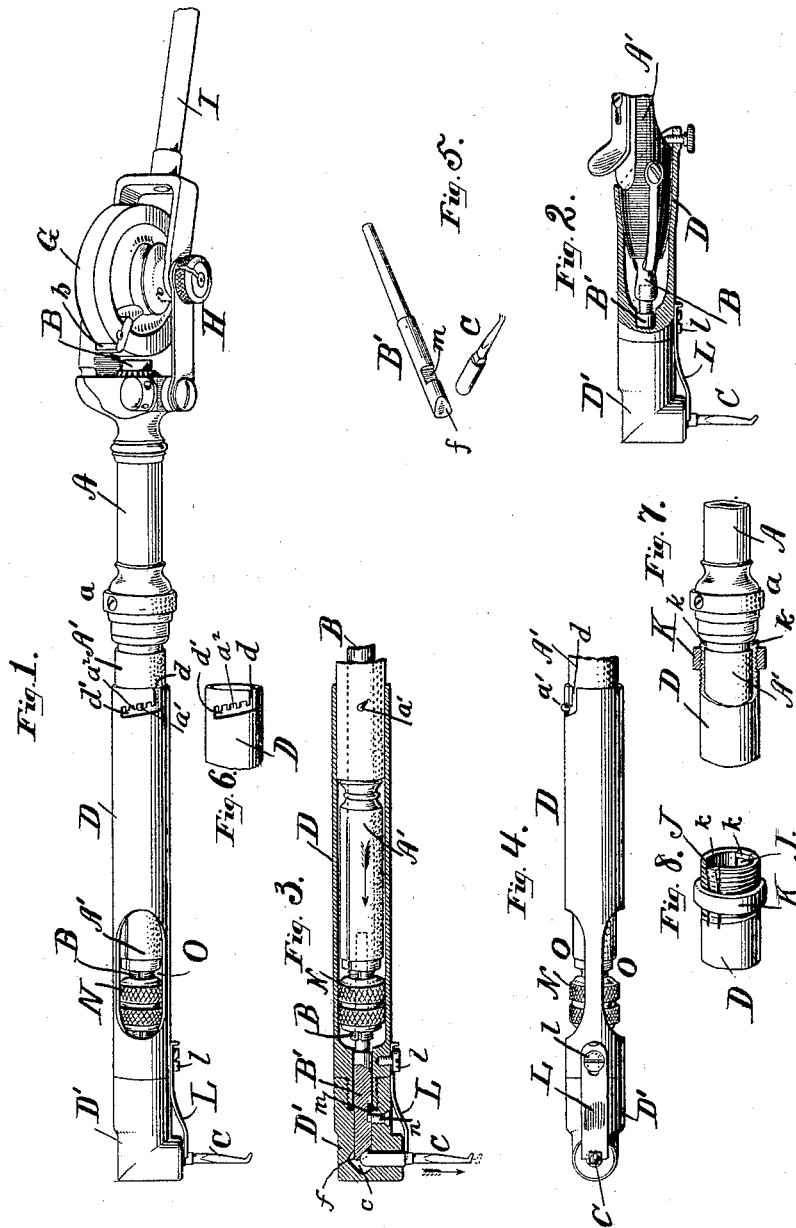


(No Model.)

W. G. A. BONWILL.
DENTAL PLUGGER.

No. 418,492.

Patented Dec. 31, 1889.



Witnesses:

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DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 418,492, dated December 31, 1889.

Application filed May 25, 1889. Serial No. 312,066. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. A. BONWILL, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Dental Pluggers, of which the following is a specification.

My invention relates to improvements applicable to dental pluggers, whether mechanically or electrically actuated, of the class in which the plugging tools, points, or pluggers proper are so arranged and operated as to move in striking and in retracting after blows are struck at angles to the directions of movement of their actuating or blow-imparting plungers or mallets; and my objects mainly are to provide an improved angle-plugger, simple in construction and efficient in operation, of that type of said class adapted for use in lieu of or interchangeably with straight pluggers, or those reciprocating in line with their actuating plungers or mallets.

The improvements deemed novel are hereinafter specifically claimed.

As in this instance organized my improvements are especially adapted for use in connection with the improved revolving hammer-plugger invented by me, one type of which is shown in United States Letters Patent No. 378,920, dated March 6, 1888.

In the accompanying drawings, which show the preferred embodiment of my improvements, Figure 1 is a view in perspective thereof, adapted to be mechanically operated. Fig. 2 is a similar view of portions thereof, adapted to be electrically operated. Fig. 3 is a view, partly in longitudinal section, showing details of parts of the angle-plugger attachment. Fig. 4 is a view representing parts shown in Fig. 3 at a right angle thereto. Fig. 5 shows the plugging tool or point and the plunger end or striker therefor detached. Fig. 6 represents a detached end portion of the angle-attachment casing. Figs. 7 and 8 are detail views representing a modification of the connection of the angle-attachment casing.

It is not deemed necessary to herein describe in detail all features of the complete instrument, as many parts used in connection with my improvements may be of any suit-

able well-known construction—such in some respects, for instance, as shown and described in the before-mentioned Patent No. 378,920, and in United States Letters Patent No. 402,156, dated April 30, 1889.

The inner or outer casing-sections A A' have swiveling connection with each other at *a*, so that the outer or hand-piece section A' of the casing, while having no longitudinal movement, may turn freely relatively to the inner section about its longitudinal axis. A suitably-rotated hammer G is mounted on its shaft in the jointed yoke H, which has a supporting-arm I, and the inner section of the casing is connected with and rocks about the axis or shaft of the hammer. A mallet or plunger B, mounted to reciprocate in the casing A A', projects at its inner end therefrom, so as to be struck by the projection *b* of the revolving hammer. The plunger is made adjustable toward and from the hammer in order to regulate the force of the blows. The plunger-adjusting mechanism in this instance employed is the same as set forth in patent No. 378,920, above referred to, and as shown in said patent the plunger is provided at its outer end with a clamp, the plunger being split, screw-threaded, slightly tapered, and fitted with a nut, so as to operate in an obvious way to grip and admit of the removal of a suitable tool or an end section or plunger-striker B' of the angle-plugger attachment.

A casing of the angle attachment envelops and is detachably connected with the hand-piece-casing section A', and consists of a main or body section D and an end portion or nose-piece section D', having detachable screw-threaded connection therewith, as plainly shown in Fig. 3. Normally this outer or angle-attachment casing has no movement relatively to or independently of the hand-piece casing, the two casings moving together during operation of the instrument.

To provide for readily connecting and separating the angle-attachment casing and the hand-piece casing, as well as provide for slight adjustment of the angle-attachment casing longitudinally and relatively to the hand-piece casing, for a purpose further on to be explained, a pin *a'* is fixed to the hand-piece

casing, and the outer or angle-attachment casing has an angular slot $d d'$ in it. The longitudinally extending or entering portion d of this slot extends from the rear end of the outer casing forward a short distance and intersects the portion d' of the slot, which is inclined or oblique to the entering portion, the outer end of the portion d' of the slot being farther from the end of the casing than that end intersected by the entering slot. Notches a^2 are provided in the rear wall or side of the portion d' of the slot to be engaged by the pin a' .

It will be seen that the parts may be quickly put together and separated, and that the outer or angle-attachment casing may be moved longitudinally upon the hand-piece casing by turning, the pins securely engaging the parts in the desired position by means of the notches or teeth of the slot-wall.

Although I prefer the above-described adjustable connection between the inner and outer casings, these parts may be otherwise detachably connected—as, for instance, in the manner represented in Figs. 7 and 8, where the outer casing is shown as screw-threaded and split at its inner end and provided with spring-arms or yielding tongues J , having inwardly-projecting end flanges k , which by means of an adjusting screw-threaded sleeve or nut K may be caused to grip the inner or hand-piece casing, and thus securely engage or clamp the parts together. The angle-plugging tool or point C is carried by the nose-piece of the outer casing and projects therefrom laterally thereto. A socket or bearing, in which the tool and its holder reciprocate in a right line at an angle to the casing, extends from the hollow central portion or cavity c of the nose-piece through its side, and a spring L acts upon the tool to retract it after each forward movement thereof. As shown, the tool-holder is formed integral with the tool, being constituted by the shank portion thereof. The tool-holder is shaped to fit its relatively stationary bearing nicely, but without binding, the holder and its bearing being preferably round, with the holder end beveled or rounded off. In advance of the rounded holding or shank portion of the tool it is shouldered and squared, and the tool-holder-actuating spring L is forked at its outer end to embrace the squared portion of the tool and bear against the shoulder thereof. Turning of the tool-holder is in this way prevented, and, moreover, provision is made for readily disengaging the spring from the tool by sliding the spring out of contact therewith. This sliding movement of the spring is provided for by the slot therein, through which passes a screw l , for securing it to the main or body section D of the outer or angle-attachment casing. The turned-up end of the spring may be engaged by the finger-nail to slide it when its fastening-screw is loosened. It will be seen that tools may readily be inserted and secured and removed from their

bearing or holding socket in the angle-attachment casing. The outer section of the plunger—that is, the striker B' thereof—is formed with an inclined or beveled end or tool-actuating striking-face f , which, as the plunger is struck by its hammer, bears and slides upon the inner end of the tool shank or holder and projects the tool, forcing it outward against the stress of its spring.

The plunger-striker has a notch or slot m in its side, into which projects the end of a screw-pin n , serving to prevent turning movement of the striker. If desired, the plunger-striker B' may constitute one piece with the plunger B , but the sectional construction is deemed preferable, permitting of ready adjustments and change of tools and the substitution of a new striker for one whose striking-face may have become worn by its sliding contact with the tool-holder.

In lieu of the tool C having the shank extending to the plunger-striker, and thus providing a holder integral with the tool, as shown, a suitable separately-made tool holder or chuck may be provided for the tool, and this holder be rounded or beveled at its inner or butt end, in sliding contact with which the striking-face of the plunger works.

To insure proper contact of the plunger-striker with the tool-holder, the inclined or beveled striking-face f is shown as made concave or rounded transversely to its incline, as best represented in Fig. 3. If, however, it be preferred to use a tool holder or shank with a plain surfaced or squared inner or butt end, this rounding of the striking-face transversely to its incline may be dispensed with.

To permit ready access to the nut N of the clamp for securing the striker to the plunger and releasing it therefrom, the outer casing is cut away or formed with openings O at opposite sides to admit the finger and thumb.

By means of the adjustable connection between the angle-attachment casing and the hand-piece casing, Figs. 1, 3, 4, and 6, it will be seen that the force of the blows imparted to the plugger-point may be varied, as also the amount of movement or length of stroke of the plugger-point, it being understood that the plugger-retracting spring acts always with a tendency to move the plugger inward to the maximum extent of movement allowed it, thus keeping it always pressed against the plunger-striker face, unless the parts be so adjusted, as it will readily be seen they may be, as to throw the plugger out of action by failure of the plunger-striker to operate upon it.

By reference to Fig. 2 it will be understood that features of my improvements may advantageously be applied to electro-magnetic pluggers of well-known construction. In this figure the parts are lettered to correspond with like or equivalent parts of the other figures of the drawings.

From the foregoing description it will be understood that my improved attachment,

with an angle plugging-tool, may readily be applied to an ordinary plugging-instrument in place of the straight plugging-tool, or the latter substituted for the former, and that the parts of the angle attachment are compactly arranged and occupy but little space, being thus best adapted for use. It will further be understood that my improvements may be applied to various instruments as well as to that in connection with which they have herein particularly been described, and that the parts may be modified in sundry respects without departure from essential features of my invention—as, for instance, by rounding or squaring instead of inclining the face of the plunger-striker, which in action has sliding contact with the inner end of the tool-holder, and in this event inclining or beveling the inner end of the tool-holder; but I prefer the construction illustrated by the drawings and hereinbefore in detail described, with the plunger-striker provided with the inclined face.

I claim as my invention—

1. The combination of the angle-attachment casing, the plugging-tool with its holder reciprocating in a bearing in said casing, and the rectilinearly-reciprocating plunger-striker having the inclined striking-face operating by direct sliding contact upon the tool-holder to force the tool outward at an angle to the direction of the blow, substantially as and for the purpose set forth.

2. The combination of the hand-piece casing, the angle-attachment casing, the rectilinearly-reciprocating plunger-striker provided with a striking-face, and the tool provided with the holder reciprocating in a bearing in the angle-attachment casing and operated upon by direct sliding contact therewith of the

striking-face of the striker-plunger, whereby the tool is moved at an angle to the direction of the blow, substantially as and for the purpose set forth.

3. The combination of the rectilinearly-reciprocating plunger-striker and the plugging-tool carried by its reciprocating holder, having the rounded or beveled inner end directly upon which the plunger-striker acts by sliding contact, substantially as and for the purpose set forth.

4. In a dental plugger, a plunger-striker having the striking-face provided with the bevel or incline, and concaved or rounded transversely to the incline, substantially as and for the purpose set forth.

5. The combination, in a dental plugger, of the tool with its holder, having the rounded or beveled inner end, and the plunger-striker having the inclined or beveled striking-face concaved or rounded transversely to its incline, substantially as and for the purpose set forth.

6. The combination of the hand-piece casing, the angle-attachment casing having detachable and longitudinally-adjustable connection with the hand-piece casing, the spring-retracted plugging-tool carried by the angle-attachment casing, the plunger, the striker having a striking-face, and the means, as the pin *a'* and notched angular slot *d d'*, for securely engaging the hand-piece casing and the angle-attachment casing in their adjusted positions, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

WM. G. A. BONWILL.

Witnesses:

WILLIAM J. WALL,
JOHN W. LEWIS.