

G. F. GREEN.

ELECTRO MAGNETIC DENTAL PLUGGER.

No. 171,120.

Patented Dec. 14, 1875.

Fig.1.

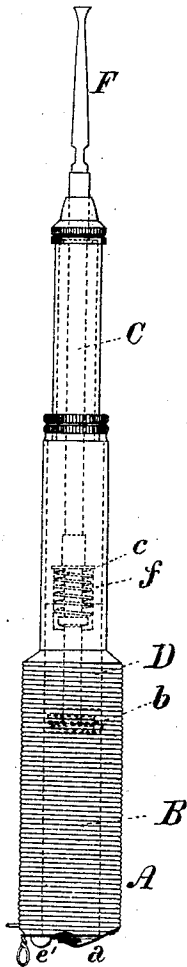


Fig.2.

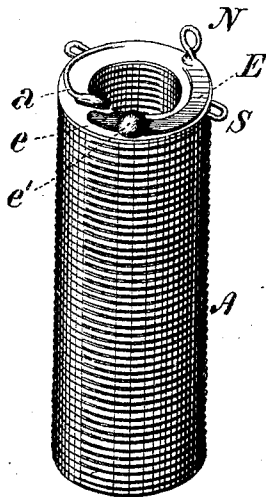


Fig.4.

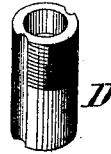


Fig.5.



Fig.3.



Witnesses.

J. Snowden Bell.

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Inventor.

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UNITED STATES PATENT OFFICE.

GEORGE F. GREEN, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO SAMUEL S. WHITE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN ELECTRO-MAGNETIC DENTAL PLUGGERS.

Specification forming part of Letters Patent No. **171,120**, dated December 14, 1875; application filed August 5, 1873.

CASE C.

To all whom it may concern:

Re it known that I, GEORGE F. GREEN, of Kalamazoo, Michigan, have invented certain Improvements in Dental Mallet Pluggers, of which the following is a specification, reference being had to the accompanying drawings, wherein—

Figure 1 is an elevation, with dotted lines indicating the arrangement of certain parts; Fig. 2, a view in perspective of the lower section of the casing inverted; Fig. 3, a view in elevation of the mallet; Fig. 4, a view in perspective of the fixed core, and Fig. 5 a view in elevation of the plugger-spindle.

It is the object of my invention to provide an instrument for dentists' use in plugging teeth, employing electricity as a motor, and to secure a succession of blows more or less rapid and heavy or light, according to the length of the stroke or the distance the mallet travels.

The lower section of the casing consists of a common helix of copper wire, A, Figs. 1 and 2, having a core, D, Fig. 4, fitted into its top, which core supports the spindle C, Figs. 1 and 5, and at the same time constitutes an auxiliary magnet, which will assist the helix in giving the blow. This core has grooves along its circumference, through which an escape is afforded for the air forced into the helix at each stroke of the flanged mallet B, Figs. 1 and 3, and which air would otherwise cushion the mallet and destroy, or at least impair, the force of the blow. Against the lower end of this core I place within the helix a coiled spring, *b*, Fig. 1, upon which the inner end of the mallet bears, while its outer end projects out beyond the helix. By the resilience of this spring the mallet is thrown back when the blow is struck, and at other times kept protruding from the helix to a greater or less extent, according to the greater or less length of the stroke to be given by the mallet. It will be seen that the length of the stroke may thus be readily determined or regulated. Upon the bottom edge of the helix, and between it and the flanged end of the protruding mallet, I mount a spring, E, which I prefer to

load, as shown in Fig. 2, by a counter-weight, *e'*, and which extends, say, half-way round the helix, its free end standing a little above the helix, but below and clear of the protruding end of the mallet. This spring E must not touch the mallet, but rests in contact with a part of the helix-wire *a*, which is brought outside of the coil for that purpose, thus connecting or closing the circuit so long as this contact of the spring with the wire is maintained. A lip or stud, *e*, on the spring projects over the edge of the coil so as to come under the flange of the mallet.

When the current is established, and the power of the battery thus brought to bear upon the mallet, the mallet moves toward the fixed core D, compressing the spring *b*, and delivering the blow, when the flange of the mallet, striking the lip *e* of the spring E, draws the spring down or out of contact with the helix-wire, and thus breaks the circuit, the depression of the spring being facilitated by the weight upon it, and its resistance against the blow of the mallet thus diminished, while, after the blow is struck, the counter-balance will tend to retard the resilience of the spring E, and thus permit the mallet to be thrown back for another blow solely by the quicker action of the coiled spring *b*.

The upper part of the casing serves as an additional guide for the spindle C, the socketed end of which, C', Fig. 5, protrudes through it, and receives the plugging-tool F, Fig. 1, while the other end of the spindle passes through the fixed core D and through the coiled spring *b* to such a distance as may bring it to the proper point for receiving the blow of the mallet. I prefer to form a shoulder within the fixed core D, at its upper end, and above the core to put a collar, *c*, Fig. 5, on the spindle. Between the shoulder and the collar I confine a coiled spring, *f*, which serves to keep the spindle in its due position, instead of allowing it to slip up and down in the casing, so that the mallet will at all times strike the end of the spindle at the same point, and not at irregular distances.

The wires from the battery being properly

connected with the helix through the eye attachments N S, Fig. 2, the operation of the above-described instrument will be as follows: The current of electricity traversing the helix excites a magnetic circuit, which attracts the mallet B toward the fixed core D, and the end of the spindle C being between the mallet and the core, the whole power of the current is delivered upon the end of the spindle, and imparted through the spindle to the plugger. With the attraction of the mallet and the delivery of the blow the flange upon the outer end of the mallet is caused to depress the spring E, and this breaks the circuit, leaving the coiled spring *b* free to exert its power upon the mere weight of the mallet; and, the mallet being thus thrown back beyond the edge of the helix and above the spring E, the spring E rises and again comes in contact with the wire *a* of the helix, which re-establishes the circuit, and thus the blow is repeated.

Some of the devices herein shown and described are claimed in other applications of mine filed simultaneously herewith, and are not, therefore, claimed herein.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the electro-magnet, the mallet reciprocating therein, and the end-wise-reciprocating spindle carrying the tool, substantially as described.

2. The combination, with the casing of a dental plugging-instrument, of the helix, the fixed core, the reciprocating mallet, and the spindle carrying the tool, substantially as described.

3. A circuit-breaker spring, actuated by the flange of the mallet, for the purposes described.

4. The combination of the shoulder in the fixed hollow grooved core, or its equivalent, with the collar *c* on the spindle, or its equivalent, and the coiled spring *f*, for the purposes described.

5. The combination of the helix, the flanged mallet, and the grooved fixed core.

6. A mallet for an electro dental plugger, provided with a flange, for the purpose of breaking the electric circuit, substantially as described.

In testimony whereof I have hereunto subscribed my name.

GEORGE F. GREEN.

Witnesses:

LEVI TEAL,

WM. E. MORGAN.