This invention relates to mating tooth blocks adapted for use in artificial dentures. This application is a continuation in part of my pending application Serial No. 284,175, entitled Artificial Denture and Method.

It is a general object of this invention to provide artificial dentures that have balanced occlusion. I achieve balanced occlusion by embodying novel interfitting tooth blocks in the rear or molar sections of the dentures and providing the occlusal surfaces of such blocks with angulation of such degree that, in protrusion relationship of the upper block to the lower, the lower block slides forward against the upper block up onto the full slope or angulation of the occlusal surfaces. In practice, this relative movement creates an opening in the nature of one millimeter or one that allows suitable freedom so there can be an overlap of the anterior teeth in the centric relationship of the dentures. In tooth structures having flat occlusive faces, there can be no opening of correction. Thus, as the lower jaw slides forward, the hinged action of the mandibular joint results in a tipping of the mandible itself which does not allow the anterior teeth to hit correctly in incision. It is another object, therefore, to provide, in a set of dentures, tooth blocks having angulation of the occlusal surfaces of such degree that the anterior teeth are correctly related in incision.

It is of extreme importance that the two sets of tooth blocks be initially accurately related as during a centric relationship of the upper and lower of a set of dentures. Another object of the invention, therefore, is to provide a mechanical but temporary connecting means for said pairs of blocks whereby such accuracy of relationship is assured during the positioning of said pairs of blocks and production of a set of dentures.

Another object of the invention is to provide the occlusal surfaces of said tooth blocks with the ability to cut food efficiently, that is, to provide for improved cutting, mashing, trituration, and milling.

A further object of the invention is to provide tooth blocks of the nature indicated that are in balance in all excursions of the mandible. I achieve the same by eliminating all cusps in the bicuspid-molar areas, since cuspal interference will rock or tilt artificial dentures, and use instead the previously mentioned angulated occlusal surfaces formed in continuous transversely sloping planes provided with depressions that define food-attributing raised portions.

The relative size and relationship of the upper and lower gum ridges of the human mouth vary considerably. Therefore, in addition to a normal size ratio and aligned relationship, some upper gum ridges are relatively narrower than the lower gum ridges, with resultant offset from normal alignment. Also, such offset varies considerably since either or both gum ridges may vary with respect to a normal aligned relationship. In order that the general object above be capable of being fulfilled, it is a further object of the invention to provide the tooth blocks with occlusal surfaces in which the angulation is offset from a normal medial condition in one or both of the blocks, as

conditions require, so that balanced occlusion is achieved regardless of the degree of offset of the gum ridges.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawing merely shows and the following description merely describes embodiments of the present invention, which are given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

Fig. 1 is a perspective view of mating tooth blocks according to the present invention and as embodied in a set of artificial dentures.

Fig. 2 is a perspective view, as seen from the inner side, of said mating tooth blocks as prepared for positioning prior to embedding the same in the acrylic, or other suitable plastic, dental plates of a denture.

Fig. 3 is a top plan view showing the occlusal surface of the lower tooth block.

Fig. 4 is a bottom plan view of the mating occlusal surface of the upper tooth block.

Fig. 5 is an enlarged cross-sectional view taken through the mating tooth blocks in normal mating relationship, the same being shown with relation to upper and lower gum ridges that have normal aligned relationship.

Fig. 6 is a further enlarged fragmentary sectional view showing the tooth blocks in lateral displacement.

Figs. 7, 8 and 9 are cross-sectional views similar to Fig. 5, showing different forms of angulation on the occlusal surfaces of the blocks according to the degree of offset of the upper and lower gum ridges.

In the drawing, Fig. 1 shows a generally conventional artificial denture 10 in which is embodied mating tooth block unit 11 of which one is shown, the one on the opposite side being comparable. In the usual manner, denture 10 comprises upper and lower acrylic, or like material, plates 12 and 13, respectively, and respective upper and lower artificial incisors, canines and bicuspid 14 and 15. Of this general structure, the tooth block unit 11 is the novel element and the subject matter of this invention.

Each unit 11 comprises upper and lower mating blocks 16 and 17, respectively, and the same are formed of such length as to extend through the position of the two molars, on one side or the other, and may be sufficiently long to extend also through the positions of one or both bicuspid or premolars, as desired. In other words, the teeth 14 and 15 need only comprise the incisor and canine teeth of the denture and the remaining tooth space be occupied by a unit 11 on each side.

Each block 16 and 17 is made of a suitable long-wearing material, of which porcelain and hard plastics are examples. In cross-section, each block is formed to have a thicker portion 18 and a progressively thinner portion 19 so that the front surface 20 of the block is relatively high while the back surface 21 is quite narrow. The thinner portion 19 is defined between front surface 20 and a preferably concave surface 22 that extends between surface 21 and the thinnest edge 23 of the block.

Block 16 has an occlusal face 24 and block 17 an occlusal face 25. In the present case, these faces are formed to have transverse obtusely angled face sides. In the upper block 16, face 24 is longitudinally grooved to have an included angle between said face sides of approximately 160°. In the lower block 17, face 25 is provided with a longitudinal crest or ridge that forms an obtuse angle between its face sides that conforms to

the included angle between the face sides of surface 24.

In Fig. 5, it is shown that the face sides of faces 24 and 25 are substantially equal, the longitudinal groove in block 16 and the longitudinal crest in block 17 being substantially midway between the fronts and backs of the blocks. It will be clear, therefore, that the upper and lower blocks will be vertically aligned when normally interfitted on their occlusal faces, as in Fig. 5. Therefore, as seen in Fig. 6, when one block is moved forward or rearward relative to the other, the angularly disposed face sides slide relative to each other at an incline of some 10° and there is a vertical separation of the tooth blocks as a result of such angulated sliding.

The generally symmetrical form of the occlusal faces, as in Fig. 5, is provided where the blocks are to be embodied in a denture fitted to upper and lower gum ridges 26 and 27 that are in normal vertically aligned relation, as shown in said figure. In a case where the upper gum ridge 26 is narrower than normal and the lower gum ridge 27 is normal, the latter is forwardly offset, as shown in Fig. 7. In such case, the crest defining the face sides of one block, preferably the lower block 17, is offset rearwardly so that the occlusal face 25a of said block has a longer face side on the outside, as shown. Where the offset relationship of the gum ridges is still greater, as when the upper gum ridge is quite narrow, and the lower gum ridge is wider than normal, both occlusal faces 24b and 25b are preferably formed with their crests and grooves mutually oppositely offset, as shown in Fig. 8. In exaggerated conditions where the gum ridges are still further offset and the groove and crest lines would otherwise fall outside the blocks, the upper occlusal face 24 is formed in accordance with any of the previously-described forms, and the lower occlusal face 25c is reversed over any of the previous forms, as shown in Fig. 9. While said figure shows both occlusal faces with grooves, it will be clear that both may be formed to have crests.

The occlusal faces above provided are each formed with chevron-like ridges or lands 28 that, in the upper block, are arranged in one angular direction and, in the lower block, in an angularly transverse direction, as shown in Figs. 3 and 4. These lands define shallow depressions 29. Thus, lands 28 cross each other, in the mating blocks, and when the blocks are moved relatively in protrusion or laterally, said lands slide against each other to create attrition that facilitates cutting through food.

While the blocks 16 and 17 may be of sufficient hardness that obviates the need for lining the same with metal, such lining or covering may be used, as desired, as indicated at 30 in Fig. 6. One advantage of such lining is that the same, when unduly worn, may be replaced without otherwise disturbing the denture. Also, the tituration effect may be increased by use of metallic chevron-provided faces.

The above-described block unit 11, in all of its various forms, can be made up in production and stocked by suppliers to afford dentists and dental mechanics a choice of units to suit a particular condition. Since, when fabricating a set of dentures, it is of paramount importance that the plane of occlusion, indicated at 31 in Fig. 6, be substantially horizontal both transversely and front-to-back when the block unit is positioned, as in an articulator, preparatory to embedding the same in wax which is a model of the plastic plates 12 and 13, to insure such accuracy of position of the blocks, the upper block 16, at both ends thereof, has temporarily affixed thereto, a pair of thin and light transverse rods 32 of metal or plastic that are disposed on plane 31. After the occlusal plane has been determined in the articulator, it would otherwise be difficult to place the block unit in proper relationship. By placing rods 32 or any element that establishes the occlusal plane or, even by merely gauging the position of the rods relative to any flat hori-

zontal surface, the first step of modeling wax around the blocks may be performed with assurance that the blocks are properly embedded therein. Thereafter, the usual step of investing the wax-modeled plates and replacing the wax with the permanent material of said plates, may be carried out.

While the upper and lower blocks are shown as of substantially the same length, one may be longer than the other. In any case, it is important that the established longitudinal relationship of the blocks be retained at all times and against the possibility of inadvertent relative longitudinal displacement. To this end, a small hole 33 is drilled through both blocks and a pin 34 is fitted into said hole. In this manner, the blocks are held in mutual register longitudinally. After said pin has served its purpose, it is removed and the holes in each block plugged in any suitable manner.

Since the manner of setting teeth 14 and 15 made be carried out in the usual manner, the same need not be described. Nor is it deemed necessary to detail well-known and accepted dental techniques that may attend the use of the present mating tooth block unit.

While I have illustrated and described what I now contemplate to be the best mode of carrying out my invention, the constructions are, of course, subject to modification without departing from the spirit and scope of the invention. It is, therefore, not desired to restrict the invention to the particular forms of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described the invention, what I claim and desire to be secured by Letters Patent is:

1. A new article of manufacture comprising a pair of mating upper and lower molar tooth blocks of plural tooth length, and means extending through the blocks to temporarily hold the same in mating register, said means comprising an extractable pin in aligned holes in said tooth blocks.
2. An article of manufacture according to claim 1: a pair of rod members temporarily secured to the ends of the upper of said blocks and residing in a plane common to the plane of occlusion between the blocks.
3. A tooth block unit comprising a lower block of plural tooth length and having an occlusal face that has a longitudinal crest defining downwardly and outwardly sloping occlusal face sides, a mating upper block of plural tooth length and having an occlusal face of a form to interfit with the occlusal face of the lower block, and means extending through the blocks to separably hold the same in mating register both transversely and longitudinally.
4. A tooth block unit according to claim 3: the ridge in the lower block being medial of the sides of the block, and the two blocks being substantially vertically aligned.
5. A tooth block unit according to claim 3: the ridge in the lower block being medial of the sides of the block, and the two blocks being vertically offset.
6. A tooth block unit according to claim 3: the ridge in the lower block being nearer one side of the block than the other and the two blocks being vertically offset.
7. In a set of artificial dentures according to claim 3: the angle included between the sloping faces of the lower molar tooth block being approximately 160°.
8. In a set of artificial dentures according to claim 3: the angle of each sloping occlusal face being approximately 10° to the horizontal.
9. In a set of artificial dentures according to claim 3: a set of angularly directed lands on each said sloping occlusal face and residing in the respective plane of each said face, and the angular disposition of the ridges in one tooth block being substantially transverse to the angular disposition of the ridges of the other tooth block.
10. A tooth block unit comprising a lower block of plural tooth length and having an occlusal face that has a longitudinal crest defining downwardly and outwardly

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sloping occlusal face sides, and a mating upper block of plural tooth length and having an occlusal face of a form to interfit with the occlusal face of the lower block the occlusal faces having ribs extending at less than right angles to the mid-portions of the occlusal faces.

11. A tooth block unit comprising a lower block of plural tooth length and having an occlusal surface defined by a longitudinal crest and downwardly and outwardly sloping side faces, a lining element for said surface having a similar longitudinal crest and downwardly and outwardly sloping raised ribs, a mating upper block of plural tooth length having an upper occlusal surface, and a lining element for the latter surface defined by a mid-portion and

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upwardly and outwardly sloping raised ribs, arranged to interfit with the lower lining element.

12. The structure of claim 11 characterized by the linings having spaced aligned recesses.

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