No. 699,006. Patented Apr. 29, 1902.

C. A. PALMER.

CASTING FLASK.

(Application filed June 5, 1900.)

(No Model.)

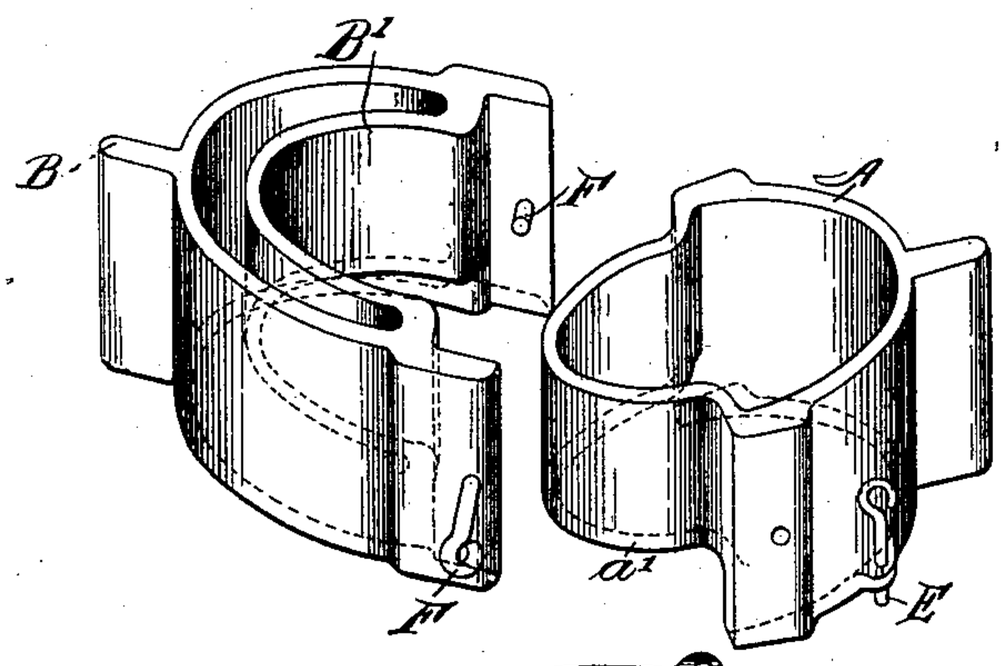

Fig. 1.

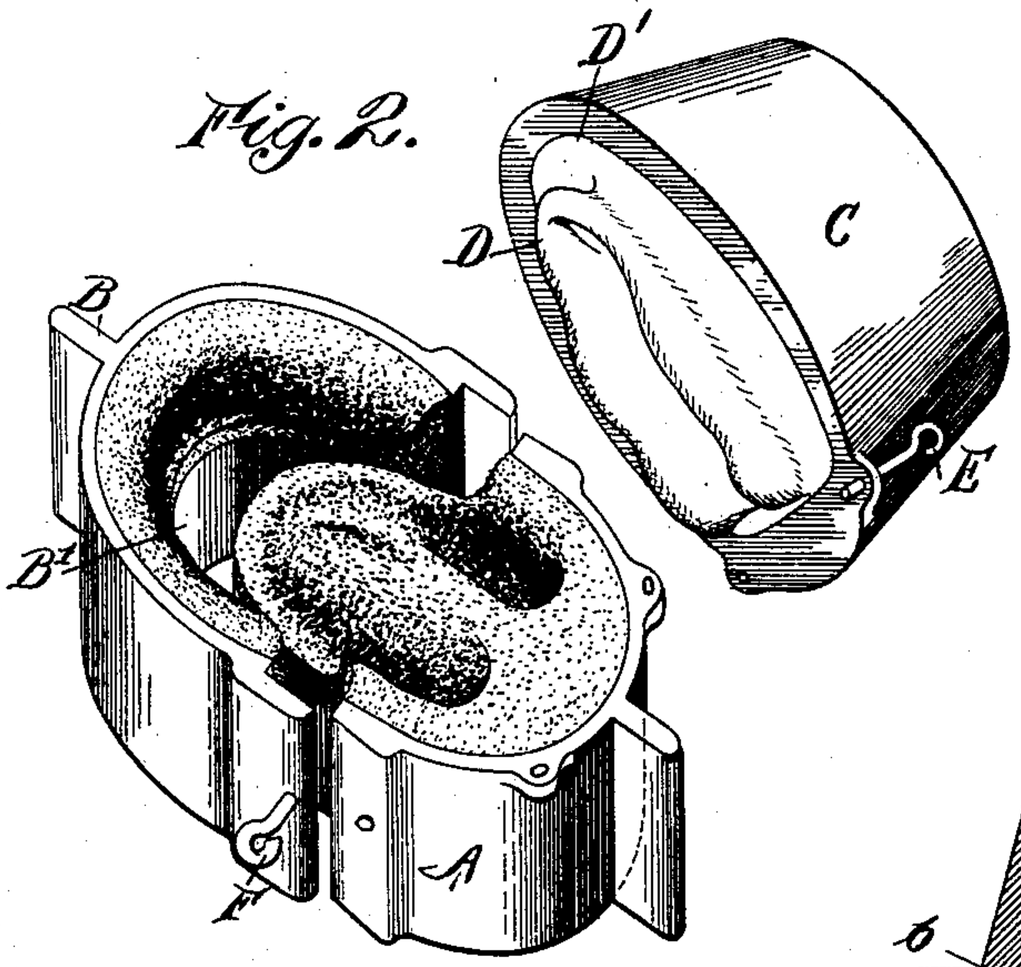

Fig. 2.

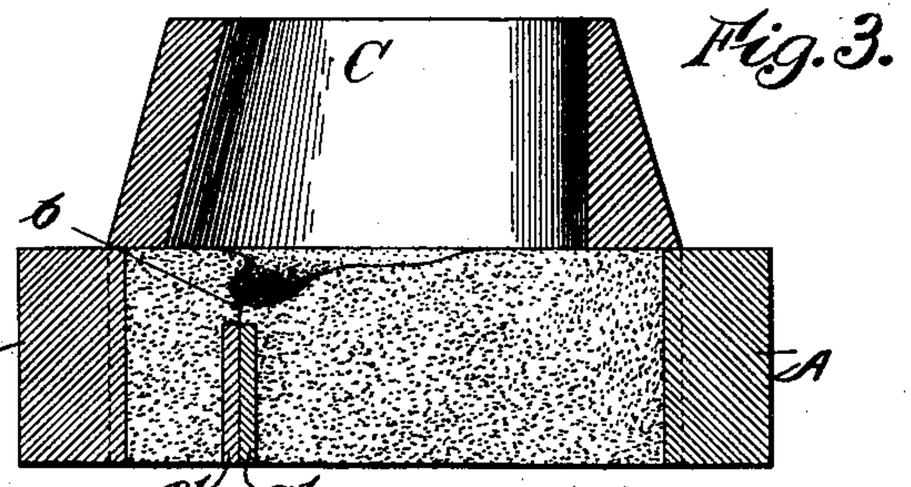

Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES ALFRED PALMER, OF GRINNELL, IOWA.

CASTING-FLASK.

SPECIFICATION forming part of Letters Patent No. 699,006, dated April 29, 1902.

Application filed June 5, 1900. Serial No. 19,115. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ALFRED PALMER, a citizen of the United States of America, and a resident of Grinnell, county of Poweshiek, and State of Iowa, have invented certain new and useful Improvements in Casting-Flasks, of which the following is a specification.

My invention relates to improvements in casting-flasks, and more particularly to flasks peculiarly adapted for casting accurate metal dies conforming to dental models, the object of my said invention being the provision of simple and convenient apparatus whereby the mold and resulting casting may be readily made to conform to a model or pattern having a marked "undercut" or other difficult shape.

I will describe my improvements in connection with a flask especially designed for casting metal dies from undercut dental models. In the manufacture of such dies it is desirable that the sand mold may be easily formed within the flask and in such manner that the plaster model, with its undercut portions, may be readily removed without involving the breakage or disturbance of the mold. This may be accomplished by forming the mold in sections, so that they can be separated without breakage, the said sections of the mold being afterward assembled to make the casting. It will be seen, however, that the mold should be formed in as few sections as possible to avoid the chance of injury thereto. Moreover, the flask should be constructed of as few parts as possible and in a manner to support the mold-sections intact and admit of their ready separation and assemblage accurately in position to complete the mold. The improved flask of my invention admirably meets these requirements.

The embodiment herein shown may be briefly described as consisting of but three separable parts, preferably made of metal, which respectively receive the plaster cast or dental model and the two sections of the sand mold conforming thereto, the last-named parts of the flask also conforming as to their line of separation to the outline of the dental model. These flask-sections have accurately-fitting inner retaining-walls, which support and retain the mold-sections and facilitate the ready formation of the sectional sand mold. Means are provided for readily and accurately securing together the flask-sections.

My invention will be more easily understood by reference to the accompanying drawings, showing a dental casting-flask constructed in accordance with said invention, wherein—

Figure 1 is a view in perspective, showing the flask-sections inverted and about to be assembled to form the mold. Fig. 2 also is a perspective view showing the completed sand mold within the flask, the sections thereof being separated to permit the removal of the model; and Fig. 3 is a sectional view through the flask and sand mold when ready for casting.

Similar parts are therein designated by the same letters of reference.

The complete flask consists of three sections or parts, preferably constructed of iron, steel, or brass, comprising the ring A and the conforming front or section B, together forming a sectional drag, and the cope or cone C, the two first-named sections fitting upon and being separable from the latter substantially along a given or horizontal plane. These parts are adapted to be removably secured together by pins E F, fitting in lugs or ears provided upon the said sections. Sections A B are constructed with walls of moderate thickness, the abutting faces of the inner walls a' B′ being semicircularly shaped to conform generally to the outline of the dental model or plaster cast D, surmounting the conical plaster base D′. These walls are centrally cut away in a horizontal plane, permitting the formation of a practically continuous sand mold when the sections are assembled, which mold naturally separates along the line of the abutting walls. Section C is provided with an interior tapering opening, conforming generally in shape to the frustum of a cone, with a flattened rear portion, in which opening the plaster cast accurately fits. It will be understood that no top or bottom is provided for the flask-sections.

With the aid of the drawings and the foregoing description the use of my improved flask will now be made clear. Having inserted the plaster cast D of the mouth in cone C, which cast is prepared in a well-known man-

ner not necessary to be explained herein, the several sections are assembled and secured in place by means of pins E F, the flask being placed in an inverted position—that is, resting on the smaller end of the cone. Fine molding-sand is then placed first in ring A and carefully tamped down sufficiently to form a finished section of the mold, a quantity of sand also being placed in section B temporarily to support the mold-section thus formed in ring A while the sand is being tamped down. Pins F are then withdrawn, permitting the removal of the front or section B, together with its contained portion of the sand mold which parts or separates along the line of the engaging faces of sections A B. The exposed or curved outer edges of the sand-mold section in ring A are then shaped by the fingers or suitable tools to present a sharp even parting-line, and the exposed edges are dusted over with French chalk *b*, or tissue-paper is placed over said edges to prevent the other section of the sand mold from adhering thereto. The incomplete portion of the sand mold in section B is removed, and said section is replaced in its former position. Molding-sand is then filled into said section and carefully tamped down about the exterior edges of the sand mold and undercut portions of the model, thereby completing the mold. The flask-sections may now be separated after removing the pins, and by tapping the walls of sections A B it will be found that the sand mold will separate along the parting-line conforming to the outline of the dental model and the engaging interior walls of said flask-sections, which serve to support the sections of the said mold. The plaster cast is now readily removed from the mold and its containing-cone C without disturbance of the lip or protruding portion conforming to the undercut. With a little care and experience, however, a simpler method of using the flask than that just described may ordinarily be practiced. This consists in forming the complete mold-sections in A and B at one operation. Then after sufficiently tamping down the sand, inverting the flask, and removing the pins the mold and flask sections A B may be slightly separated to withdraw the dental model D from the mold. The mold-sections are rarely disturbed by this operation, if carefully performed, and may be immediately reassembled for casting, the seam or parting-line being previously smoothed over should it be required.

It will be seen that the mold is formed in but two sections, thus affording but little chance for injury thereto in separating and assembling the same, as well as readily securing an accurate sand mold from a model having a decided undercut or other difficult conformation.

By shaping the engaging interior portions of the flask-sections to correspond or conform to the outline of other models it will be perceived that three-section molds may readily be formed therein, as in my improved dental casting-flask, which, moreover, may be utilized, if desired, by forming a portion of the sand mold in the third section or cone C, as required in many classes of work. I have used the terms "cone," "ring," &c., herein merely to designate flask-sections, which will be the equivalents of the specific forms set forth.

The flask-sections are reassembled and accurately secured together by means of the pins, after which the metal die, of zinc or alloy, is cast by pouring the melted metal through the opening in the smaller end of cone C.

Having now described one embodiment of my invention, I claim as new, and desire to secure by Letters Patent, the following, together with all such modifications as may be made by mere skill or are by law implied:

1. A casting-flask of the class described, comprising three separate sections, to wit, a cope having a substantially flat parting face and a drag fitting said cope, comprising two separable sections having curved abutting inner walls shaped to conform to the curved outline of the model, substantially as described.

2. A casting-flask of the class described, comprising three separate sections, to wit, a cope having a substantially flat parting face and a drag fitting said cope, comprising two separable sections having curved abutting inner walls depressed or cut away below the plane of the parting face and shaped to conform to the curved outline of the model, substantially as described.

3. A casting-flask for undercut models or patterns, consisting of three sections, to wit, a cope C having a substantially flat parting face and a drag fitting said cope comprising two sections A B, the outer and inner walls of the section B having the general form of concentric arcs of circles and the section A having an outer wall conforming substantially to the adjacent portion of the cope, said section A removably fitting upon section B, whereby a parting is secured conforming to said curved inner walls, substantially as described.

4. A dental casting-flask comprising three separable flask-sections, of which the cone C is separable from the other sections along a horizontal plane, and sections A and B for receiving the sectional sand mold, are separable from each other substantially at right angles with said plane, along a curved line conforming to the exterior outline of the dental model, said sections A and B being provided with a supporting-wall for the sectional sand mold, conforming likewise to the exterior outline of the dental model, substantially as described.

5. In a casting-flask, the combination with flask-section C, of sections A B wherein a sectional sand mold may be formed, said sections fitting upon section C substantially in a horizontal plane, the sections A B being separable and fitting accurately together substantially

along the curved outline of the model from which the casting is to be made, which outline is marked by a curved supporting-wall, and means for removably securing the flask-sections in their relative positions, substantially as described.

6. In a flask for casting dies from undercut dental models, the combination with a cone C adapted to receive the cast bearing the dental model, of a ring or section A and a front B wherein the sectional sand mold is formed, the said latter sections being interiorly shaped to fit together along a curved line conforming substantially to the exterior outline of the dental model, and means for removably securing the flask-sections together, substantially as described.

7. A dental casting-flask consisting of three sections, to wit, a cope C substantially in the form of a cone having a flat parting face, and a drag having a flat parting face and consisting of two sections A, B, the outer and inner walls of the section B having the general form of concentric arcs of circles and the section A having an outer wall substantially conforming to the adjacent portion of the cope C and an inner wall fitting in the concavity of section B, substantially as described.

8. In a dental casting-flask, the combination with a cone C wherein the cast bearing the dental model is adapted to be disposed and the metal die may be cast, of a ring A, the forward portion of which is shaped to conform substantially to the exterior outline of the dental model D, a front B fitting thereon, whereby a parting-line is insured which admits of the use of a two-section sand mold in parts A and B, and means for removably securing the flask-sections together, substantially as described.

Signed by me at Grinnell, Iowa, this 6th day of February, A. D. 1900, in the presence of two subscribing witnesses.

CHARLES ALFRED PALMER.

Witnesses:
S. A. PALMER,
R. M. HAINES, Jr.