

(No Model.)

L. S. PFOUTS.
DENTAL ENGINE.

No. 510,484.

Patented Dec. 12, 1893.

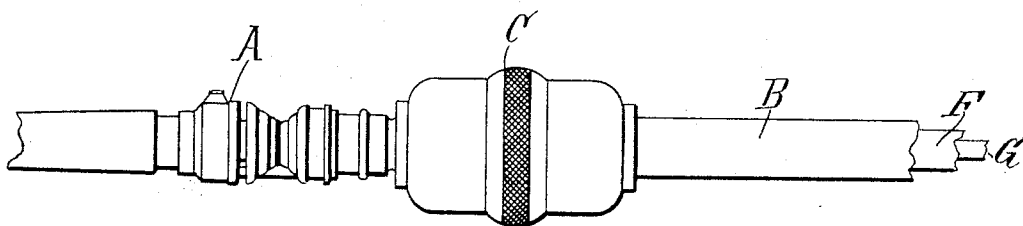


Fig. 1

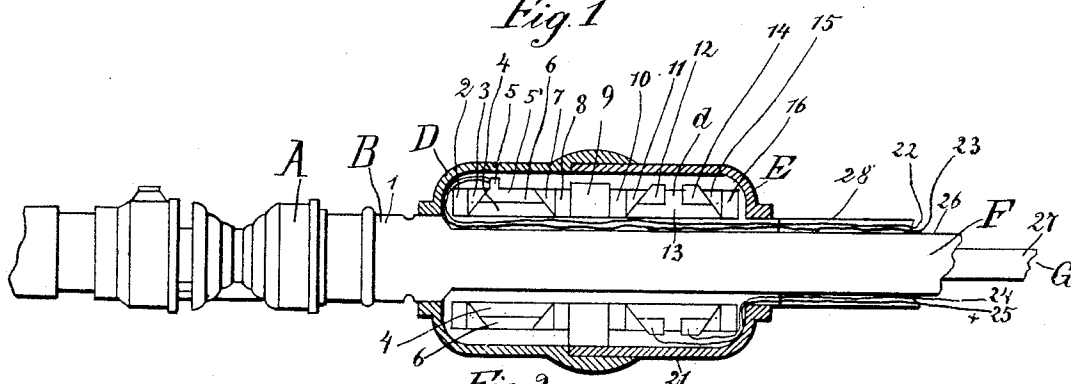


Fig. 2

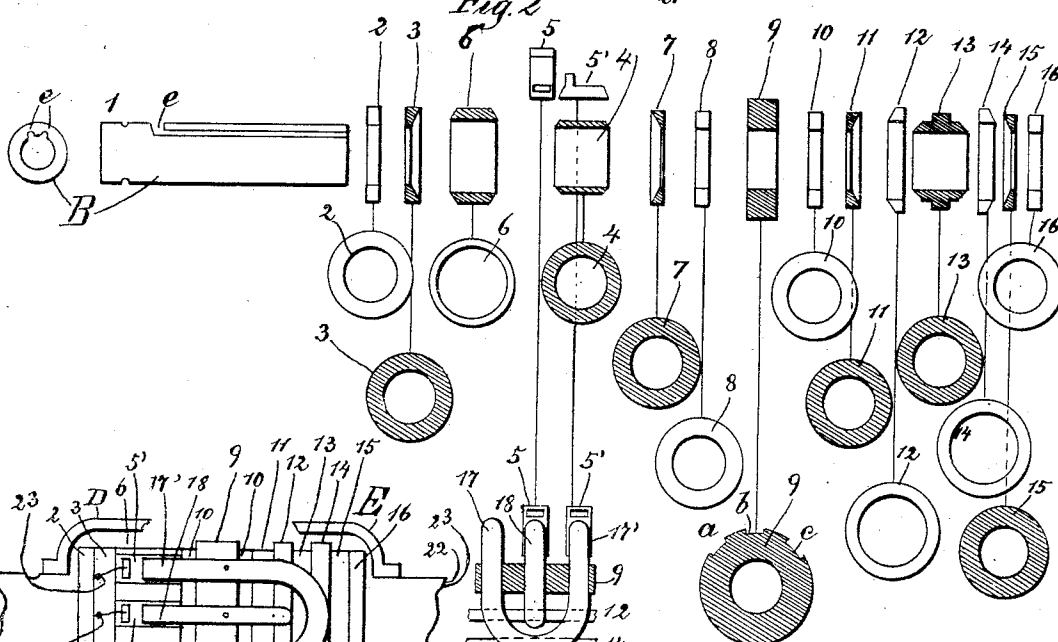


Fig. 3

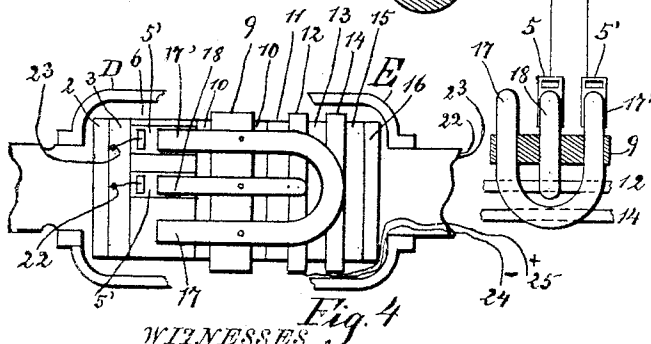


Fig. 4

WITNESSES

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UNITED STATES PATENT OFFICE.

LEROY S. PFOUTS, OF CANTON, OHIO.

DENTAL ENGINE.

SPECIFICATION forming part of Letters Patent No. 510,484, dated December 12, 1893.

Application filed January 13, 1893. Serial No. 458,263. (No model.)

To all whom it may concern:

Be it known that I, LEROY S. PFOUTS, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have
5 invented a new and useful Improvement in Dental Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

10 My invention relates to an improvement in dental engines, and particularly to the class of dental engines, that are actuated by electric motors.

The object of the invention is to provide
15 means within the hand piece or tool holder or connected thereto, whereby the operator may control the movements of the motor.

With this end in view my invention consists of certain features of construction and combination of parts as will be hereinafter described or pointed out in the claims.

Figure 1 of the accompanying drawings is a plan view of a fragment of a hand piece with inclosed switch attached thereto, natural
25 size. Fig. 2, is a similar view enlarged showing a longitudinal section of assembled parts. Fig. 3, is a group of the several parts of the switch showing them in cross section and plan view. Fig. 4, is a plan view with inclosing
30 case cut away to disclose the parts in operative position.

Similar letters and numerals of reference indicate corresponding parts in all of the figures of the drawings.

35 Fig. 1, of the drawings illustrates the adaptation of the invention, natural size.

Referring to Fig. 2, which is enlarged to show the parts more distinctly, A represents a fragment of a tool holder or hand piece with
40 switch attached or coupled thereto, and B, a tube made of hard rubber or some non-magnetic material on which the several parts are assembled. C is the covering or inclosing cap formed of the two open ended cylindrical portions D and E, one end of each part adapted
45 to the tube B, the other or open ends to slide together, one embracing the other as shown.

On the tube B is provided a series of rings and tubes of hard rubber or some non-magnetic material, excepting the rings, Nos. 12 and
50 14, which are of copper or some conductor of electricity, and are placed upon the tube in

the following order, beginning with No. 2, which serves as a stop for ring No. 3, which is under cut to form a binder as hereinafter
55 described. Tube No. 4, is preferably made of hard rubber having beveled ends as shown, placed on the tube against ring No. 3; on this tube are secured metal terminals or commutator segments No. 5 and 5'; about the tube
60 No. 4, is placed an open sided tube No. 6, the edge portions to have contact with the outer edges of the commutator strips No. 5 and 5', the space between the parts 5 and 5' to be filled preferably with mica to correspond with
65 the surface of the metal commutator strips, and the hard rubber open-sided tube No. 6, the ends of the commutator strips and the ends of the tubes mentioned to be beveled outwardly as shown against which is now
70 placed a binder ring, No. 7, beveled under as No. 3, to correspond with the bevel ends of the metal strips Nos. 5 and 5' and the tubes 4 and 6. The rings Nos. 3 and 7 should be made of some good insulating material, as they
75 serve not only to bind and hold the parts Nos. 4, 6, and 5 5', that form the commutating portion of the switch, but to insulate the commutator thus formed; ring No. 8, as ring No. 2, is made of some non-magnetic material and
80 forms a spacing portion between the commutator and the hard rubber ring No. 9, in the periphery of which are provided recesses *a, b* and *c*, in which the several branches of the commutating brush are secured as shown in
85 Fig. 4; against the ring No. 9, is placed a spacing ring No. 10, of material similar to Nos. 2 and 8, against which is placed the binding ring No. 11, and should be of a similar insulating material; against this last mentioned ring is placed a hard rubber tube 13,
90 having beveled ends, and a central annular rib *d*. About said tube and against the two sides of the rib *d* are placed copper or other electric conducting metal commutating rings,
95 Nos. 12 and 14, the outsides of which are beveled to correspond with the beveled ends of the tube 13, and rings Nos. 11 and 15, the outside diameter of the rings Nos. 12 and 14 to be a little larger than the diameter of the
100 rib *d* or of the rings adjacent thereto. The binding ring No. 15, is now placed against the beveled ends or sides of the ring No. 14 and tube 13, and against the ring No. 15 is

placed the insulating ring No. 16, similar to ring No. 2, by the two outside or end rings; these several parts are held in position as shown in Figs. 2 and 4, the circular end portion of the U-shaped brush Nos. 17 and 17', resting on the commutating ring No. 14, and the end of brush No. 18, resting on the commutating ring No. 12, thus connecting the metal commutating strip or terminals 5 and 5' with the commutating rings No. 12 and 14.

On the inside of tube B are provided longitudinal grooves *e*, which may be placed side by side as shown in cross section B, Fig. 3, or if preferred, the grooves may be placed elsewhere in the tube, as they only serve to provide room within the tube and outside of the casing F, that incloses the flexible driving cable G.

The leading in wire No. 25 by which the electric energy is conducted from the generator or place of supply, may be concealed under the cover F. The tube B, may be discontinued after passing out of the portion of the inclosing cap C; said wire is connected with the commutator ring 12, and communicates through the brush piece 18 to the commutator strip No. 5, and from there over wire No. 22, to the armature of the motor, (not shown,) and through said armature back on wire No. 23, to the commutating segment or strip No. 5', to the brush strip No. 17', thence to the commutating ring No. 14, and out to the dynamo or place of supply.

The middle ring No. 9, that supports the brushes and by which they are rotated about the rings Nos. 12 and 14, and over the commutator segments Nos. 5 and 5', is connected to the E portion of the cover C to move or rotate with said cover about the tube B, to move the brushes over the segments Nos. 5 and 5', to start or stop or reverse the movement of the motor and thereby start or stop or reverse the movement of the dental tool in use in the tool holder or hand piece.

It will be seen by the foregoing description that by the use of my invention, the mo-

tor whereby the flexible shaft or driving cable is rotated, to rotate the dental tool, may be located remotely or near by, the control of which is placed with the hand piece within the hand of the operator.

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

1. The combination with a dental hand piece of an electric current switch comprising the tubular portion B, tubes Nos. 4 and 6, and commutator or terminal strips the sides and end portions of which are beveled as shown, the non-magnetic binding rings Nos. 3 and 7, whereby the before mentioned parts are held in operative position, the tube 13, having an annular rib *d*, the metal commutator rings Nos. 12 and 14 having beveled sides as shown, the non-magnetic binding rings 11 and 15, and the non magnetic ring 9 to rotate about the tube B, to carry the switch brush about the commutator segments, and rings, substantially as described and for the purpose set forth.

2. The combination with the hand piece of a dental engine, inclosing a tool holder, rotated by an electric current, of a current controlling switch and inclosing cap D, E, substantially as described and for the purpose set forth.

3. The combination with the hand piece and tool holder of a dental engine of the tube B, having internal longitudinal grooves *e*, of the conducting wires, the commutator segments Nos. 5 and 5', the rings Nos. 12 and 14, the ring No. 9 to rotate about said tube to carry the brushes 17, 17' and 18 about the commutator and an inclosing case, substantially as described and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 4th day of January, A. D. 1893
LEROY S. PFOUTS.

Witnesses:

W. K. MILLER,
CHAS. R. MILLER.