2 Sheets—Sheet 1.

W. W. EVANS.

DENTAL-ENGINE.

No. 169,347. Patented Nov. 2, 1875.

Fig 1.

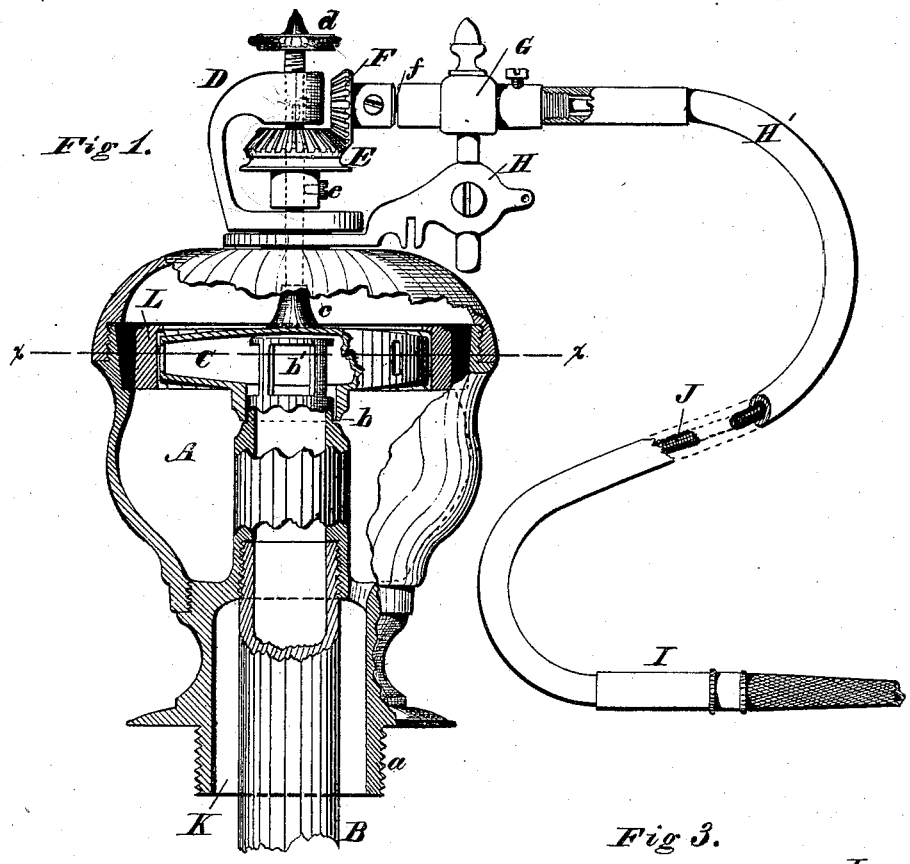
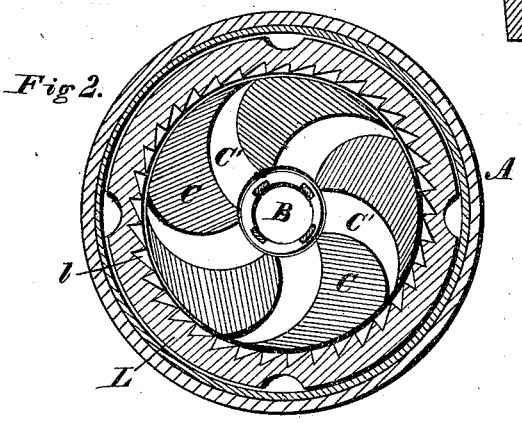


Fig 3.

Fig 2.



WITNESSES

H. H. Young

Baltis DeLong

INVENTOR

W. W. Evans

By his Attorney

Wm D. Baldwin

2 Sheets—Sheet 2.

W. W. EVANS.

DENTAL-ENGINE.

No. 169,347. Patented Nov. 2, 1875.

Fig 4.

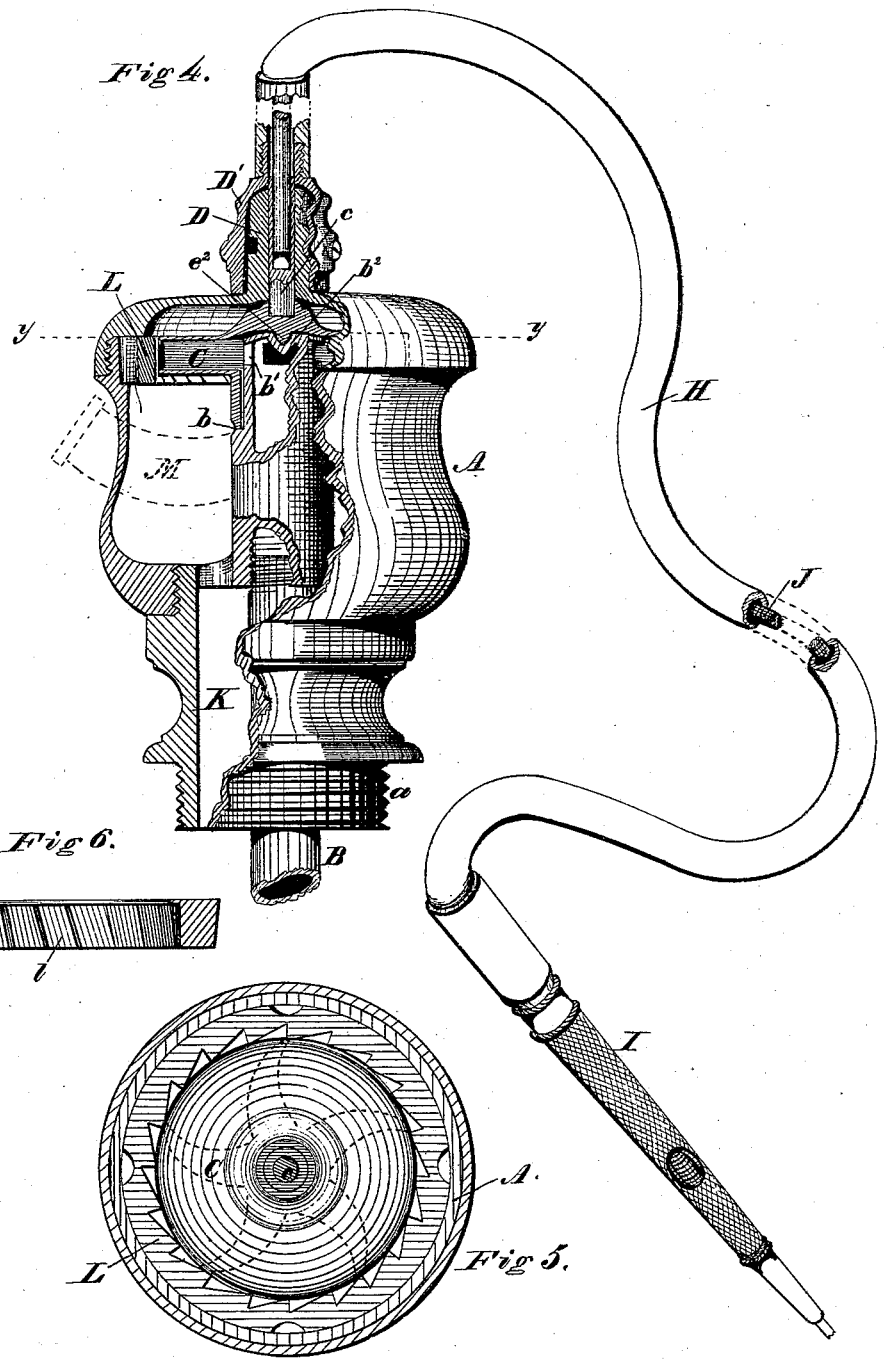


Fig 6.

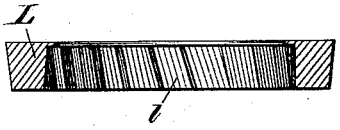


Fig 5.

WITNESSES

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Baltis De Long

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W. W. Evans.

By his Attorney

Wm D. Baldwin

UNITED STATES PATENT OFFICE.

WILLIAM WARRINGTON EVANS, OF GEORGETOWN, DISTRICT OF COLUMBIA, ASSIGNOR TO SAMUEL STOCKTON WHITE, OF PHILADELPHIA, PA.

IMPROVEMENT IN DENTAL ENGINES.

Specification forming part of Letters Patent No. **169,347**, dated November 2, 1875; application filed July 15, 1875.

CASE C.

To all whom it may concern:

Be it known that I, WILLIAM WARRINGTON EVANS, of Georgetown, in the District of Columbia, have invented certain new and useful Improvements in Dental Engines, of which the following is a specification:

My invention relates to dental engines of that class adapted to be driven by water-power. Its objects are to secure a compact, simple, and efficient water-motor adapted to be mounted on the operator's table, and capable of being readily controlled by the operator, and to combine therewith a tool having great freedom of movement.

My present invention constitutes an improvement on the dental engine for which Letters Patent of the United States, No. 151,653, were granted to me June 2, 1874.

The subject-matter claimed will hereinafter specifically be designated.

In the accompanying drawings, Figure 1 represents a view, partly in section, of my improved apparatus, showing a flexible shaft driven by gearing; Fig. 2, a horizontal section therethrough on the line *x x* of Fig. 1; Fig. 3, a vertical section through the battery or abutment ring. Fig. 4 represents a view, similar to that shown in Fig. 1, of a modification of my invention with the flexible shaft attached directly to the motor-shaft; Fig. 5, a horizontal section on the line *y y* of Fig. 4; and Fig. 6, a vertical section through the battery or abutment ring.

The casing A of the motor is shown as provided with a screw, *a*, by which it may be coupled to a tubular post, bracket, table, or other suitable support, in convenient proximity to the dentist's chair. The supply-pipe B is secured centrally in the casing, an annular space, K, being left between them for the escape of the waste water. The reaction-wheel C, shown in Fig. 3, turns in bearings on a shoulder, *b*, on the supply-pipe, its spindle *c* passing upward through the casing, and through a post, D, mounted thereon. A battery or abutment ring, L, surrounds the wheel, its abutments *l* being inclined somewhat from the perpendicular, as shown. The upward thrust of the wheel incident to this mode of construction is borne by a set-screw, *d*, on the post D, which bears on the spindle *c*. A bevel-gear, E, fixed on this spindle by a set-screw, *e*, drives a corresponding pinion, F, on a counter-shaft, *f*, turning in long pipe-box bearings G, mounted in a bracket-frame, H, capable of swinging freely around the post D. A flexible sheath, H′, is connected at one end with the pipe-box bearings, and at the other with a hand-piece, I. A flexible shaft, J, connects the counter-shaft with a tool mounted in the hand-piece. The construction of these parts being well understood need not be more particularly described herein. As the bracket swings around the post, and the sheath and shaft are both flexible, great freedom of movement is imparted to the tool. The water escapes from the feed-pipe through the lateral openings *b′* at its upper end, and passes through the chutes C′ of the wheel, impinges upon the abutments *l* of the battery L, and escapes downward from the casing through the annular waste-way K, which connects with a suitable pipe.

I have found such a wheel in practice to do its work quietly, steadily, and efficiently.

While my improved motor is more especially adapted for light work it is obviously capable of being enlarged, and thus adapted to do heavier work with good effect. In such large wheels the supply-pipe could be brought in laterally under the wheel, instead of perpendicularly, as shown in the drawing. The dotted lines in Fig. 1 show this pipe M. The pressure of the water being upward tends to lift the wheel, and thus cause it to run very lightly, while the inclination of the abutments *l* of the battery tends to deflect the water downward, and thus secures its rapid discharge after having done its work. The wheel shown in Figs. 4, 5, and 6 is like the other, except that the number of abutments *l* are somewhat greater, and that a bearing, b^2, is formed in the top of the supply-pipe, on which the step c^2 of the water-wheel rests, thus insuring the steady running of the wheel. The flexible shaft is, in this instance, coupled in a usual well-known

way directly to the spindle *c* of the water-wheel, while the flexible sheath is secured upon a collar, D′, turning freely on a post, D, and held thereon by a check-screw, thus permitting the sheath and hand-piece to turn freely.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of the casing, the supply-pipe, the wheel revolving on the supply-pipe, the chutes, and the battery for the purposes specified.

2. The combination, substantially as hereinbefore set forth, of the casing, the supply-pipe, the wheel, its spindle, the post on the casing, the flexible sheath, and the flexible shaft.

3. The combination, substantially as hereinbefore set forth, in a dental engine, of the casing, the water-wheel revolving therein, and a dental tool driven by a flexible shaft mounted on a frame swinging around the water-wheel shaft, and driven by a gearing from said shaft, whereby great freedom of movement is imparted to the tool.

4. The dental engine, hereinbefore set forth, consisting of the combination of the casing, the supply-pipe, a wheel mounted thereon, the annular waste-pipe, and a dental tool driven by a flexible shaft connected directly with the water-wheel shaft, whereby the parts are adapted to be mounted directly upon the operator's table or other suitable support.

In testimony whereof I have hereunto subscribed my name.

W. WARRINGTON EVANS.

Witnesses:
WM. D. BALDWIN,
E. C. DAVIDSON.