(No Model.) 2 Sheets—Sheet 1.

W. E. WHEELER.

ELECTRICALLY OPERATED DENTAL ENGINE.

No. 534,536. Patented Feb. 19, 1895.

Fig. 1.

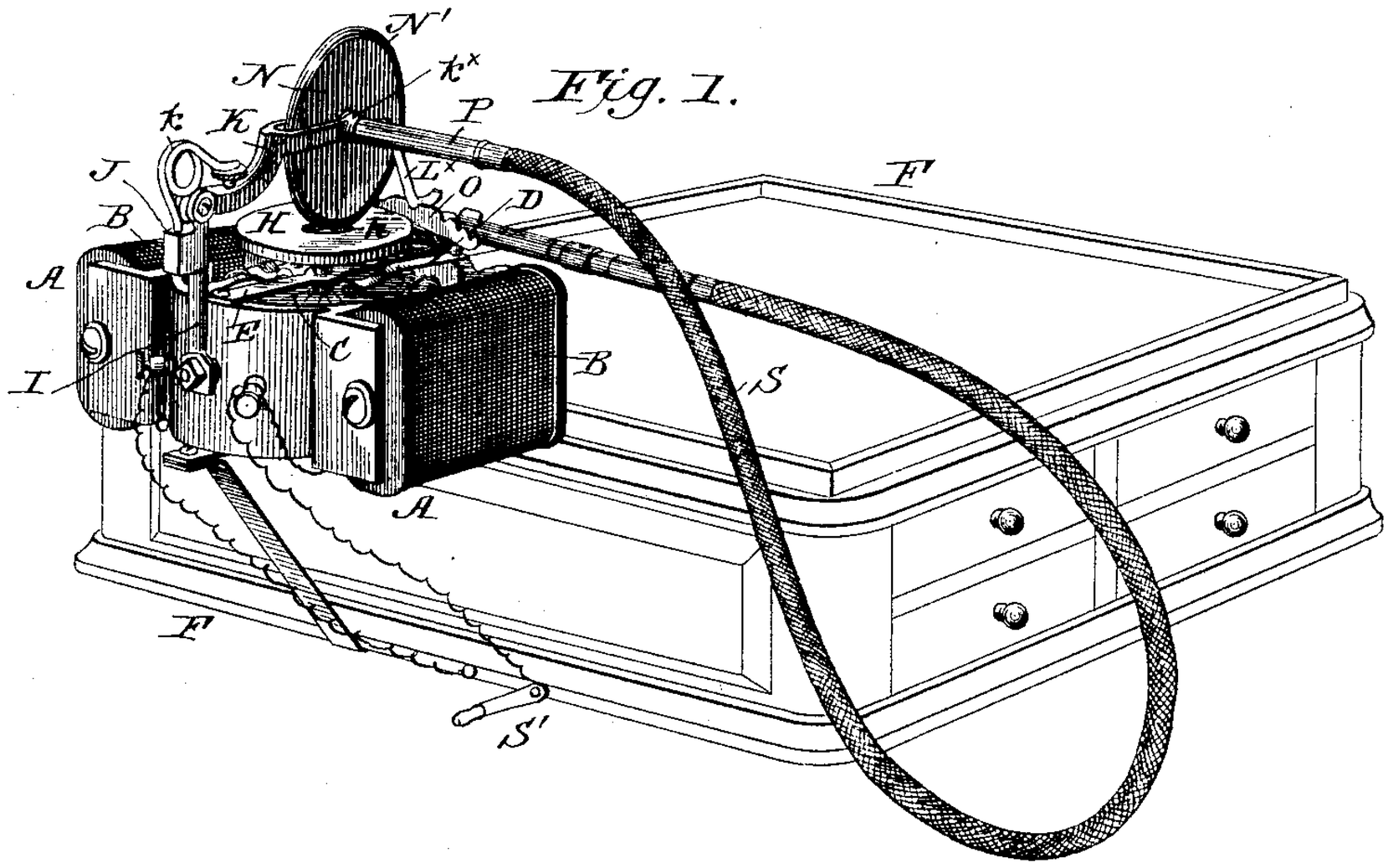
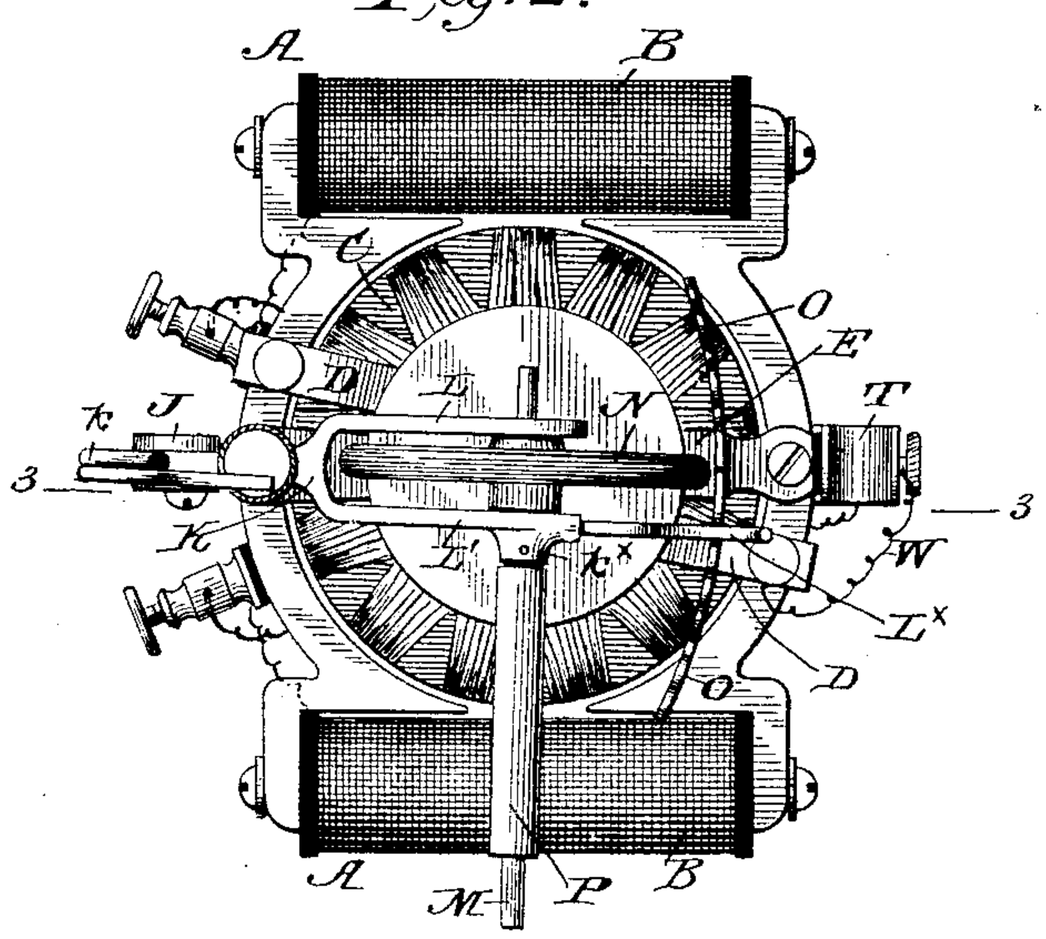


Fig. 2.



WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

W. E. WHEELER.

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Fig. 3.

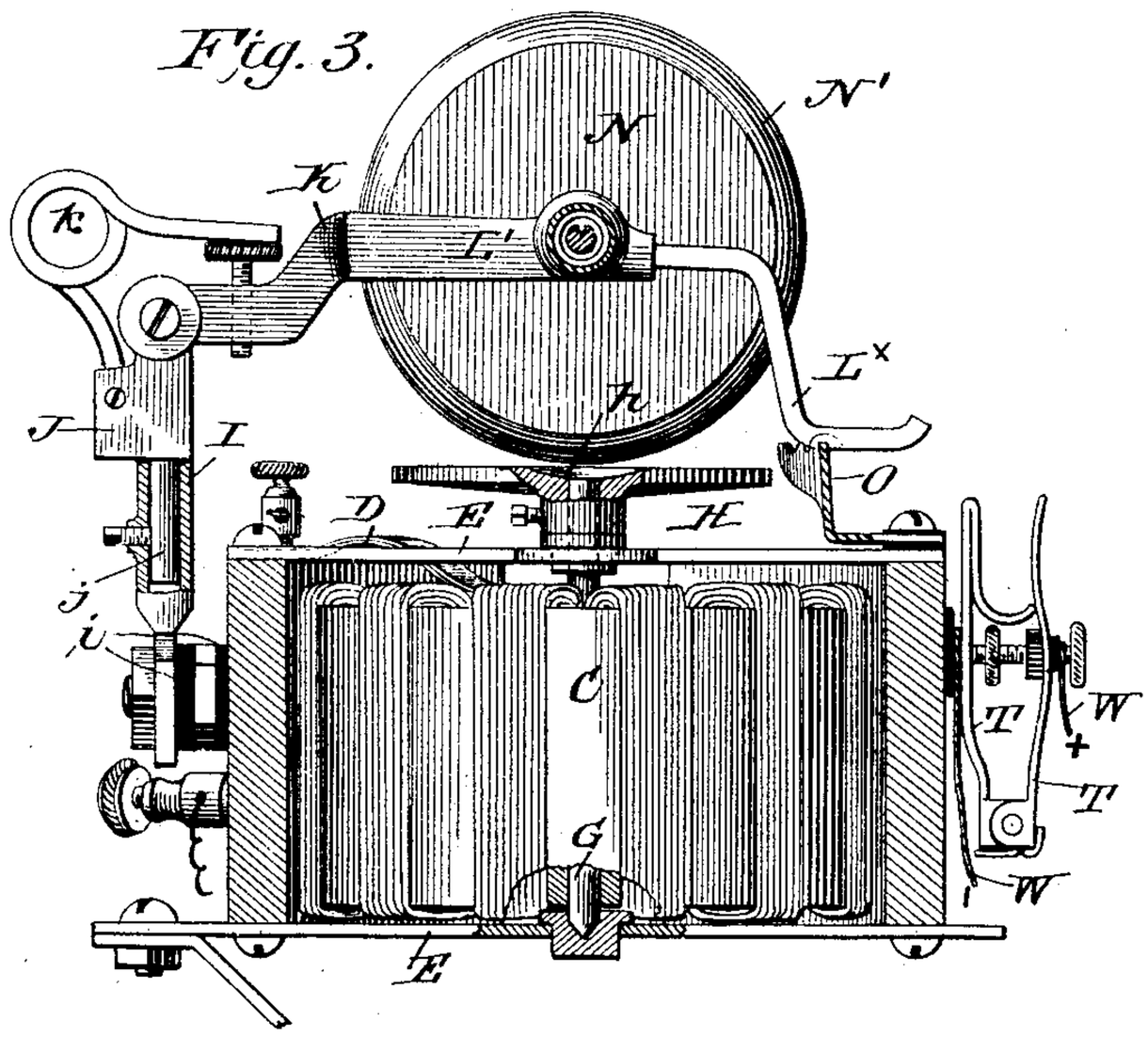
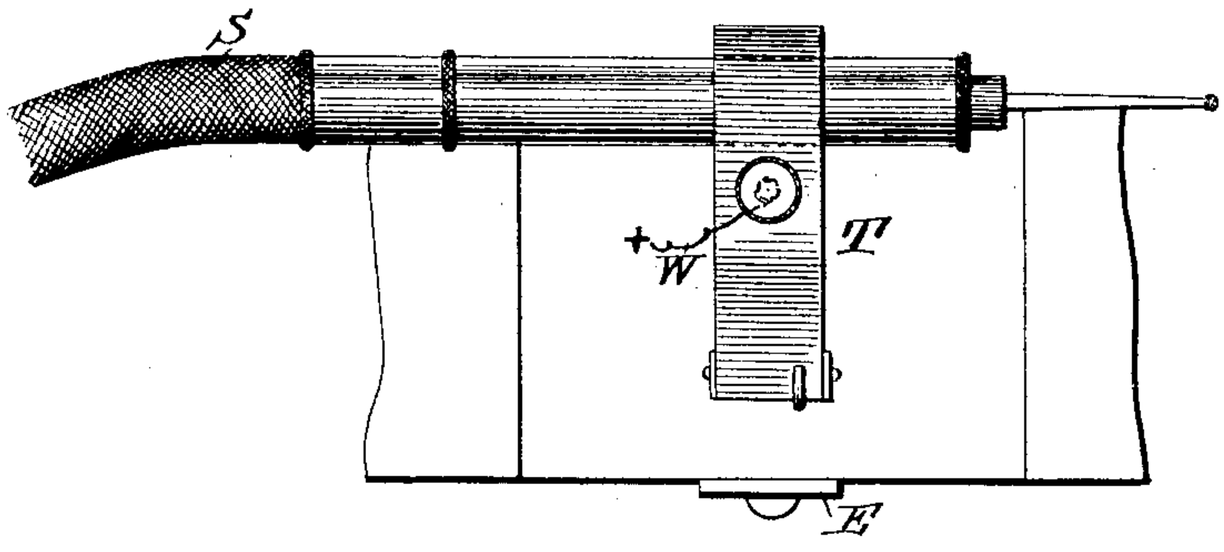


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM EUGENE WHEELER, OF DAYTON, TENNESSEE, ASSIGNOR OF ONE-HALF TO GEORGE W. JOHNSON AND JAMES F. JOHNSON, OF SAME PLACE.

ELECTRICALLY-OPERATED DENTAL ENGINE.

SPECIFICATION forming part of Letters Patent No. 534,536, dated February 19, 1895.

Application filed October 6, 1893. Serial No. 487,388. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EUGENE WHEELER, residing at Dayton, in the county of Rhea and State of Tennessee, have invented a new and useful Electric Dental Engine, of which the following is a specification.

My invention relates to improvements in dental engines, and it has primarily for its object to provide a simple and convenient electrically operated engine of this character which can be easily manipulated and which will serve to materially lessen the labor of the dental operator.

Furthermore it has for its object to provide a dental engine so constructed and arranged that the operator can at all times stand on both feet and work from each side of the chair, thereby enabling the operator to perform such operation quicker, and with more freedom, and ease of movement, and in consequence mitigating the pain of the patient.

It also has for its object to provide an engine of this kind having suitably arranged and easily operated shifting devices whereby the speed of the drill-operating drive-wheel can be increased or decreased as desired, and the motor stopped when the drill-holding cable is hung up at rest.

With other minor objects in view which hereinafter will appear, my invention consists in such novel features of construction and peculiar combination of parts as will be first described in detail and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved dental engine showing the same in its operative position on the bracket table. Fig. 2 is a top plan view of the engine or motor. Fig. 3 is a longitudinal section thereof taken practically on the line 3—3 in Fig. 2, and Fig. 4 is a partial end elevation taken from the automatic switch end.

In its practical construction my invention embodies an electric motor, having field magnets, and in which the armature runs vertically or in a perpendicular position, the shaft of which has a friction disk which is adapted to engage and drive the drill-operating devices.

In my arrangement of the motor the field magnets are so arranged as to place the armature shaft and armature in a perpendicular position, so as to make it practical and convenient to use the shifting devices attached thereto in the manner hereinafter described.

Referring now to the accompanying drawings by letters of reference A A indicate the field magnets; B B, their coils; C, the armature; D D, the brushes; E E, the armature supports, which parts constitute the motor, and are supported and held in position, in practice on the bracket table F, although they may be, if desired, secured upon a suitable base provided therefor.

The armature C as before stated runs vertical, and has its shaft G formed cone shaped at the lower end and fitted in a cone bearing, while the upper end is fitted in and projects above the upper support E and has detachably secured thereon a plane face wheel H slightly dished in the center as shown at *h*.

At the front side of the motor or engine is secured a socket-like bracket I, which is held insulated from the motor body by the rubber washers *i i*. In this socket is fitted to turn the vertical stem *j* of a standard J, to the upper end of which is connected a horizontally disposed arm K, which is normally held spring pressed in a downward direction by the spring *k*, and such arm has bifurcated members L L′ which have journal boxes to receive the drill-operating spindle M, on which is mounted to turn therewith the friction wheel N, which has a rubber rim N′ and which is disposed at right angles to the drive-wheel H and normally held in contact therewith by the spring pressure before mentioned. One of the friction wheel bearing arms (L′) is extended and has a downwardly bent angular portion $L^{\times}$, which is arranged to engage a notched segmental support O, as shown most clearly in Figs. 1 and 3.

The bearing arm K has at one side a threaded extension $k^{\times}$ on which is adapted to be fitted the internally threaded sleeve P, to which is secured the cable or sheath S.

On the inner end of the motor is secured what I term the automatic switch and cable rest, which comprises a pair of spring clasp-

like arms T T, which have secured thereto the terminals + and — of the circuit wire W, and such arms are normally spring pressed toward each other, whereby to cause the terminals + and — to contact and thereby close the circuit. An ordinary switch S′ is also preferably arranged in the circuit wire as shown.

From the foregoing description taken in connection with the accompanying drawings the operation of my improved dental engine is best explained as follows: When not in use the drill or handle end of the cable is fitted in and supported on the rest T, and as the diameter of the cable in the practical construction of the parts is greater than the normal width between the arms T T, such arms are caused to spread, and in consequence, separate the terminals + and —, break the circuit and stop the motor. When however the cable is lifted out of the rest for use, the terminals contact, close the circuit and set the motor in operation. Now by shifting the wheel N, toward the periphery of the wheel H at one side, the speed thereof is increased, and by shifting it toward the axis of the said wheel H the speed is proportionately decreased, the same results of speed being obtained for the wheel N if moved over onto the opposite side of the wheel H—it being understood the rotation of the wheel N then being in a reverse direction. Should the wheel N be held centrally over the dished portion of the wheel H, it is manifest the same will be held from frictional contact therewith, and such wheel N be then stopped from revolving.

It will be readily seen from the drawings that the drill-driving devices proper are so insulated from the motor or engine, as to prevent any electrical contact or connection with either the operator or patient, thereby preventing any possibility of a shock, and thereby rendering the machine perfectly safe.

It will also be manifest that by combining the drill shaft and the drive disk thereon, with tension means for holding the disk against the motor drive wheel, the force of contact of the drill shaft disk against the drive shaft disk may be so regulated that in case of accident, (the burr of drill getting caught in the mouth) the friction disk will slip and thus hold the drill from a too forcible rotation.

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

1. An improved dental engine comprising a motor having a friction drive wheel on its operating shaft, a movable drill shaft having a disk member adapted to be rotated by contact with the aforesaid drive wheel, and means for adjusting the pressure of the said shaft toward the said drive wheel, whereby the said disk will become non-rotatable, when the drill meets with a resistance greater than the contact tension of the aforesaid disk against the drive wheel as hereinbefore described.

2. An electric dental engine comprising a motor having a friction drive wheel on its armature shaft, a supporting member pivotally supported on the motor frame to swing laterally over the drive wheel, and spring pressed toward the said wheel, a drill shaft journaled in the said member and a friction disk fixedly held on the said shaft and in contact with the drive wheel by the spring pressure of the supporting member, substantially as shown and described.

3. An electric dental engine comprising a main frame adapted to be secured to a bracket or table, and having field magnets secured thereto, an armature journaled on the frame and held to rotate vertically between the said magnets said armature having a friction drive wheel, a drill operating disk held to engage the said drive wheel, the drill cable connected with the bearing for the said disk and a combined automatic switch member and rest for the drill end of the cable, arranged substantially as shown whereby the engine will be stopped and started as the cable is placed between and withdrawn from the said rest portion as set forth.

4. In an electric motive power dental engine, a rest for the cable, comprising yielding arms having the terminals of the circuit connected normally held with their terminals in contact and to break such contact when the cable is held thereon as specified.

5. In an electric motive power dental engine, a combined automatic switch and cable rest, the switch being governed by the insertion and withdrawal of the cable, to stop and start the engine substantially as described.

6. An improved dental engine comprising an electric motor having a frictional drive wheel or disk, a drill shaft having a friction drive disk, a pivoted supporting member for such shaft, and tension means for holding the drill shaft drive disk in frictional contact with the armature shaft drive disk substantially as and for the purposes described.

7. In combination with the motor and the armature friction wheel, of a laterally swinging arm, a notched guide therefor, the drill shaft journaled on the said arm, and a friction wheel mounted on the drill shaft to turn therewith held in contact with the face of the armature friction wheel all substantially as shown and for the purposes described.

8. The combination with the motor, the armature shaft of which has a friction wheel having a plane face, of an insulated arm held on the motor to swing laterally over the said friction wheel, said arm being held spring pressed toward such wheel, the drill-shaft journaled in the said arm, and a friction wheel on such shaft having a rubber rim, said wheel being held in contact with the armature friction wheel substantially as shown and for the purposes specified.

WILLIAM EUGENE WHEELER.

Witnesses:
H. B. RIVES,
THOMAS F. AUNSPAUGH.