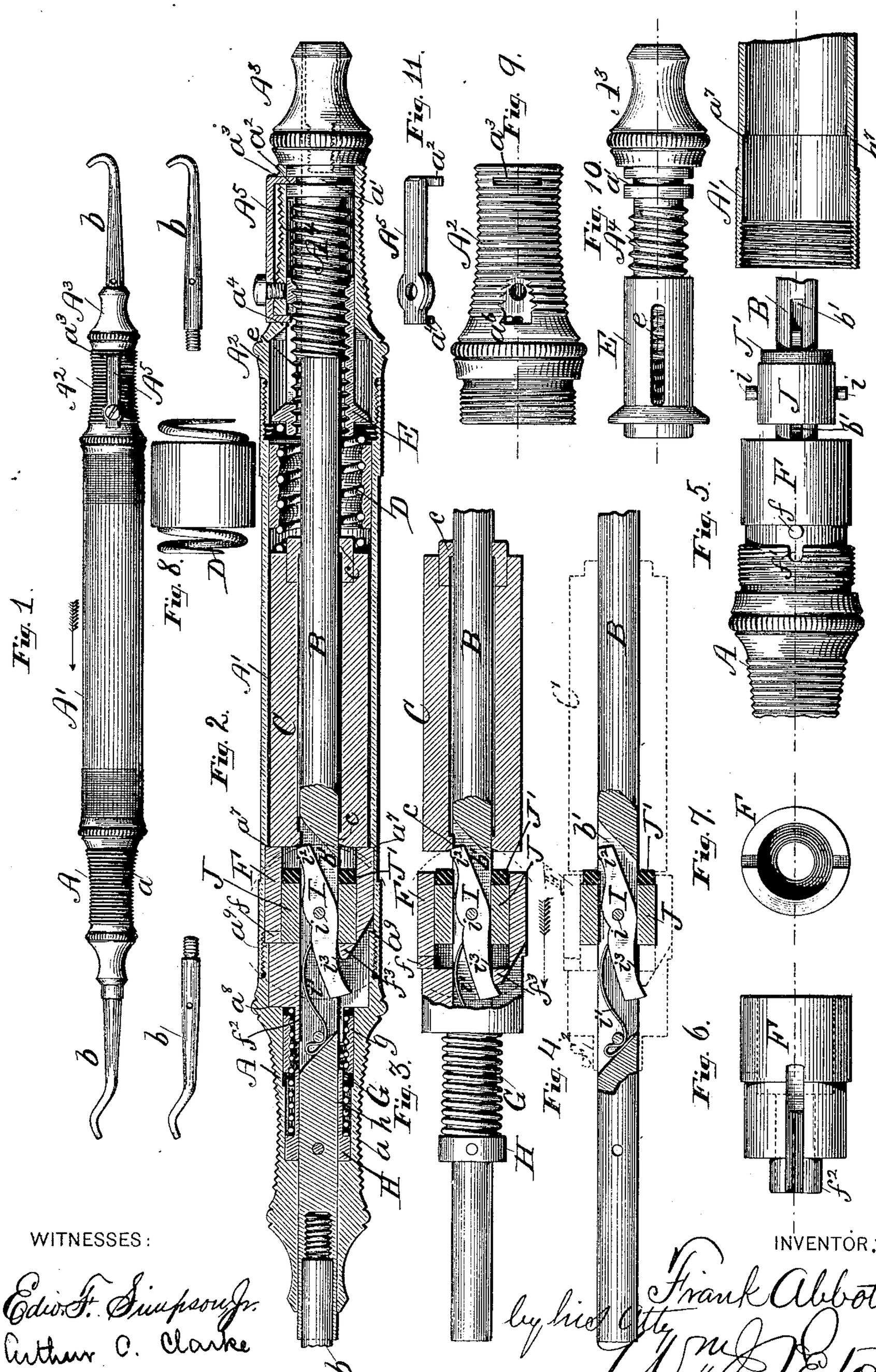
(No Model.)

F. ABBOTT.

DENTAL PLUGGER.

No. 368,179. Patented Aug. 16, 1887.



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DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 368,179, dated August 16, 1887.

Application filed March 21, 1887. Serial No. 231,746. (No model.)

To all whom it may concern:

Be it known that I, FRANK ABBOTT, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Dental Pluggers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in dental pluggers of the type known as "hand-pluggers," (as distinguished from engine-driven pluggers,) in which the blows of the sliding hammer are communicated to the plugger-point by means of a spring operated by the pressure of the plugger-point upon the filling which is to receive the blow and which is to be impacted or condensed in the cavity of the tooth.

The object of my invention is to improve hand-pluggers by simplifying their construction and improving the effectiveness of their operating organism.

To this end my invention consists of certain novel organizations of parts and combination of devices which will first be described, with the aid of the accompanying drawings, in detail, as embodied in the best way now known to me, and then particularly recited in the claims at the close of this specification.

In said drawings, Figure 1 is a view in elevation of the improved plugger about the usual size of such instruments. Fig. 2 is a longitudinal section therethrough, enlarged for the sake of clearer illustration, and showing the parts in their normal position or at rest. Fig. 3 is a view of the front end of the internal parts of the instrument, partly in section, and showing the parts in the position they occupy in operating, with the hammer raised and just prior to being tripped to deliver its blow upon the plugger-point or tool-holder. Fig. 4 is a view substantially similar to that of Fig. 3, with the sliding hammer and tripping portion of the instrument shown in dotted lines. This view shows more clearly the blow-receiving collar and its hard-rubber or equivalent facing of the tool-carrying shaft or spindle and the spring which acts upon the hammer-raising tripping-lever carried by said spindle and also the position of the parts just after the lifting-lever has been tripped and the hammer thrown forward to strike the blow-receiving surface or end of said spindle-collar. Fig. 5 is a view of a portion of the instrument, showing more particularly the front section of the casing and the tripping-case, the blow-receiving collar and the spindle being drawn back, and the front end of the handle or middle section of the casing being shown detached and in section. Fig. 6 is a view of the tripping-case detached, showing more particularly its slotted side to accommodate movements of the tripping-lever rocking therein. Fig. 7 is a view of the end of said tripping-case, showing slots or recesses therein to receive the projecting ends of a pin which pivots the tripping-lever in the spindle, and which passes through the blow-receiving collar, said pin ends fitting said slots or recesses of the tripping-case to prevent the spindle from turning. Fig. 8 is a view in elevation of the incased hammer impelling or striking spring. Fig. 9 is a view of the main portion of the rear casing-section, and Fig. 10 is a view of the minor or other portion of said rear casing-section, showing its connection with a male-screw tube, which reciprocates a female-screw tube or nut to control the power of the hammer or striking spring to regulate the blow to be struck. Fig. 11 is a perspective view of the retaining-plate coupling the two portions of the rear casing-section together, with the capacity of the minor or end portion to turn relatively to the other portion in regulating the power of the impelling or striking spring.

The casing of the instrument is preferably tubular and made in three main sections, a front section, A, a main or handle section, A′, and a rear section, A^2 A^3. The front section is or may be roughened, as at *a*, to afford a better grasp for the fingers of the operator, and is screw-threaded, so as to screw into the front internally-threaded end of the main section A′. The front end of the rear section, A^2 A^3, is likewise threaded to screw into the rear internally-threaded end of said main section A′. Said rear section is made up of two por-

tions, A^2 A^3, the portion A^3 fitting in the portion A^2 by means of a front sleeve, A^4, forming part of the portion A^3, and said portion A^3 having an annular, groove, a', to receive the bent end a^2 of a plate, A^5, fastened on said portion A^2, with its bent end a^2 passing through a slot, a^3, into said groove a'. By this coupling of the portions A^2 A^3 together the portion A^3 swivels or turns on the portion A^2, so as to revolve the sleeve A^4 for a purpose which will hereinafter appear.

A central spindle, B, passes through the casing from end to end, and its ends are screw-threaded to receive the threaded ends of the tools or plugger-points *b*, one for each end of the instrument, as is common, so that thrust and pull blows can be delivered and all character of fillings reached. Separate views of the tools are also shown in Fig. 1, and they may of course be secured in the tool-holding spindle in other ways than by the screw-threaded ends.

The hammer C is fitted to the spindle B so as to be guided and slide freely thereon without frictional contact at its periphery. This permits easy action. The bore of the hammer is preferably of smaller diameter at its ends than between them, so as to fit the hammer to slide on the spindle by end bearings, *c c*. This reduces the friction to a minimum. The hammer C is thrown forward by an impelling or striking spring, D, when the hammer is moved back to compress said spring, and is then released or tripped in the usual way. This spring, however, is peculiar. It has no frictional bearing at its outer side against the interior of the casing, which is objectionable. On the contrary, it is fitted with a covering—such as leather—having frictional contact with the casing and in which the spring may be compressed and expand in action. This covering has another function. It prevents noise from the spring, stopping vibration and making the action of the spring noiseless. The front end of said striking-spring D bears against the rear end of the hammer and its rear end against the front end of an adjusting nut or thimble, E. This adjusting-nut is internally threaded, and works on male threads of the sleeve A^4 of the swiveling portion A^3 of the rear casing-section. The nut is held from turning by the front bent end a^4 of the plate A^5, which passes through a hole, a^6, in the casing-section A^2 A^3 into a longitudinal slot, *e*, of said nut E.

Obviously, upon turning the sleeve A^4 of the swiveling portion A^3 of the rear section of the casing, the nut E may be moved back and forth to regulate the tension or force of the striking-spring D, and consequently the force of the blows administered by the hammer C to the plugging point or tool.

The front end of the hammer is the striking end, and normally rests upon an annular shoulder formed by the rear end of a sleeve, F, which I term the "tripping-case." (See Fig. 2.) This tripping-case is confined between a shoulder, a^7, of the main casing-section A' and a shoulder or shoulders of the front casing-section, A—as, for instance, at a^8 and a^9—and is locked from turning by a lug or pin, *f*, which enters a slot, *f'*, in the casing-section A. (See Figs. 2 and 5.) The spindle B passes through this tripping-case F, and its front end f^2 is much reduced, so as to permit the rear end of the case-raising spring G to be fitted thereon and bear against the tripping-case as a shoulder. The front end of said case-raising spring bears against a shoulder formed by a collar, H, pinned to the spindle B, the rear reduced end, *h*, of said collar H forming a sleeve, and the space between the rear end of said sleeve and the front end of the tripping-case defines and limits the range of endwise movement of the casing of the instrument on the central spindle.

The case-raising spring G, like the hammer-spring D, is fitted with a cover, *g*—such as leather—and for the same purposes.

Within the tripping-case F the spindle B is slotted, as at *b'*, for example, to receive a rocking hammer raising and tripping lever or latch, I, pivoted by means of a through-pin, *i*. The ends of said pin also pass through a blow-receiving collar, J, so as to unite said collar firmly to the spindle B. This blow-receiving collar is fitted to work or slide in the enlarged bore of the rear end of the tripping-case F. One side of said tripping-case is slotted to permit of the passage of the tripping-lever I, and enable its tail end to rock or vibrate therein.

A spring, *i'*, acts on the tail end of the tripping-lever I, with a tendency to throw the rear or hammer end, i^2, of said lever crosswise of the slot in the spindle in which it is pivoted.

The lever I is peculiar. It has a curved end, i^2, the center of the curve being the axis of the lever. The end of the hammer, against which this curved end of the lever acts, is correspondingly curved, so that the rocking of the lever on its pivot merely causes its end to rub over the curved surface of the hammer end without, by the rocking of the lever *per se*, causing any elevation of the hammer, as a square or flat surface would do. This lessens friction and conduces to regular smooth action. The tail end of the tripping-lever has a curved or cam surface, i^3, to work against a cam-surface, f^3, of the tripping-case F.

The operation of the instrument is as follows: The normal position of the parts is as represented in Fig. 2. Now place the point of the plugging-tool on the filling to be compacted. Press on the casing, or push or pull, according to which end of the instrument is used. This causes the casing to slide on the spindle, and as the end of the hammer raising and tripping lever is in contact with the hammer forces the hammer to slide on the spindle and compress its impelling-spring. As the pressure continues the cam-surface on the tail end of the lever begins to work on the cam-surface of the tripping-case, and it is rocked

inward, so as to carry both ends of said lever within its slot in the spindle, and of course its hammer end out of lifting contact with the hammer. At the end of the necessary movement the lever is entirely withdrawn from contact with the hammer, or is tripped and released, and at this moment the striking-spring, with its accumulated power, impels the hammer quickly against the blow-receiving surface of the collar J, which during the movement of the casing on the spindle has been protruded or exposed, as in Figs. 3 and 4, beyond the end of the tripping-case. The blows are thus received on the collar J and communicated to the tool or point through the spindle B.

The blow-receiving collar is preferably provided with a hard-rubber collar, J′, to deaden the sound of the blows administered by the hammer.

The advantages of my instrument are simplicity of construction and easy effective operation.

I claim as my invention—

1. The combination of the casing, the hammer, the striking-spring of the hammer, the slotted adjusting-nut of said spring, the swiveling portion of the casing having an annular groove, and the interlocking connection of the casing fitting said slotted nut and annular groove, substantially as described.

2. The combination of the casing, an inclosed expanding and contracting spring, and a sound-destroying cover for said spring between it and said casing, substantially as described.

3. The combination, in a dental plugger, of detachable casing-sections fitted with an internal detachable tripping-case confined between shoulders of said detachable casing-sections, substantially as described.

4. The combination of the annular tripping-case, the spindle, the hammer fitted to slide on said spindle, and the pivoted hammer raising and tripping lever, substantially as described.

5. The combination of the casing, the slotted spindle, the hammer, the tripping-lever pivoted in the slot of said spindle, and a cam-surface in said casing to rock said lever to release the hammer, substantially as described.

6. The combination, with the hammer having a curved seat on its striking end, of a hammer raising and tripping lever having a curved lifting end to fit said curved end of the hammer, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK ABBOTT.

Witnesses:

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FRANK ABBOTT, Jr.