

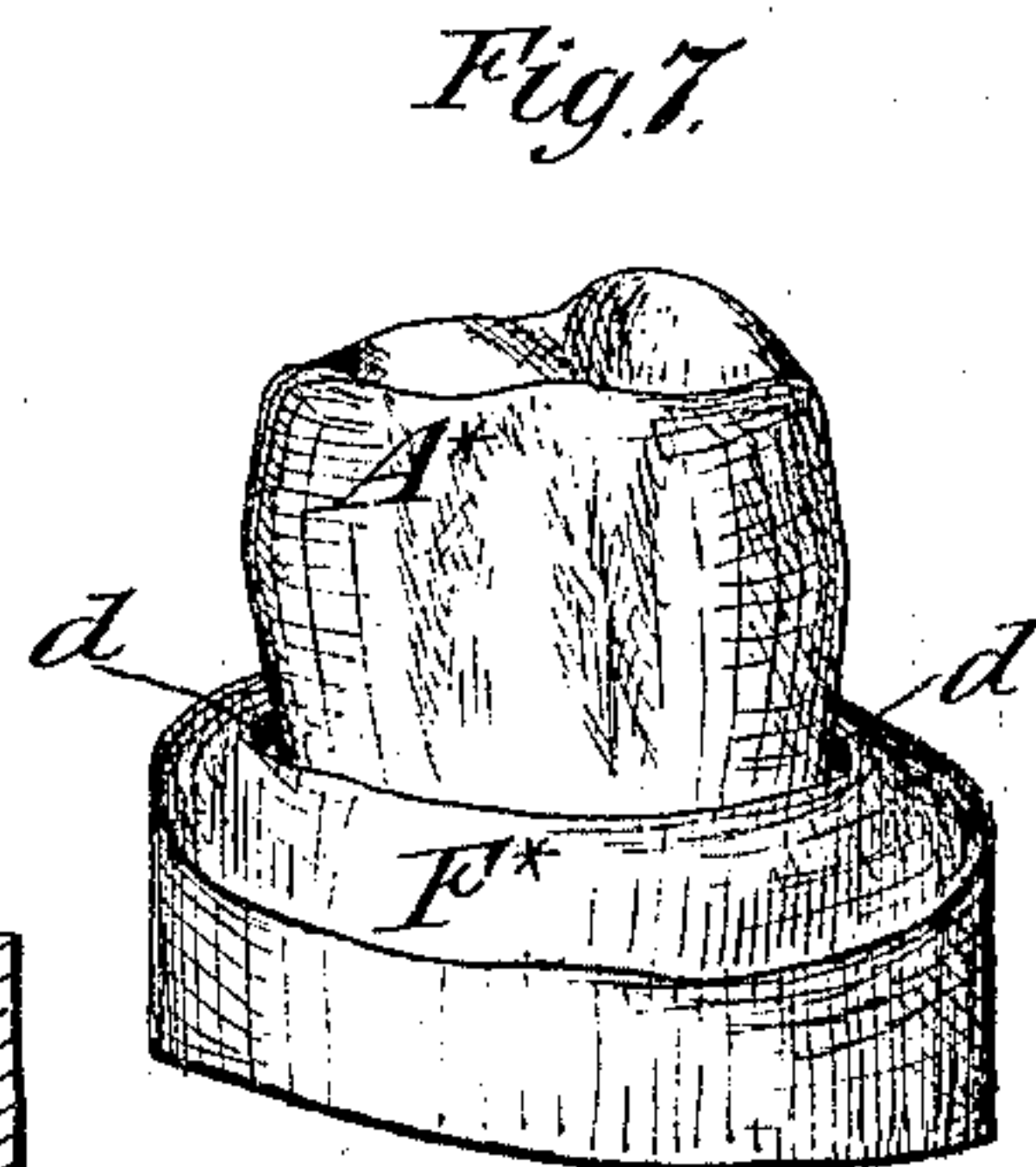
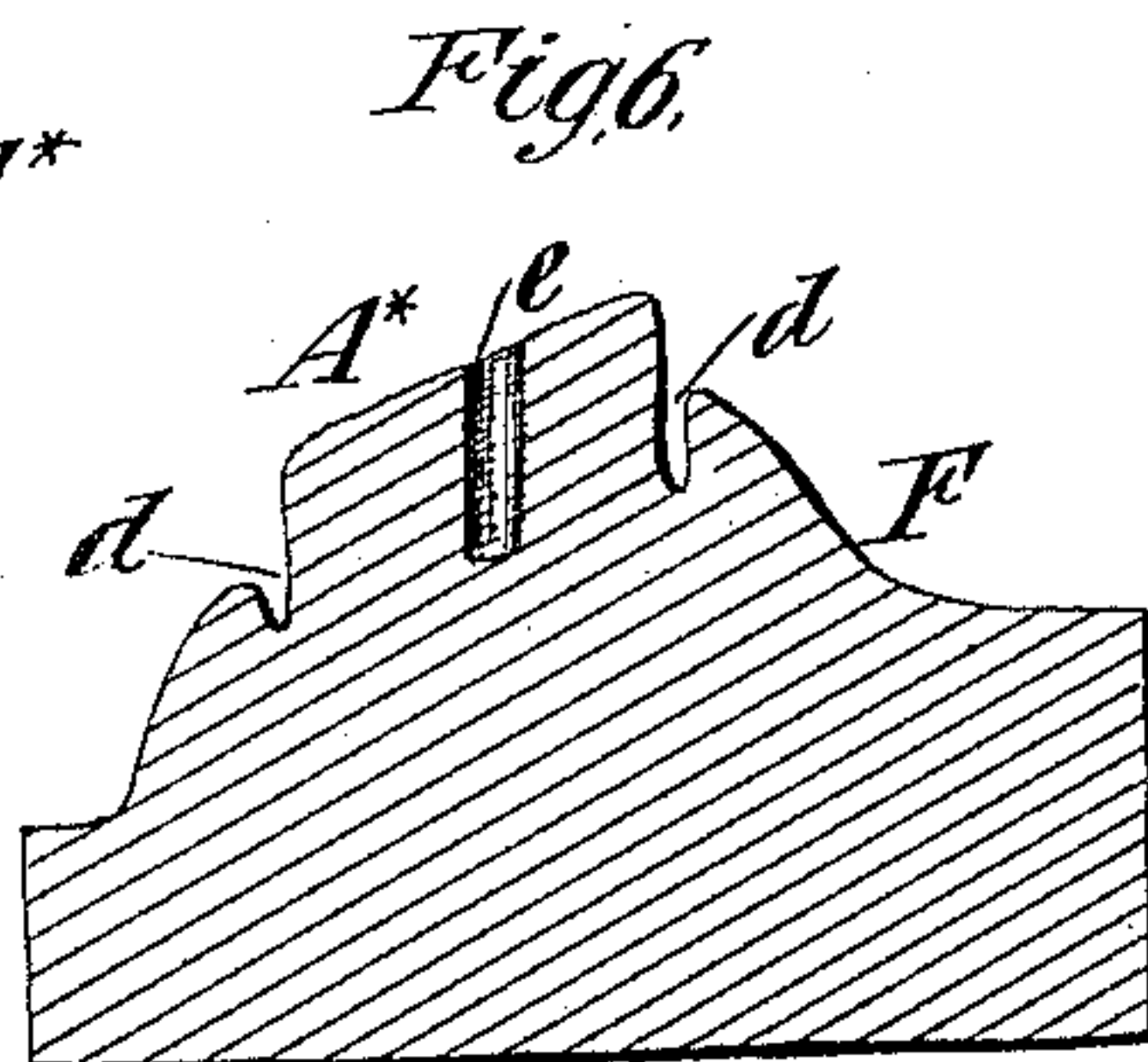
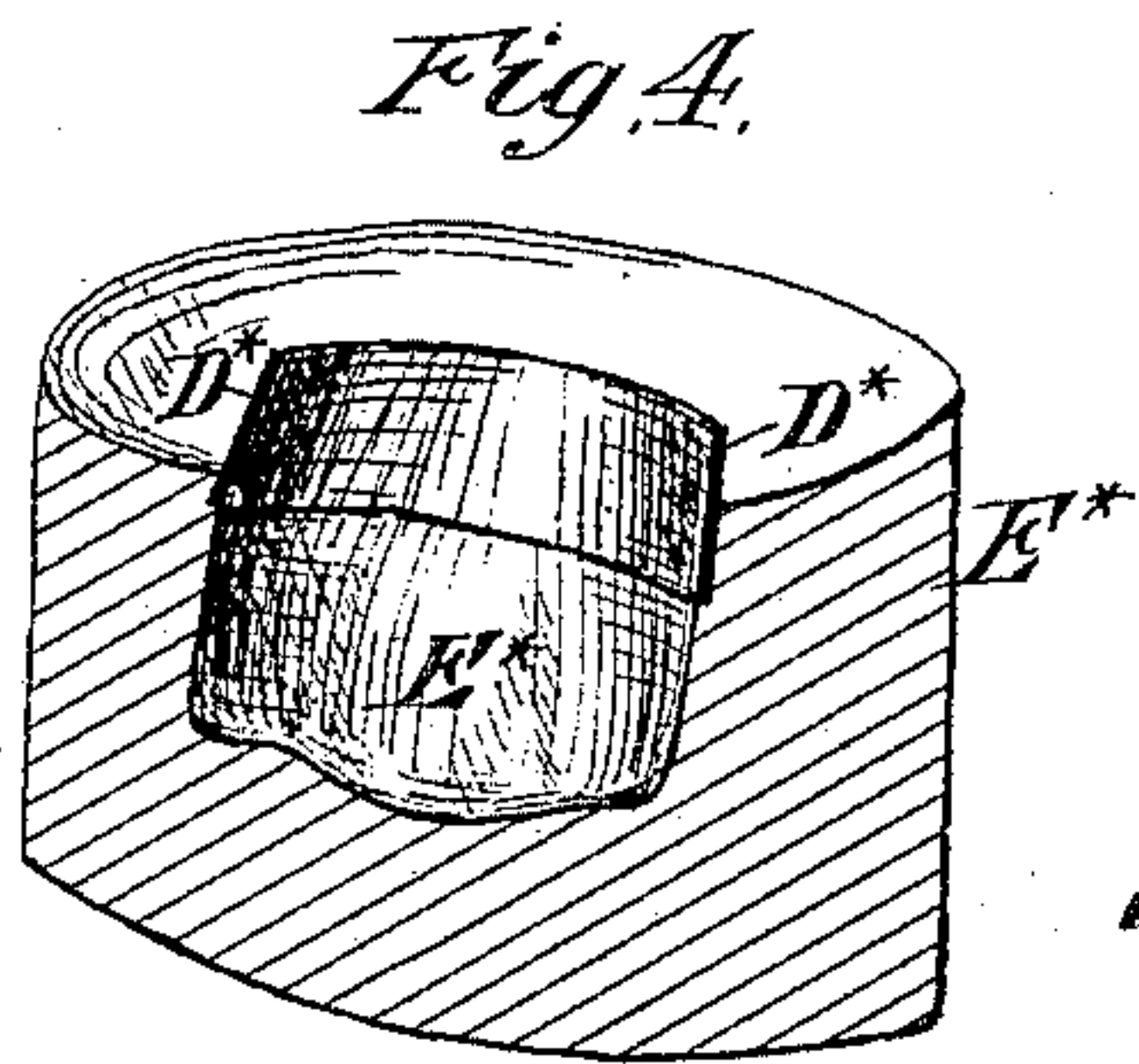
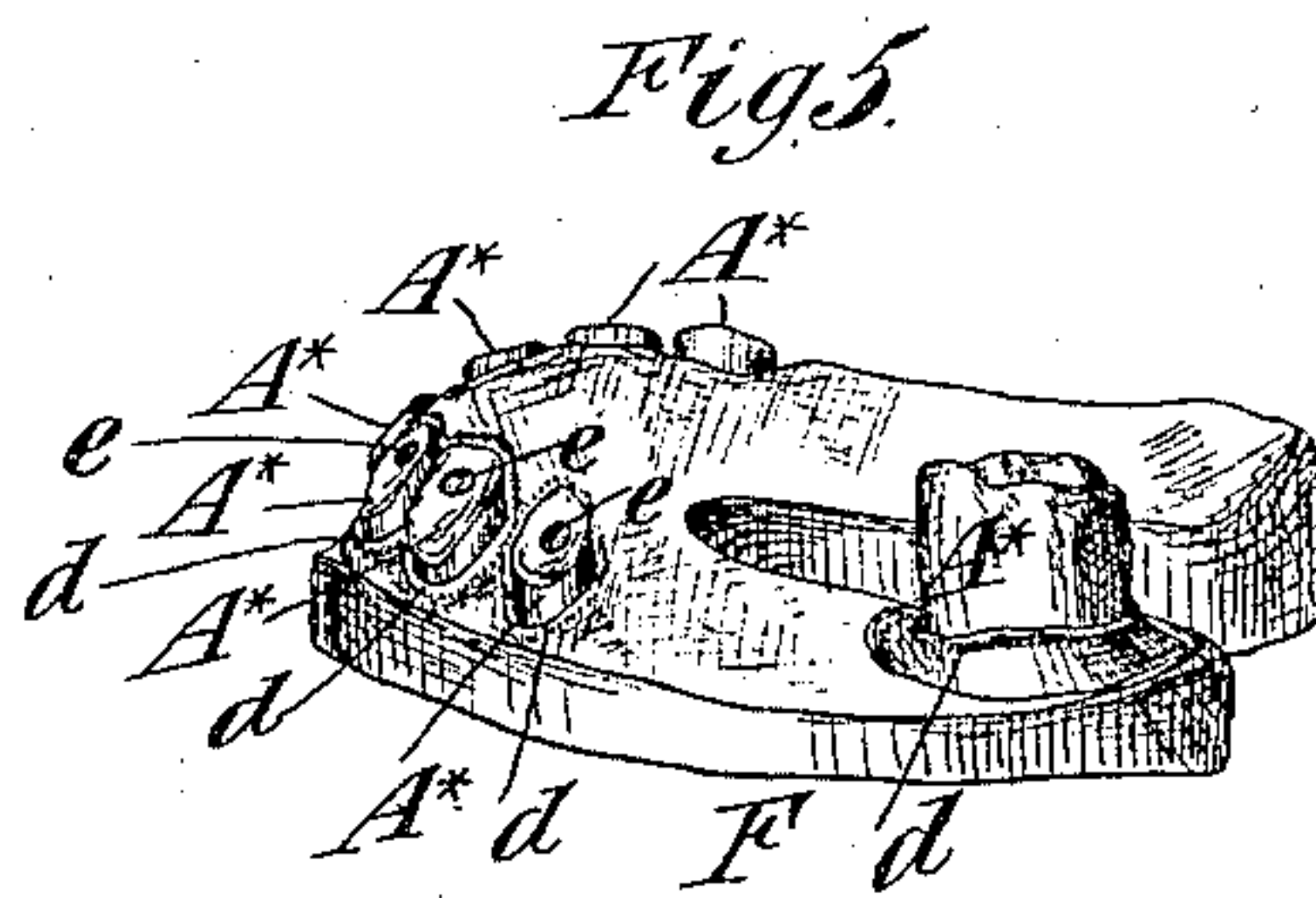
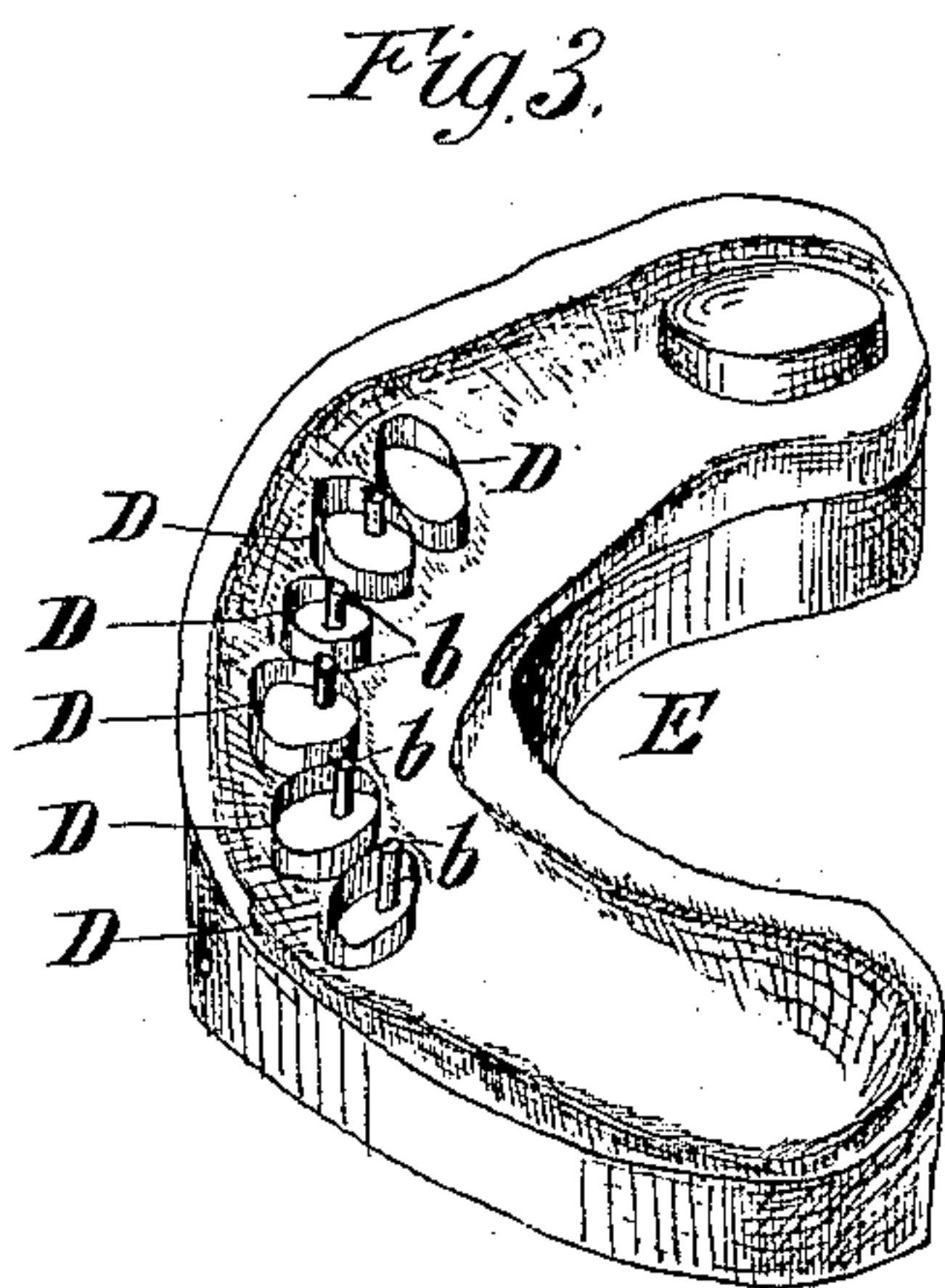
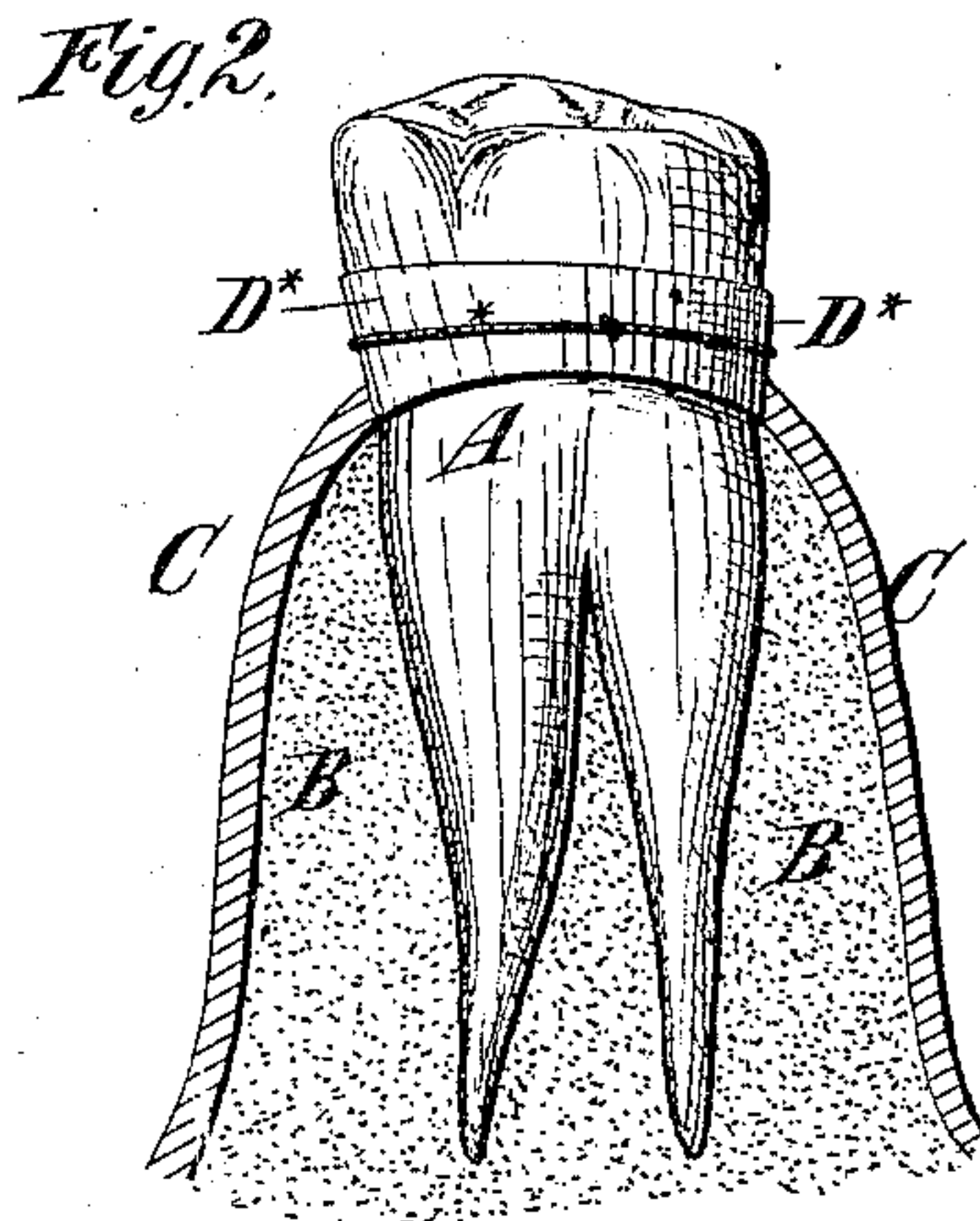
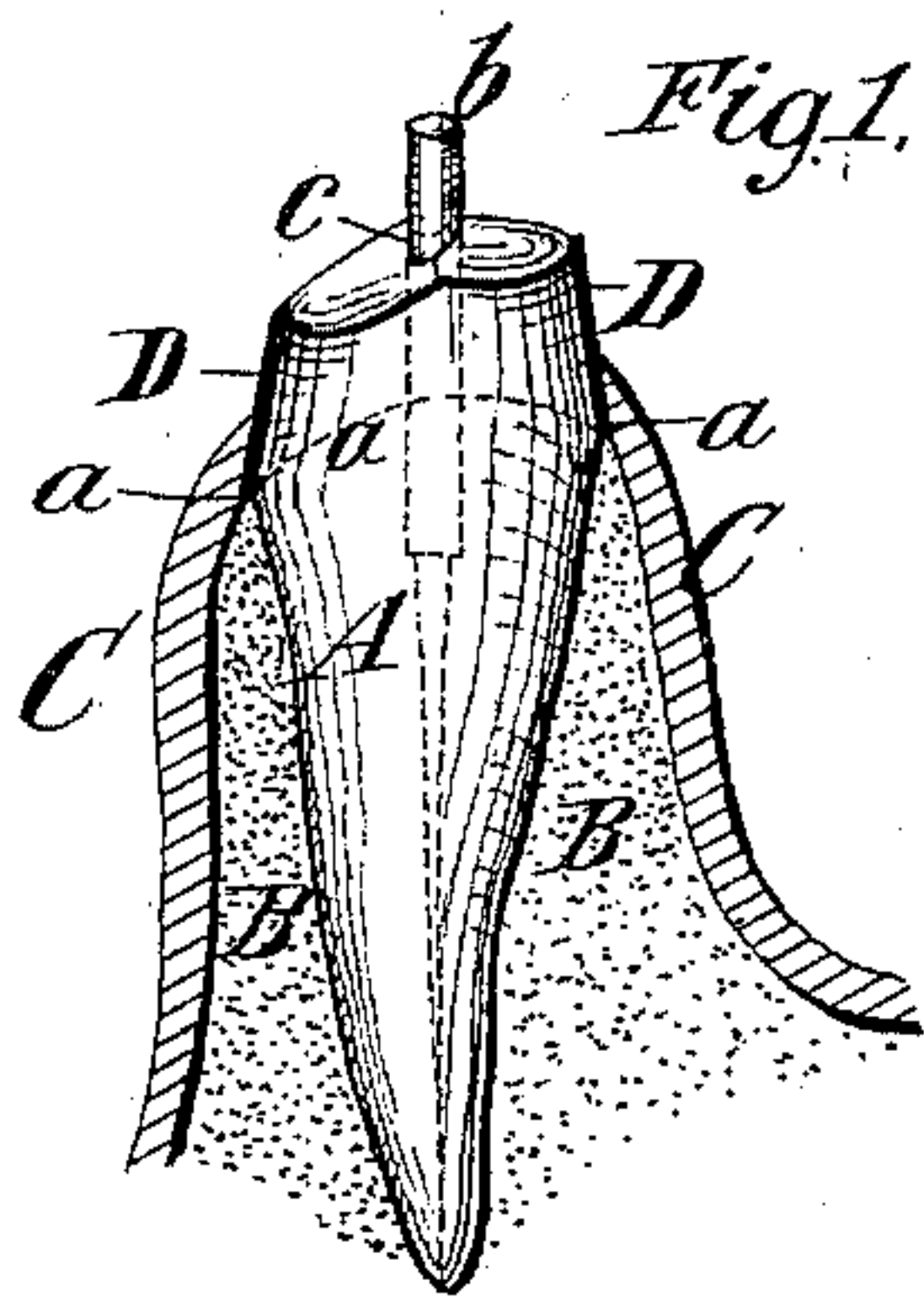
(No Model.)

C. P. GROUT.

METHOD OF APPLYING METALLIC TOOTH CROWNS.

No. 319,238.

Patented June 2, 1885.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

CHARLES P. GROUT, OF NEW YORK, N. Y.

## METHOD OF APPLYING METALLIC TOOTH-CROWNS.

SPECIFICATION forming part of Letters Patent No. 319,238, dated June 2, 1885.

Application filed April 7, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES P. GROUT, of the city and county of New York, in the State of New York, have invented a new and useful  
5 Improvement in the Method of Making and Applying Metallic Tooth-Crowns and Appliances therefor, of which the following is a specification.

According to the ordinary method of making and applying metallic tooth-crowns the  
10 tooth root or stump is first trimmed or cut to the proper shape, a band portion, of gold or other thin metal, of proper size, is then made, and, after placing it upon the root or stump, is  
15 forced down below the free margin of the gum, and to or near to the alveolar border. The metal of which the band is composed is comparatively hard, and so unyielding that the  
20 band has usually to be driven down on the root or stump with a mallet to bring it to its proper place. Not only has the band to be forced down on the root or stump in order to bring it to its proper form, but frequent visits  
25 of the patient are necessary in order that the band and crown may be placed and forced down into position on the root or stump from time to time during the process of making it.

The objects of my invention are to relieve the patient in a great measure from the annoyance and pain incident to the ordinary  
30 practice observed in making and applying artificial tooth-crowns, and also to enable the crowns to be fitted more accurately and carefully, so that when finally placed upon the  
35 roots or stumps a firmer and better piece of work in every respect will be produced.

In carrying out my invention the root or stump may be shaped or trimmed in the usual way, or according to the method and by means  
40 of the appliances set forth in my application for Letters Patent filed February 4, 1885, the serial number of which is 154,937. In lieu of first applying a band of gold or other metal, which is to form the crown to the root or  
45 stump, I employ soft-metal tubes, of block-tin or other metal sufficiently yielding and flexible to enable them to readily adapt themselves to the shape of the root or stump. I first take  
50 a plaster impression of the mouth, and from this impression I can ascertain what sizes of soft-metal tubes are required. I then cut the lower ends of the tubes to conform to the pro-

file of the gum, which is given by the plaster impression. I then force each soft-metal tube  
down on the root or stump to the desired position below the free margin of the gum, and  
55 to or near to the alveolar border. The tube which I employ is sufficiently flexible to enable it to be forced down to the desired position on the root or stump by means of the  
60 thumb and fingers applied thereto, and will not require any hammering with a mallet to bring it to its place. After it is in position it is cut off to the desired length, so that its upper end will be a little above or below the end  
65 of the exposed root or stump, as may be desired. I then form in the end of the root or stump, by enlarging the nerve-canal, a hole or socket to receive the pin by which the finished crown is to be held in place. All the  
70 roots or stumps which are to be crowned being thus provided with soft-metal tubes and pins, a plaster impression of the mouth is taken, and in removing this plaster impression the tubes and pins will remain embedded  
75 therein, and will all, or most all, of them come off with the impression. Where the pins in any roots are slanting, they may be drawn out first through the top of the impression-cup. In the case of molar teeth or other teeth which  
80 are inclined or slanted it may be necessary to take an impression of them and the adjacent portion of the mouth separately, inasmuch as their impression and tubes would not readily draw off with the general impression of  
85 the other teeth and tubes. In the case of molar teeth where the natural crown or a portion thereof still remains, I take a strip of sheet metal of proper width to extend from a point  
90 at or near the alveolar border up to the bulge of the tooth, and, placing it around the tooth, I wrap it with waxed silk or wire and force it down to or near to the alveolar border. I then take an impression of the tooth from the  
95 bulge upward in plaster, the end of the sheet-metal band forming a shoulder in the plaster, and after the plaster is removed the band is taken off and set into its proper position in the plaster impression. Having thus obtained  
100 by means of the plaster impression the impressions of the soft-metal tubes and form of the roots and stumps above and below the free margin of the gum, I place them in suitable investments and obtain from them in fusible



metal a perfect fac-simile of the roots or stumps, both above and below the gum, and also a fac-simile of the mouth. I use fusible metal—such as may be composed of lead, tin, and bismuth, because it will have very little shrinkage in cooling, and will not when molten melt the soft-metal tubes. Such metal will melt at about 200° Fahrenheit. I may first make a fac-simile of the molar tooth from the plaster impression and metal band taken therefrom and place this metal fac-simile in the main impression of the other teeth, so that it will be incorporated with the fac-simile obtained from said main impression in the operation of casting. The fac-simile of the roots or stumps having been thus obtained, I fit upon them, instead of upon the natural teeth, all the crown-bands of gold or other permanent metal, and during the whole operation of forming the crowns they may be fitted upon the metal cast as often as may be desired, and a more secure and more accurate fit of the band and crown can be obtained than was possible by the old method of applying the band or crown frequently to the root or stump itself. By this method I not only produce crowns which will fit the roots or stumps to which they are applied much closer, and are therefore less liable to work loose, but I also save the patient a vast amount of pain and annoyance incident to the ordinary method of making and applying tooth-crowns.

In the accompanying drawings, Figure 1 represents an elevation of a tooth root or stump having a soft-metal band applied to it, the band being shown in section, and includes a sectional view of the alveolar process and gum-tissue. Fig. 2 represents an elevation of a molar tooth with a soft-metal band extending upward from below the gum to the bulge of the tooth, also a sectional view of the alveolar process and gum-tissue. Fig. 3 represents a perspective view of the plaster impression in which the soft-metal tubes and the pins are embedded. Fig. 4 represents a sectional view of a plaster impression taken from a molar tooth, and in which the form of the tooth from the bulge upward is in the plaster, and its form from the bulge inward is given by a piece of soft metal which is bent into annular form and set in the plaster. Fig. 5 is a perspective view of a metal fac-simile which has been produced from the plaster impression and tubes. Fig. 6 is a sectional view through such fac-simile, the section being taken through one of the projections which represent the tooth-roots; and Fig. 7 is a perspective view of the metal fac-simile of a molar tooth. All figures except Figs. 3 and 4 are on an enlarged scale. Similar letters of reference designate corresponding parts in the several figures.

A designates the root or stump; B, the alveolar process; C, the gum-tissue. The exposed portion of the root or stump is first trimmed or shaped to the desired form from the alveolar border *a* outward. A hole or socket, *c*, is then formed by enlarging the nerve-canal or

otherwise, and in this hole is placed a pin, *b*, the purpose of which will be hereinafter explained.

D designates a soft-metal tube, which may be of block-tin or composition, and which should be sufficiently yielding and flexible to enable it to be forced down below the margin of the gum and clear to or near to the alveolar border. This may be done without any hammering or pounding with a mallet. The outer end of the tube is then cut off near the exposed end of the root or stump. Of course, for different-sized teeth tubes of different sizes should be provided; but the tubes must be of such metal as will readily adapt itself and conform to the roots or stumps, which vary somewhat in size.

All the roots or stumps which are to be crowned having been provided with soft-metal bands D and pins *b*, I take in the ordinary way a plaster impression of the mouth, and when it is removed all, or nearly all, of the soft-metal tubes and pins will come off with and remain embedded in the impression E, as shown in Fig. 3, and will project from the plaster a distance equal to the length of the root or stump below the gum and down to or nearly to the alveolar border. Any tubes or pins which do not draw off with the plaster impression may be removed separately and placed in their proper seats in the impression. Where there are any molar or other teeth which, by reason of their being inclined, will not permit of the bands being drawn off with the others, all of which have the same general direction, a plaster impression of such inclined teeth is to be taken separately. In the case of molar teeth where the crown is well preserved outward beyond the bulge of the tooth, it will be necessary to apply a strip of metal, D\*, bent into annular form and forced down under the free margin of the gum, and then wrapped around with waxed silk or wire \*, as shown in Fig. 2. This band should be of a width sufficient to extend from below the gum outward to the bulge of the tooth, and when the plaster impression is taken it will have the form of the tooth from the bulge outward, and a shoulder or seat formed by a band, D\*. After the impression is removed the band D\* will be removed and set into its place in the impression. In Fig. 4 I have represented such impression E\* with the band portion D\* placed therein. I afterward place the impression E E\* in suitable investments, and by means of fusible metal which will melt at a low temperature I obtain from them fac-similes of the mouth and roots or stumps, as shown in Figs. 5, 6, and 7. Figs. 5 and 6 represent such a fac-simile or cast, F, as would be obtained from the impression shown in Fig. 3, and has projecting from it pegs or projections A\*, which conform to the shape of the tooth roots or stumps, and which have at their bases grooves or channels *d*, representing the space inside of the free margin of the gum. The projection A\* from its outer end down to



the bottom of groove *d* is a true fac-simile of the root or stump from its outer end inward to the alveolar border, and under the free margin of the gum.

5 Fig. 7 represents such a cast or fac-simile, *F*\*, as would be obtained from the plaster impression *E*\* shown in Fig. 4, and the peg or projection *A*\* is a true fac-simile of a molar tooth from its outer end inward to, or nearly  
10 to, the alveolar border, and under the free margin of the gum. I may first make a metal fac-simile, as is shown in Fig. 7, from an impression of a molar tooth, and then place that fac-simile in the impression shown in Fig. 3  
15 before making a metal fac-simile therefrom. The metal fac-simile shown in Fig. 5 will then have incorporated in it the fac-simile of the molar tooth.

To the projections *A*\* on the metal fac-simile  
20 the bands which are to be applied to the tooth roots or stumps are carefully fitted, and it will be readily understood that in this way the bands and crowns may be fitted far more accurately than they can be when that work has  
25 to be done in the mouth of the patient, and all the pain and annoyance to the patient caused by driving the bands down on the roots or stumps and frequently trying them on in the course of manufacturing is avoided. After  
30 the band has been carefully fitted to the metallic projection and the crown completed, it will be found that the crown will fit snugly and firmly upon the natural root or stump.

Where a number of crowns are to be connected by a bridge, all the work may be performed  
35 upon a metal fac-simile, and it will be found that when the bridge and the crowns incorporated therein are placed in the mouth of the patient a good fit and a serviceable piece of  
40 work will be produced.

In the projections *A*\* upon the metal fac-simile *F* are formed holes *e*, and after the metal crowns are fitted to these projections the pins which are to secure the crowns in  
45 place on the teeth may be fastened in the crowns, and will be given the desired slant by fitting in the holes *e*.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method of obtaining a metallic fac- 50 simile of tooth roots or stumps on which to fit metallic tooth-crowns, consisting in trimming or shaping the natural tooth roots or stumps to the desired form; in then enveloping such roots or stumps in soft metal, which is forced 55 down below the free margin of the gum; in then taking a plaster impression of the natural roots or stumps with the soft metal in place, and removing the plaster impression and soft metal from the mouth, and in finally 60 casting from this impression and soft metal a metallic fac-simile having projections which correspond to the form of the natural roots or stumps, substantially as and for the purpose herein described. 65

2. The method of obtaining a metal fac-simile of natural tooth roots or stumps on which to fit metallic tooth-crowns, consisting in trimming or shaping the natural roots or stumps to the desired form, and forming in 70 them pin holes or sockets; in then applying soft-metal tubes to the roots or stumps and pressing them down below the free margin of the gum; in inserting pins in the holes or sockets; in then taking a plaster impression of 75 the natural roots or stumps and the soft-metal tubes and pins; in then removing the plaster impression, with the soft-metal tubes and pins, from the mouth, and in finally casting from this impression, with its tubes and 80 pins, a metal fac-simile having projections in which are holes or sockets, and which correspond in form to the natural roots or stumps, substantially as and for the purpose herein described. 85

3. A metallic fac-simile on which to fit metallic tooth-crowns, having upon it projections provided with grooves at their bases, and corresponding in form to the natural tooth roots or stumps, substantially as and for the purpose herein described. 90

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Witnesses:

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FREDK. HAYNES.