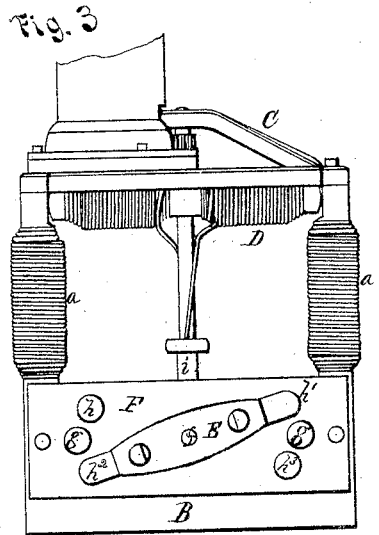
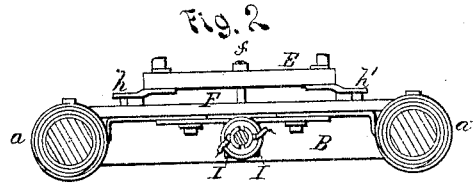
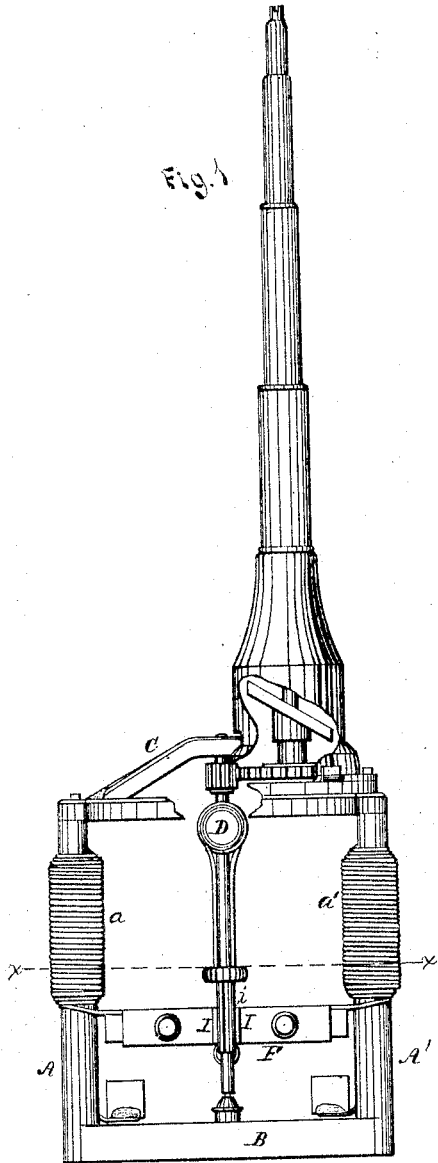


J. BISHOP.  
 Electric Magnetic Dental Engine.

No. 166,843.

Patented Aug. 17, 1875.



Witnesses.  
 E. Davidson  
 Baltis & Long.

Inventor.  
 J. Bishop  
 by his atty  
 W. D. Baldwin

# UNITED STATES PATENT OFFICE.

JOAQUIM BISHOP, OF SUGARTOWN, ASSIGNOR TO SAMUEL S. WHITE, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN ELECTRO-MAGNETIC DENTAL ENGINES.

Specification forming part of Letters Patent No. 166,843, dated August 17, 1875; application filed August 6, 1873.

*To all whom it may concern:*

Be it known that I, JOAQUIM BISHOP, of Sugartown, in the county of Chester and State of Pennsylvania, have invented an Improvement in Electro-Magnetic Dental Engines, of which the following is a specification:

The object of my invention is to gain an increased battery-power from a battery of given strength.

My improvement consists in combining in a dental engine two independent electro-magnets of similar polarity, an interposed revolving armature, and a shifting break to reverse the direction of rotation of the armature by throwing one or the other of the magnets into action.

The accompanying drawings show my improvements as adapted to an electric burring-engine invented by Geo. F. Green, of Kalamazoo, Michigan.

Figure 1 is a rear elevation of so much of the instrument as is necessary to illustrate the invention herein claimed; Fig. 2, a horizontal section therethrough on the line *x x* of Fig. 1; and Fig. 3, a rear elevation thereof.

Independent poles *A A'* are connected at bottom by a cross-bar, *B*, and at top by the frame *C* of the engine. Each pole is encircled by its appropriate helical coil *a a'*, each having its independent connection with an armature, *D*, revolving in bearings in the frame. The wires of the battery are connected with a circuit-shifting break-lever, *E*, rocking on a fulcrum, *f*, on a bar, *F*, of the frame by means of spring hooks and eyes or other well-known connections. The bar *F* is provided with two non-conducting buttons, *g g*, and four conductor-buttons, *h h' h<sup>2</sup> h<sup>3</sup>*, an end of one of the

coils being connected with each button. The wires of the armature-coil are connected with an insulated split ring, *i*, in the usual way. This ring turns between and in contact with spring-plates *I* on the bar *F*.

In operation, with the parts in the relation shown in the drawing, the current passes through the button *h<sup>1</sup>*, through the coil *a'*, and through the spring-plate, to and through the armature-coil and the button *h<sup>2</sup>*, to the negative-wire of the battery, the other coil, *a*, remaining inactive. The circuit being broken and reversed in the revolving electro-magnet at every semi-revolution of the insulated split ring *i*, a rapid rotation is kept up. The direction of rotation of the armature is changed by rocking the break-lever *E*, so as to throw the other coil into action, while the first one remains quiescent.

It is deemed unnecessary to describe here the burring-engine proper, as it forms no part of the subject-matter claimed, and is of well-known construction.

I claim as my invention—

The hereinbefore-described electro-magnetic dental engine, consisting of the combination of the frame, the revolving armature, independent electro-magnets of similar polarity, and the circuit-shifting break-lever, which throws one of the magnets into and the other out of action to reverse the direction of rotation of the armature, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

JOAQUIM BISHOP.

Witnesses:

BALTIS DELONG,  
E. C. DAVIDSON.