

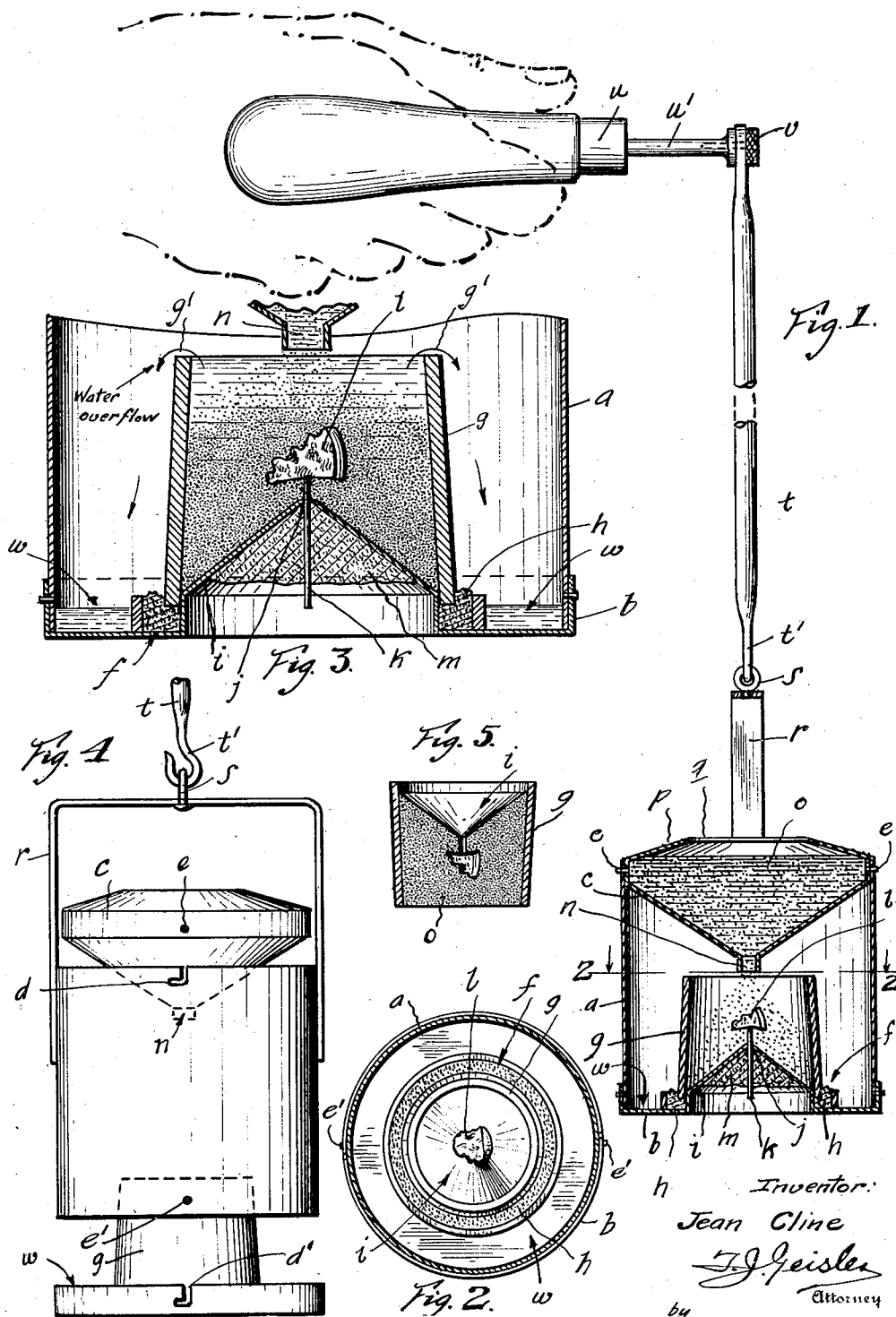
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METHOD FOR INVESTING DESTRUCTIBLE PATTERNS FOR INLAY FILLINGS

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METHOD FOR INVESTING DESTRUCTIBLE PATTERNS FOR INLAY FILLINGS.

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To all whom it may concern:

Be it known that I, JEAN CLINE, a citizen of the United States, and a resident of the city of Portland, county of Multnomah, and State of Oregon, have invented a certain new and useful Improvement in Methods for Investing Destructible Patterns for Inlay Fillings, of which the following is a specification.

10 This invention relates to the making of castings and particularly to the making of dental castings which are used in gold inlay work, and the like.

As it is well known, the most common 15 manner in which these castings are made is by making a wax impression of the cavity in the patient's tooth and investing this wax impression or pattern with any composition sold in the dental trade as investing material which usually consists in a large degree of plaster of Paris. The composition 20 is sold in a dry powdered state and requires the addition of water. The water must be mixed with the composition in definite proportions, as only a definite amount of the composition will take up only a definite amount of water, and thus if there is a relative excess of either material it will remain in a free state. If there is a relative excess 30 of moisture there will be suspended in the mixture small particles of water. After the mold has become set it is subjected to heat so as to melt and drive out the wax impression so as to leave a cavity in the mold, which is the exact size and shape of the cavity in the tooth and thus when the gold or other metal is poured into this cavity and has become set it will fit exactly into the cavity.

40 I have noted that if the proportions of the composition are not exact and there is an excess of moisture the heat applied to melt the wax impression will cause the water to be evaporated and leave holes or voids in the mold and thus as these holes communicate with the recess in the mold, resulting from the wax impression, there will be formed on the casting, small bubbles or projections which prevent the impression 50 from fitting exactly into the tooth and thus these minute projections must be removed before the casting can be used.

I have also discovered that the various investing materials require different proportions of water, and thus it is very diffi-

cult to know exactly the correct amount to be placed in a definite amount of investing material so that there will not be an excess of moisture or of composition material.

The object of my invention therefore is to provide a method and a means for investing the wax impression, or other destructible pattern, with an investment material which consists of a composition mixed with water so as to make a fluid, which subsequently sets due to chemical action, which will eliminate any excess or uncombined moisture from the composition, as it is taking its set.

A further and incidental object is to provide a method by which the investing material will form itself more closely about the impression or pattern so as to make more nearly an exact replica thereof without subjecting the minute and fragile parts to a force which would tend to deform them.

I attain these and other objects by providing a device consisting of an open top container which has a hollow member or, as it is known, an inlay ring, seated therein. I provide a recess in the container which is provided with sealing means and I also make the portion of the container within said hollow member convex and mount a destructible pattern thereon. I then pour this liquid investing material into the hollow member and subject the device to centrifugal force whereby this composition investing material, which is mixed with water, sets and the chemical action takes place but the excess moisture is forced upwardly from the container due to its lighter specific gravity and the combined material sets in solid form at the bottom and surrounds the pattern. The container is preferably larger and higher than the hollow member containing the investing material and thus the excess moisture is forced over the top of the hollow member into the container in which it is trapped.

The construction and operation of my device is described in the accompanying specification and is illustrated in the drawings in which:

Fig. 1 is an elevation of one of the simplest means of utilizing my invention with a portion of the devices shown in sections to illustrate details of construction;

Fig. 2 is a section taken on the line 2-2 of Fig. 1;

Fig. 3 is an enlarged fragmentary sectional view of my device and diagrammatically illustrates the the action of the device when subjected to centrifugal force;

Fig. 4 is an elevation of the container and a vessel for holding the investment material, and shows the parts separated but in their approximate positions;

Fig. 5 is a sectional view of the hollow member containing the investment or cementitious matrix material after it has become set and the destructible pattern removed.

The device shown in the accompanying drawings comprises a bucket *a* which has a removable bottom *b* and the top of which is substantially closed by a funnel shaped vessel *c*. Both the bottom *b* and the funnel shaped vessel *c* are removably secured by a mechanism which holds them rigidly in place when being used but permits them to be readily detached. One type of mechanism of this character is the bayonet joint, which is shown in Fig. 4, which consists of an L-shaped slot *d* in which the pin *e* fits, this joint being used to hold the funnel shaped vessel in the cylindrical container and a similar slot *d'* is provided on the removable bottom *b* which co-operates with the pin *e'* on the lower portion of the cylindrical container *a* and is used for holding the removable bottom in place. The bottom is provided with a trough *f* in which the hollow inlay ring *g* is mounted. I preferably fill this trough *f* with some viscous material such as beeswax, as shown at *h*, in which the inlay ring may be seated and the material serving to make a water-tight joint around the bottom of the inlay ring. I make the central portion of the removable bottom *b* raised as at *i*, so that it is substantially convex, and I provide a small aperture in the apex as *j* in which I mount the hollow pattern-mounting pin *k* which supports the destructible pattern or wax impression *l* which is to be invested.

I usually provide a piece of wax or similar material as *m* in which the hollow pattern-mounting pin *k* is secured. Said pin constituting an outlet from the vessel *c* has an aperture *n* in its lower surface so that it substantially like a funnel, and this aperture is preferably arranged directly over the center of the hollow member or inlay ring and thus when the investing material *o* is placed in the vessel *c* it will be directed so as to fill the inlay ring *g*. I preferably provide a protecting lip *p* over the vessel *c* and provide a filling aperture *q* in this lip and I provide a bail *r* for the container which has an eye *s*, which is permitted to swivel therein. On this eye I provide a handle *t* which has a hook on the lower end *t'* and is provided with a gripping portion *u*, which is preferably at right angles thereto. The handle *u* is either rotatably mount-

ed on its rod *u'* or the rod *u'* is mounted to rotate relatively in the handle *t*, that is, I provide a nut *v* for holding the handle *t* on the rod *u'* and I do not draw the nut up tightly against the handle *t* and thus when a person is rotating this device, it is not necessary to let the grip slip in the hand. The reason I provide this protecting lip *p* is that when the device is first rotated and the action of the centrifugal force is not very strong, the investing material tends to overflow from the vessel and thus be thrown about the room. This is especially true if the centrifugal force is occasioned by arranging the vessel to be whirled by a machine. This protecting lip *p* is made with a relatively small hole *q* and thus the investing material is held in the vessel even in the preliminary stage of rotation.

The operation of my device is as follows:

If my invention is used for making castings for inlay filling, the wax impression is mounted on the end of the hollow pin *k*, is inserted in the hole *j*, and fixed in place inside of the inlay ring *g*. This inlay ring is seated firmly into the sealing material *h* and the bottom is then placed on the container and fastened thereto by the bayonet joints composed of the pins *e'* and the slot *d'*. The vessel *c* is then placed in position so that the aperture *n* will be directly above the inlay ring *g* and then the vessel is filled with the matrix material. The bucket is then swung around by the handle *t* and the action of the centrifugal force so set up tends to feed this material from the vessel *c* out through the aperture *n* and into the inlay ring *g* so that it surrounds and is packed around the wax impression or destructible pattern *f*. The ring is thus gradually filled with this composition investing material and is prevented from seeping out of the bottom of the inlay ring by the sealing material *h*. The quantity of material placed in the vessel *c* is preferably proportioned so that it is slightly in excess of the amount held by the inlay ring *g*. The centrifugal force tends to separate the moisture from the solid material and causes the latter to completely invest the pattern. Thus, as the inlay ring *g* is filled, the water is forced upwardly until it overflows the top, as *g'*, of the inlay ring. This moisture is trapped in the outer trough *w* which surrounds the trough *f* for the sealing material, and thus is prevented from being thrown into the room.

I have discovered as an incidental but important feature that the investing material is packed more closely about the pattern due to the effect of centrifugal force rather than by tapping as heretofore and thus brings out the minor configurations of the pattern more closely than by any present method of investing with which I am familiar.

I claim:

1. The method of investing a destructible pattern for an inlay filling consisting in mounting the pattern in a container, then filling the latter with an investing composition until the pattern is completely covered, and subjecting the composition to centrifugal force until the excess moisture is separated therefrom.
2. The method of investing a destructible pattern for an inlay filling consisting in mounting the pattern in a container, then gradually filling the latter with an investing composition until the pattern is completely covered, and subjecting the composition to centrifugal force until the excess moisture is separated therefrom.

JEAN CLINE.