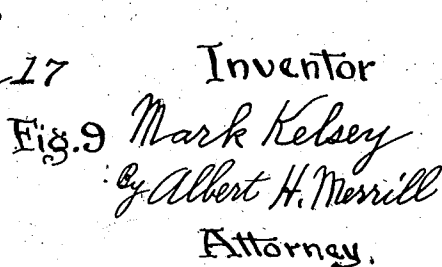
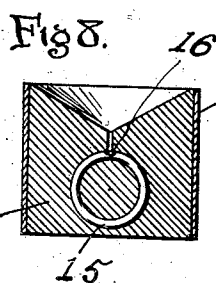
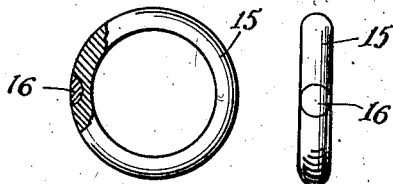
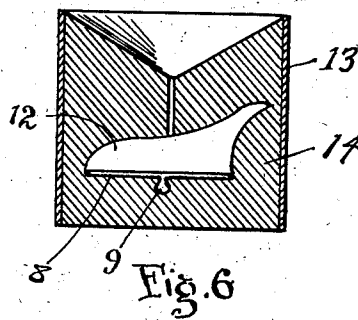
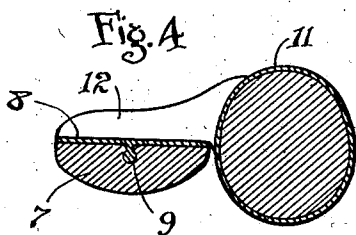
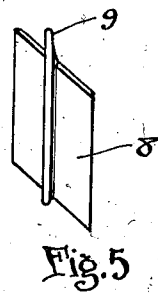
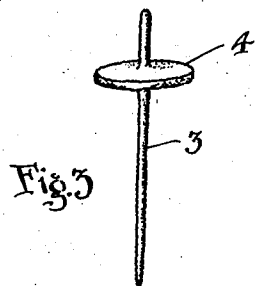
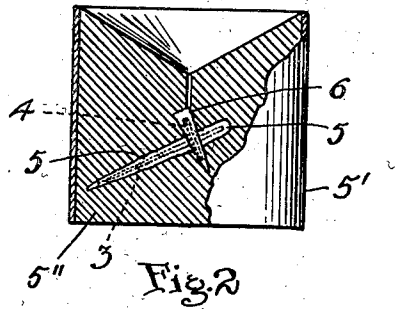
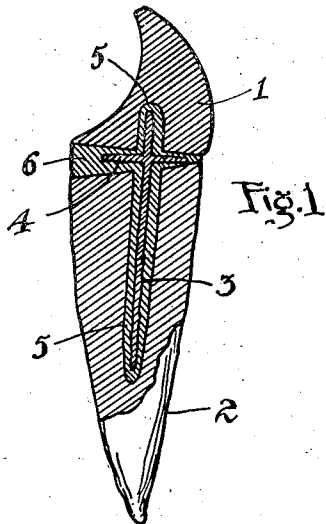


M. KELSEY,  
PROCESS OF PRODUCING PATTERNS FOR CASTINGS, &c.  
APPLICATION FILED SEPT. 1, 1910.

1,037,489.

Patented Sept. 3, 1912.



Witnesses  
G. J. G. Holt.  
Henry C. Platt

Inventor  
Mark Kelsey  
By Albert H. Merrill  
Attorney.

# UNITED STATES PATENT OFFICE.

MARK KELSEY, OF LOS ANGELES, CALIFORNIA.

PROCESS OF PRODUCING PATTERNS FOR CASTINGS, &c.

1,037,489.

Specification of Letters Patent.

Patented Sept. 3, 1912.

Application filed September 1, 1910. Serial No. 580,131.

*To all whom it may concern:*

Be it known that I, MARK KELSEY, a citizen of the United States, residing at Los Angeles, California, have invented a new and useful Process of Producing Patterns for Castings, &c., of which the following is a specification.

Among the objects of this invention are to produce a combustible pattern of sufficient stability to be transported and handled as a stock article without injury; to provide for economically manufacturing sample patterns in such large numbers that the trade can be, without too great an expense, supplied with a sufficient variety of stock forms and sizes to accurately designate to manufacturers any cast article that the consumer may desire; to provide a more perfect method, applicable especially to dentistry, for casting the attachments of porcelain teeth and porcelain facings, and for forming metallic dummies in bridgework.

Hitherto it has been impossible to secure perfect wax patterns to make one-piece backings for the attachment of porcelain teeth because the removal of the porcelain preparatory to casting distorts the wax patterns. Another difficulty heretofore encountered has been the fact that backings or attachments for the porcelain teeth have been made of a metal which either shows a tendency to burn while casting or to oxidize sufficiently to prevent perfect union; and also a difficulty is encountered by reason of the metal left in the mold interfering with the free flow of the liquid metal to all parts of the chamber in the mold. In dentistry there has also been a liability of melting the metal backing after the same has been invested when heating it sufficiently to enable the casting of new metal or during the operation of soldering to assemble the bridge. Another difficulty which applies to all methods heretofore employed in dentistry is that patterns are not made in such a form as to be readily handled and trimmed preparatory to casting. Other difficulties are that in order to make a sufficient number of patterns to supply a great variety of forms for jewelers and dentists the investment of a large amount of capital would be required owing to the precious metal contained in the stock forms. Furthermore, a large amount of precious metal has hitherto been wasted in trimming down stock patterns to the desired size and shape, and there has also been difficulty, in dentistry, in

joining the two pieces of metal used in the attachments or backings to porcelain facings and teeth. Moreover, the present methods of casting a body of new metal to a metallic base, in dentistry, have been found uncertain on account of more or less oxidation of the metallic base.

One way in which this invention overcomes the greater number of the foregoing difficulties is by providing a method of forming the backing or attachment used by dentists and the castings used by jewelers, into one solid homogeneous piece of metal, and also avoiding all air spaces and waste of material.

Broadly considered this invention relates to a new article of manufacture consisting of a pattern made of a highly combustible material of sufficient rigidity to permit the same to be transported and handled as may be necessary.

The invention further consists in a method of constructing patterns for castings out of a plurality of materials one of which is highly combustible and yet possesses sufficient rigidity to form a support upon which a more plastic exterior may be placed to build to desired contour.

Referring to the accompanying drawings, which illustrate the invention as applied to dentistry and jewelry, Figure 1 is a vertical section of a tooth root and porcelain tooth showing therein the mold pattern. Fig. 2 is a sectional view of a mold showing the completed pattern invested therein. Fig. 3 is a perspective of the foundation body or skeleton of the pattern. Fig. 4 is a transverse section of a backing for a porcelain tooth illustrating the method of attaching said backing to a gold crown. Fig. 5 is a perspective of the backing piece shown in section in Fig. 4. Fig. 6 is a vertical section of a mold containing the pattern for the backing piece of Fig. 5 together with the attachment shown in Fig. 4. Fig. 7 is a plan view of a foundation body to be sold to the trade as a pattern for casting a ring. This view is partly sectioned in order to show a recess in the side thereof to be filled with wax to support the pattern on a sprue. Fig. 8 is an edge view of the ring pattern shown in Fig. 7. Fig. 9 is a sectional view of a mold showing the ring pattern therein completed by filling the cavity therein with wax, the sprue having been withdrawn.

Referring first to Figs. 1, 2 and 3, to apply the invention to the setting of porce-

lain crowns, first select a suitable porcelain tooth 1 and grind in the usual manner to secure approximate fit to root 2, the root being reamed to receive a pin. Then select the foundation body or skeleton 3 having the transverse flange 4 and trim to the proper length, then cover the skeleton 3 with a coating of wax 5 in excess of what will be required to form the contour of the completed pattern, heat coating of wax to an even softness, press into moistened root canal the long end or pin of skeleton 3, and when in place force slightly dampened porcelain tooth 1 over pattern projecting from root thus forcing wax partially out and leaving porcelain crown in proper position to form the wax portion 6 on flange 4. Then chill wax and remove porcelain tooth 1. Next remove completed pattern from tooth root and place upon the usual sprue (not shown) and invest in the usual way as in a mold 5' containing investing material 5'' employed in pressure casting where a disappearing pattern is used. Then heat the mold sufficiently to remove the wax and skeleton by combustion and it is ready for use in forming the casting in the usual manner.

In order to apply the invention to attachments of porcelain facings to stationary fixtures in the mouth, select facing 7 of proper size and shape to fill space, grind to place, select backing 8 of celluloid or similar rigid combustible material and trim to proper shape and size, fit to porcelain facing, put facing and backing together in place and join it to the abutment (in this case the gold crown 11) by means of a body of wax 12. Now remove facing 7, backing 8 and wax 12 together, from abutment 11. Then remove facing 7 from backing 8 and fix a sprue (not shown) into wax 12 and invest said wax and backing, thus supported, in the usual manner. The investment may be made in a mold 13 containing investing material 14. Then clear the mold chamber by heating as already described.

The skeleton 3 and its flange 4 are provided with a roughened surface as shown in Fig. 3 to cause the wax to adhere more firmly.

Celluloid is plastic when heated allowing it to be pressed into any desired form, and therefore enables making of skeleton patterns of any shape or size and in comparatively large quantities at small expense.

In Fig. 7 is shown a ring pattern or foundation body 15 of celluloid, having a recess filled with wax 16 to form attaching means for the sprue (not shown). Fig. 9 shows the ring invested in a mold 17 containing investing material 18. The next step is to heat the mold sufficiently to destroy the pattern by combustion in order to make room

for the casting. It will be seen that the foundation body for the ring has features in common with the foundation bodies of the first two forms described although a smaller amount of wax is required to form the completed pattern.

According to present methods it necessitates an enormous expenditure of capital to carry a sufficient variety of forms and sizes of wedding rings and other stock rings to supply the demands of consumers. Without such an extensive stock, drawings must be made which do not exhibit the article as well as patterns. By using the patterns provided by this invention as hereinbefore last described, after the selection of the pattern representing the desired ring or other article, the finished casting can be turned out in about one-half the time taken by present methods, and with much less loss of material by polishing and trimming up.

I claim:

1. The process of forming a pattern which consists in inserting into a cavity or recess which is to be filled by a casting a rigid combustible skeleton of smaller dimensions than said cavity, and forming the pattern by building upon said skeleton a plastic filler which is combustible or fusible.

2. The process of forming a pattern which consists in placing in position a rigid skeleton composed of a material removable by heating; and forming the pattern by building upon said skeleton a plastic addition which is combustible or fusible.

3. The process of forming a pattern which consists in inserting into a cavity or recess which is to be filled by a casting a skeleton of smaller dimensions than said cavity; and building upon said skeleton a plastic filler to form the pattern.

4. The process of forming a pattern which consists in building a plastic addition externally upon and supporting the same by a celluloid backing member to form the pattern.

5. The process of forming a pattern, which consists in applying to the exterior of a fusible skeleton, a plastic addition of fusible material, and introducing the two into a cavity, to cause the plastic addition to take the form of said cavity, and thus produce the pattern.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses at Los Angeles, in the county of Los Angeles and State of California, this 27th day of August, 1910.

MARK KELSEY.

Witnesses:

ALBERT H. MERRILL,  
LILLIAN YOUNG.