J. C. SCHWARTZ.

DEVICE FOR SHAPING GOLD CROWNS TO TEETH.

APPLICATION FILED FEB. 5, 1912.

1,052,850.

Patented Feb. 11, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

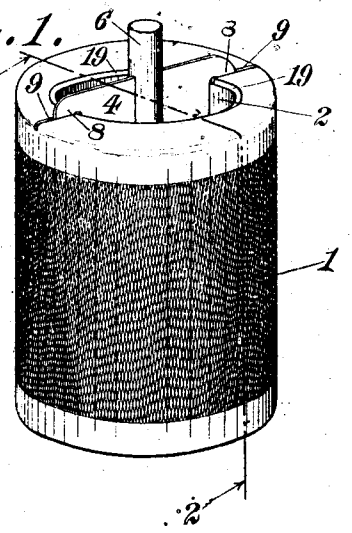


Fig. 2.

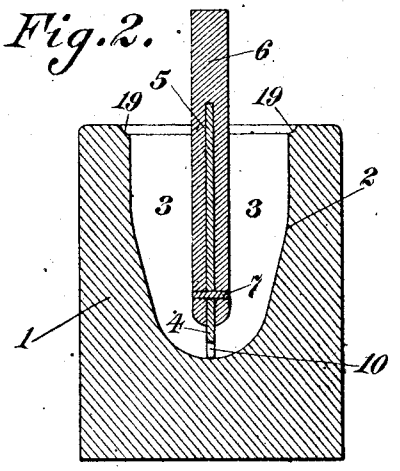


Fig. 3.

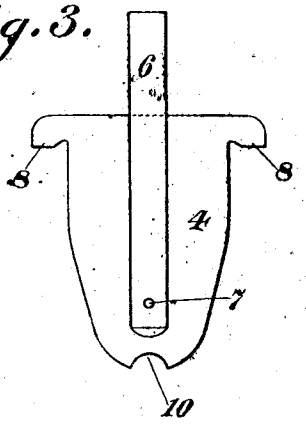
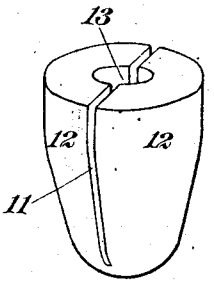


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

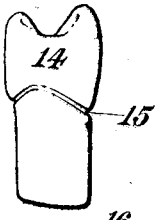


Fig. 6.

Fig. 7.

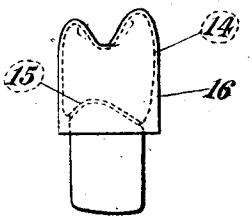


Fig. 8.

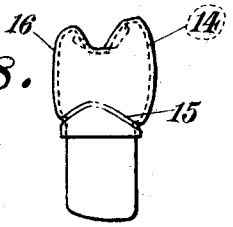


Fig. 9.

Fig. 10.

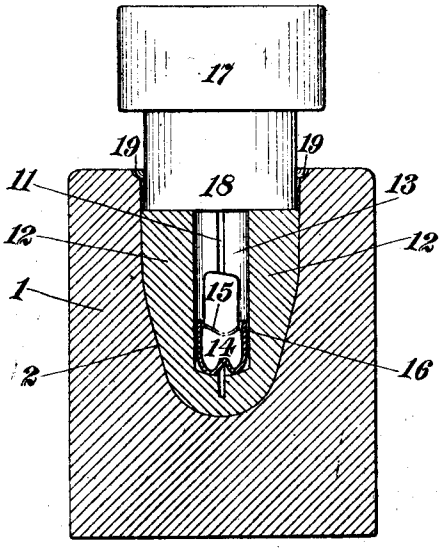
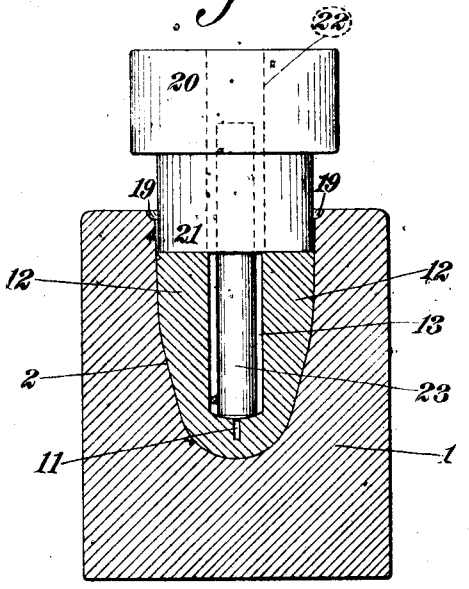


Fig. 11.



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UNITED STATES PATENT OFFICE.

JACOB C. SCHWARTZ, OF ST. LOUIS, MISSOURI.

DEVICE FOR SHAPING GOLD CROWNS TO TEETH.

1,052,850. Specification of Letters Patent. Patented Feb. 11, 1913.

Application filed February 5, 1912. Serial No. 675,543.

To all whom it may concern:

Be it known that I, JACOB C. SCHWARTZ, a citizen of the United States, residing at the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Devices for Shaping Gold Crowns to Teeth, of which the following is a specification.

This invention relates to dental apparatus and pertains particularly to devices for pressing metal crowns into the shape of teeth, the object being to provide a device of this character in which the malleable metal, such as lead, or the like, that is used for pressing the crown around the model of the tooth, is molded in one piece instead of several pieces as has been heretofore customary.

Further, the present invention contemplates the provision of a device, in which not only the malleable metal can be molded in a single piece, but, also, in which the malleable metal can be compressed to press the crown around the model of the tooth.

In the accompanying drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a perspective view of the device; Fig. 2 is a sectional view on the line 2—2, Fig. 1; Fig. 3 is a side elevation of the member for dividing the interior of the mold into two compartments; Fig. 4 is a perspective view of the piece of malleable metal removed from the mold; Fig. 5 is an elevation, on an enlarged scale, of the model of a tooth; Fig. 6 is a perspective view, on an enlarged scale, of the metal cap or thimble before same is formed into the shape of the tooth; Fig. 7 is an elevation, on an enlarged scale, showing the metal cap or thimble upon the model of the tooth after the tooth indentations have been formed in the closed end of the former; Fig. 8 is an elevation, on an enlarged scale, showing the metal cap or thimble upon the model of the tooth after the wall of the former has been pressed snugly against the sides of the tooth model; Fig. 9 is a perspective view of the completed or finished crown; Fig. 10 is a vertical sectional view of the mold in conjunction with the device for compressing the malleable metal around the cap or thimble upon the tooth model; and Fig. 11 is a vertical sectional view of the mold showing a device in conjunction therewith for reducing the opening in the malleable metal.

The device consists of a mold 1 which is preferably formed of a cylindrical piece of steel or other suitable metal having either part or all of its periphery milled to form a roughened grasping surface and containing a relatively deep depression 2 in its upper end. The upper part of the depression 2 is preferably cylindrical, and the lower part of the same tapers inwardly toward the bottom thereof where said depression is rounded, as depicted in Fig. 2. Said depression 2 is divided vertically into two compartments 3 by means of a blade 4 which is secured in a slot 5 in the lower end of a mandrel 6 by a pin 7 or other suitable means. The upper end of the mandrel 6 extends above the top of the blade 4, in order to afford a handle by which the same is held when the blade is inserted into or removed from the depression 2 in the mold 1, and the lower end of said mandrel terminates within a short distance of the lower edge of said plate, the slot 5 being preferably arranged to extend longitudinally through the axis of said mandrel, so that the two parts of the latter that embrace the blade 4 serve the purpose of a core, as hereinafter described, and said mandrel being preferably located centrally of said blade, so that when the latter is inserted into its proper position in the mold, the axis of the mandrel will coincide substantially with the axis of the depression 2. The blade 4 bears a pair of ears or projections 8, the latter being arranged to project from the opposite edges of said blade and being adapted to seat in a pair of grooves 9 formed in the upper surface of the mold, said grooves being disposed diametrically opposite each other, with respect to the axis of the depression 2. The blade 4 is formed with a configuration that is substantially the same as the vertical sectional configuration of the depression 2, so that, when the blade is inserted into its proper position in the mold, *i. e.*, with its ears 8 resting in the grooves 9, the side and lower edges of the blade 4 fit closely to the sides and bottom of the depression 2, whereby the two compartments 3 into which the depression is divided by said blade are separated from each other without any communication except through a notch 10 in the lower edge of said blade, said notch being preferably located below the lower end of the mandrel 6.

After the blade 4 is inserted into its

proper position in the mold 1, so that the ears 8 of the former rest in the grooves 9 in the latter, as shown in Fig. 1, a low fusing malleable metal, preferably lead, in a molten state is poured into one of the compartments 3 of the depression 2. The molten lead not only fills the compartment 3 into which it is poured, but, also, at the same time, runs through the notch 10 in the lower edge of blade 4 into the other compartment 3, thereby filling both compartments to substantially the same level. When the lead has cooled in the mold, the blade 4 and mandrel 6 are removed from the mold by grasping the upper end of said mandrel and pulling the same upwardly, thus leaving the lead in the mold. The blade 4 forms a slot 11 between the two halves 12 of the lead within the mold, and the two parts of the mandrel 6 that embrace the blade 4 form depressions in the opposing faces of the two halves 12 of the lead, which depressions register with each other and form a central opening 13, said halves 12 being connected at the bottom by the lead that cools in the notch 10 in said blade, as clearly illustrated in Figs. 10 and 11.

An impression of the broken tooth to be crowned is taken, and, from such impression, a metal model 14 of the whole tooth is made in the usual manner with a groove 15 formed therein to define the gum line between the tooth proper and the root portion, said model being preferably formed of a composition of tin, lead, and bismuth. The model 14 is used as a die to form an impression of its crown in a piece of lead or other suitable metal (not shown) and then, with the proper size of metal cap or thimble 16, preferably of gold, fitted upon the tooth portion of the model 14, said cap is driven into the impression in the piece of lead by means of the model 14, so as to form the same indentations in the closed end of the cap as are in the crown of the model 14, as illustrated in Fig. 7. The model 14 with the indented cap 16 upon the tooth portion of the same is then placed into the opening 13 in the lead in the mold 1 with the model inverted, so that said cap rests upon the bottom of said opening, as shown in Fig. 10. A block 17 of steel or other suitable metal, preferably cylindrical in shape and having a shank 18, which is adapted to fit in the upper part of the depression 2, is placed so that said shank rests upon the tops of each half 12 of the lead within the mold 1, and then the top of said block is hammered, so as to drive the shank 18 downwardly into the depression 2, thereby compressing the two halves 12 of the lead around the cap 16, so as to press the latter closely around the model 14. By this means, the cap 16 is pressed into the same shape as the tooth portion of the model 14 and the metal of said cap adjacent the groove 15 in the model is pressed into said groove, in order to form the gum line on said cap, as shown in Fig. 8. After the cap 16 has been pressed closely around the model 14 as just described, the lead is removed from the mold and is then cut or removed in any other suitable manner from around said model and cap. The model 14 is then melted, so as to run out of the cap 16, after which the part of the latter below the gum line is cut away, so as to leave the hollow gold crown 16^a with the same shape as the tooth, as depicted in Fig. 9. The finished crown 16^a is then ready to be cemented in the usual manner upon the broken tooth to be crowned. In order to prevent the lower edge of the shank 18 of the block 17 from chipping the edge of the depression 2 in mold 1, a bevel 19, preferably somewhat concave, is formed on the edge of said depression, so as to cause the shank 18 to slide into the depression without chipping the edge of said depression in case the edge of said shank strikes said bevel.

It should be understood that blades having different sizes or mandrels 6 secured thereto as hereinabove described or formed integrally therewith may be used, so as to form the proper size openings 13 in the lead in the mold for the various sizes of caps 16. In case, however, it is desired to reduce the size of the opening 13 in the lead in the mold 1, a block 20 of steel or other suitable metal, preferably cylindrical in shape and having a shank 21, which is adapted to fit in the upper part of the depression 2 is placed so that said shank 21 rests upon the tops of each half 12 of the lead within the mold 1. Said block 20 contains an opening 22, which extends longitudinally through the middle of the same, in order to register with the opening 13 in the lead in the mold. A mandrel 23 of the proper size to which the opening 13 is to be reduced is inserted into the opening 13, so that the lower end of same rests upon the bottom of said opening, said mandrel 23 being preferably of such length that the upper end thereof projects into the lower part of the opening 22 in block 20, as depicted in Fig. 11. The top of the block 20 is then hammered, so as to drive the shank 21 downwardly into the depression 2, whereby the two halves 12 of the lead are compressed against the mandrel 23 and the opening 13 consequently reduced to the size of said mandrel, after which the block 20 and mandrel 23 are removed.

I claim:

1. A piece of lead or similar metal for pressing a crown around the model of a tooth and molded in two opposing halves united integrally at one end, the opposing faces of said halves having depressions

therein, the depressions in said halves uniting to form an opening for the reception of the tooth model with a crown fitted thereon.

2. A piece of lead or similar metal for pressing a crown around the model of a tooth and molded in two opposing halves united integrally at one end, the opposing faces of said halves having depressions therein, the depressions in said halves uniting to form an opening for the reception of the tooth model with a crown fitted thereon, one end of said opening being closed by the lead that unites said halves.

3. A piece of lead or similar metal molded in two opposing halves for pressing a crown around the model of a tooth received between said halves, the latter being united integrally at one end thereof.

4. A one-piece malleable metal member for pressing a crown around the model of a tooth, formed of a plurality of sections integrally connected at one end, the confronting faces of the sections being recessed to conjointly form an opening for the reception of the tooth model with a crown fitted thereon.

5. A one-piece malleable metal member for pressing a crown around the model of a tooth, formed of a plurality of sections integrally connected at one end, the confronting faces of the sections being recessed to conjointly form an opening for the reception of the tooth model with a crown fitted thereon, one end of said opening being closed by said integral connection between the sections.

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

JACOB C. SCHWARTZ.

Witnesses:
MATTIE C. GUELS,
BERTHA VON BEHRENS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."