Sept. 8, 1925. 1,552,574

A. F. SEBERT

SPRUE PIN FOR DENTAL CASTINGS

Filed March 11, 1924

Fig. 1.

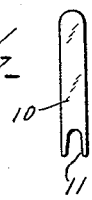


Fig. 2.

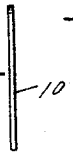


Fig. 3.

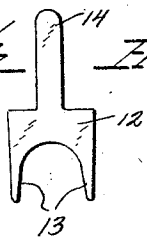


Fig. 4.

Fig. 5.

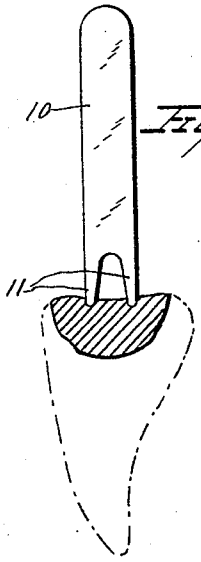


Fig. 6.

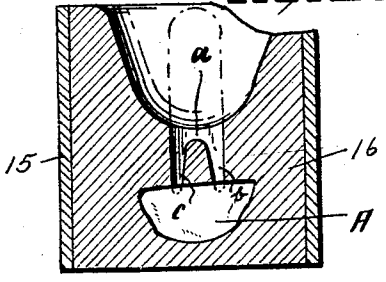


Fig. 7.

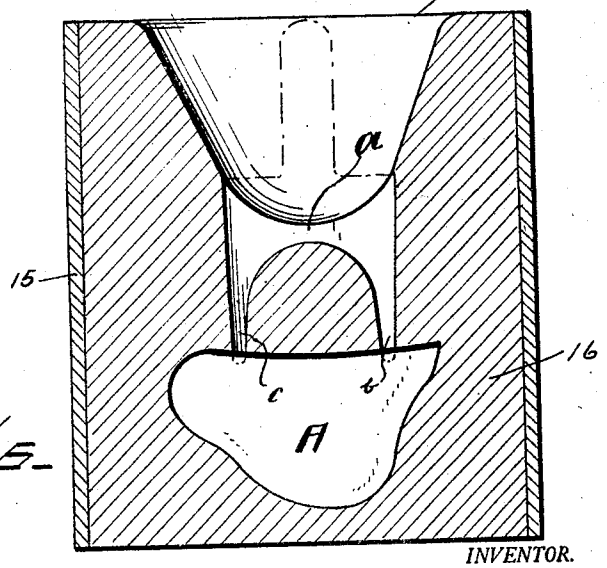
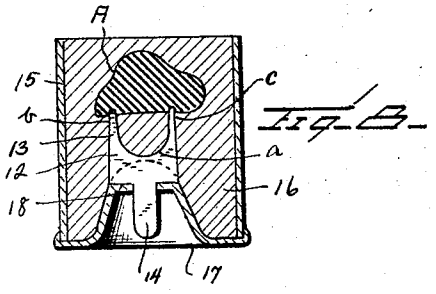


Fig. 8.



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Patented Sept. 8, 1925. 1,552,574

UNITED STATES PATENT OFFICE.

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SPRUE PIN FOR DENTAL CASTINGS.

Application filed March 11, 1924. Serial No. 698,438.

To all whom it may concern:

Be it known that I, ALVIN F. SEBERT, a citizen of the United States, residing at Clinton, in the county of Custer and State of Oklahoma, have invented certain new and useful Improvements in Sprue Pins for Dental Castings, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to the art of dental casting, and particularly to means for forming the sprue hole or passage in the investment within which the casting is made.

In forming dental castings, it is usual to force wax into the cavity of the tooth so as to secure a pattern, a sprue pin is then forced slightly into the wax sufficiently to permit the removal of the wax from the cavity of the tooth, and the wax pattern with the sprue pin is disposed within an investment cup usually in connection with a sprue former, and the investment cup is then filled with investment material. When the investment material has hardened, the sprue pin is removed, leaving a sprue opening or passage. The investment is then submitted to heat, which melts the wax, which is discharged through the sprue passage. Then the molten metal is forced into the mold by the casting machines commonly used for this purpose.

One of the objects of my invention is to provide a sprue pin of such form that the arm of the wax pattern will not be likely to be bent in the removal of the pattern from the tooth, and which is so constructed that it will engage the wax impression at two spaced points, thus holding the wax impression in the proper position during the process of removing it from the tooth.

A further object is to provide a sprue pin which is so constructed as to form two sprues or passages communicating with the hollow interior of the mold so that the metal has two passages to travel through instead of one and thus the metal will pass rapidly into the hollow interior of the mold while in a molten condition and without the metal becoming cool before the cast is finished.

A still further object is to provide a sprue pin which is bifurcated at one end, this bifurcated end being adapted to be engaged with the wax of the pattern and to form the two sprue openings.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of one form of sprue pin constructed in accordance with my invention;

Figure 2 is an edge elevation thereof;

Figure 3 is a face elevation of a larger form of sprue pin;

Figure 4 is an edge elevation thereof;

Figure 5 is an elevation showing the manner in which the sprue pin is used with a wax pattern to remove the wax pattern from the teeth shown in dotted lines;

Figure 6 is a sectional view through an investment ring after the wax pattern and pin have been removed to show the sprue openings formed by the pin;

Figure 7 is a like view to Figure 6 but showing the form of sprue opening formed by the pin shown in Figure 3, this pin being shown in dotted lines in Figure 7;

Figure 8 is a sectional view through an investment ring and the investment showing the manner in which the sprue pin is supported upon a sprue former before the sprue pin is withdrawn.

Referring to these drawings, and particularly to Figure 1, the sprue pin 10 is formed of a flat and relatively thin strip of metal, which in practice will be approximately $\frac{1}{8}''$ in width, this strip having parallel sides and at one end being longitudinally cleft to provide two spaced prongs 11.

In Figure 3, I illustrate another form of the device used for casting larger inlays, in which the body 12 of the pin is relatively wide, having a width approximately $\frac{1}{2}''$ in actual practice, and is formed to provide the two prongs or arms 13. Above the body 12 there is a shank 14 which is relatively narrow and having a width no greater than the width of the pin 10. Both the pin shown in Figure 1 and that shown in Figure 3 are of the same thickness and material, that is about $\frac{1}{32}''$ thick in actual practice. Preferably these will be made of aluminum. I have illustrated two forms of these pins, but it will be understood that other forms might

be used and that they will be made in assorted sizes so that there will be a double pronged pin corresponding in size to the casting to be made.

In the use of this construction, the wax is forced into the cavity of the tooth in the usual manner and then the prongs of the pin, which has been slightly warmed, are forced into the wax very slightly or just far enough so as to strengthen the wax pattern and keep it from bending or breaking during the process of removing from the cavity. After the wax pattern is removed from the cavity and cleaned, it is then ready for the investing. It is placed in a sprue former, such as the sprue former 17 or of any suitable character as, for instance, the Roach former, this sprue former having a slot 18 cut in it wide enough to receive the shoulder of the sprue. The sprue should be inserted into the former as far as the operator wishes, the wax pattern being upward, as illustrated in Figure 6. The ring may be then poured full of investment. If the ring is filled with investment material first and the wax pattern inserted in the investment, the sprue should be set into the investment as far as the operator wishes to trim the investment for making his cast so that in trimming he will expose the shoulders of the sprue, permitting it to be easily withdrawn. The investment is then hardened and when it is entirely hard the pin is removed, the wax investment is then dried out and brought to such a degree of heat that the wax will be melted and the investment heated to where the wax will be boiled out. The complete investment then has the form shown in Figure 6, providing a single passage *a* and two lateral passages *b* and *c*. Obviously if the end of the cleft between the prongs is even with the upper surface of the investment material, two passages will be provided and not a single passage having two branches. In either case, however, there will be two branches or passages extending into the hollow interior A of the investment. The gold is then poured in the usual manner and enters the hollow interior of the investment to form the casting desired.

Of course, where a form of pin such as shown in Figure 3 is used, the shoulders 17 of the pin must not be below the upper surface of the investment material, as otherwise the pin would be incapable of being removed. It will be noted from Figure 3 also that in this case the two side edges of the pin converge toward the extremities of the prongs so as to permit the easy removal of the pin from the investment after the investment has hardened.

I have found in practice that a pin constructed in accordance with my invention is particularly valuable for the reason that the double sprue splits the point of contraction in the residue button, thereby cutting down the contraction of the casting and in addition leaving two holes by which the gold may pass through into the mold with the least possible resistance, the gold getting into its proper shape before contraction starts, which thus minimizes the contraction. It is the first movement of the casting machine which places the gold in the mold and the sooner the gold is placed in its proper position when in its molten stage, the better cast will be obtained. The double sprue is particularly valuable where the wax pattern is formed with an arm or is angular, for instance, in cross section. In using a single sprue, the operator will often bend the arm to such degree that after casting the inlay will not go into place, and often also the operator will break the arm of the wax pattern in removal and a new wax pattern must be then made. The bifurcated sprue pin prevents this. It will not allow the arm to be broken off or to bend, due to the fact that the bifurcated sprue pin engages the wax pattern at two places instead of merely at the center. The unbifurcated pin only holds the wax pattern at a single place, whereas the double sprue pin engages the wax pattern at two separated places. Furthermore it has been found in practice that the use of a bifurcated sprue pin secures a particularly good cast, inasmuch as the metal has two holes to travel through instead of one and thus the metal will flow into and fill the cavity of the mold while in the molten stage and with less shrinkage. With a small sprue pin not bifurcated, it is hard to make a large cast on account of the gold becoming cool before the cast is finished, and while a large single sprue pin might be used in making a large cast, yet in that case there is liable to be shrinkage.

I claim:—

1. As an article of manufacture, a sprue pin of sheet metal having a plurality of prongs at one end adapted to be inserted into a single wax pattern to thereby provide a plurality of sprues entering said wax pattern.

2. As an article of manufacture, a sprue pin formed throughout its entire extent of relatively thin sheet metal, one extremity of the pin being bifurcated to provide a pair of prongs adapted to be inserted in a single wax pattern.

3. As an article of manufacture, a sprue pin formed throughout its entire extent of relatively thin sheet metal and formed to provide a thin but relatively wide body portion having a thin and relatively narrow shank extending therefrom, the opposite end of the body portion being bifurcated to provide two prongs.

4. As an article of manufacture, a sprue pin formed from a sheet of relatively thin metal and having a uniform thickness throughout its entire extent, one extremity of the pin being formed with a longitudinally extending recess to thereby provide two prongs on this extremity of the pin adapted to be inserted in a single wax pattern.

5. As an article of manufacture, a sprue pin formed of relatively thin metal and formed to provide a relatively wide but thin body portion having a relatively thin and narrow shank extending therefrom, the opposite end of the body portion being bifurcated to provide two prongs, the side edges of the body portion being convergent toward the extremities of the prongs.

In testimony whereof I hereunto affix my signature.

ALVIN F. SEBERT.