(No Model.)

J. B. ODELL.

DENTAL MALLET.

No. 256,850. Patented Apr. 25, 1882.

Fig 1.

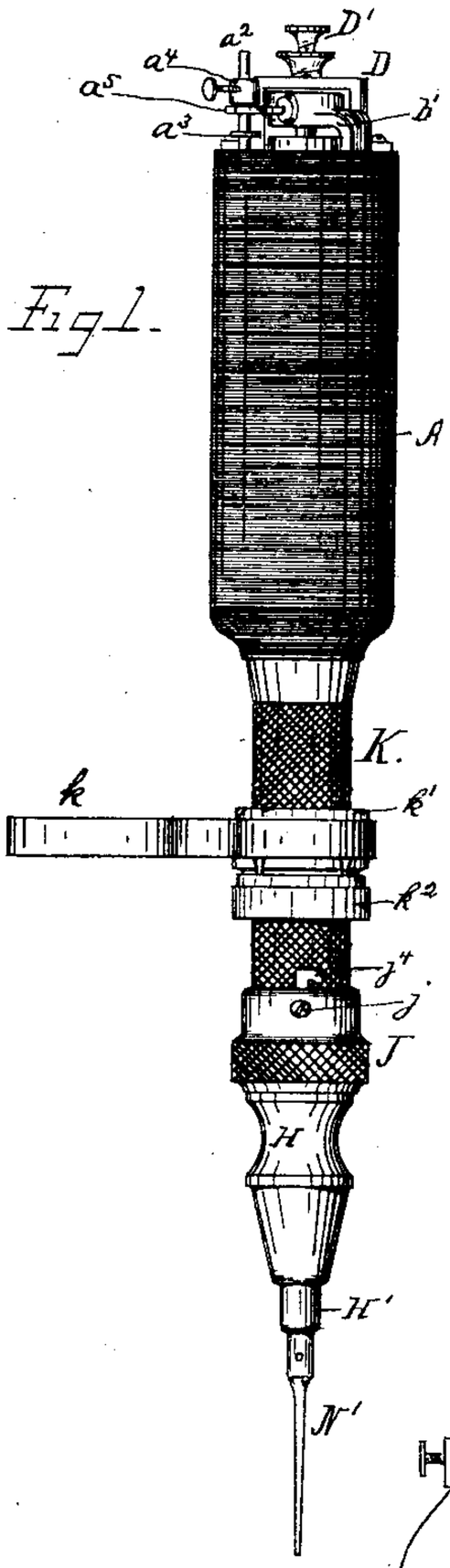

Fig 2.

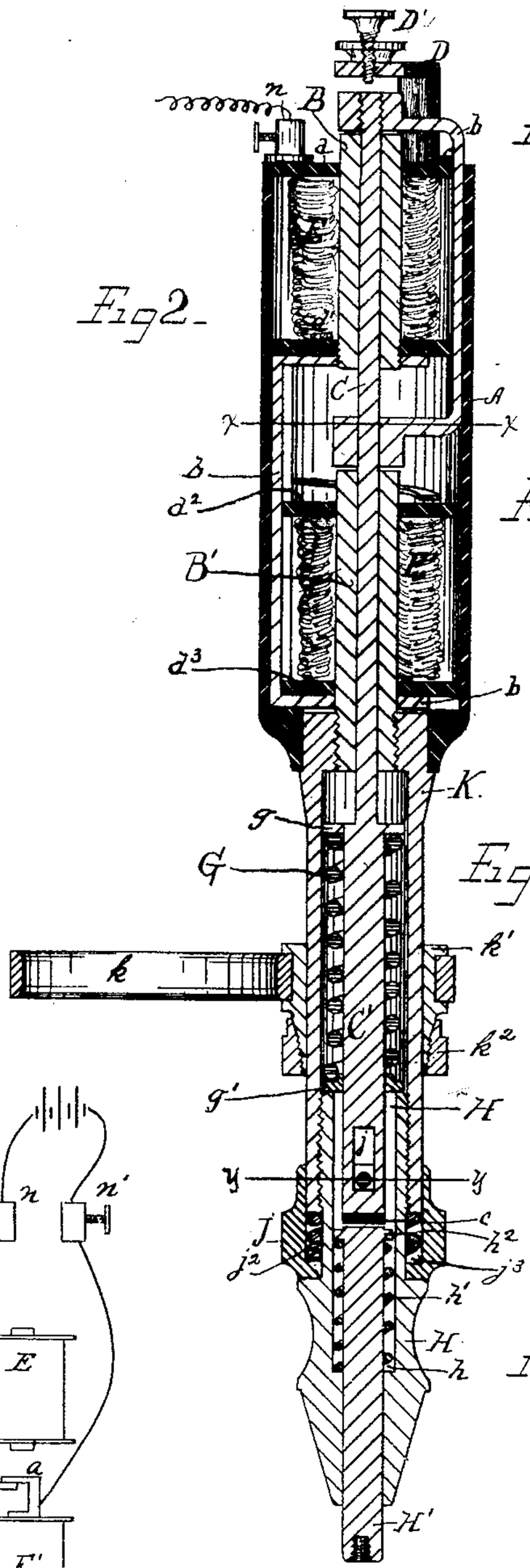

Fig 3.

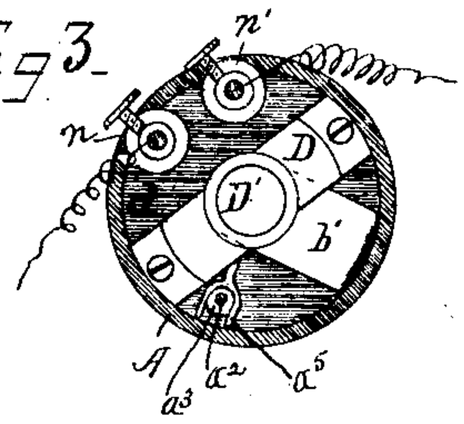

Fig 4.

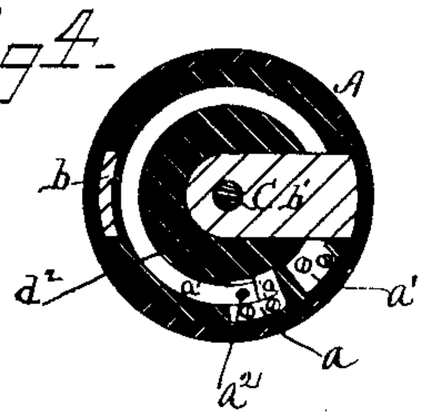

Fig 5.

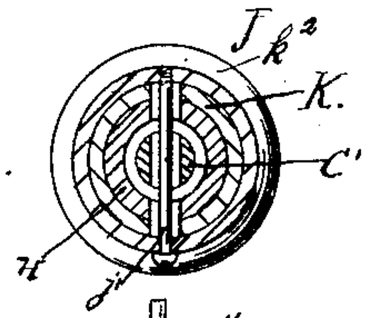

Fig 6.

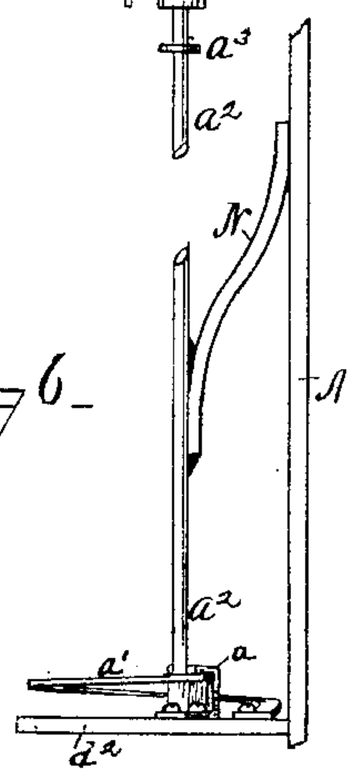

Fig 7.

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UNITED STATES PATENT OFFICE.

JOHN B. ODELL, OF CHICAGO, ILLINOIS.

DENTAL MALLET.

SPECIFICATION forming part of Letters Patent No. 256,850, dated April 25, 1882.

Application filed December 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. ODELL, of Chicago, Cook county, State of Illinois, have invented certain new and useful Improvements in Dental Mallets, of which the following is a specification.

In my invention electricity is employed as the motive power, and the two cores of the electro-magnet are made hollow and arranged axially with each other, the heel-plate and the armature of the magnet being made of a semi-rectangular form, so that the stem of the mallet, which is made of brass or other non-magnetic substance and actuated by the armature, works up and down through the center of the cores. In this way it will be seen the instrument is made symmetrical, and may be much more conveniently handled in the use for which it is designed than if it be unevenly balanced on one side or the other; and being thus of a cylindrical form, the electrical part of the apparatus may be compactly inclosed in the rubber casing which forms part of the handle or frame of the instrument. The electric circuit is broken at or near the end of the stroke of the mallet, so as not to impede its force. This I do by means of a spring-contact operated by a small circuit-breaking rod or piston actuated by an arm projecting from the armature, the circuit-breaking rod being provided with a stop and an adjustable collar, so that when the stroke is nearly finished this arm, impinging against the stop on the rod, will thereby break the circuit. By adjusting the collar any desired length of stroke may be given. To aid in the adjustment of the instrument and to limit the retraction of the mallet-stem after the blow is given, an adjustable screw-stop is inserted in a brace or angle piece projecting over the end of the mallet-stem. The retraction of the mallet-stem from the blow, as well as that of the piston in which the plugging-tool is mounted, is effected by means of springs; and the apparatus is set in motion by means of a pin passing through a slot near the end of the mallet and through a ferrule surrounding the handle part of the instrument. By slipping the ferrule up the mallet-stem is permitted to be retracted by the spring, thus drawing back the circuit-breaking rod until the spring-contact closes the circuit.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a side elevation of a full-sized device embodying my invention. Fig. 2 is a central longitudinal section of the same one-third enlarged. Fig. 3 is a top or plan view, also enlarged. Fig. 4 is a section on line *x x* of Fig. 2. Fig. 5 is a section on line *y y* of Fig. 2. Fig. 6 is an enlarged detail of the circuit-breaking mechanism, and Fig. 7 is a diagram of the circuits.

In the drawings, A represents the shell or casing, preferably made of hard rubber, in which the electro-magnets are inclosed and upon which a part of the mechanism is mounted. The cores B B′ of the magnets are provided with a central hole for the mallet-stem C, and are arranged on the same axial line with each other.

b is the heel-plate, and *b′* the armature, each of which, it will be observed, are of a somewhat semi-rectangular form, so as to partially embrace one of the coils of the magnet. The mallet-stem passes through suitable holes in the ends of the armature, one of said holes being provided with screw-threads whereby the mallet-stem is secured to the armature.

D is an angle-piece, secured to the top of the hard-rubber head *d* of the coil by means of a screw or otherwise; and D′ is a set-screw, the end of which projects over the end of the mallet-stem to limit its upward movement and to afford additional means of adjusting the length of the mallet-stroke. The mallet-stem C is made of brass, so that the magnetism of the cores B B′ will not interfere with its free movement.

C′ is the mallet, which is secured to or made parcel with the mallet-stem. It is provided with a hard-rubber or other suitable cushion, *c*, on its end to break the shock of the blow.

E and E′ are the coils, and *d*, *d′*, d^2, and d^3 are the hard-rubber heads, between which the wire of the coils is wound. The head d^2 serves as a base-plate upon which to mount the contact *a* and the spring-contact *a′*, which is made of spiral form. The contact-breaker a^2 passes down through suitable holes in the heads *d* and *d′* and projects over the end of the spring-contact *a′*. This rod a^2 is provided near its upper end with a stop, a^3, and an adjustable collar, a^4, which are set at about such distance apart

as it is desired the length of the mallet-stroke shall be.

The contact-breaker is actuated by means of a small yoke or arm, a^5, secured to the upper end of the armature. When the armature is drawn down by the magnetized cores until the arm or projection a^5 impinges against the stop a^3 the further movement of the armature will cause the rod a^2 to press down the end of the spring a', and thus break connection between a and a', thus demagnetizing the cores and releasing the armature, when the mallet-stem and armature will be retracted by means of the coil-spring G surrounding the mallet. As the mallet-stem is withdrawn by the spring the arm a^5, after it comes against the collar a^4, will lift the contact-breaker a^2 with it, thus permitting the spring-contact a' to make connection with contact a, when the stroke will be repeated, the same as before.

The stop or set-screw D′ should be so adjusted as to raise the circuit-breaker only such distance as may be necessary to break the circuit. The coil-spring G surrounding the mallet presses at one end against a shoulder, g, on the mallet, and at the other end against a collar, g', resting on the end of the tubular head or sleeve H, in which the tool-holder H′ is mounted.

The sleeve or handle K is secured to the end of the shell A and incloses the coil-spring G in the annular space surrounding the mallet. The outer surface of this handle is knurled or roughened, so that the adjustable finger-rest k, which is mounted loosely on the conical threaded split sleeve or collar k', may be securely fixed in any desired position on the handle by means of the conical threaded nut k^2.

The tubular head H is secured to the end of the sleeve K by screw-threads, so as to be adjustable thereon, and is provided with an interior shoulder, h.

h' is a light coil-spring surrounding the tool-holder H′, resting at one end against the shoulder h and at the other end against a shoulder, h^2, on the tool-holder. This spring serves to keep the tool-holder in position to receive the blow of the mallet. Near the end of the mallet there is a slot, j, through which passes a pin, j', terminating in the collar J, surrounding the sleeve K at its junction with the tubular head H. A coil-spring, j^2, inclosed within the collar J and bearing at one end against a shoulder, j^3, on said collar and at the other against the end of the sleeve K, serves to press this collar into the position shown in Fig. 2, thus holding the mallet down and permanently breaking the circuit. When the operator gets the tool in position and is ready to commence plugging, by simply pulling this collar up with his thumb or finger and turning it slightly until the pin j' rests in the end of the slot j^4 in the sleeve K the instrument is put in operation. Ordinarily, however, the operator simply raises and holds the collar up with his thumb.

N is a curved spring, one end of which is secured to the circuit-breaker a, and the other bears against the interior of the shell A for the purpose of steadying the motion of the circuit-breaker.

n and n' are the binding-posts secured to the head d.

The arrangement of the circuit is as follows: from the battery to binding-post n, thence to upper coil, to lower coil, to spring-contact a', to contact a, to binding-post n', and thence to battery.

The plugging-tool N′ is secured in the end of the tool-holder by screw-threads or other suitable means, so as to be readily removed for the purpose of substituting other tools, as may be required.

I have shown and described what I consider the best mode of practicing my invention, and it will be observed that the same may be used as an electric pen by simply substituting the pointed stylus or perforator in place of the plugging-tool and making the mallet-stem, mallet, and tool-holder continuous, and also for other analogous uses, and I do not wish to limit myself to its use as a dental mallet.

I claim—

1. The combination, with an electro-magnet having hollow cores arranged axially with each other, of the mallet-stem mounted in said hollow cores and the bent armature secured to said mallet-stem for actuating the same, substantially as specified.

2. The combination, with an electro-magnet having fixed hollow cores arranged axially with each other and connected by a heel-plate, of a movable non magnetic mallet-stem mounted in said hollow cores and an armature secured to said mallet-stem for actuating the same, substantially as specified.

3. The combination, with an electro-magnet having fixed cores arranged axially with each other, of a bent reciprocating armature secured to a reciprocating mallet-stem, substantially as specified.

4. The combination of the mallet and mallet-stem, spring for retracting the same, an electro-magnet having hollow cores arranged axially with each other, shell inclosing said magnet, coil-heads, spring-contact, circuit-breaker provided with stop and adjustable collar, and an arm secured to the armature for actuating the circuit-breaker, substantially as specified.

5. The combination, with an electro-magnet, of the mallet and mallet-stem, spring for retracting the same, adjustable stop to limit its upward motion, spring-contact, and circuit-breaker provided with stop and adjustable collar, and arm secured to the armature for actuating said circuit-breaker, substantially as specified.

6. The combination, with the handle K, provided with roughened exterior surface, of the finger-rest mounted on an adjustable conical split threaded sleeve and conical threaded nut for securing said sleeve in position on the handle K, substantially as specified.

7. The combination of handle K, provided

with bent slot j^4, hollow head H, ferrule J, provided with pin j', and mallet provided with slot j, substantially as specified.

8. The combination of shell A and the handle K, provided with an adjustable finger-rest, with the mallet-stem and spring for retracting the same, an electro-magnet having cores arranged axially with each other inclosed within said shell A, mechanism for breaking the circuit by movement of the mallet-stem, and a sliding ferrule, J, mounted on said handle K and connected with the mallet-stem, whereby the circuit may be broken at the will of the operator, substantially as specified.

JOHN B. ODELL.

Witnesses:
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EDMUND ADCOCK.