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A. W. BROWNE.

DENTAL ENGINE.

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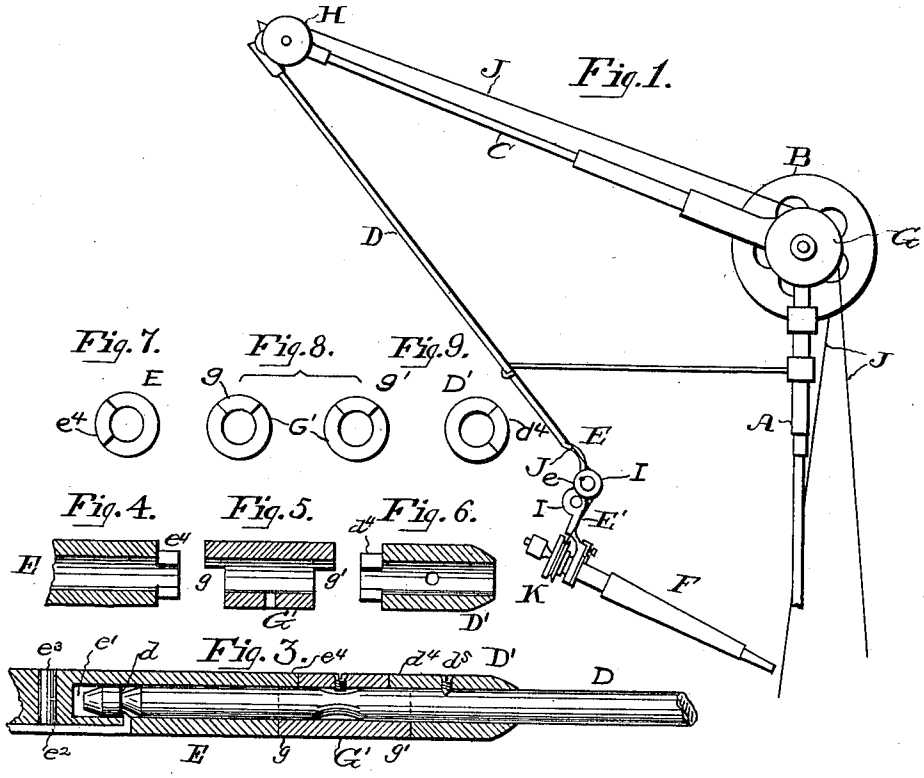


Fig. 1.

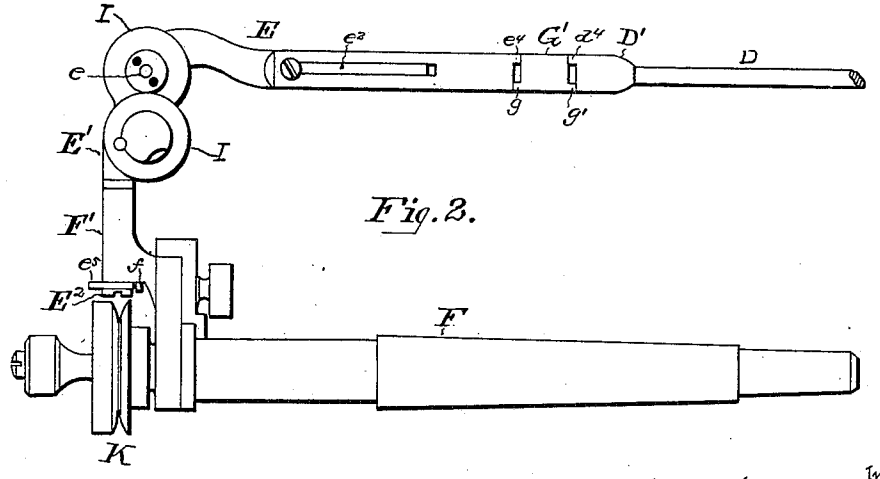


Fig. 2.

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DENTAL ENGINE.

No. 825,891. Specification of Letters Patent. Patented July 17, 1906.

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To all whom it may concern:

Be it known that I, ARTHUR W. BROWNE, a citizen of the United States, residing at Prince Bay, in the county of Richmond and State of New York, have invented a certain new and useful Improvement in Dental Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to dental engines of the class in which the driving cord or belt passes from the driving-wheel to a pulley connected directly to the spindle of the handpiece and commonly known as "cord" or "belt" engines as distinguished from "cable engines." As will be more fully explained hereinafter, there is a tendency in this class of engines of the cord or belt becoming unduly wound or twisted around the engine-arm, and it is the object of my invention to overcome this tendency.

The invention consists of the improvement indicated in the accompanying drawings, described in the following specification, and pointed out in the claims at the conclusion thereof.

In the drawings, Figure 1 represents the upper section of a typical dental engine of the cord or belt type without my improvement. Fig. 2 is a view in side elevation, on a larger scale than Fig. 1, of a handpiece connected to the outer portion of the engine-arm, showing my improvement applied thereto. Fig. 3 is a central longitudinal sectional view of the connection between the wrist-joint and forearm. Figs. 4, 5, and 6 are central longitudinal sectional views of the parts of the stop device separated. Figs. 7, 8, and 9 are end or face views of the parts of the stop device, showing the lugs or stops thereof.

Before describing my improvement I will first describe the typical cord or belt engine illustrated in Fig. 1. This comprises a support A, a head B, main arm-section C, forearm-section D, wrist-joint section E E′, and handpiece F. The support A may be the upright standard of a foot or electric engine or it may be mounted upon a wall-bracket or upon any other form of mounting. The head B is mounted to turn horizontally. The main arm-section C has vertical rocking connection with said head B. The forearm-section D has hinged connection with the main arm-section C, while the handpiece has a compound turning and hinged connection with the forearm-section by way of the wrist-joint E E′. A pair of guide-pulleys G is located on the head B. Another pair H is located at the hinged connection between the main and forearm sections, while a third pair I is carried by the wrist-joint connection, the pulleys of each pair being arranged on opposite sides of the parts to which they are connected. A driving cord or belt J, which passes over the above-named pulleys and about the driven pulley K on the handpiece-spindle, also passes about the driving-wheel, (not shown,) the driving-cord thus extending substantially parallel with and on opposite sides of the engine-arm and wrist-joint.

The compound connection of the handpiece is as follows: The wrist-joint section consists of two parts E E′, hinged together at *e*. Part E is swiveled upon the outer end of the forearm D, which is adapted to enter a socket *e′* in the part E. A spring-catch e^2, carried by the part E, engaging the annularly-shouldered extremity *d* of the forearm D, serves to detachably connect said forearm and the wrist-joint and at the same time permits the latter to freely turn relatively to the former. A push-pin e^3 may be employed for disengaging the spring-catch. The handpiece-frame F′ is swiveled to part E′ of the wrist-joint, this connection being formed by a shouldered bolt E^2 of the wrist-joint fitting in a socket of the handpiece-frame F′. This construction permits of the handpiece being freely rotated relatively to the wrist-joint and also of the wrist-joint being freely rotated relatively to the forearm-section, this, together with the other connections pointed out, providing a very wide and free range of movement of the handpiece and engine-arm. Owing to this freedom of movement, there is a tendency, as before stated, of the driving cord or belt becoming wound or twisted about the wirst-joint and forearm, so that at times the free running of the engine is interfered with. My improvement makes it impossible to twist the cord to an undesirable extent, while permitting the handpiece all necessary freedom of movement. This is attained by means which, while preventing the unlimited

turning of the handpiece about the arm, permits of said handpiece being turned about said arm in a complete circle, more or less.

The particular means shown in the drawings consists of stops, one formed by a lug e^4 on the end of the socketed portion E of the wrist-joint and the other by a lug d^4, formed upon a sleeve D′, rigidly connected to the forearm D by a set-screw d^5, or this lug may be formed directly upon said forearm. For the purpose of identification these stops will be termed, respectively, the "movable" stop and the "fixed" stop. Instead of these two stops coming in contact with each other, which would restrict the range of movement of the wrist-joint to the extent of the combined width of the stops, they are spaced a suitable distance, and between them is a piece or collar G′, loosely surrounding the forearm and free to turn thereon. This collar is provided on its opposite ends with lugs $g\,g$, corresponding to the movable and fixed stops and against which they are respectively adapted to abut. The collar-lugs will hereinafter be referred to as the "intermediate stops." By making the width of each of the four stops equal to one-quarter of the circle the movable stop is permitted a full half-turn in respect to the intermediate stop, while the collar G′ is permitted a full half-turn with respect to the fixed stop. To illustrate, assume that one of the intermediate stops is in contact with one side of the fixed stop and the movable stop is in contact with the opposite side of the other intermediate stop. When the stops are so positioned, the wrist-joint and consequently the handpiece are arrested from moving in one direction. By turning the handpiece in the opposite direction the movable stop can be turned a half-circle before it abuts against the intermediate stop, and as the turning movement of the handpiece continues the collar is carried around the remaining half-circle until the intermediate stop abuts against the fixed stop, thus arresting the movement of the handpiece after it has made a full revolution.

Obviously by increasing or decreasing the width of the stops the range of movement permitted the handpiece may be varied more or less, as desired, although in the particular engine to which my improvement is applied a full revolution of the handpiece permits the necessary amount of freedom without unduly twisting the driving-cord.

It is also desirable to limit the turning movement of the handpiece relatively to the wrist-joint. For this purpose a lug e^5 may be placed on the pin E^2 and a stop-lug f on the handpiece-frame F′. The handpiece may be freely turned in opposite directions until the stop-lug f of the handpiece-frame comes in contact with the wrist-joint lug e^5, when its movement is arrested. With this form of stop device the handpiece cannot be turned in a complete circle relatively to the wrist-joint, owing to the space occupied by the lugs, the movement being restricted to the extent of the combined width of the two lugs. This, however, is not objectionable, because it is not necessary to turn the handpiece in a complete circle in reference to the wrist-joint.

I claim as my invention—

1. In a dental engine of the character indicated, the combination of the forearm, the handpiece, the turning connection between the two, and a stop device for preventing unlimited turning of said handpiece about said forearm, but permitting said handpiece to be turned about said forearm in a complete circle, more or less.

2. In a dental engine of the character indicated, the combination with a handpiece, of the wrist-joint connected therewith, the forearm, the turning connection between the forearm and wrist-joint, the fixed stop on the forearm, the movable stop on the wrist-joint, and the intermediate stops between said fixed and movable stops.

3. In a dental engine of the character indicated, the combination with the handpiece, of the wrist-joint, the forearm, the turning connection between the wrist-joint and forearm, the fixed stop on the forearm, the movable stop on the wrist-joint, a collar loosely surrounding said forearm between said fixed and movable stops, and stops on the opposite ends of said collar.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR W. BROWNE.

Witnesses:
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