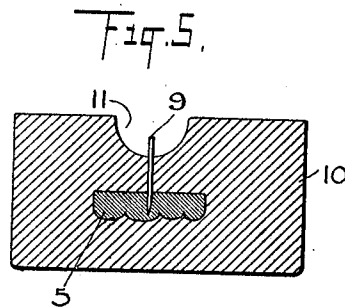
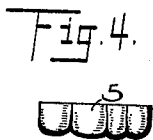
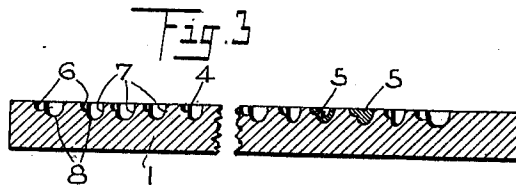
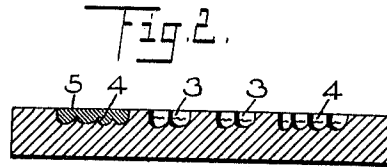
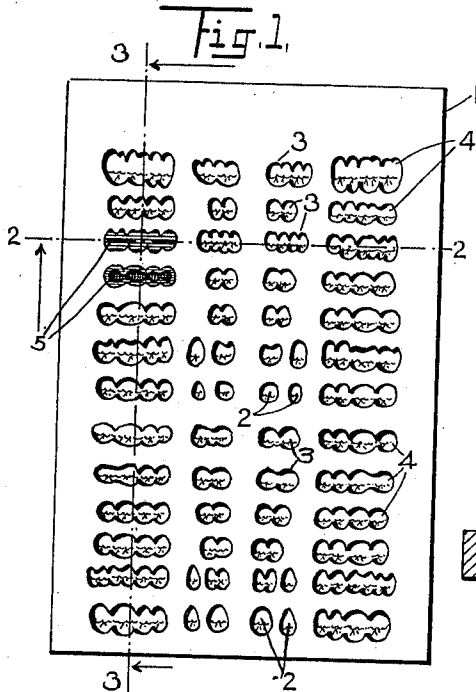


T. C. HUTCHINSON.
PROCESS FOR FORMING DENTAL BRIDGES AND THE LIKE.
APPLICATION FILED JUNE 1, 1908.

992,199.

Patented May 16, 1911.



WITNESSES:

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UNITED STATES PATENT OFFICE.

THOMAS C. HUTCHINSON, OF DECORAH, IOWA,

PROCESS FOR FORMING DENTAL BRIDGES AND THE LIKE.

992,199.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed June 1, 1908. Serial No. 436,171.

To all whom it may concern:

Be it known that I, THOMAS C. HUTCHINSON, a citizen of the United States, residing at Decorah, in the county of Winneshiek and State of Iowa, have invented certain new and useful Improvements in Processes for Forming Dental Bridges and the Like, of which the following is a description.

My invention relates to the production of that class of artificial or partially artificial teeth, known as bridges, crowns and the like and the object of my invention is to provide an accurate, convenient and extremely expeditious means for forming such teeth.

In the accompanying drawings wherein like or similar reference characters indicate like or corresponding parts: Figure 1, is a plan view of a die plate for carrying my process into effect. Fig. 2, is a section taken substantially on line 2—2 of Fig. 1. Fig. 3, is a section taken substantially on line 3—3 of Fig. 1. Fig. 4, is a side elevation of a model formed in one of the cavities in the die plate. Fig. 5, is a model inclosed in a suitable investment to form a mold.

In the preferred form shown in the drawings 1, is a die plate formed of any suitable material and provided with any desired number, form and arrangement of dies or cavities, 2, 3 and 4 each preferably corresponding accurately with one or more articles or some portion of one or more articles which it is desired to produce. In the form shown each of the cavities 2 accurately corresponds to the form and size of a normal tooth and the cavities 3 and 4 to a plurality of normal teeth in their natural relation to each other. Several sizes of each tooth or combination of teeth are preferably provided so that a die or cavity may be selected which will accurately correspond with the size of the teeth of any designated person.

After selecting the desired cavity to be employed in a particular case, the operator fills the cavity, with any suitable substance which will accurately conform to the shape of the cavity and retain its shape to serve as a dummy or model 5 and which may be volatilized or otherwise eliminated by heat or other convenient agency. Preferably a sheet of suitable wax is first warmed over a flame or in hot water until it is sufficiently plastic, then rolled to size desired to properly fill the cavity selected. The walls of the cavity are then preferably moistened with water or other suitable liquid and the

softened wax carefully pressed into the cavity with a blunt instrument taking care to force the wax firmly against the sides 6 and 7 of the cavity and to its extreme bottom 8 to insure an accurate model and the proper form at the bucco-occlusal point. Having properly filled the cavity any surplus wax may be removed with a heated spatula or other convenient means and the completed model lifted out of the die. When a bridge is being constructed the abutments should now be made and fitted to the plaster or other model which may be mounted upon an articulator in the usual or any desired manner. The wax dummy or model 5 is then carefully fitted buccally and labio-distally trimming or otherwise forming the same to accurately fit in place. The wax model will readily bend to conform to the shape of the plaster model without seriously distorting or injuring its appearance. The model is completed by carefully forming the palatal surface to fit the plaster model so that an accurate wax model of the finishing bridge is provided.

When it is desired to provide a porcelain facing for all or a portion of a bridge, the buccal surface of the model may be employed as a pattern by which to determine the size of the facing desired, after which the buccal surface may be cut from the model with a knife or other suitable means and after oiling the pins upon the facing press the same into place, reinforce the cutting edge of the facing, cool or permit the model to harden, remove the facing and insert suitable carbon points in the pin holes, which may be readily removed after the bridge is cast leaving the metal part of the bridge ready to receive the facings which may be easily cemented into place. A small pin or stem 9 is next forced into or otherwise attached to the finished model to serve as a handle for supporting the model while it is being invested and also to serve as an inlet or runner by which molten metal may be introduced into the finished mold. The finished wax model is next invested in a suitably refractory porous material, such for example, as a mixture of plaster of Paris and silica, to form a mold or casing 10 with a suitable cup or crucible 11 at the stem 9 to receive the molten metal.

As soon as the investing material has sufficiently set or hardened, the pin or stem 9 is withdrawn and the mold 10 is subjected

to sufficient heat to vaporize or burn the wax model and completely eliminate the same, leaving a mold with a suitably formed cavity to receive the molten metal to form the desired article connected by a small runner or opening to a cup or crucible 11. The walls of the mold are sufficiently porous to permit the escape of any imprisoned air so that when molten metal is placed in the crucible it may be forced into the mold to form an article.

The molten metal may be forced into the mold in any desired manner, for example, the molten metal may be forced into the crucible 11 from a suitably constructed pump or the air may be exhausted from the mold cavity, thus permitting the metal in the crucible to enter the mold under ordinary atmospheric pressure, but as mechanism for forcing metal into the mold forms no part of my present invention, a further description of the same is unnecessary. After the cast is complete and the metal permitted to cool the mold is broken away and the finished article polished or otherwise finished, as may be desired.

Having thus described my invention it is obvious that such immaterial modifications may be introduced as may be found necessary or desirable for adapting the same to particular uses hence I do not wish to be understood as limiting myself to the exact construction shown.

What I claim as new and desire to secure by Letters Patent is:

1. The herein described process of forming dental bridges and the like, comprising, first, providing a die or cavity of suitable form, second, inserting a suitable material in said cavity and forming a model thereof corresponding with the form of the cavity, third, shaping the model to fit the final lo-

cation of the finished article, fourth, investing said model in a body of suitable refractory porous material to form a mold, fifth, heating said mold until the model is eliminated, and lastly, filling said mold with molten metal.

2. The herein described process of forming dental bridges and the like, comprising, first, providing a die plate having a plurality of separate dies or cavities in its face and selecting the proper cavity, second, inserting a suitable material in said cavity and forming a model thereof corresponding with the form of said selected cavity, third, shaping the model to fit the final location of the finished article, fourth, investing said model in a body of suitable refractory porous material to form a mold, fifth, heating said mold until the model is eliminated, and lastly, filling said mold with molten metal.

3. The herein described process of forming dental bridges and the like, comprising, first, providing a die plate having a plurality of separate dies or cavities in its face each provided with the impression of the labial, occlusal and crown face of a plurality of normal teeth in substantially their natural arrangement, second, inserting a suitable material in a selected cavity and forming a model thereof corresponding with the form of the cavity, third, shaping the model to fit the final location of the finished article, fourth, investing said model in a body of suitable refractory porous material to form a mold, fifth, heating said mold until the model is eliminated, and lastly, filling said mold with molten metal.

THOMAS C. HUTCHINSON.

Witnesses:

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E. W. CUTTING.