(No Model.)

W. E. GIBBS.

ELECTRIC DENTAL PLUGGER.

No. 427,070. Patented May 6, 1890.

Fig. 1.

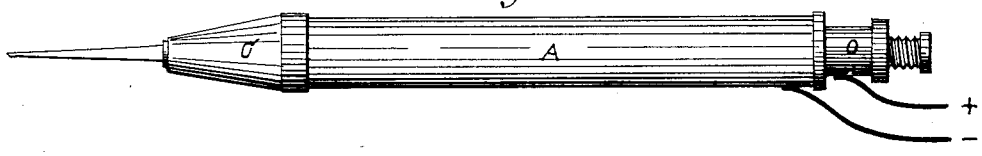


Fig. 2.

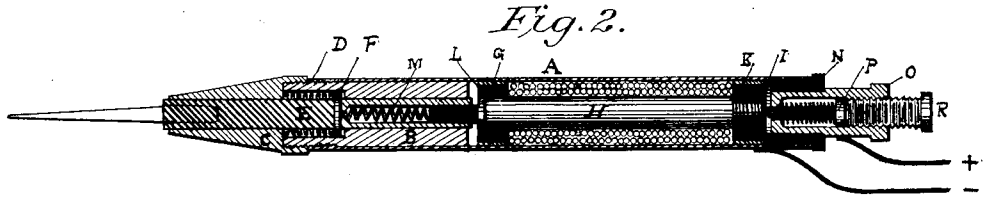


Fig. 3.

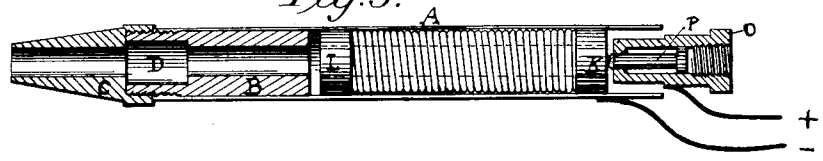
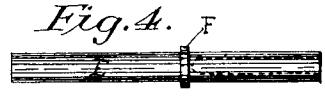


Fig. 4.



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ELECTRIC DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 427,070, dated May 6, 1890.

Application filed January 14, 1889. Serial No. 296,363. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. GIBBS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Electric Dental Pluggers, of which the following is a description.

In the accompanying drawings my improvements are shown as embodied in a single instrument having a number of distinctive parts.

Referring to the drawings, Figure 1 is a view of the plugger complete with the dental plugging-point attached. Fig. 2 is a longitudinal sectional view of the complete instrument. Fig. 3 shows for the sake of clearness part of the plugger in section and part in elevation, and Fig. 4 is a detail view of the tool-holder.

In each figure like letters refer to the same parts.

My electric dental plugger consists of an outer case A, of metal, within which at one end is a tubular piece of soft iron B, having screwed or otherwise attached to one end a hollow conical section C, also of soft iron. The parts B and C when conjoined form a hollow cylinder of uniform interior diameter, except at D, where the diameter of the bore is enlarged, as shown.

Within the cylinder formed by the parts B and C is a loosely-fitting bar of iron E, (shown separately in Fig. 4,) having near its center an enlarged ring F. One end of the bar E is adapted to hold the dental plugging-point by being bored out and threaded, or in any convenient way, while in the other end is a hole extending downward to the ring F. This loosely-fitting bar, being placed within the section B C, is pressed upward or toward B by a spiral spring inserted in the enlarged portion D of the bore of B and bearing on the enlarged ring F of the bar E. When in position, as described, the ends of the bar E project slightly beyond the terminal parts of B and C, as shown in Fig. 2.

Within the tube A and beyond the iron parts B, C, and E slides freely an electro-magnet formed of a soft-iron core H, surrounded by a coil of insulated wire and having at each end a non-conducting washer G I. These washers are surrounded by short tubes of brass L K, which form within the tube A smooth bearing-surfaces. The wire upon the core H has one of its ends in electrical connection with said core and the other end similarly connected with the brass tube L. A coiled spring M within the bar E presses upon a rod of hard rubber, which bears upon the downward end of the core H.

The upper end of the case A is closed by a plug of insulating material N, through which passes the circuit-breaker, constructed as follows: A brass cylinder of the form shown at O has within it a loosely-fitting sliding bar of iron P, the outer end of which is enlarged by a flange. A coiled spring surrounds this rod P, as shown in Fig. 2, and lightly presses it against the adjustment-screw R. The inner end of the iron bar P projects through the cylinder O and rests in contact with the iron core H of the electro-magnet, which in turn is pressed against the rod P by the retracting-spring M bearing upon the hard-rubber rod.

The action of my plugger is as follows: The wires marked + — being connected with a source of electricity of sufficient power, the electric current comes in through the wire marked + to the circuit-breaker at O, passes down the rod P to the core H of the electro-magnet, through the insulated wire coil, and thence to the brass tube L, thence to the casing A, and back to the source by the wire —, all these parts being in electrical contact. The moment the current passes, the core H becomes magnetized and is violently drawn toward the lower end of the instrument by the mutual attraction between the magnetized core H and the mass of iron forming the parts B, C, and E, the spring M yielding as the parts come together. The core H, by virtue of its magnetic force, draws down the rod P of the circuit-breaker with it, the spring surrounding the rod yielding as the rod advances. When the core H, with its surrounding coil of wire, reaches the end of its downward stroke, it comes in contact with the plugging-point-holding bar E, and the blow is by this bar transmitted to the plugger or point, and by it to the gold or other filling impacted in the tooth; but when the core H comes in contact with the end of the bar E the electric current is no longer compelled to pass through the long coil of wire upon the core H, but

takes a more direct road from the core H through the parts B and E directly to the outer case A, thus cutting the coil out of the circuit. As soon as this happens the core H becomes demagnetized and no longer draws upon the circuit-breaking rod P, which is thrown back into contact with the adjustment-screw R by the spring surrounding it. The retracting-spring M immediately returns the electro-magnet to its original position and the operation is repeated so long as the current is applied. It is of the utmost importance that this operation should be effected without any adhesion or hesitation on the part of the different parts of the instrument brought into conjunction and released by the shifting of the current, as hereinbefore described. To obviate a defect in this particular which was found to exist to the impairment of the utility of my invention, I face the upper end of the core H with a thin plate or washer of platinum and screw or otherwise fasten into the lower end of the sliding rod P a button or point of platinum, so that the contact of the core H and sliding bar P is made upon this metal and instantaneously severed upon the shifting of the current after the blow is delivered upon the rod E. By means of these points or washers of platinum the burning of the ends of the soft-iron core H and rod P by the passing current, and also any tendency to the adhesion of those parts because of the residual magnetism remaining after the shifting of the current, are avoided.

In all vibrating electrical instruments hitherto invented the circuit is broken just before the blow is given, thereby losing the force of the magnetic attraction, which is strongest at the moment of contact of the armature and the magnet.

I am aware that electro-magnetic dental pluggers have been invented having many of the features embraced in my invention; but nearly all of those features were common to the arts and unpatentable as separate inventions; but none of these prior instruments have been found of sufficient practical use by dentists to warrant their application to the purposes for which they were intended to be applied and have been for the most part dispensed with. One of the defects of such instruments which rendered them comparatively useless was the breaking of the electric current, as hereinbefore explained, before contact between the armature and the magnet, and consequently before the delivery of the blow, which my invention overcomes.

I make no claim upon any portion of the instrument embraced in this specification contained in the lower section thereof, or so much as is shown beyond the lower termination of the core H downward, as such parts consist either singly or in combination of hitherto well-known devices; but

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

1. The combination of the sliding bar P, maintained in electrical connection with the core H by the retracting-spring M, the core H, the non-conducting washers G I at either end of the core H, surrounded by the brass tubes L K, and the wire upon the core H in electrical connection with the core H and the brass tube L, for the purpose and substantially in the manner herein described.

2. The combination of the circuit-wires + and — with the circuit-breaker O, the circuit-breaking rod P, the sliding electro-magnet core H and its surrounding coil, the outer casing A, and the armature B, for the purpose and substantially in the manner herein described.

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