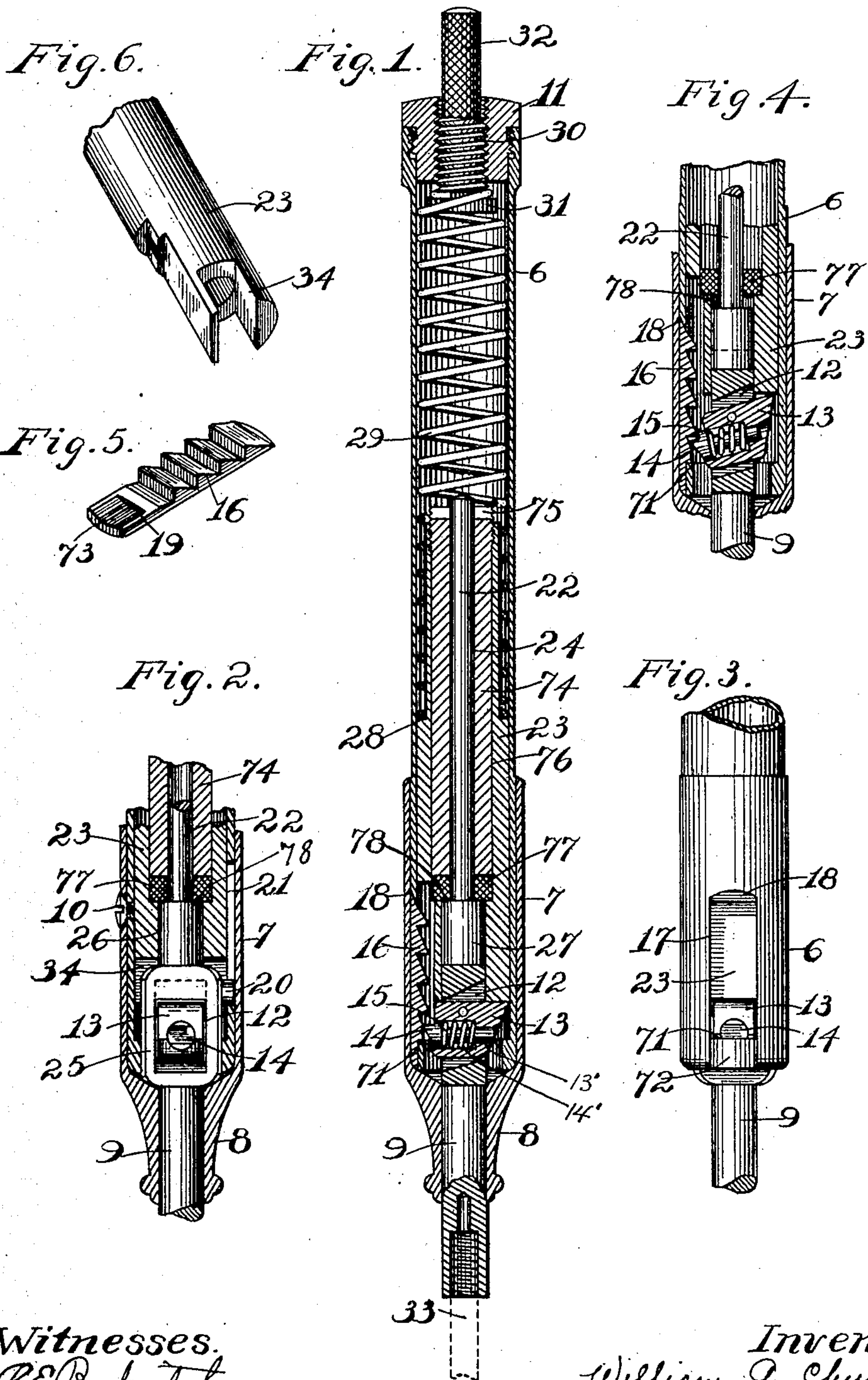


W. G. CHURCH.
DENTAL PLUGGER.
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916,387.

Patented Mar. 23, 1909.



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UNITED STATES PATENT OFFICE.

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DENTAL PLUGGER.

No. 916,387.

Specification of Letters Patent.

Patented March 23, 1909.

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To all whom it may concern:

Be it known that I, WILLIAM G. CHURCH, citizen of the United States of America, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Dental Pluggers, of which the following is a specification.

My invention relates to the class of devices more especially employed for condensing and compacting the gold in the filling of teeth and the object of my invention is to provide a device of extreme simplicity in construction and operation.

A further object of the invention is to provide a device requiring comparatively little power in its operation.

A form of device in the use of which these objects may be attained is illustrated in the accompanying drawings in which—

Figure 1 is a view illustrating my improved plugger cut in central lengthwise section. Fig. 2 is a like view of the lower end of the plugger on a plane at right angles to the plane of the view of Fig. 1. Fig. 3 is a view in elevation of the lower end of the plugger with the outer sleeve removed. Fig. 4 is a view in central section through the lower end of the plugger illustrating the hammer partially raised. Fig. 5 is a detail perspective view of the rack. Fig. 6 is a detail perspective view of the lower end of the hammer.

In the accompanying drawings the numeral 6 denotes a case constructed of any suitable metal and preferably round in form in cross section. One end of this case is partially closed by a tipped sleeve including the sleeve proper 7 fitting about the end of the case, and reduced to form a tip 8 through which the end of a tool holder or spindle 9 projects. This sleeve may be held in place in any suitable manner, a screw 10 being shown herein to accomplish this purpose. The opposite end of the case is closed by a cap 11 suitably held in place, as by means of interengaging screw-threads as shown. The spindle or tool holder 9 has a lateral opening 12 within which is pivoted a hammer-operating lever 13. This opening 12 is preferably formed in an enlarged portion 25 of the tool holder, such enlarged portion being substantially in the form of an open frame and affording means for mounting the hammer operating lever in the tool holder without

weakening the latter. The lever 13 extends transversely of the spindle and projects on opposite sides thereof.

The hammer-operating lever is provided with an opening 13' counterbored as at 14' for a portion of its length, and in this opening is mounted a pawl 14, the shank of which is surrounded by a spring 15 accommodated in the opening by the counterbored portion 14' thereof, one end of said spring abutting against the inner end of the head of said pawl, and the other end thereof abutting against the shoulder at the inner end of the counterbored portion 14'. The pawl 15 may therefore reciprocate longitudinally in its seat, and, by means of the spring 15, is normally held in engagement with a rack 16 secured to the case 6. In the preferred form of construction this rack is separately formed from the case and is secured in an opening 17 in the case. This opening has a beveled end 18 against which the beveled end of the rack rests. The rack is held against lengthwise movement in any desired manner with the two beveled surfaces in contact, thus preventing the rack from passing into the opening in the sleeve. As will be noticed the rack is of such thickness as to conform to and lie in the outer plane of the case 6 so that the sleeve 7 engages the rack and holds it in position against its seat. In the form herein shown a shoulder 19 is formed on the rack which abuts against the end 71 of the opening 17, which latter terminates short of the end of the case.

A groove or recess 73 is formed in the inner surface of the rack at its lower end, this groove or recess preferably being of a width corresponding with the width of the opening 17 and forming a passage of such depth as to leave a portion of the body of the casing 6 which forms a bridge or seat 72 to support the lower end of the rack 16 the shoulder 19 of said rack abutting against the upper edge of said bridge or seat.

A lug 20 is formed on the enlarged portion of frame 25 of the spindle and engages in a slot 21 in the case to prevent relative turning movement of the parts. A shank 22 projects from the upper end of the spindle into an opening 24 in a hammer. This hammer in the preferred form of construction, and as herein shown, is composed of two pieces, a body 23 having an opening

within which is located a filling piece 74 which, in the form of device herein illustrated, is provided with an opening 24. This filling piece is secured in position by means of interengaging screw-threads as shown in Fig. 1 of the drawings and may have a slot 75, to receive a screw driver or other implement by means of which the parts may be disengaged. A chamber is formed at the lower end of the filling piece in which is located a cushion 77 mounted on the shank 22 of the spindle to contact with the shoulder 78 thereon, and the screw threaded engagement between the filling piece and body of the hammer allows for such adjustment of the parts that the cushion 77 will strike the shoulder 78 formed on the spindle 9 at the same time that the end of the hammer is brought to rest against the lever 13. The cushion thus relieves the spindle from the hard metallic blow, which would otherwise be given by the hammer and which is particularly disagreeable in the use of devices of this class. It is not absolutely essential to my invention however that the hammer shall be formed as described, as the filling piece may be omitted and the entire hammer constructed of a single piece.

The lug 20 is retained in place in the slot 21 by the following construction. The enlarged portion or lever support 25 on the spindle is of a size to permit lateral play within the case to a degree sufficient to disengage the lug from the slot. The hammer 23, however, while of a size to slide freely within the case, yet is permitted practically no lateral play. The shank 22 fits so closely within the opening in the hammer that when in place in the opening lateral play of the spindle is prevented. In assembling the parts the spindle is first inserted in the case and the lug 20 engaged with the slot 21. The hammer is now inserted and the shank 22 projected into the opening therein. This engagement of the parts now prevents any lateral play of the spindle and therefore holds the lug in engagement with the slot, the latter limiting the movement of the spindle within the case. As shown herein an enlarged chamber 26 is formed in the hammer within which an enlargement 27 on the spindle may engage.

The hammer 23, as before stated, while closely fitting the case has a free sliding movement therein and has a shoulder 28 against which the spring 29 abuts. This spring is used for forcing the hammer against an anvil on the spindle, and also for returning the parts to their normal position, thus serving a double purpose.

The tilting lever 13 hereinbefore referred to, and which acts to raise the hammer, constitutes the anvil on which the blow of the hammer is received and transmitted to the spindle 9. By reference to Fig. 1 it will be evident, that if the case 6 is forced down-

wardly or toward the spindle 9, the pawl 14 engaging the outermost tooth on the rack 16, will cause the lever 13 to be rocked on its pivot and be moved to the position shown in Fig. 4, and in this movement, the lever 13 has raised or forced the hammer toward the outer end of casing 6 and has thereby increased the tension on the spring 29. As soon as the pawl 14 swings clear of the outer tooth on the rack 16, the spring 29 forces the hammer downward or toward the spindle 9, and the lever 13 being arrested in its return movement when it reaches the position shown in Fig. 1, the blow of the hammer is delivered on this lever and by it transmitted to the spindle 9. This operation is continued until the range of movement of the spindle is exhausted. It will be evident that as soon as pressure is relieved from the casing 6, that the spring 29 forces the hammer and spindle to their outermost, or normal position, after which the operation may be repeated.

As a means of adjusting the tension of the spring a pin 30 having a flange 31 engaged with the spring is adjustably secured within the cap 11, as by means of interengaging screw-threaded parts. The projecting end 32 of the pin, which may be milled, is accessible for the purpose of adjusting the tension of the spring.

In the operation of the parts as the tool 33 secured within the spindle is held against the filling in a tooth, and the case moved downward, the pawl 14 engaging a tooth on the rack 16 causes the lever 13 to be tilted on its pivot. The engagement of the end of the lever with the lower end of the hammer raises the latter within the case against the tension of the spring 29. It will be noted that this lifting of the hammer places an additional tension on the spring to that caused by the movement of the case downward upon the spindle. When the lever has been tilted to a certain position, (shown as partially tilted in Fig. 4) the pawl 14 is swung from engagement with the tooth on the rack, and the tension on the spring 29, immediately throws the hammer downward bringing the lever 13 to its normal position and stopping this downward movement of the hammer due to the pawl engaging with the next succeeding tooth on the rack. The upper end of the lever thus acts as an anvil to receive the blow which is transmitted to the spindle and thence to the tool held thereby. Only that portion of the tension on the spring caused by the lifting of the hammer is relieved in the disengagement of the pawl, that portion of the tension on the spring caused by the movement of the case downward being retained. The case being now further lowered the operation is repeated with the effect, however, that the blow is a trifle heavier owing to an extra tension on the spring caused by a further movement of the

case on the spindle. The operation is then repeated, several successive blows being imparted to the tool, four being the number to which the tool herein shown and described is subjected. As soon as the tool is relieved of pressure, the spring 29 acts to return the parts to normal position, the pawl 14 riding over the teeth of the rack 16 during such movement.

10 The lever support is flattened on opposite sides, this flattened portion resting within a groove 34 in the lower end of the hammer by means of which relative turning movement of the hammer and spindle is prevented.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a dental plugger, the combination with a case, of a spindle movable lengthwise within the case, a hammer mounted within the case, a lever of the first class pivotally mounted in the spindle, engaging means between one end of the lever and case for operating the former to cause the other end thereof to engage and move the hammer in the case, means for successively disengaging the lever from the case in a movement in one direction of the latter, and a spring located within the case and thrusting against the hammer to cause the latter to deliver successive blows on the spindle as the lever is successively disengaged from the case.

2. In a dental plugger, the combination with a case, of a spindle movable lengthwise in the case, a lever pivoted in the spindle, a hammer movable within the case and operatively connected with one end of the lever, a pawl mounted in the opposite end of the lever, rack teeth on the case engaging said pawl, and a spring thrusting against said hammer.

3. In a dental plugger, the combination with a case, of a spindle movable lengthwise within the case, a hammer mounted to deliver a blow upon the spindle, means for operating the hammer, a rack removably secured to the case, a lever pivotally mounted in the spindle, a spring-pressed pawl car-

ried by said lever to engage said rack, and a spring located within the case and thrusting 50 against said hammer.

4. In a dental plugger, the combination with a case having a rack opening therein, a rack secured within said opening, and a sleeve to hold the rack within its opening, 55 of a spindle movably mounted within the case and provided with an enlarged intermediate portion, a hammer movably mounted on said spindle to deliver a blow upon the same, a lever pivotally mounted in said enlarged portion of the spindle, a pawl mounted in said lever for engagement with said rack, said lever and pawl constituting connections between said hammer and rack for operating the former, and a spring located within the 65 case and thrusting against the hammer.

5. In a dental plugger, the combination with a case having an opening, a rack fitting within said opening, and having teeth projecting within the case, and a sleeve fitted 70 upon one end of the case and holding said rack in position and formed with a tip, of a spindle located within the case and projecting through said tip, a hammer movably mounted on said spindle to deliver a blow 75 upon the same, a pivoted lever and a pawl carried by said spindle, said pawl engaging said rack, and a spring located within the case and thrusting against said hammer.

6. In a dental plugger, the combination 80 with a case, of a spindle movable lengthwise within the case and arranged to receive the blow of a hammer, a hammer mounted within the case, a lever pivotally mounted in the spindle, a spring for normally holding 85 the hammer in engagement with said lever, means for actuating the lever to cause the same to operate the hammer and deliver a blow on said spindle, and a cushion interposed between the spindle and the hammer 90 to receive the blow of the latter.

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Witnesses:

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