

No. 628,524.

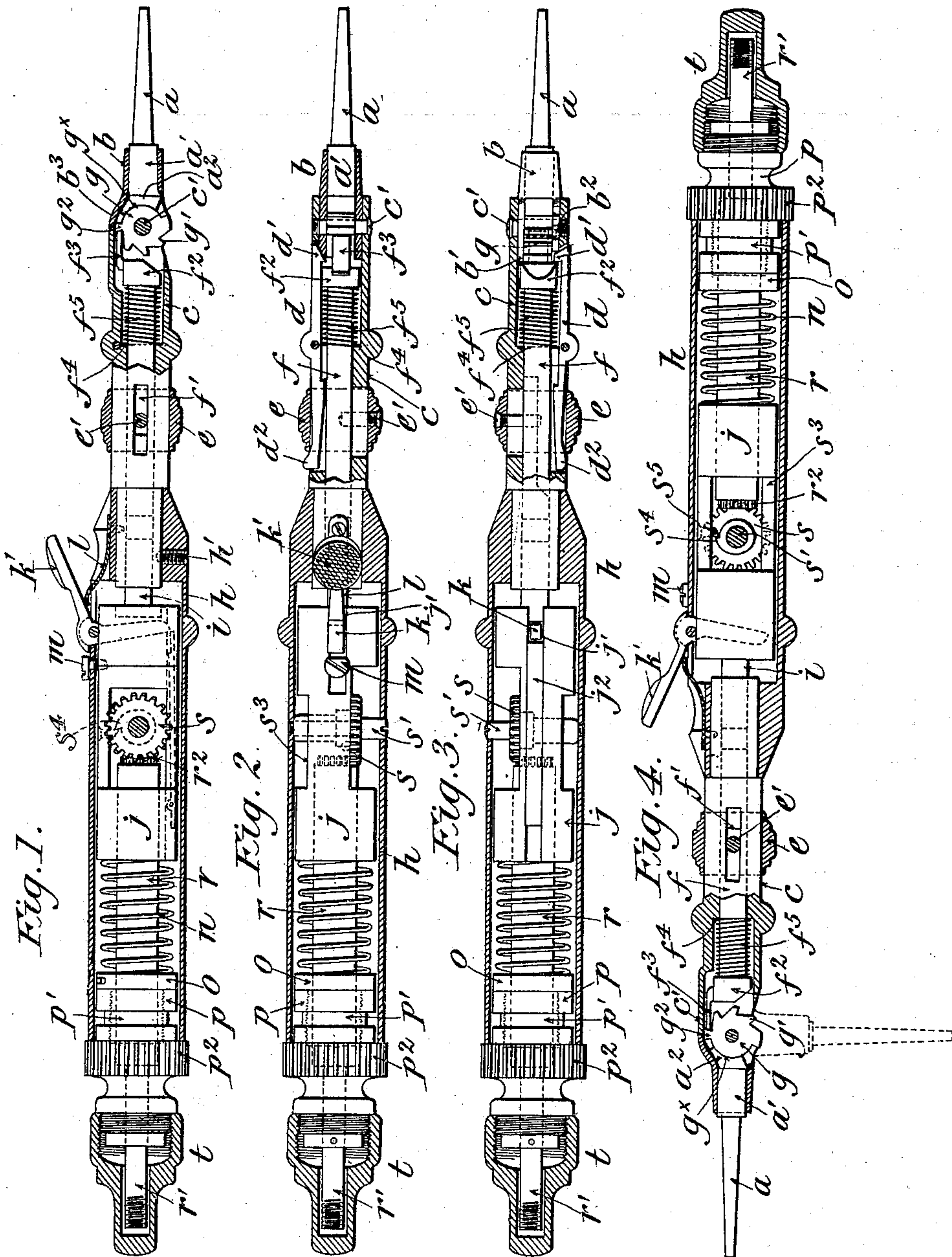
H. CASE & E. D. SHAW.  
DENTAL PLUGGER.

(Application filed Sept. 2, 1898.)

Patented July 11, 1899.

(No Model.)

2 Sheets—Sheet 1.



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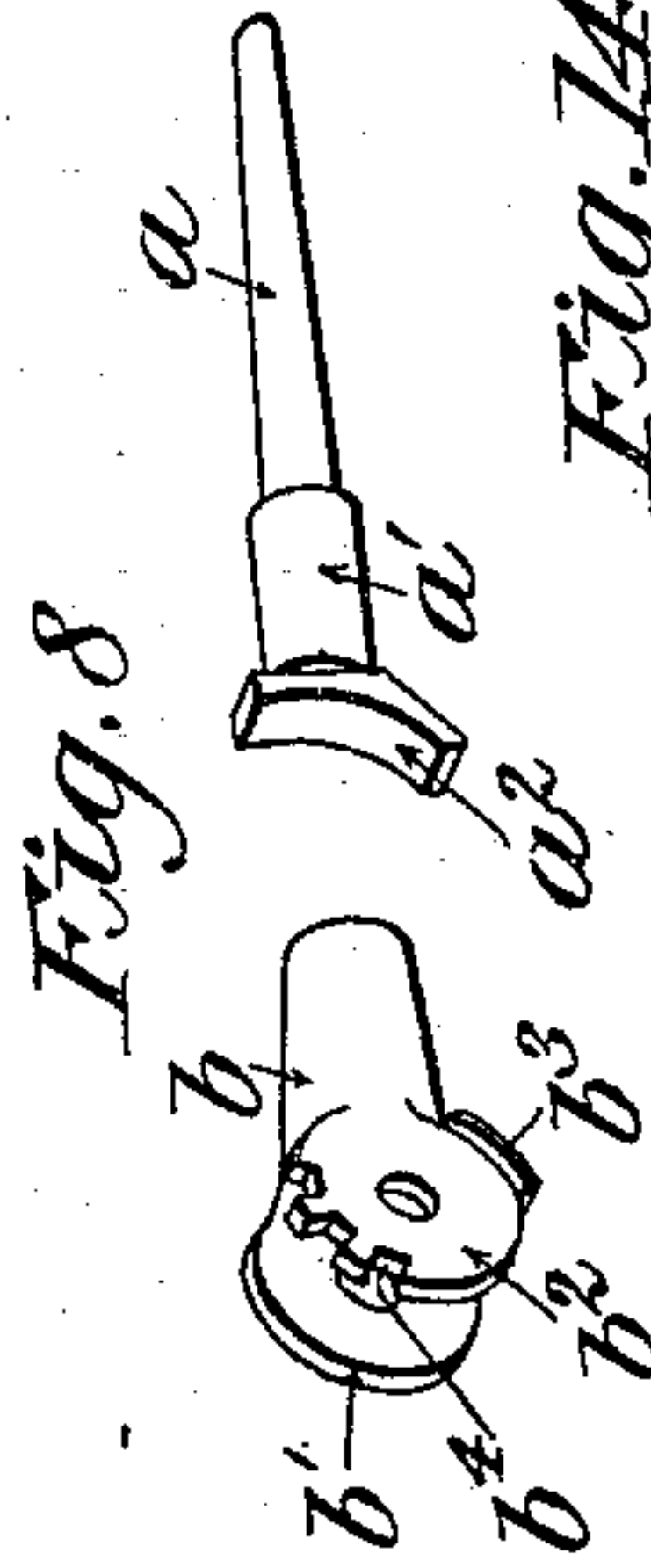
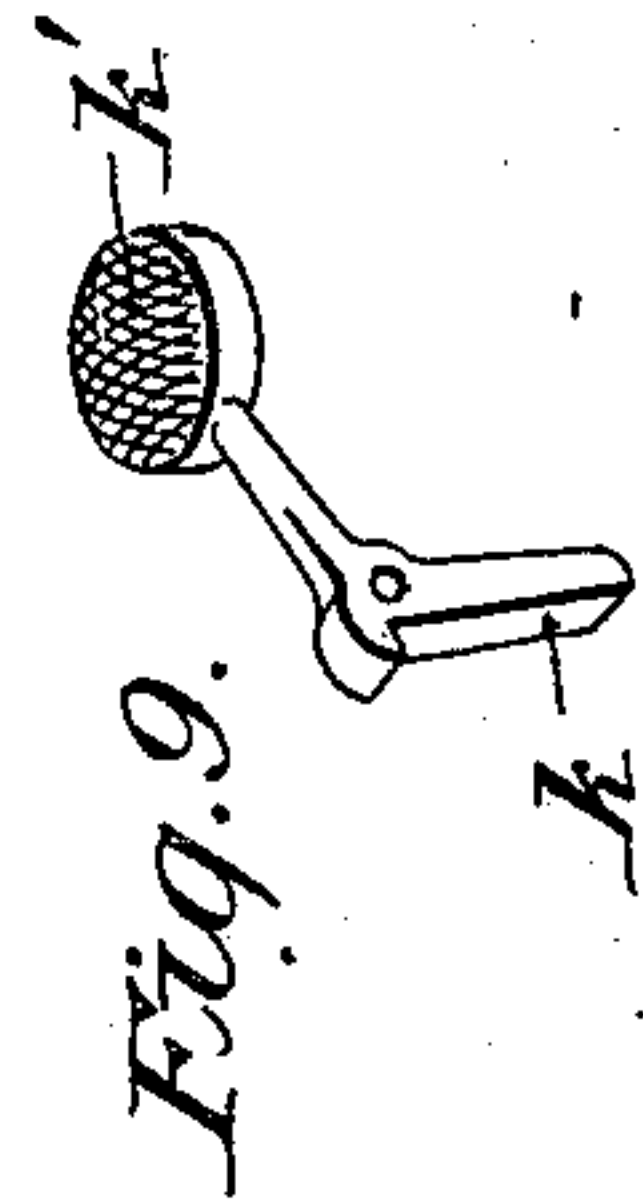
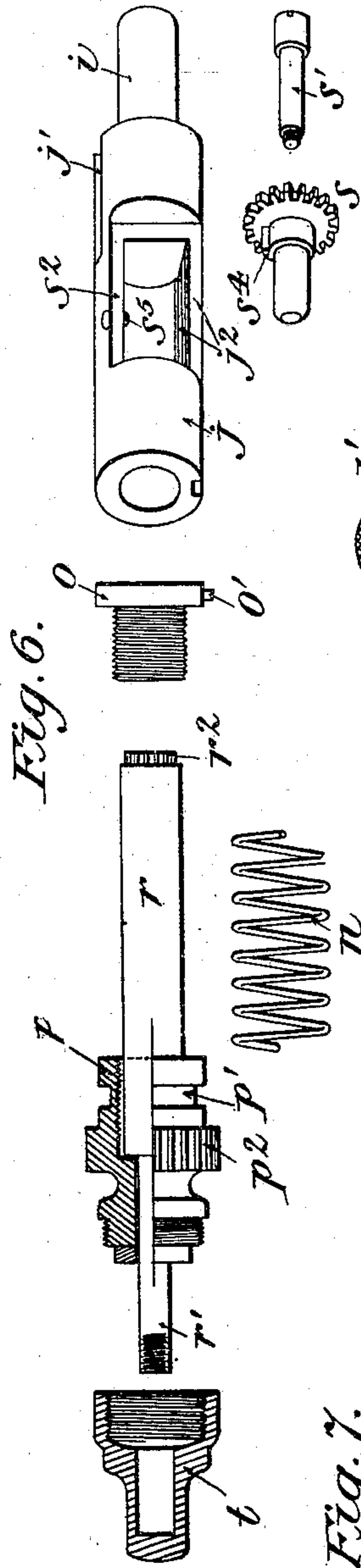
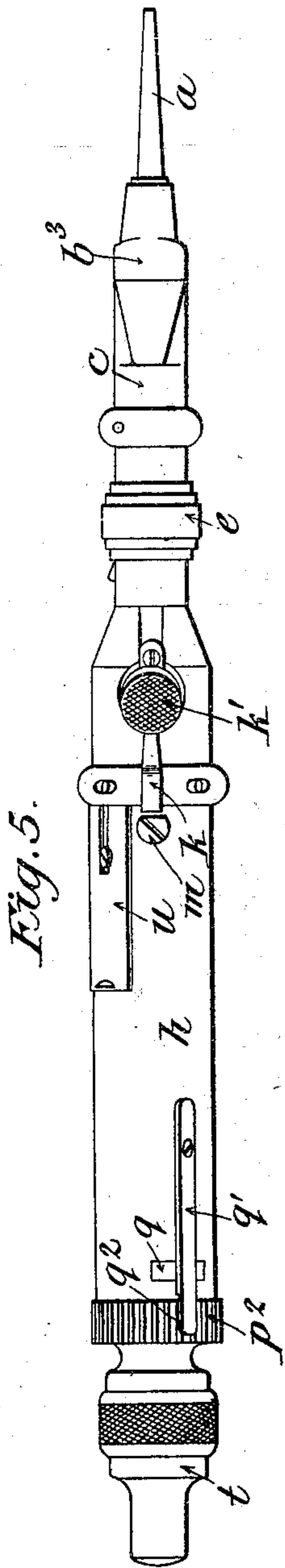


Fig. 14.

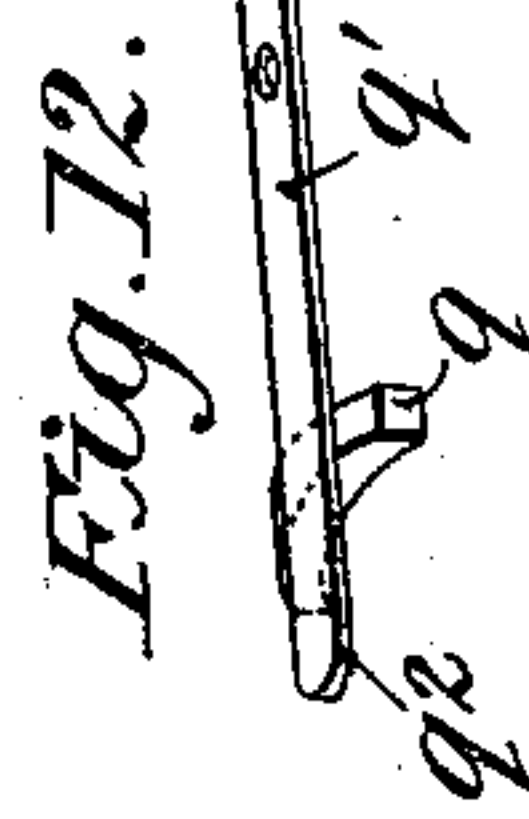
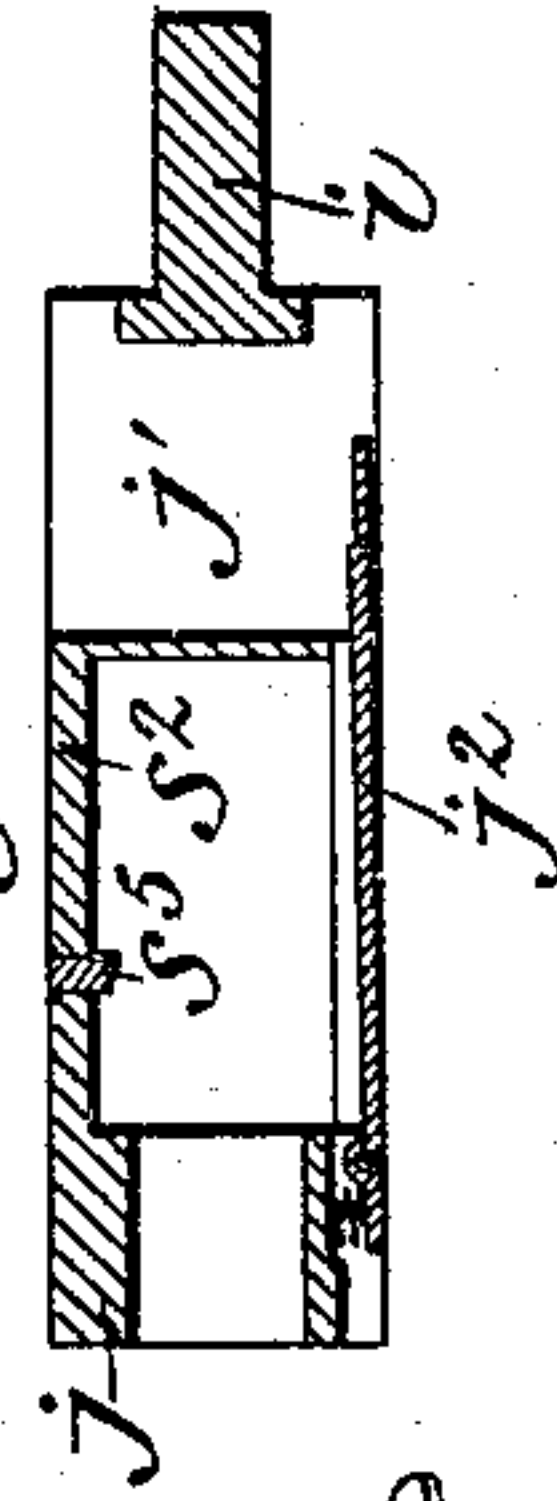


Fig. 11.

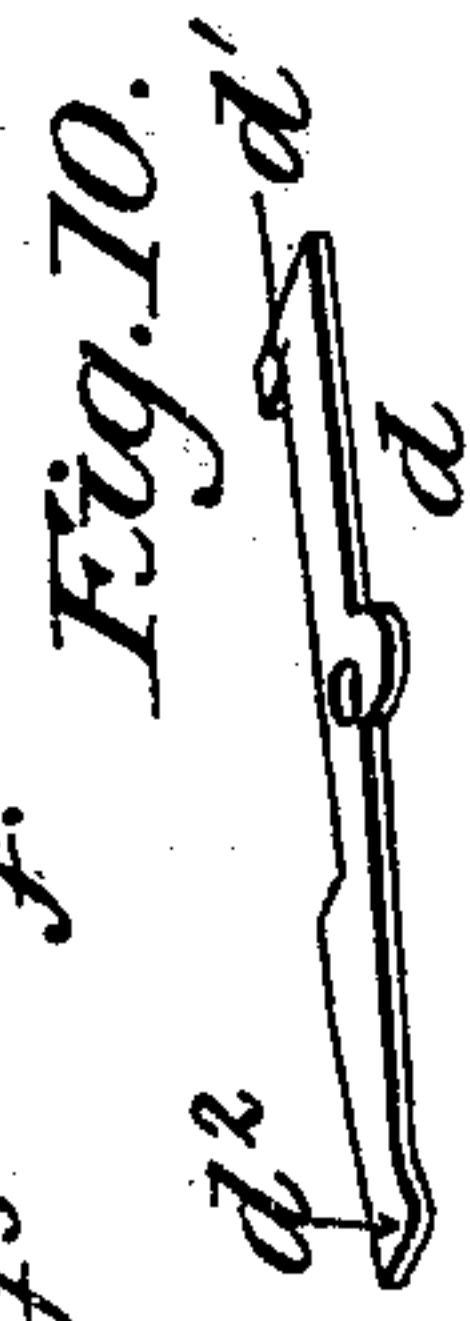
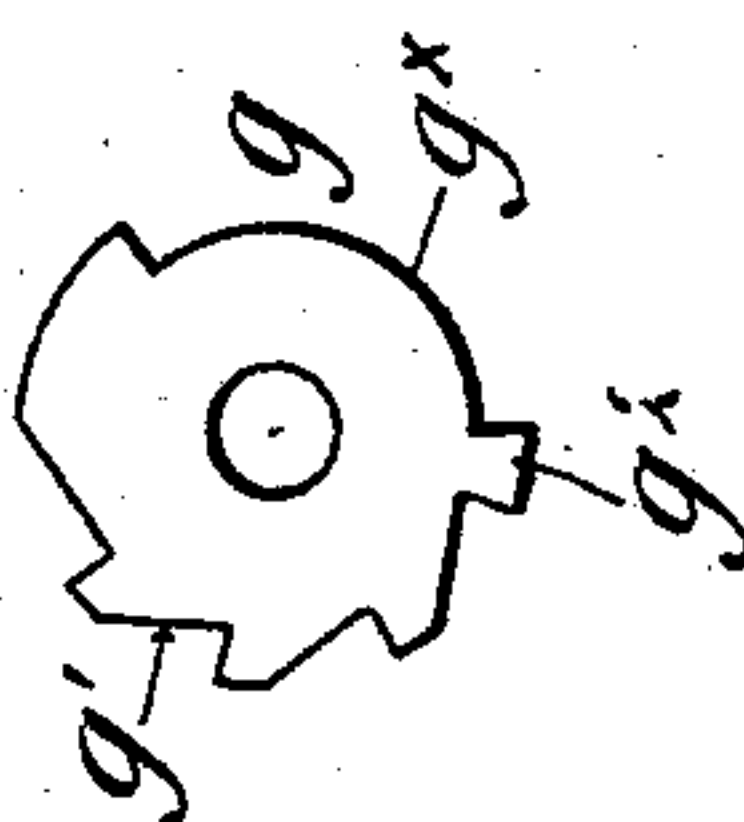
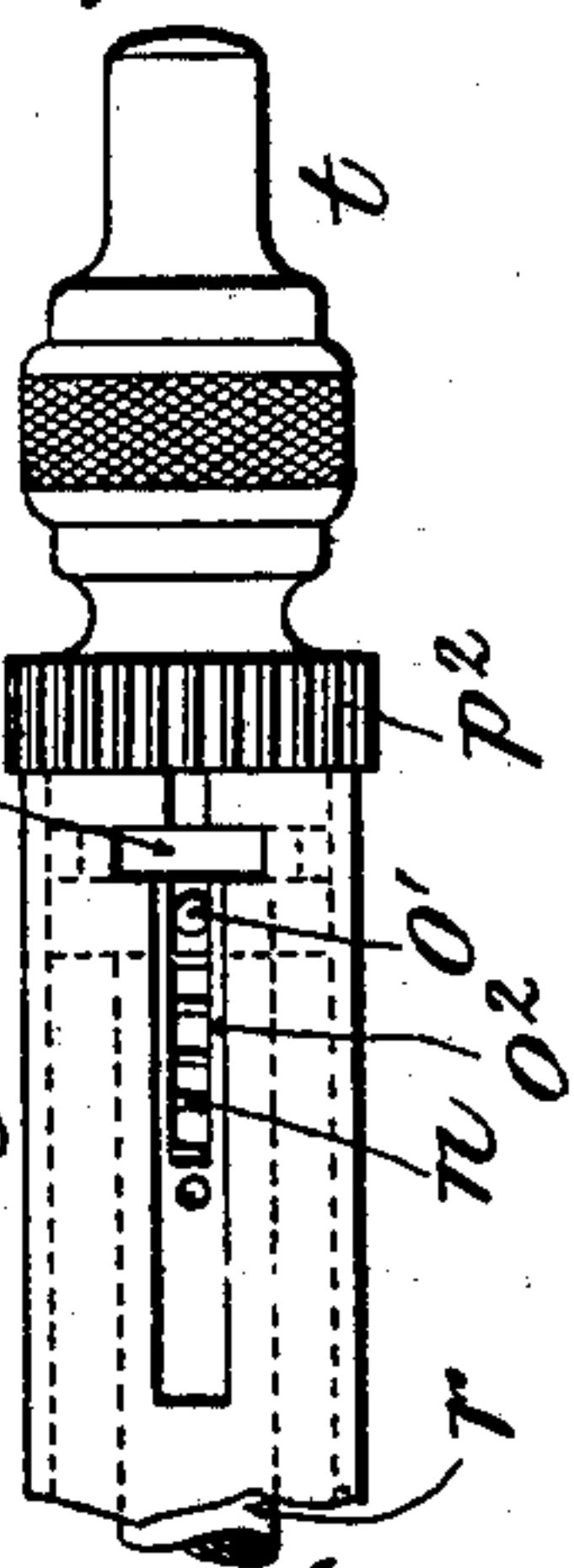


Fig. 13.



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# UNITED STATES PATENT OFFICE.

HENRY CASE AND EDMUND D. SHAW, OF GLOVERSVILLE, NEW YORK.

## DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 628,524, dated July 11, 1899.

Application filed September 2, 1898. Serial No. 690,070. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY CASE and EDMUND D. SHAW, citizens of the United States, residing at Gloversville, in the county of Fulton and State of New York, have invented a certain new and useful Improvement in Dental Pluggers, of which the following is a full, clear, and exact description.

This invention relates to those dental tools which may be described as "mechanically-operated mallets" and which are sometimes designated "pluggers."

Our invention comprises a mechanically-operated plugger the movement of which may be effected by hand or by power. The tool is arranged in a socket, which may be adjusted so as to bring said tool in alinement with the body of the instrument and at right angles thereto and at points between these two extremes. Between the tool and the hammer are interposed a tool-locking block and a plunger coöperating therewith, the said plunger transmitting the blow of the hammer to the tool through said block. The hammer has a reciprocating motion, and its stroke is given by the relaxation of a spring, and the movement of said hammer is effected by a manually-actuated trip-piece or by a cam which is power-driven. By the use of the term "mechanically operated" we mean to include not only a spring, but also any usual power mediums as distinguished from manual organisms. These features and other details of construction, as hereinafter more particularly set forth and claimed, constitute our invention.

In the accompanying drawings, illustrating our invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation with the casing partly in section. Fig. 2 is a top plan view with the casing in section. Fig. 3 is a plan view from the other side with the casing in section. Fig. 4 is a view similar to Fig. 1, but looking at the opposite side. Fig. 5 is an elevation. Fig. 6 shows in section, elevation, and perspective various parts of our plugger. Fig. 7 is a perspective view of the plunger. Fig. 8 is a perspective view of the tool-socket and tool. Fig. 9 is a perspective view of a trip-piece for manually operating the plugger. Fig. 10 is a perspective view of a locking-lever. Fig.

11 is a perspective view of the tool-locking block. Fig. 12 is a perspective view of the rear catch. Fig. 13 is an elevation of the rear end of the plugger with the catch of Fig. 12 removed. Fig. 14 is a longitudinal section of the hammer.

$a$  may represent a tool, and  $a'$  its shank or holder, which latter has a segmental heel  $a^2$ .

$b$  is the tool-socket, which comprises a barrel in which is seated the shank  $a'$  of the tool and which is provided with parallel ears  $b' b^2$ , which are connected and closed in at top by a web  $b^3$ . The ear  $b^2$  is provided with a series of notches  $b^4$  for a purpose presently appearing.

$c$  is a tube in which the socket  $b$  is secured, as by a pivot-screw  $c'$ , in such manner that more or less friction may be applied to the ears  $b' b^2$  in order to secure the tool-socket firmly in position. In a slot in this tube  $c$  is pivoted a locking-lever  $d$ , having a hook end or beard  $d'$ , which coöperates with the notches  $b^4$  in order to hold the tool-socket in any given angular position with relation to the body of the instrument. The end  $d^2$  of this lever is made as a cam, and with this cam coöperates a sliding sleeve  $e$  in order to disengage the hook  $d'$  from the notched ear  $b^2$ , and said sleeve engages the body of the lever to hold said lever in engagement with the said notched ear.

Within the tube  $c$  is arranged a plunger  $f$ , which is held within the tube by means of a screw-pin  $e'$ , threaded into the sleeve  $e$  and projecting into a slot  $f'$  in said plunger. This slot is continued as a groove on one side (see Fig. 7) to receive the lever  $d$ . The plunger has a head  $f^2$ , from one side of which projects an ear  $f^3$ , and between the head of this plunger and the shoulder  $f^4$  in the sleeve is arranged a spring  $f^5$ , which normally projects the said plunger toward the tool-socket. Between the heel  $a^2$  of the tool-shank and the ear  $f^3$  of the plunger is interposed a block  $g$ , which is mounted upon the pivot pin or screw  $c'$ . One edge of this block is recessed at  $g^x$  to receive the heel  $a^2$  of the tool-shank, and the opposite edge is provided with a series of notches  $g'$  to coöperate with the ear  $f^3$  of the plunger in order to effect various adjustments of the tool and tool-socket. Normally—that is to say, when the tool is in alinement with the plunger—the notch-body  $g^2$  is interposed



between the ear  $f^3$  and the heel  $a^2$  of the tool-shank, so as to transmit the motion of the plunger to the said tool. Inasmuch as the said heel  $a^2$  always engages the block, said block must turn with the tool-socket, and hence the other notch-bodies  $g'$  of said block are brought into position to be engaged by the plunger-ear  $f^3$ , and when so respectively engaged by the said ear  $f^3$  each of said notch-bodies serves a similar purpose to notch-body  $g^2$  in transmitting the blow of the plunger.

The tube  $c$  may be secured in the body  $h$  by a screw  $h'$ , and its inner end receives the point  $i$  of the hammer, said point being in alinement with the inner end of the plunger and imparting the blow of the hammer to said plunger, which blow is transmitted to the tool through the mechanism already described.

The hammer comprises not only the point  $i$ , but a peculiarly-constructed block  $j$ , the essential features of which are a recess  $j'$  and a spring-tappet  $j^2$ , having its free end projecting into the bottom of said recess, and this recess receives the arm  $k$  of a trip-piece, Fig. 9, which is pivoted to the casing  $h$  and is provided with a finger-piece  $k'$  for manual operation. This trip-piece is lifted by a spring  $l$ , secured to the casing  $h$  out of normal contact with the spring-tappet  $j^2$ .

The block  $j$  is guided in its longitudinal movement by a screw or other device  $m$ , projecting into the upper end of the recess  $j'$ .

Back of the hammer is arranged a spring  $n$ , which normally projects the said hammer forward, and this spring is held in place by a nut  $o$ , which is adjustable in the plug  $p$ . (See Fig. 6.) The nut is held from rotation by a pin  $o'$ , which engages a slot  $o^2$  in the casing, as clearly shown in Fig. 13.

The plug  $p$  is arranged in the rear end of the casing  $h$ , and it is provided with a groove  $p'$ , which is inclosed within the said casing, and this groove is engaged by a lug  $q$  of a spring  $q'$ , which is fastened to the casing, the said spring having a projecting portion  $q^2$ , which engages with a deep milled portion  $p^2$  of the plug  $p$  in such manner that the said plug may be rotated by its said milled portion  $p^2$  to adjust the screw  $o$  in order to put more or less tension on the spring in order to increase or diminish the force of the blow of the hammer.

The devices  $q$   $q'$   $q^2$  constitute the rear catch.

It will be seen that the trip-piece, Fig. 9, when depressed will engage the tappet  $j^2$ , as in Fig. 1, and force the block  $j$  backward against the tension of the spring  $n$  and that when in the arc of its movement the arm  $k$  disengages itself from the said tappet  $j^2$  the spring  $n$  will forcibly propel the block  $j$  and impart a blow to the plunger. Thus the instrument may be used under manual control; but we prefer to provide also for the operation of the instrument by power, and for this purpose we use a rotary shaft  $r$ , having any usual means, as  $r'$ , for connection with a source of power and supplied with a gear-

wheel  $r^2$ , which meshes with a gear-wheel  $s$ , the last being mounted upon a screw-stud  $s'$ , having its bearings in the casing  $h$ . In order to receive this shaft  $r$  and its gear  $r^2$ , the rear end of the hammer is made hollow, and in order to receive the gear  $s$  one side of the said hammer is slabbed off, as at  $s^2$ , and the opposite side is left open, as at  $s^3$ , for a distance equal to the travel of the hammer. The gear  $s$  is provided with a cam  $s^4$  on its hub, which coöperates with a projection  $s^5$  on the hammer, so that at each revolution of the said gear-wheel  $s$  the hammer is moved back against the tension of the spring  $n$  and released to impart a blow.

$t$  is a cap which may be screwed onto the plug  $p$  to cover in the shaft  $r'$  when the instrument is to be used as a hand-tool only.

$u$  is a slide to cover an opening in the casing  $h$ , through which access may be had to the gearing for inspection and lubrication.

We do not limit our invention to the form of tool or tool-socket described or to other mere details of construction, which are obviously variable within the principle of our invention.

What we claim is—

1. A dental plugger, having a tool-socket adjustable thereon to vary the angle of inclination of the tool with relation to the body of the plugger, blow-imparting mechanism, and a notched block mounted in and carried by the tool-socket and interposed between the tool and the blow-imparting mechanism, to transmit to the tool the force of the blow at whatever angle the tool-socket and tool may be held, substantially as described.

2. In a dental plugger, a tool-shank, a socket therefor means to adjust said socket at various angles to the body of the plugger, means to hold it in such adjusted position, a hammer mechanism, and a notched block engaged by the tool-shank, pivoted concentrically with the tool-socket and movable therewith, and adapted to coöperate with the tool and the hammer through its notches to transmit the blow of the hammer to the tool in whatever position the tool and its socket may be given, substantially as described.

3. In a dental plugger, a tool-shank, a socket therefor adjustable angularly with relation to the body of the plugger, a notched block pivoted concentrically with the said socket, engaged by the tool-shank and movable therewith and with the socket, a spring-actuated plunger in normal engagement with said notched block, and a hammer whose blows are transmitted to the tool-shank through said plunger and block, substantially as described.

4. In a dental plugger, a tool-shank, an adjustable tool-socket, a latch to hold the socket in adjusted position, arranged parallel with the plugger, a sleeve encircling the said latch to open and close it, a plunger, and a plunger-block interposed between the plunger and the tool, engaged by the tool-shank and turning with the socket, and a pin fast in said sleeve



and passing through the plunger, substantially as described.

5. A dental plugger, having a sliding hammer, a spring from which it derives its force, and a hand-operated device for said hammer, comprising a spring-retracted trip-piece with an arm working in a recess in the hammer, and a spring-tappet pivoted in the hammer and with which the said arm of the trip-piece is in slip connection, substantially as described.

6. A dental plugger, comprising a hammer, a spring therefor, an actuating mechanism comprising a rotary shaft, a gear-wheel on said shaft, a gear-wheel  $s$ , engaged by the gear-wheel on the shaft, a cam carried by said gear-wheel  $s$ , and a projection on the said hammer in the path of movement of the said cam, substantially as described.

7. A dental plugger, comprising a hammer, a spring therefor, a casing in which the hammer and a spring are inclosed and having a longitudinal slot  $o^2$ , a plug for closing the end of the said casing, a spring-adjusting nut arranged in said plug and adjustable by rotation of said plug, and having a pin  $o'$  engaging said slot, and means to secure the plug rotatably in said casing, substantially as described.

8. A dental plugger, having a hammer, a spring therefor, a casing in which they are inclosed, a plug for closing the end of said casing having a groove  $p'$  and a milled portion  $p^2$ , an adjusting-nut in said plug for varying the tension of the spring, and a spring-

catch having a lug  $q$  and projection  $q^2$  for engaging respectively the groove and the milled portion of the plug to hold the said plug in the casing and permit the adjustment of the nut, substantially as described.

9. A dental plugger, comprising in a single casing a spring-impelled hammer, means for operating the said hammer by hand, and independent means for operating the same by power, substantially as described.

10. A dental plugger, comprising in a single casing a power-hammer and a hand actuating device therefor, and also a power actuating device therefor, the said actuating devices being independent of one another, substantially as described.

11. A dental plugger, comprising in a single casing a power-hammer, a hand actuating device therefor comprising a trip-lever in engagement with the hammer, and a power actuating device therefor comprising a cam, a cam projection on the hammer in the path of movement of said cam, a power-shaft and gearing interposed between the shaft and the cam, the hand actuating mechanism and the power actuating mechanism being independent of one another, substantially as described.

In testimony whereof we have hereunto set our hands this 31st day of August, A. D. 1898.

HENRY CASE.

EDMUND D. SHAW.

Witnesses:

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EDWARD K. CASSEDY.