

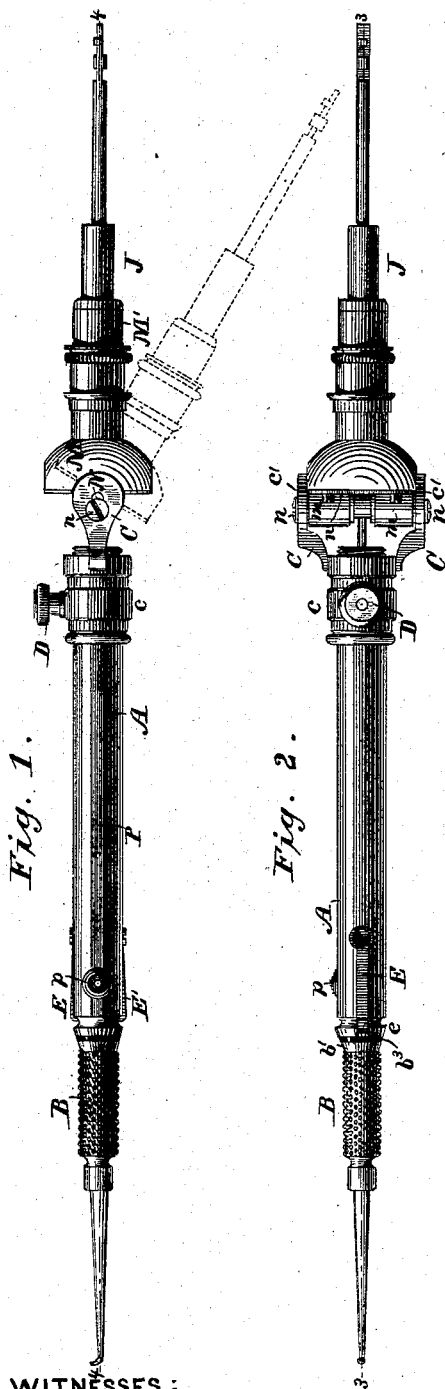
(No Model.)

A. W. BROWNE.

DENTAL PLUGGER.

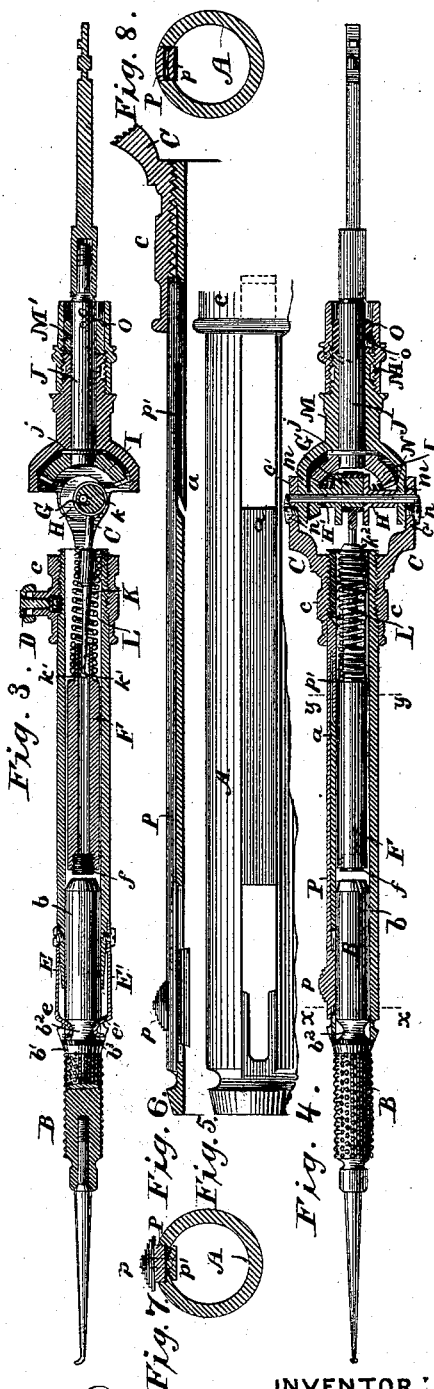
No. 347,567.

Patented Aug. 17, 1886.



WITNESSES:

Wm. J. Peyton,  
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INVENTOR:

Arthur W. Browne,  
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# UNITED STATES PATENT OFFICE.

ARTHUR W. BROWNE, OF WESTFIELD, N. Y., ASSIGNOR TO THE S. S. WHITE  
DENTAL MANUFACTURING COMPANY, OF PHILADELPHIA, PA.

## DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 347,567, dated August 17, 1886.

Application filed August 4, 1884. Serial No. 139,612. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR W. BROWNE, of Westfield, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Dentists' Pluggers, of which the following is a specification.

My invention relates to instruments for plugging teeth, known as "dentists' pluggers," and to that class of such pluggers which are driven by the rotary chuck of a dental-engine hand-piece, or, in other words, by power; and the objects of my invention more particularly are to simplify and otherwise improve such instruments, and to provide in such instrument means for stopping the blows upon the plugging-tool without stopping the motive power or engine—as when picking up the gold-foil, for instance, which is to be rammed into the tooth to be filled—means for readily adjusting the strength of blow to be delivered by the instrument, and means whereby the operating-tool may be turned or adjusted during the operation of the plugger, as desired.

The subject-matter claimed is first particularly set forth in detail as organized in the best way now known to me, and is then distinctly recited at the close of the specification.

In the accompanying drawings, Figure 1 is a plan or top view of my improved instrument. Fig. 2 is a side elevation thereof, the view being at right angles to that of Fig. 1. Fig. 3 is a longitudinal sectional view through the instrument on the line 3 3 of Fig. 2, and Fig. 4 is a similar view on the line 4 4 of Fig. 1. Fig. 5 is an enlarged view of a portion of the instrument-casing; and Fig. 6 is an enlarged sectional view through a portion of said casing, showing more particularly the slide-plate for controlling the delivery of the blows upon the plugging-tool. Fig. 7 is a cross-section through the instrument on the line *xx* of Fig. 4, and Fig. 8 is a similar section on the line *yy* of said Fig. 4.

The handle portion of the casing consists of a tube, A, the front end of which is fitted to receive the tool-holder B, and the rear end of which is fitted for connection with a yoke, C, into a tubular portion, *c*, of which yoke the rear end of said handle portion of the casing is fitted and rendered adjustable by means of a screw-threaded connection, as clearly shown.

The adjustment of the handle portion A of the casing within the yoke C is maintained by means of a set-screw, D, passing through the tubular portion *c* of said yoke and impinging against the periphery of the handle portion of the casing, so as to lock the two together. The tool-holder B preferably consists of a metal rod having a smooth shank, *b*, to enter the front end of the handle portion of the casing, so as to receive the blows from the hammer upon its rear end, while the front end of said holder is socketed to receive the end of the operating-tool, which may be threaded to fit a corresponding thread in the tool-holder socket.

Instead of a separate rod B and tool, the two may be formed together in one piece, or in separate pieces afterward united. The extent to which the tool-holder B enters the front end of the casing A is determined by means of the shoulder *b'* upon said tool-holder, which abuts or comes against the front end of the casing.

An annular groove, *b''*, is formed in the tool-holder about its middle and just back of the shoulder *b'*, and into this groove the front bent ends, *e e'*, of springs E E' engage or snap when the holder is inserted in the casing, and its groove comes opposite the ends of said springs. These springs hold the tool-holder in place, and by this organization of tool-holder and springs the springs permit the holder to be driven forward under the impact of the blow delivered by the hammer or plunger hereinafter described, while they return said holder to the proper position to receive the next blow by acting on the rear inclined wall of the annular groove *b''*, as will be obvious and in a known way, this form of grooved holder and its operation in connection with the returning-springs being before known and not of my first invention. The bent ends of the springs E E' operate through slots in the end of the casing, and the shoulder *b'* of the tool-holder B is preferably faced with hard rubber or wood *b'''*, (or some equivalent thereof,) to deaden the noise, which would otherwise occur on the return of the holder by its springs after a blow has been given.

It will be obvious that the tool-holder may be readily turned in its seat in the casing, so as to place the point of the operating-tool in

the desired position, and the surface of said holder is roughened to facilitate these turning movements.

The blows which are imparted to the tool-holder in the operation of the instrument are given by means of a hammer or plunger, F, fitted to slide in the rear end of the handle section or portion A of the casing, and fitted at its front end to strike upon the rear end of the tool-holder B by means of an interposed plug or cushion of hard rubber, *f*, for instance, so as to deaden the noise and render the operation of the instrument more noiseless than would be the case were metal to strike upon metal. The hammer or plunger F is reciprocated by means of an eccentric, crank, or cam, G, forming part of a rotary tubular shaft, H, in this instance, which is rapidly revolved by means of a pinion, H', fixed thereon, which meshes with a gear-wheel, I, mounted on the end of a driving-shaft, J, to which latter a rapid revolving motion is given by a connection with the tool-holder or chuck of the hand-piece of a dental engine, for instance. The eccentric or crank G is connected with the rear end of the hammer or plunger F by means of a loosely-connected pitman or rod, K, the rear end of which terminates in a strap or ring, *k*, which encircles the eccentric, while the front end is reduced and provided with a knob or ball, *k'*, which enters and loosely fits the bore or socketed rear end of the plunger; and, in addition to this loose pitman or rod connection, there is a spring-connection, consisting, preferably, of a spiral spring, L, the rear end of which is tightly coiled, so as to fit tightly upon the pitman-rod in front of a shoulder, *k*<sup>2</sup>, thereon, and the front end of which spring is also tightly coiled to fit tightly upon the rear reduced end of the plunger or hammer F, as clearly shown in Figs. 3 and 4, while the central portion of the spring has its coils separated, so as to be capable of a free springing action, as will be obvious.

The driving-shaft J is fitted to turn in a tubular sleeve, M, which is enlarged or cup-shape at its forward end to accommodate the correspondingly-shaped gear-wheel I, in this instance, and on each side of the enlargement of the sleeve an ear or lug, *m*, is formed to fit nicely with the correspondingly-shaped ends *c c'* of the yoke C, an axis-pin, N, being passed through said sleeve and yoke to articulate or joint them together. The casing A is thus jointed to the sleeve M, so as to be free to be moved about or rocked relatively to said sleeve in the operation of the instrument. The pivot-pin N passes through the tubular eccentric-carrying shaft H, and forms the axis about which said shaft is turned. Said axis-pin N is retained in position, preferably, by means of screws *n n*, the heads of which are made to bear on the opposite ends of the pin. The driving-shaft J is locked from endwise movement in the sleeve M by means of a shoulder, *j*, on said shaft in front and an adjustable collar, O, at the rear. A set-screw,

o, serves to lock the collar O in its properly-adjusted position, and the rear end of the sleeve M may be fitted with a thimble, M', to hide the collar O and add to the finish of the instrument, if desired. The rear end of the driving-shaft J, or a connection thereof, preferably terminates in suitable locking and driving surfaces to fit the chuck of the hand-piece.

The peculiar construction of the driving end of the shaft J (shown in the drawings) adapts it to the tool locking and driving devices of the hand-piece of the well-known dental engines manufactured by the S.S. White Dental Manufacturing Company. Of course the construction may be such as to adapt the driving end of the shaft J to hand-pieces of other manufacture.

The operation of the instrument is as follows: The driving-shaft J is driven by the dental engine, and, through the gear-connection, rapidly revolves the cam-shaft and cam or eccentric thereof. This, through the pitman and spring-connection with the hammer F, rapidly reciprocates said hammer, and causes it to impart a rapid succession of blows upon the end of the tool-holder carrying the plugging-tool. The blows are distinct hammer-like blows, and their force may be graduated, as will be obvious, by adjusting the casing A more or less into the yoke C, so as to vary the distance between the rear end of the tool-holder and the front end of the hammer. During the operation the tool-holder is also free to be turned or manipulated in the casing, as occasion requires. In order to enable the operator to stop the delivery of the blows upon the tool-holder without stopping the engine—as when picking up the gold for the tooth-cavity, for instance—I have fitted the casing A with a slide, P, seated in a longitudinal recess or groove in said casing, and provided at its front end with a knob, *p*, by which it may be readily operated, and at its rear end with a tongue or wedge-piece, *p'*, the front end of which is beveled or pointed, so as to ride under a correspondingly-shaped shoulder, *a*, of the casing at the end of the slot in which said tongue works when said slide is moved forward. Consequently, when the slide is moved forward by the finger or thumb of the operator, the tongue *p'* is wedged or forced down upon the periphery of the hammer F, and locks it from movement in the casing, so that no blows are imparted to the tool-holder, notwithstanding the fact that the engine is kept running and the cam-shaft in operation. The motion of the eccentric or crank, when the locking wedge or tongue is in action, is taken up by the expansion and contraction of the spring L at its central portion, as will be obvious. When the hammer is to be again thrown into action, the slide is retracted or moved backward upon the handle-casing, and this permits the tongue or wedge to spring up so as to lie in its slot in the casing A, out of contact with the hammer.

I have neglected to state that the front end

of the sleeve M is closed by a detachable cap-plate, n', which is slotted to permit the passage of the pitman-connection with the hammer, and which retains the cam-shaft and its 5 connected parts in their proper positions for effective operation.

My improvements conduce to a very simple and effective plugger.

I claim herein as my own invention—

- 10 1. The casing having a retaining spring or springs connected therewith, in combination with a tool-holder having a shank to enter a socket in said casing, a circumferential retaining-groove, and a shoulder in front of 15 said groove to limit the extent of movement of the tool-holder into said casing, substantially as described.
2. The combination, with the casing and its retaining spring or springs, of the tool- 20 holder acted on by said springs, and a shoulder to determine the extent of movement of said holder in said casing, said shoulder being faced with a noise-reducing substance, such as hard rubber, substantially as described.
- 25 3. The combination, with the handle-section of the casing, of the jointed or pivoted yoke, into the tubular front portion of which the rear end of said handle-section is screwed, substantially as described.
- 30 4. The combination of the yoke with which the handle-casing is connected, the sleeve in which the driving-shaft is mounted, connected to said yoke by a jointed connection, so as to permit free movement of said casing in the 35 operation of the instrument, the eccentric or crank, the hammer mounted so as to reciprocate in said casing, and a connection between said eccentric and said hammer, whereby said hammer may be reciprocated during the revo- 40 lution of the driving-shaft, substantially as described.
5. The combination of a tool and a hammer arranged to impart blows to said tool with driving mechanism for said hammer, a com-

pensating connection between said driving 45 mechanism and said hammer, and a locking device to stop the motion of said hammer without interfering with the action of the driving mechanism, whereby the hammer may be stopped independently of the driving mech- 50 anism and the motion of said driving mechanism taken up by the yielding action of said compensating connection between the driving mechanism and hammer, substantially as de- 55 scribed.

6. The combination, in a dental plugger, of a tool and hammer arranged to impart blows to said tool with an eccentric or crank and a spring, and rod or pitman connection between said eccentric and said hammer, substantially 60 as described.

7. The combination of the pivoted or jointed yoke with which the casing carrying the hammer is connected, with the sleeve carrying the driving-connections, said yoke and said 65 sleeve being jointed together by a through-pin, substantially as described.

8. The combination of the yoke and the sleeve, carrying, respectively, the handle-casing and its parts and the driving-connections, 70 by means of a pin-connection passing through the eccentric and pinion, constituting part of said driving-connections, substantially as described.

9. The combination of the slotted or recessed 75 casing, a hammer fitted to reciprocate therein, a slide fitted in a recess or slot in said casing, and a wedge or tongue carried by said slide to act upon said hammer to lock it from reciprocation in the casing, substantially as de- 80 scribed.

In testimony whereof I have hereunto subscribed my name.

ARTHUR W. BROWNE.

Witnesses:

L. WHEELER,  
G. MEURER, Jr.