

(No Model.)

J. G. HOLLINGSWORTH.
METHOD OF FORMING DENTAL CROWNS.

No. 488,008.

Patented Dec. 13, 1892.

Fig. 1.

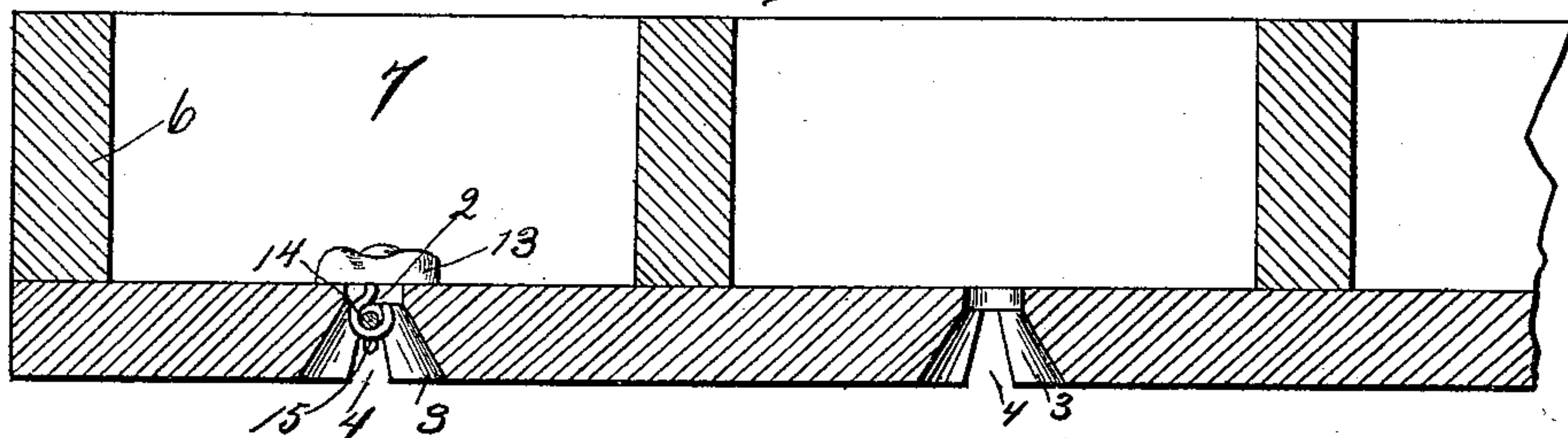


Fig. 2.

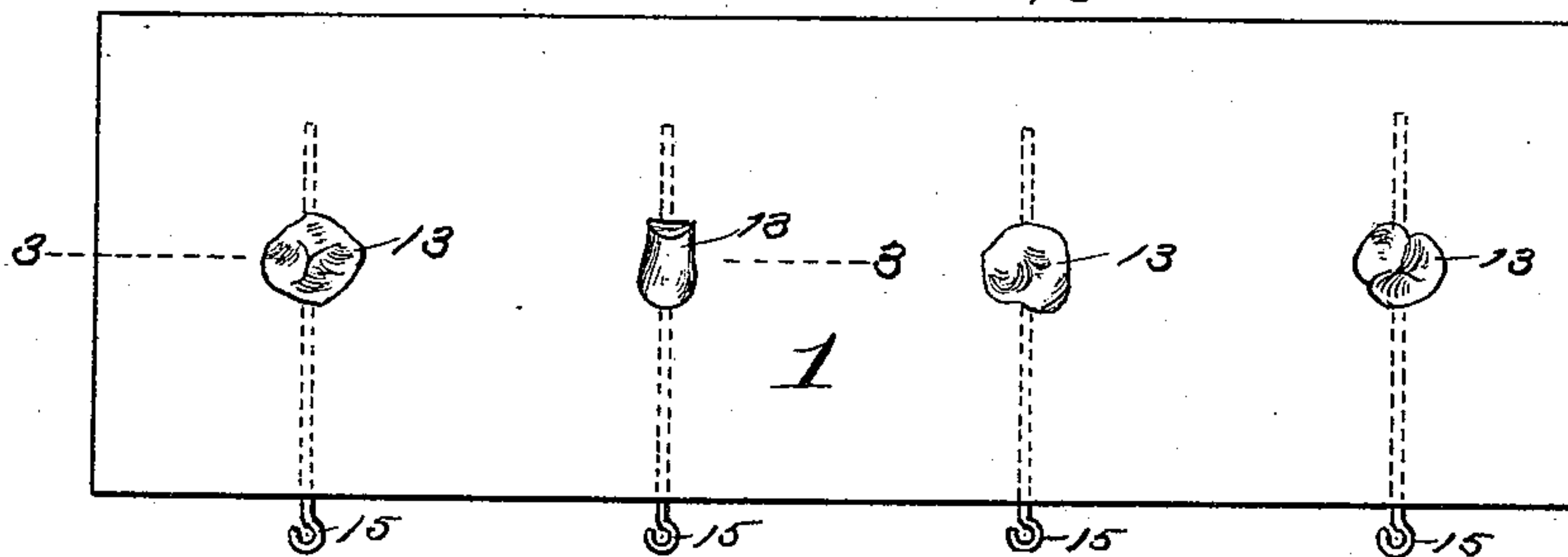


Fig. 3.

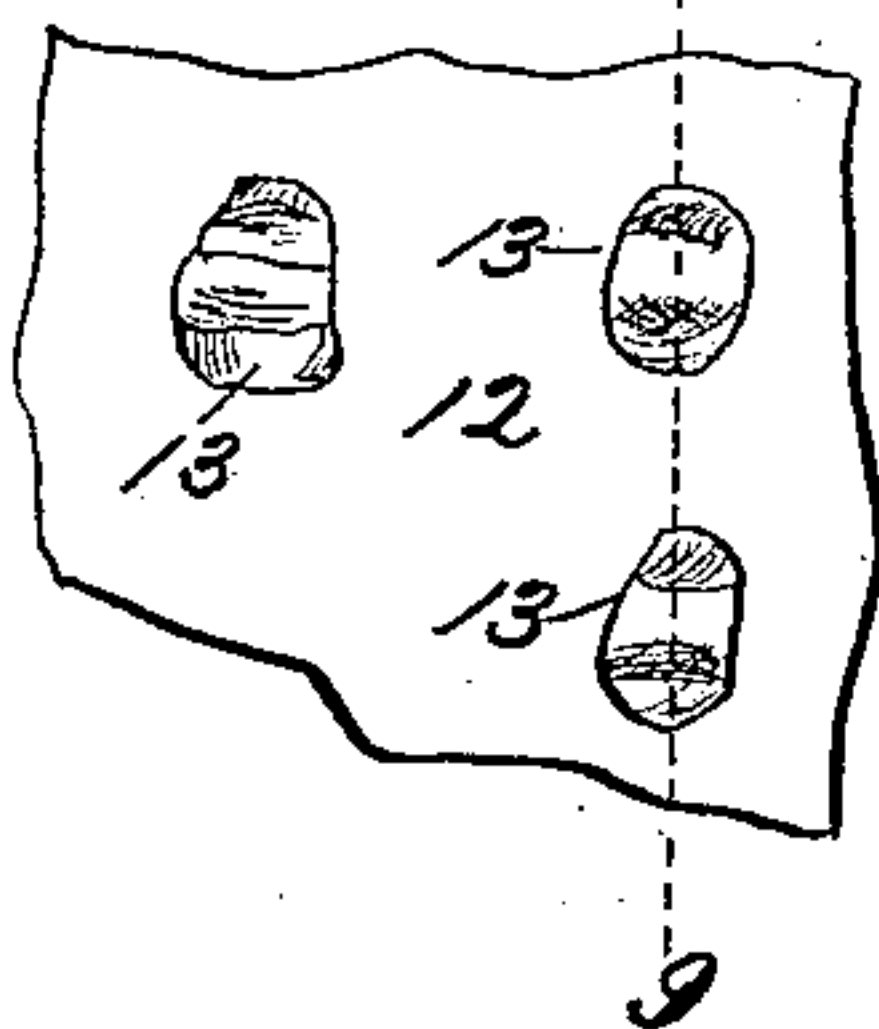
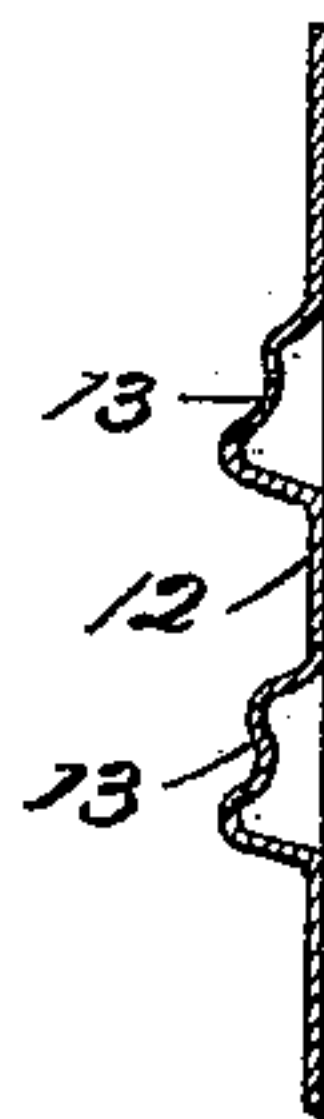


Fig. 4.



Witnesses:-

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UNITED STATES PATENT OFFICE.

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METHOD OF FORMING DENTAL CROWNS.

SPECIFICATION forming part of Letters Patent No. 488,008, dated December 13, 1892.

Application filed April 26, 1892. Serial No. 430,677. (No model.)

To all whom it may concern:

Be it known that I, JEPHTHA G. HOLLINGSWORTH, of Kansas City, Jackson county, Missouri, have invented certain new and useful
5 Improvements in Appliances for Dental Crown and Cap Work, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

10 My invention relates to the formation of artificial tooth-crowns; and its object is to produce expeditiously and inexpensively dental tooth-crowns which will have artificial grinding-surfaces and side contours closely con-
15 forming to the natural surfaces of the original crown and which will closely articulate with the corresponding surfaces and contour of the opposing tooth.

20 The invention consists, essentially, in making from suitable patterns by stamping in thin metal or by electrolysis a model simulating the natural tooth and in employing said model as a core for forming a mold or die into which the crown or crown-cap is produced.

25 In the accompanying drawing, Figure 1 is an enlarged vertical longitudinal section of a portion of the cope or case and drag or bottom of the mold on line 3 3 of Fig. 2. Fig. 2 is a plan of the drag or bottom of the mold.
30 Fig. 3 is a plan of a portion of one of the electroplated sets of models or impressions formed in a metal plate. Fig. 4 is a cross-sectional view of the same on the line 9 9 of Fig. 3.

35 In carrying out my invention I first form of any suitable material and in any suitable or preferred manner one or more sets of patterns of the crowns and grinding-surfaces of the teeth, and then subject the same to an
40 electroplating action, so as to produce facsimiles of these patterns in concavo-convex form, as shown in Fig. 5. I next carefully separate each of these electroplated models from the others, cutting or stamping out the
45 models precisely along their marginal lines, and then secure to the under or concave surface of each model an eye or open shank, the said shanks or eyes being attached by solder or in any other suitable or preferred manner
50 to form the finished model or core ready for the mold. I next insert the stems of one or more of the finished models or cores, as the particular work in hand may require, into

one or more of a number of openings in the drag or base-plate of a mold, securing the die 55 or dies by cross-pins passing through the eyes of the cores. The cores lie closely upon the upper surface of the drag or base-plate of the mold, so as to close the openings through which the shanks or stems of the cores are
60 inserted. A cope is now placed upon the drag or base-plate of the mold and a suitable metal alloy or other metallic composition, in fused condition is now poured into the cope and allowed to set. The metal is removed af- 65 ter having cooled or become set, and an intaglio impression or matrix is found upon the under surface of the metal, the solid matrix being an exact counterpart of the die which was placed in the mold. Into this matrix is
70 swaged gold in plate or leaf or other suitable form or other suitable metal, and this gold or other metal assumes precisely the form of the original pattern or core, from which the matrix or impression was made in the mold, and
75 these swaged caps are readily applied to the teeth and articulate precisely with the denture of the mouth.

Referring now to the drawings in detail, 1 designates the drag or bottom of the mold, 80 having a flat upper surface to lie preferably flat while the pouring operation is being performed. Through the body portion of the drag are formed a suitable or preferred number of holes or openings 2, through which the 85 eyes 14 of the cores or models 13 are passed, a cross-pin 15, passing through the said eyes upon the bottom of the drag, serving to hold the under sides of the cores closely down upon the flat upper surface of the drag to provide
90 relief-surfaces upon the drag and project up into the mold, over which the fused metal may be poured to form intaglio-dies a precise counterpart of the cores held upon the upper surface of the drag. 95

Referring to Figs. 4 and 5, 12 designates a portion of a plate which is formed preferably by electroplating upon a suitable substance, this plate having at intervals raised or relief models 13, which are of concavo-convex form 100 and the outer upper surfaces of which correspond to the desired forms of the crowns and grinding-surfaces with which the teeth are to be provided. After this plate, with its relief models, has been formed the substance upon 105 which the metal has been deposited by elec-

trolysis is removed from the plate and the models 13 of each tooth, cap, or crown is subsequently cut or stamped from the metal, so as to exactly preserve their original contours.

5 It is to be understood at this point that while I have described the plate 12 and its dies 13 as formed by electrolysis the models may be formed, if preferred, by stamping the plate, a suitable stamping-press or other machine or means and suitable dies and matrices being used for this purpose. However,

10 I will state that I prefer electrolysis for the work on account of the perfect accuracy in the formation of the dies resulting from such manner of making the same, as well as

15 the great difference in cost, no dies or matrices being required, which are exceedingly difficult and expensive to make in hard metal, while by electrolysis the model is formed of

20 any suitable plastic material, or, if preferred, a natural tooth may be obtained and used as an original pattern by the dentist, who can thus provide and form for himself all the necessary appliances to form a complete

25 tooth crown or cap to suit each particular piece of work to be done. After the cores 13 have been properly cut or stamped out of the plate 12 an eye or open shank 14 is attached to the under or concave side of each core,

30 preferably at the center or middle of same, and either by soldering or in any other suitable or preferred manner, and thus extend directly outward from the under or concave surfaces of the cores, as shown.

35 In casting the matrices from these cores any desired number of said cores are placed upon the upper side of the drag or bottom plate 1, each with its stem or shank 14 extending downwardly through one of the holes

40 2, as shown, and a pin 15 is passed lengthwise through the eye of each core to retain it in proper position during the pouring operation. The cope 5 is now placed upon the drag 1, and is secured thereon by a clamping-

45 arm 8, or in the usual manner. A suitable metal—such as zinc or a suitable alloy or other metal composition in a fused state—is now poured into each of the cavities 7 of the mold, into which is held the core 13, and after

50 such metal has set or become cold the clamping-arms 8 are removed or loosened and the cope 5 is removed from the drag 1. When the set metal is removed from the cope, an intaglio impression or matrix of the corresponding core 13 is found in the under surface of

55 the metal. Gold or other suitable metal, either in the form of a plate or in leaf form, or in any suitable or preferred form, is now swaged into the cavities or matrices, and the

60 crown or grinding-surface of the tooth is then formed perfectly and is to be applied to the crown-band, which in plan view corresponds to the marginal contour of the crown or grinding-surface. The crown is then complete and

65 ready to be applied to the root or to bridge-work in the usual well-known manner.

A counter-die may be formed in the mold and the cap swaged or pressed between them to the required shape, although it is preferable to swage the plate or leaf into the cavities of the mold, as it is much the simplest, cheapest, and most expeditious. The preliminary steps or steps of the process are essential—that is to say, the employment of button models or cores applied to a band after it has been fitted to the root to see that it articulates with the tooth above and also with the contour of the band, and if the first button does not fit the band and the opposing teeth properly other buttons are selected and

70 applied and, if necessary, trimmed or shaped to the required form and size. This button-mold is then placed upon a drag in a cope or mold-box and a mold or matrix formed around it, into which matrix the finished

75 crown-cap is formed.

From the above description it will be seen that I have produced appliances for dental crownwork which are simple, durable, and inexpensive in construction, easy to manipulate

80 and produce, and which cheapen and facilitate the work and also lessen the amount of labor involved in the work, while perfecting the results thereof; also, that I have produced a method of effecting this class of work which

85 is also simple and inexpensive and which produces perfect results.

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

1. In the manufacture of caps for artificial metallic tooth-crowns, the process of forming a number of relief-molds integrally with a metal plate and then separating said molds and mounting them to form core buttons or

90 molds for the dies from which the caps for the crown are made, substantially as described.

2. In the manufacture of caps for artificial metallic tooth-crowns, the process of fitting one of a number of core-buttons upon the

95 band fitted to the root, the casting of molds in intaglio upon a plate from said core or cores, and finally filling said molds with metal from the plate or leaf, substantially as described.

3. In the manufacture of caps for artificial metallic tooth-crowns, the process of first producing from a pattern a model button-core of the surface to be produced, mounting the button-core in a suitable mold and casting a matrix in intaglio upon a plate from said button-core, the swaging of the plate or leaf

100 metal into the matrix to produce a cap the fac-simile of the model, and finally fitting and securing the cap upon the root-band, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JEPHTHA G. HOLLINGSWORTH.

Witnesses:

H. E. PRICE,

JOHN L. CONDRON.