J. P. LEDERLE.

PROCESS OF MAKING DENTAL INLAYS.

APPLICATION FILED JAN. 21, 1911.

1,013,666. Patented Jan. 2, 1912.

Fig. 1.

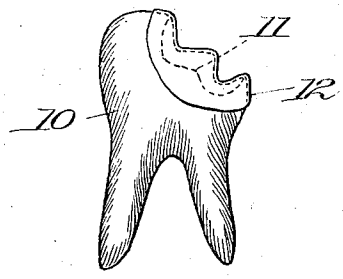

Fig. 2.

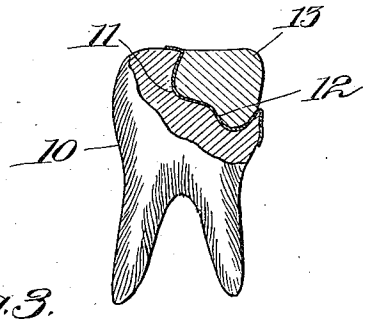

Fig. 3.

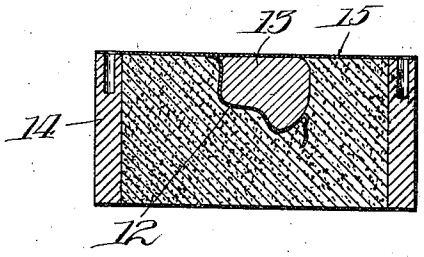

Fig. 4.

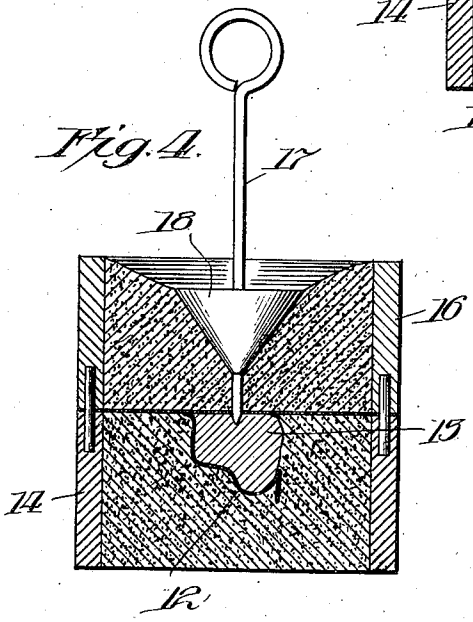

Fig. 5.

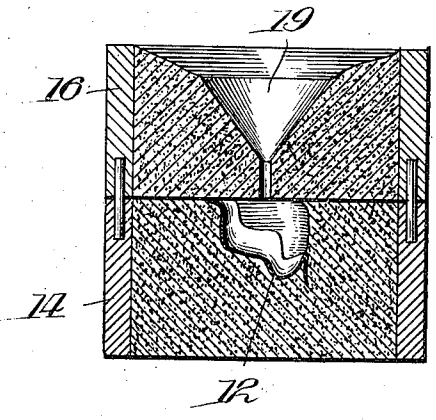

Fig. 6.

WITNESSES

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PROCESS OF MAKING DENTAL INLAYS.

1,013,666. Specification of Letters Patent. Patented Jan. 2, 1912.

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To all whom it may concern:

Be it known that I, JOHN P. LEDERLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Processes for Making Dental Inlays, of which the following is a full, clear, and exact description.

My invention relates to the forming of cast inlays now so extensively employed in dentistry and more particularly to the method and means employed for forming the matrix or model to be used in the flask. Its principal object is to provide suitable means for coating the wax model, so that, when the same is withdrawn from the tooth cavity, the danger of injuring or marring the wax is eliminated. Also to insure an accurate fit of the inlay, as will hereinafter more fully appear, said inlay will be coated with metal the exterior surface will be an exact duplicate of the interior of the cavity. This I do by swaging a thin sheet of gold, silver or other suitable metal upon the inner surface of the cavity after the same has been properly prepared. For convenience, a small quantity of the metal may be allowed to escape and be condensed on the surrounding or adjacent surfaces of the tooth. The remainder of the cavity is then filled with wax or other matrix-forming material and molded the shape of the desired inlay so that when the model is removed the metallic shell will be taken out intact. This I accomplish by the means and in the manner hereinafter fully described, and as more particularly pointed out in the claims, reference being had to the accompanying drawings forming a part thereof, wherein:—

Figure 1 is a side elevation, greatly enlarged, of a molar tooth showing a cavity therein that has the metal swaged on its surface as above suggested and illustrating the first step of the process. Fig. 2 is a similar view having a portion of the tooth broken away to show the matrix of wax and metal in the tooth, and illustrating the second step of the process. Fig. 3 is a central vertical section of a casting flask or ring showing the matrix imbedded in the investment material thereof and illustrating the third step of the process. Fig. 4 is a view similar to Fig. 3 showing the two parts of the split-flask properly assembled, each invested, and the sprue-former in position in the wax of the matrix, illustrating the fourth step of the process. Fig. 5 is a view similar to Fig. 4 showing the sprue-former removed from the flask, the wax burned out or melted from the matrix and the mold ready for the forcing of the inlay material (such as gold, silver, celluloid and the like), into the flask. Fig. 6 is a perspective view of the finished inlay removed from the flask and ready to be cemented in the tooth cavity.

In making dental inlays and the like, the most efficient manner of preparing the cavity is to cut the tooth so that the inlay can only be inserted or removed in one direction. This is usually done by preparing the cavity with a key-hole or dove-tail opening in its crown so that the inlay is only removable upwardly and mastication will have a tendency to force the inlay filling tighter into the cavity. After the cavity has been thus prepared a gold or other malleable metal matrix is made by swaging the metal to the interior of the cavity so that a thin coating is formed, a portion of which is allowed to remain on the outside of the tooth.

By reference to Fig. 1 of the drawings, it will be seen that 10 represents a molar tooth having a cavity 11 therein that has been prepared substantially as above described, and has the metal matrix 12 swaged therein, and overhanging portion on the exterior of the tooth. The next step consists in filling the remainder of the cavity with bees-wax or other fusible material, 13, and the same worked up to the desired shape as shown in Fig. 2 of the drawings. After being molded into the proper shape the bees-wax and metal matrix is removed intact from the cavity, the former clinging to the latter and being removable therewith. Investing of the model in the flask as shown in Fig. 3 of the drawings, comprises the third step of the process. This consists in filling the lower member or ring 14 of a split-flask with investment material, packing the model firmly therein with a portion of the wax-surface uppermost and exposed, but substantially flush with the top of the flask ring 14. When the investment has hardened, the upper surface is coated with a separating compound as shown at 15, to prevent the investment of the upper ring adhering to the same. The upper ring 16 of the flask is now placed in proper position

on the lower ring 14 and the spindle of 17, of a sprue-former 18 is inserted into the wax so that its axis is parallel with the axis of the flask. Investment material is packed into this upper ring and allowed to harden after which the sprue-former is removed. The rings of the flask are then separated and the wax melted out of the matrix in any suitable manner, preferably, with boiling water or steam. After the wax has been entirely removed the rings are again placed together and the molten metal or other material of which the inlay is to be made, is poured into the sprue 19 and, preferably, forced into all parts of the mold by compressed air or the like.

In the event of celluloid or similar material being used for the inlay, this material is placed in proper relation to the mold and put under vise-pressure and subjected to heat in boiling water or steam and the screw of the vise tightened at intervals to insure the proper distribution of the material to all parts of the mold. In this connection I desire to state that I do not wish to be understood as limited to any particular inlay material, as various substances may be used with equal success.

What I claim as new is:—

1. The method of making dental inlays consisting in first, coating the walls of the cavity with the inlay material; second, completing the inlay model with non-metallic fusible material; third, removing the model and coating from the cavity; fourth, investing the same; fifth, removing the fusible material; and sixth, casting with the inlay material.

2. The method of making dental inlays consisting in first, coating the walls of the cavity and a portion of the exterior of the tooth with the inlay material; second, completing the inlay model with non-metallic fusible material before removal from the cavity; third, removing the model and coating from the cavity; fourth, investing the same; fifth, removing the fusible material; and sixth, casting with the inlay material.

3. The method of making dental inlays consisting in first, coating the walls of the cavity and a portion of the exterior of the tooth with the inlay metal; second, completing the inlay model with wax before removal from the cavity; third, removing the model and coating from the cavity; fourth, investing the same; fifth, removing the wax from the investment; and sixth, casting with molten inlay metal.

4. The method of making dental inlays consisting in forming a model by swaging metal on the interior of the cavity and coating the exterior of the tooth adjacent the walls of said cavity, removing the model and investing the same, and casting the molten metal.

In witness whereof I have hereunto set my hand this 16th day of January, 1911.

JOHN P. LEDERLE.

Witnesses:
E. K. LUNDY,
KATHERYNE MCHUGH.