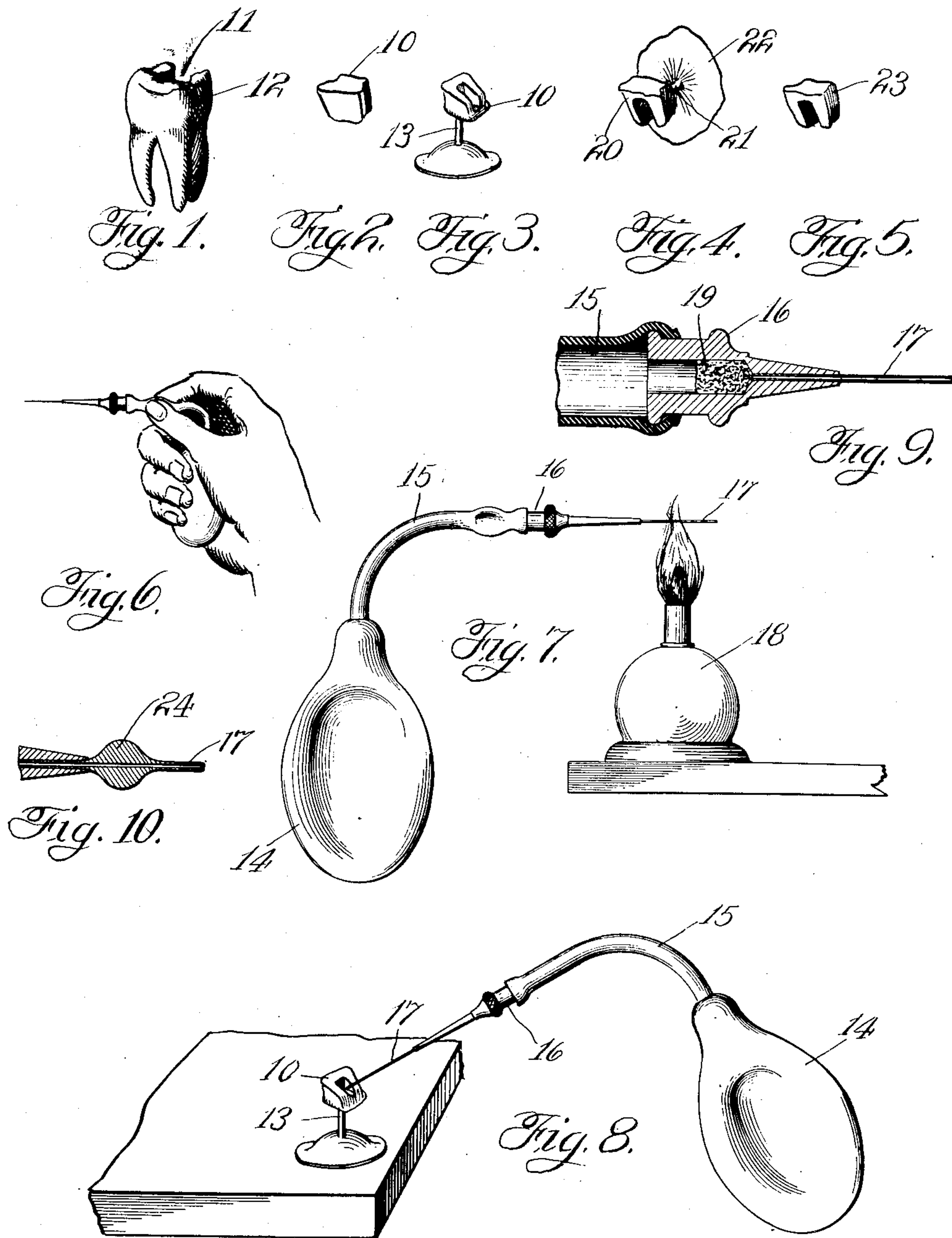


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 PROCESS OF MAKING PATTERNS FOR CASTING HOLLOW DENTAL FILLINGS.
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PROCESS OF MAKING PATTERNS FOR CASTING HOLLOW DENTAL FILLINGS.

944,254.

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To all whom it may concern:

Be it known that I, EDGAR P. BINFORD, 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 of Making Patterns for Casting Hollow Dental Fillings, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to an improved process of making patterns for use in casting operations, and is of special utility and value in the making of patterns for use in casting dental inlay fillings.

It may be stated that there has come into extended use a process of filling dental cavities which comprises taking an impression of the cavity to be filled in wax or similar fusible material and using this impression as a pattern from which to make a casting in gold, silver or other suitable metal. This casting, which is of the exact shape of the cavity of which the impression was taken, is inserted into the cavity in the tooth and cemented or otherwise secured therein. In the case of large fillings a considerable quantity of metal is frequently required and if gold is used the cost of the material for the filling is large. It is not essential that the filling consist wholly of metal, it being perfectly satisfactory to have only the outer or exposed part of the filling of metal, while the inner side of the filling may well be of other material, such as cement. Furthermore, by the removal of some of the metal from the inner side of the filling a greater amount of surface is provided for the adhesion of the cement with which these fillings are usually secured in place.

It is the object of the present invention to provide a process of forming a pattern, by the use of which a casting may be made in which the unnecessary material is omitted. This process includes the taking of an impression of the cavity in fusible material, such as wax, in the usual way, and the removal of a portion of the pattern thus obtained by the application thereto of a heated tubular instrument provided with means for drawing the wax into the instrument as it melts. The pattern thus made is used in the casting of a filling in any suitable casting machine. Because of the smallness of the article which is being worked upon and

the fact that it is composed of material which requires great care in handling in order to guard against deformation (which would make the casting obtained from the pattern faulty in its fit in the cavity), it has been found very difficult to remove any of the material of the impression by any other process than that which forms the subject of the present invention. Any attempts to accomplish this result by cutting away a portion of the wax with a sharp edged or pointed instrument must result in failure because of the difficulty of working upon an article as small as a dental filling, and because of the nature of the material of which the pattern consists.

In the accompanying drawings I have illustrated the various steps in the making of a pattern according to the process of my invention for casting a dental filling. I have also illustrated a convenient form of apparatus for use in carrying out this process, although I do not consider this the only practical form of apparatus which could be used for this process and do not wish to be limited thereto, my invention, as covered in the present application, comprising the process rather than any specific form of apparatus for use in carrying this process into effect.

In the drawings—Figure 1 illustrates in perspective a tooth having a cavity for which a cast filling is to be made; Fig. 2 shows an impression in wax or other fusible material taken from the cavity in this tooth; Fig. 3 shows this impression after modification by my process, whereby part of the wax has been removed from the impression; Fig. 4 illustrates the casting as it comes from the mold; Fig. 5 illustrates the finished filling, ready for cementing in place in the tooth; Fig. 6 shows an implement which is used in the removal of the unnecessary material from the wax pattern, and the method of holding the same in the hand while in use; Fig. 7 shows this implement being heated preparatory to its application to the pattern; Fig. 8 shows the same being applied to the pattern; Fig. 9 is a sectional view taken through a portion of this implement; and Fig. 10 shows a modified form of implement, wherein the walls of the tubular part are thickened and thereby are made to serve as heat storage means to prevent rapid cooling of the point.

After the impression 10 has been with-

drawn from the cavity 11 in the tooth 12 it is placed upon the end of the sprue pin 13, as is usual in casting dental fillings, the end of this sprue pin being slightly heated so that the impression 10 will adhere thereto when the pin cools. Part of the wax of the impression is now removed by means of the instrument which will now be described.

14 is a collapsible rubber bulb to which is secured a tube 15, preferably of flexible material, which carries at its end a needle holder 16 into the end of which is inserted a hollow needle 17. After the wax impression 10 has been placed upon the sprue pin 13 the operator compresses the bulb 14, thereby driving the air therefrom out through the tube 15, needle holder 16 and needle 17. The needle is then heated in a flame, which may be that furnished by an alcohol lamp 18 or the like. The instrument is then held in the hand of the operator in the position shown in Fig. 6, and the tip of the heated needle 17 is applied to the wax impression 10 at the point at which it is desired to remove a portion of the wax. The tendency of the bulb 14 to expand, and thereby to create an inward flow of air through the needle 17, causes the wax to be drawn in through the needle as fast as it melts. Within the needle holder 16 is arranged a quantity of cotton or the like 19 which absorbs the melted wax as it comes in through the needle. As the needle 17 is comparatively small and light it may be readily handled without danger of deforming the impression 10. By moving the point of the needle about in the depression as the latter increases in size a cavity of any desired shape may be formed in the wax, the material taken from this cavity passing through the needle and being received by the cotton so as to prevent its passing into the tube 15.

The wax may be removed with the absorbent material 19 by detaching the tube 15 from the holder 16 and withdrawing the absorbent material from the rear of the holder, or this may be accomplished by merely reheating the holder in the flame and at the same time pressing the bulb to force the remelted wax out through the needle 17. It is not necessary to heat the holder to such a temperature as to burn the cotton, as the wax melts at a comparatively low temperature. After the desired amount of material has been removed from the impression 10, the latter is used as a pattern for casting by any suitable process. The casting 20, when taken from the mold, will have a small neck 21 extending therefrom terminating in a mass of metal 22, the neck 21 consisting of the metal which filled the gate in the mold through which the metal was poured in casting, this gate being formed by the sprue pin 13. After the portions 21 and 22 have been cut from the casting and the surfaces of the

filling 23 which will be exposed when the latter is in position in the tooth have been finished, the filling will appear as shown in Fig. 5. This filling is then cemented or otherwise secured in place in the tooth as usual, the cement extending into and occupying the space represented by the chamber formed in the pattern by the removal of the wax.

By the use of this process a cast filling may be made in which the surfaces that are visible and subject to wear are of metal, while the unexposed and invisible portions of the filling are of other material, such as cement. Other advantages than that of effecting a saving of material result from the use of such a filling. The filling is more securely held in place in the cavity by reason of the large surface in contact with the cement. If the chamber in the filling be enlarged inwardly the filling will be securely anchored in place even though the cement around the exterior of the filling fail to hold.

In Fig. 10 a modified form of needle is shown in which the walls thereof are thickened to form a bulb 24 a short distance from the tip of the needle. A needle of this form may in some cases be of advantage as it would not need to be reheated so frequently as a needle of the form shown in the other figures, as the bulb portion, because of the large amount of metal contained therein, will serve as a heat-storage means.

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

1. The process of forming a pattern for casting inlay fillings which consists in taking an impression of a cavity in fusible material, applying to said impression a heated tubular instrument to locally fuse the material of the impression, and causing the fused material to pass into said instrument.

2. The process of forming a pattern for casting inlay fillings which consists in taking an impression of a cavity in fusible material, applying to said impression a heated tubular instrument to locally fuse the material of the impression, and providing means for drawing the fused material into said instrument.

3. The process of forming a pattern for casting an inlay filling which consists in taking an impression of a cavity in fusible material and removing a portion of the material of said impression by locally fusing the material of the impression, applying thereto a tubular instrument and applying to said instrument suction producing means.

4. The process of forming a pattern for casting inlay fillings which comprises taking an impression in fusible material, applying thereto a heated tubular instrument to locally melt the material of the impression and subjecting said instrument to an influence

which causes the melted material to pass into said instrument.

5 5. The process of forming a pattern for casting inlay fillings which consists in taking an impression of a cavity in fusible material, locally fusing the material of the impression and drawing the fused material away from the pattern.

10 6. The process of forming a pattern for casting which consists in providing a body of fusible material, applying thereto a heated tubular instrument and providing means for drawing the fused material into said instrument.

7. The process of forming a pattern for 15 casting which consists in providing a body of fusible material, applying thereto a heated hollow instrument and providing means for causing the fused material to pass into said instrument. 20

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

EDGAR P. BINFORD.

Witnesses:

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