

(No Model.)

D. E. COULSON.  
DENTAL PLUGGER.

No. 456,477.

Patented July 21, 1891.

Fig. 1.

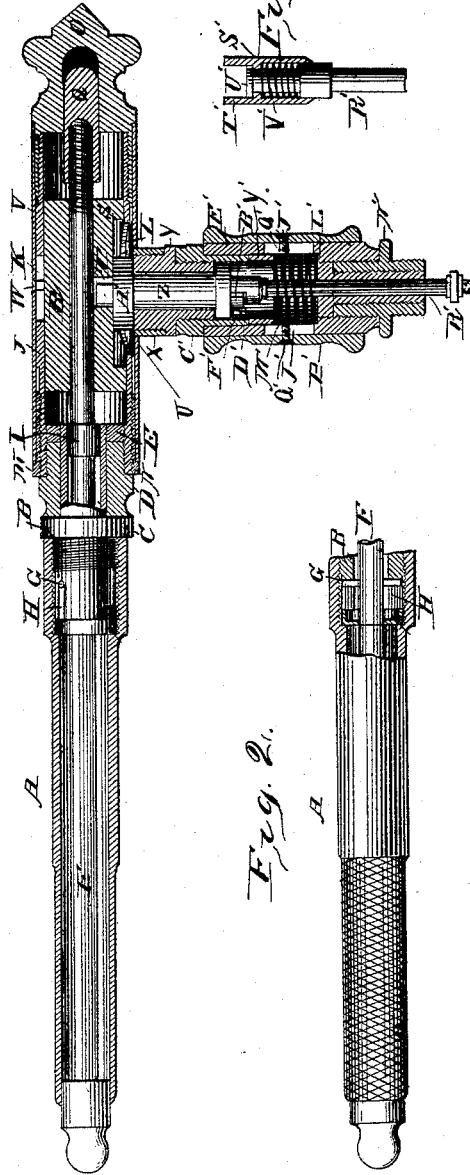


Fig. 2.

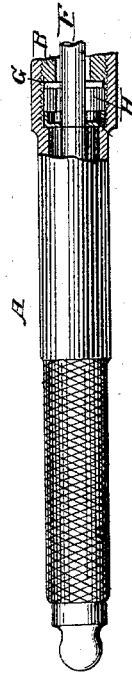


Fig. 5.

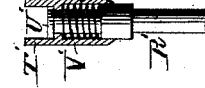


Fig. 3.

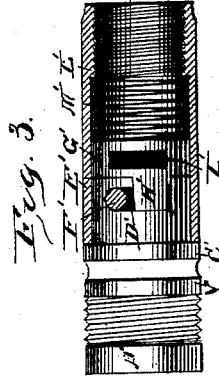


Fig. 7. Fig. 6.

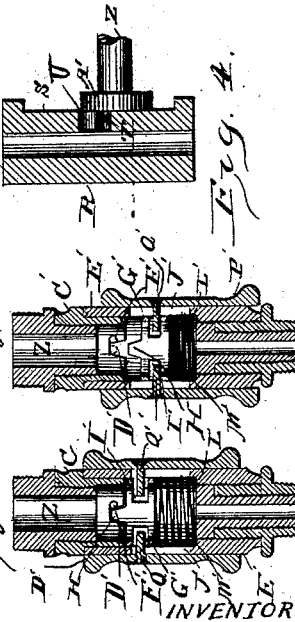


Fig. 4.

WITNESSES

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# UNITED STATES PATENT OFFICE.

DAVID E. COULSON, OF GALESBURG, ILLINOIS.

## DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 456,477, dated July 21, 1891.

Application filed May 23, 1890. Serial No. 352,855. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID E. COULSON, of Galesburg, county of Knox, and State of Illinois, have invented certain new and useful  
5 Improvements in Dental Pluggers, of which the following is a specification, reference being had to the accompanying drawings

My invention relates to improvements by which a thrust and back blow can be struck  
10 upon an instrument.

The object of my invention is to produce a plugger which is adapted to be easily manipulated by an operator and to have the impact of its hammer regulated with facility, and one  
15 which, by reason of the directness of action of its working parts, will not get out of order.

Another object is to provide means for securing the plugger readily to a flexible cable or the like, and also for preventing pressure  
20 that would impede its motion upon the end of the cable when the plugger is fastened to it.

In the accompanying drawings, Figure 1 is a central longitudinal section of my hand-piece, showing all the parts of the same. Fig.  
25 2 is a view of a part of the hand-piece detached. Fig. 3 is a view partly in section of the shaft-coupling device detached. Fig. 4 is a view of the hammer and eccentric detached.  
30 Fig. 5 is a view of the shaft connection detached. Figs. 6 and 7 are longitudinal sections through the parts adapted to fasten the plugger to a revolving shaft, showing the shaft and its uniting parts in elevation.

Referring to the letters on the drawings, A indicates a hollow hand-piece. It is roughened at its lower end to facilitate holding it and at the other end is internally screw-threaded to receive the screw-threads of the  
40 bushing B. An annular flange C is located in the middle of the bushing to form a cap for the hand-piece A and a base for the collar D, which is rotatably secured to the upper part of the bushing by the annular nut E, that  
45 is adapted to screw upon the upper end of the bushing.

Passing upward through the hand-piece is a rod F, which terminates at the lower end of the hand-piece in an ordinary tool-holder.  
50 Within the hand-piece upon this rod are provided two lugs G, which take into the slots or kerfs H in the lower end of the bushing to

limit the longitudinal motion of the rod. Above the lugs upon the rod is provided a shoulder I, which when the parts are in place  
55 fits neatly into the upper end of the bushing B and is designed to receive the blows of the hammer R.

The outside of the collar D is screw-threaded to enter the internally-screw-threaded end of  
60 the sleeve J. This sleeve is provided on one side with a longitudinal slot K and on the other with an oblong opening L. It is also provided at each end with external screw-threads. Upon its lower end is carried an  
65 internally-screw-threaded collar M, provided with an annular flange N at its lower end. Upon the other end is carried the internally-screw-threaded cap O. The rod F extends  
70 entirely through the sleeve and terminates in a screw-threaded end that carries by this means an internally-screw-threaded cap Q.

Longitudinally movable upon the rod F is the hammer R, which is confined within the sleeve between fixed limits by the shoulder I  
75 on the rod F and the cap Q upon the end of the rod, against one of which it strikes a blow in each reciprocation. The hammer is provided upon one side with a flat longitudinal  
80 incision S and in the middle with a transverse slot T. Surrounding the sleeve between the flange N of the collar M and the cap O is carried the cover V, which, with the sleeve J and parts connected therewith, constitutes the  
85 case. The cover is provided upon one side with the set-screw W, that is fixed to it and passes through the slot in the sleeve, whereby the sleeve may move longitudinally within  
90 the cover, but may not rotate. In other words, the sleeve J and the cover V are securely united together, but are adapted to be moved longitudinally within certain limits, the one within the other. Upon the opposite side the  
95 cover V is provided with an internally-screw-threaded hollow projection X, that carries the externally-screw-threaded bushing Y, within which rotates the shaft Z, which carries upon its inner end the eccentric A', provided with  
100 a pin U, and upon its other end by means of screw-threads or other suitable device the flat-sided head B', to which a revolving shaft is adapted to be coupled. The eccentric A' is thus kept in constant close operative relations with the hammer R, and by reason of

the flat head of the eccentric being close to the flat side of the hammer-head made by the longitudinal incision S prevents the hammer from turning. Thus the hammer R and the cover V are irrevocably fixed to each other. Behind this head, upon the outer end of the bushing, is screwed the collar C', which is provided at its outer end with opposite angular slots D' of the kind that are used in the well-known bayonet-joint.

E' indicates a cylinder provided with internally-projecting lugs F', adapted to enter the angular slots of the collar C'.

G' indicates a sliding collar provided with lugs H', which, when the cylinder has been attached to the collar C' by means of the lugs, slip into the open end of the angular slots and lock the cylinder to the collar.

I' indicates transverse slots on each side of the sliding collar, and J' indicates longitudinal slots in opposite sides of the cylinder. The outer end of the cylinder is provided with an internal annular projection L', upon which at one end is seated the spring M', that presses at its other end against the internally-sliding collar and projects it against the internally-projecting lugs F'.

N' indicates a bushing adapted to be screwed into the outer end of the cylinder, which is screw-threaded to receive it, and provided at its outer end with external screw-threads, which are adapted to be fastened to the case of an ordinary flexible cable.

P' indicates a sliding collar which surrounds the cylinder E'. It is provided on opposite sides with set-screws Q', that pass through the longitudinal slots in the cylinder and enter the transverse slots in the internally-sliding collar. By this means a longitudinal movement of the sleeve may be communicated to the internally-sliding collar, while the latter is at the same time susceptible of being partially rotated by means of the transverse slots independently of the sliding sleeve.

In order to fasten the cylinder and its parts to the collar C', the sliding sleeve is pressed downward, so as to permit the lugs F' to enter the angular slots in the collar C'. Then by turning the cylinder slightly the lugs enter the recesses in the angular slots. As soon as the flexible shaft is caused to revolve the internally-sliding collar moves around until the lugs upon it enter the open ends of the angular slots, when the spring presses the sliding collar forward and locks the cylinder to the collar C'. A shaft R' is loosely carried in the central part of the cylinder and is adapted to communicate motion from the flexible shaft to the shaft Z. The inner end of the shaft R' is provided with a longitudinally-movable head S', which is provided with a pair of lugs T', adapted to fit over the flat-sided head B'. A fixed head U' is carried upon the end of the shaft R' between the lugs T'.

V' indicates a coiled spring surrounding the shaft R' and seated upon projections on the shaft and the inside of the movable head

S', so as to keep the latter yieldingly pressed against the fixed head U'. When the cylinder is united to the collar C' in the manner above described, if the flat-sided head B' should project a greater distance into the interior of the cylinder than is provided for, instead of binding against the end of the shaft R', and thereby producing friction, the yielding head S' would be pressed backward; but communication from the shaft R' to the shaft Z would be perfectly established. Of course any sort of instrument might be united to this coupling in the manner described, and by means of the arrangement just explained absolute precision of joints may be dispensed with, which is very desirable.

The operation of my machine will be clearly understood from the following description: Suppose that the shaft Z is caused to rotate by means of a flexible cable driven by any suitable means. The eccentric A' will be caused to rotate and will drive the hammer R backward and forward through the sleeve J. It will be observed that the hammer is confined in the length of its travel by the eccentric, so that it cannot escape from the operation of the shaft. If the cover V is moved down toward the hand-piece A by unscrewing the collar M and screwing down the cap O, the lower end of the hammer will be caused to strike the shoulder I each time it reciprocates within the sleeve J. By this means the thrust blow is given through the rod F to the tool. By the reverse movement of the collar M and the cap O the hammer is caused to strike the cap Q upon the rod F, in which position the back blow is communicated through the rod F to the tool. It will be observed that by this means of adjustment the force of the blow can be regulated from the lightest stroke to the heaviest of which the machine is capable.

It will be understood that the relations of the parts are such that when the hammer is set to strike upon one end it does not strike upon the other, so that a blow in only one direction is communicated by the operation of the machine.

I do not confine myself to all the details of construction specified, because they may be varied in many ways without departing from the scope of my invention. I refer specially to the mechanism for causing the reciprocation of the hammer, and also that for adjusting the position of the hammer with respect to the sleeve within which it reciprocates and the rod. The adjustability of the hammer by some means is in this regard the important thing.

What I claim is—

1. In a dental plugger, the combination, with a tool-carrying rod F and its case, of a hammer surrounding the rod and adapted to reciprocate between fixed limits thereon, a cover V, longitudinally adjustable upon the case, an eccentric A', through which reciprocatory motion may be imparted to the ham-

mer, and means for fixing the adjustment of the cover, whereby the hammer may be made to strike against one or the other of its fixed limits, as desired, to impart a thrust or back blow to the rod, substantially as set forth.

2. The combination, with the rod F and the hammer R, adapted to reciprocate between fixed limits thereon, of the hand-piece A, surrounding the lower end of the rod F, the bushing B, secured thereto, a collar D, rotatably carried upon the bushing, the slotted sleeve J, secured to the rotatable collar, the flanged collar M and the cap O, adjustably fixed thereto at opposite ends, and the cover V, adjustable by means of the collar M and the cap O upon the sleeve J and adapted to carry at right angles to it the eccentric A', through which reciprocatory motion may be imparted to the hammer, all substantially as and for the purpose specified.

3. In a dental plugger, the combination, with the reciprocatory hammer R, provided with the longitudinal incision S and the transverse slot T, of a cover V, irrevolubly fixed to the hammer and provided with the screw-threaded hollow projection X, the screw-threaded bushing Y, adapted to be secured thereto, the shaft Z, and the eccentric A', carried thereon, whereby reciprocatory motion may be imparted to the hammer, substantially as set forth.

4. A separable shaft consisting of the combination of the shaft Z and the shaft R', the latter being provided with a spring-actuated longitudinally-movable head S', said head being adapted to fit upon a corresponding part upon the shaft Z for the purpose of communicating rotary motion thereto, and means for holding the parts together for operation, substantially as set forth.

5. The combination, with the collar C', provided with angular slots D', of a surrounding cylinder E', provided with internally-projecting lugs F', adapted to enter the angular slots of the collar C', and the spring-actuated sliding collar G', inclosed within fixed limits within the cylinder E' and provided with lugs H, and the sliding collar P', fixed around the cylinder E', but longitudinally movable thereon and provided with set-screws Q', that enter the transverse slots I' in the collar G', whereby the collar G' may be moved longitudinally and at the same time maintain its revolubility independent thereof, substantially as set forth.

In testimony of all which I have hereunto subscribed my name.

DAVID E. COULSON.

Witnesses:

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