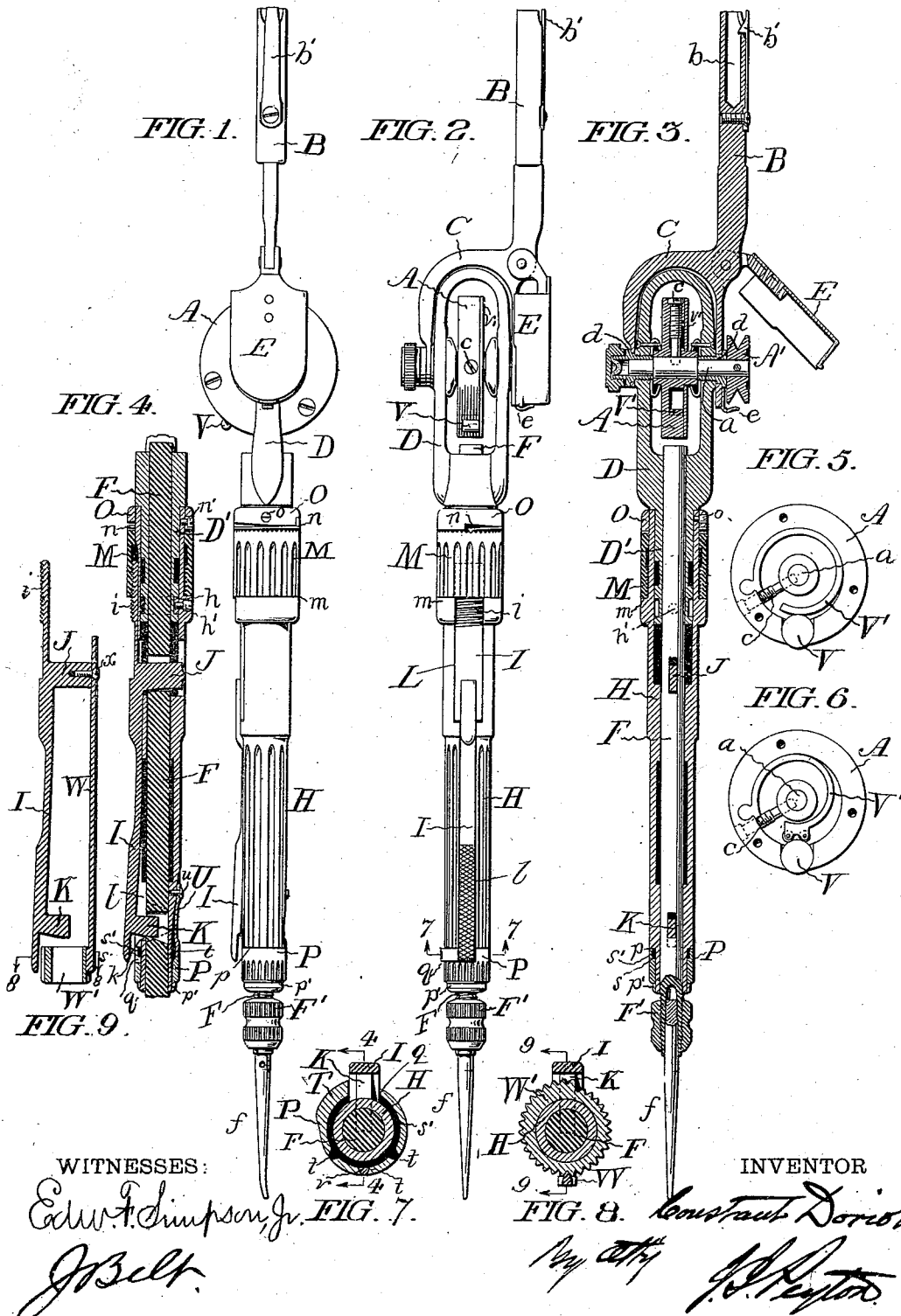


(No Model.)

C. DORIoT.
DENTAL PLUGGER.

No. 504,489.

Patented Sept. 5, 1893.



UNITED STATES PATENT OFFICE

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DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 504,489, dated September 5, 1893.

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To all whom it may concern:

Be it known that I, CONSTANT DORIOT, a citizen of the Republic of France, residing in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Dental Pluggers, of which the following is a specification.

My invention relates to certain improvements, as hereinafter specifically claimed, in automatic dental pluggers of the revolving hammer class.

In the accompanying drawings which show a suitable embodiment of my improvements, Figures 1 and 2 are views in elevation at right angles with each other. Fig. 3 is a view mainly in longitudinal central section, some parts being in elevation. Fig. 4 is a longitudinal central section as indicated by the line 4 of Fig. 7 at a right angle with Fig. 3 of portions of the plugger. Fig. 5 is a view of the rotary hammer, with its side plate or cover removed. Fig. 6 is a similar view, showing a hammer differing somewhat from that shown by Fig. 5. Fig. 7 is a section on an enlarged scale on the line 7 of Fig. 2. Fig. 8 is a section, enlarged, on the line 8 of Fig. 9, representing a modification, and Fig. 9 a section, on a reduced scale, on the line 9 of Fig. 8, the plunger and hand-piece casing being omitted.

In the organization shown the rotary hammer A of the plugger is adapted to be operated by a driving cord passing about a pulley A' on the shaft a of the hammer. The plugger is adapted for connection with the forearm or outer section of an engine arm of suitable well known construction, which is to be engaged with the socket b and spring catch b' of the connecting arm B so that this arm may turn freely about the engine arm. The connecting arm is connected to a yoke coupling C which has pivoted connection by way of the hammer shaft a with the plugger frame D. Bushing sleeves d d screwed into the plugger frame constitute bearings in which the hammer shaft rotates and also serve as journals for pivotally connecting the yoke coupling with the plugger frame. See Fig. 3. A set screw c serves to fasten the revolving hammer to its shaft. The pulley A' is protected by a hinged shield or open-top cover E

engaging with the catch e. This shield serves as a guard to prevent the driving cord from running off the pulley. The pulley, it should be noticed, is mounted outside the plugger frame D and coupling frame C, so as to be readily accessible when the inclosing shield is swung on its hinged connection with the coupling frame. A reciprocating, split-ended plunger F in which the plugger point f is clamped by a nut F' which serves as a finger rest, has suitable bearing in the hand-piece casing H and in the sleeve D' of the plugger frame. The casing is connected with the frame sleeve so as to turn freely, by means of a segmental piece or section of a ring h fitting so as to turn in an annular groove in the sleeve and secured to the casing by a screw h'. See Figs. 3 and 4.

An adjustable spring controlling arm I by means of which to regulate the length of stroke of the plunger and consequently the force of the blows struck by the plugger point, is provided as follows:—The controlling arm I is provided at one end with screw threads i, has a lug J near its screw-threaded end which passes through slots in the casing and plunger, and near its outer or free end is provided with a second lug K which is inclined on its outer or front edge and enters a slot in the plunger which is shouldered to provide a projection k which by contact with the lug limits inward movement of the plunger.

The casing is provided with a longitudinal recess L constituting a seat to receive the controlling arm at and near its rear end, and is longitudinally slotted at l in line with the recess to allow of the depression of the outer end of the arm. This controlling arm is rendered adjustable in the following way:—An internally threaded adjusting sleeve M fitting about the hand-piece casing in rear of an annular shoulder m thereon against which the sleeve abuts, engages the threaded end of the arm and serves to advance or retract it, as desired, to vary the endwise movement allowed the plunger. To prevent accidental turning of the adjusting sleeve it is provided at its rear end with serrations or V-shaped teeth which are engaged by a spring pawl n to yieldingly lock the sleeve against turning. This pawl is secured to the rear end of the

hand piece casing by means of a screw n' and by being engaged with a recess in a collar O secured by a screw o to the rear end of the casing. The pawl yields readily enough to allow of the adjusting sleeve being turned as desired.

Instead of the projection k in the plunger slot this slot may have an inclined front or rear wall as indicated by dotted lines Fig. 4, to be acted upon by the controlling arm lug K, and the incline of this lug be omitted. It will be seen that were the controlling arm terminated at its lug J there would still be provision for varying the throw or length of stroke of the plunger, as this lug is rendered adjustable in its slot in the plunger by the adjusting sleeve of the controlling arm.

An adjustable collar P turns on the nose end of the hand piece casing between an annular shoulder p and a collar p' suitably fixed in place, as by soldering. The adjustable collar has a recess or slot q formed in it corresponding in width with the slot l in the hand-piece casing. The slot q may be brought in line with the hand-piece slot by adjustment of the collar P, so that the end of the controlling arm beyond its stop lug may be depressed into this slot q . See Figs. 2, 4 and 7. The adjustable collar has an annular internal shoulder at s thus producing an annular recess s' . See Figs. 3 and 7. Three slots t are made through the recessed portion of the collar, and this collar is formed with a projecting or thickened portion T at one side of its slot. A spring locking catch U secured by a screw u to the hand-piece casing extends at its free end into the annular recess s' of the adjustable collar, and has an inclined rib v adapted to be sprung into any one of the slots t with which it may be brought to register by the turning of the collar. See Figs. 4 and 7. The catch may readily be depressed by the finger to disengage its rib from the collar to permit the latter to be turned; or the collar may be turned by the application of sufficient force without pressing upon the catch with the finger, the inclination of the rib being such that the walls of the collar slots when firmly pressed against it will force it out of locking engagement with the collar.

The revolving hammer A is provided with a spring-actuated tappet V which may either be a ball or cylindrical roller. The tappet (see Figs. 5 and 6) rolls in its bearing socket in the hammer thereby lessening friction and reducing wear, while insuring a smoother or less jarring blow upon the plunger than that struck by a tappet such as ordinarily used. The tappet-actuating spring V' may be of any suitable kind. In Fig. 5 it is shown as curved or bowed, being secured in place by a projection at one end entering a recess in the hammer, and bearing upon the roller tappet near its opposite end. Fig. 6 shows a bowed spring having anti-friction rollers at its free end for bearing upon the tappet. The side

plate v' of the hammer, secured in place by screws, serves to prevent displacement of the parts and protects them from dust, &c.

From the above description it will be seen that with the parts in the position in which they are represented in Figs. 1, 2, 4 and 7, with the adjusting sleeve M properly set to bring the lug K of the controlling arm into desired position relatively to the projection k of the plunger, (or the inclined wall of the plunger slot in lieu of this projection) the operation will be as follows:—The plugger point being held against or in close proximity to the filling to be compacted, and the rotary hammer in motion, the tappet strikes blows in rapid succession upon the plunger, and the force of the blows may be governed by depressing the controlling arm more or less so as to vary the amount of play allowed the plunger to the desired extent. When it is desired to limit the amount of play allowed the controlling arm the adjustable collar P is turned to move its slot out of line with the slot in the hand piece casing and bring beneath the end of the arm that portion of the collar at the side of its slot opposite its projecting or thickened portion, in which position the collar is locked by the catch U which now engages with a slot t of the adjustable collar at one side of the slot with which it before engaged. Only slight variation in the force of the blow by manipulation of the controlling arm is allowed with the parts in this position as the extent to which the controlling arm may be pressed inward is limited by contact of its free end with the collar. When it is desired to dispense with the actuation of the controlling arm to vary the blow, the adjustable collar is turned and locked by its catch in position to present the projecting portion of the collar beneath the arm end, and thereby prevent its depression.

In the construction shown in Figs. 9 and 10, the locking catch U is replaced by a spring locking catch W, and in place of the recessed adjustable collar P there is used a cam-shaped or eccentric turning collar W' provided with V-shaped notches in its outer surface. The controlling arm is threaded as before to be acted upon by the adjusting sleeve M and the lug J of the arm extends through the hand-piece casing and is detachably connected by a screw x with the spring locking catch W. It will be seen that by turning the adjustable collar W' the lug K of the controlling arm may be set to vary the play allowed the plunger, thus altering the force of the blows struck by the hammer as will readily be understood.

I claim as my invention—

1. The combination of the hand-piece casing, the slotted plunger therein, the controlling arm provided with the lug or lugs for acting on the plunger, and the adjusting sleeve for imparting endwise movement to the controlling arm, substantially as set forth.
2. The combination of the hand-piece cas-

ing, the slotted plunger, its lugged controlling arm, the adjusting sleeve toothed or serrated at its end, and the spring pawl yieldingly locking the adjusting sleeve against movement, substantially as set forth.

3. The combination of the hand-piece casing, the slotted plunger, its lugged controlling arm, the adjustable collar turning about the nose end of the hand-piece casing for limiting movement of the controlling arm, and the spring locking catch for securing the adjustable collar in its adjusted position, substantially as and for the purpose set forth.

4. The combination, in a dental plugger, of the revolving hammer, the roller tappet there-

of, and the spring acting upon the roller, substantially as set forth.

5. The combination of the plugger frame, the coupling frame, the pulley for actuating the revolving hammer mounted outside said frames, and the pulley inclosing shield hinged to the coupling frame, substantially as and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name.

CONSTANT DORiot.

Witnesses:

ROBT. S. GORDON,
GEORGE I. MORGAN.