J. M. STEBBINS.

Dental-Engine.

No. 203,385. Patented May 7, 1878.

Fig. 1

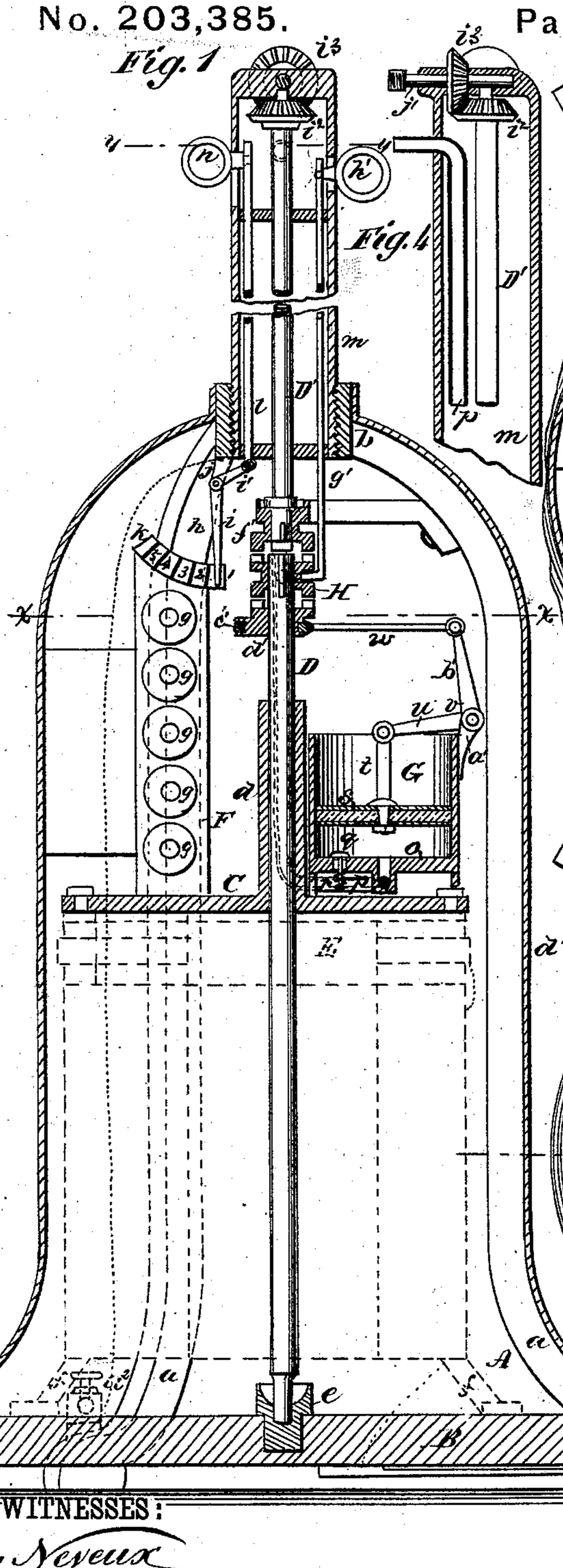

Fig. 4

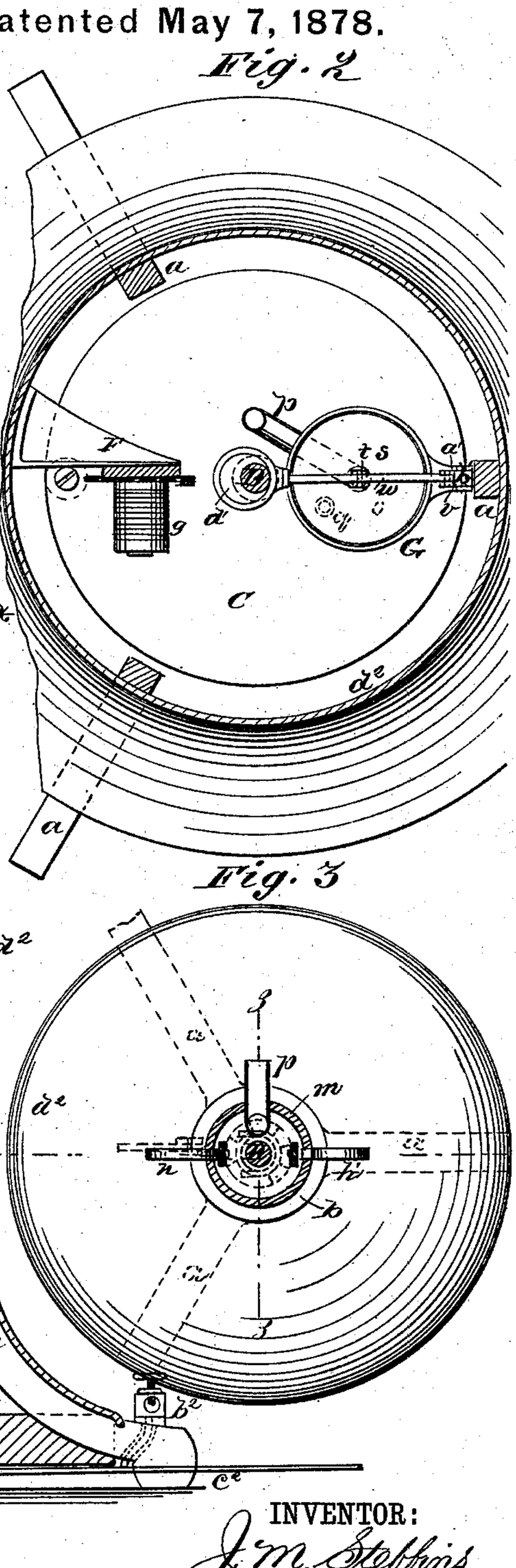

Fig. 2

Fig. 3

WITNESSES:

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JULIUS M. STEBBINS, OF NEW YORK, N. Y.

IMPROVEMENT IN DENTAL ENGINES.

Specification forming part of Letters Patent No. **203,385**, dated May 7, 1878; application filed January 14, 1878.

To all whom it may concern:

Be it known that I, JULIUS M. STEBBINS, of New York, in the county of New York and State of New York, have invented a new and Improved Dental Engine, of which the following is a specification:

Figure 1 is a vertical section of my improved dental engine. Fig. 2 is a horizontal section, taken on line *x x* in Fig. 1. Fig. 3 is a horizontal section, taken on line *y y* in Fig. 1. Fig. 4 is a vertical section, taken on line *z z* in Fig. 3.

Similar letters of reference indicate corresponding parts.

My invention relates to a device for operating dental burrs and pluggers; and it consists in the peculiar arrangement of an air-forcing apparatus and burr-driving mechanism, in combination with an electric engine whose motion and power is controlled by a series of resistance-coils, any number of which may be placed in the electric circuit.

Referring to the drawing, A is a frame consisting of the base-piece B and three standards, *a*, which are secured at the top to an internally-threaded sleeve, *b*. A disk, C, having a central sleeve, *d*, is secured to the standards *a*, parallel to the base-piece B. In the sleeve *d* a vertical shaft, D, is journaled, the lower end of which is received by a step, *e*, in the base-piece B. Upon the shaft D, below the disk C, the armatures of an electro-magnetic engine are secured. The magnets of the electric engine are supported by legs *f* attached to the base-piece B.

Above the armatures, and below the disk C, a commutator, E, of any of the ordinary forms, is placed, which makes and breaks the electric circuit at the proper instant to secure the rotation of the armatures and the shaft D.

The electro-magnetic engine employed in propelling the shaft D may be of any of the well-known forms.

Upon the top of the disk C is mounted a frame, F, which supports several resistance-coils, *g*, and at the top of the frame F there is a switch, *h*, whose arm *i* is pivoted to a hanger, *j*, that projects downward from the sleeve *b*. The arm *i* moves over an arc-shaped plate, *k*, which contains several insulated metallic segments, 1 2 3 4 5, &c., which are connected with the resistance-coils *g*, the segment 1 being arranged to form, in connection with the arm *i*, an electrical connection with one of the coils *g*, the segment 2 with two of the coils *g*, and so on, so that the resistance of one, two, or more coils may be thrown into the circuit to vary the speed and power of the magnetic engine. The arm *i* is moved by an arm, i^1, which is attached to it, and is jointed to a rod, *l*, that extends upward through a tube, *m*, screwed into the sleeve *b*. The rod *l* is provided with a handle, *n*, that passes through a slot in the tube *m*, and is in a position convenient for use.

The tube *m* extends upward to a convenient height for the attachment of the tools intended to be used with the apparatus. An air-cylinder, G, is secured to the disk C, and is provided with a head, *o*, from which a tube, *p*, leads upward through the tube *m*, and passes out at one side of the said tube *m*, to receive a flexible tube, by which it is connected with a suitable form of pneumatic plugger. The head *o* is also provided with an inwardly-opening valve, *q*, which is held to its seat by a spiral spring, *r*.

The piston *s* of the cylinder G is provided with a rod, *t*, which is jointed to the arm *u* of the bell-crank lever *v*, which is fulcrumed between ears a^1 projecting from the top of the cylinder G. The arm b^1 of the lever *v* is jointed to an eccentric-rod, *w*, whose strap c^1 surrounds the eccentric d^1, which is placed loosely on the shaft D. There are lugs on the upper face of the eccentric, which are engaged by the lugs on the under surface of the clutch H. This clutch is capable of moving longitudinally on the shaft D, but is prevented from turning thereon by a feather in the shaft and a slot in the clutch.

Above and axially in line with the shaft D there is a shaft, D′, which is journaled in cross bars or heads in the tube *m*. Upon the lower end of the shaft a clutch, *f′*, is secured, whose lugs may be engaged by lugs on the upper face of the clutch H.

The clutch H is grooved circumferentially, to receive the lower end of the sliding clutch-operating bar *g′*, the upper end of which is provided with a handle, *h′*, that projects through a slot in the side of the tube *m*, where it may be conveniently moved when it is desired to

stop or start either the shaft D′ or the eccentric d^1.

The upper end of the shaft D′ carries a miter-wheel, i^2, which meshes into the miter-wheel i^3 on the spindle j', that is journaled in the upper end of the tube m, and is connected by a flexible shaft with a burr or other tool.

The electro-magnetic engine is connected with the battery-wires by means of the screw-cups a^2 b^2. The screw-cup a^2 is in electrical communication with the switch h, and the resistance-coils g are connected with the commutator E, and the commutator is connected with coils of the engine, and the coils of the engine are connected with a spring-key, c^2, that is attached to the base-piece, and forms a metallic connection with the screw-cup b^2. The end of the key projects beyond the base-piece B, so that it may be pressed by the foot whenever it becomes necessary to break the electric current.

The parts contained by the frame A, as well as the frame itself, are covered by a metallic case, d^2, which may be painted, plated, or otherwise ornamented. The cover may, if desired, be made of glass.

When it is desired to rotate the shaft D′ the clutch H is thrown into connection with the clutch f, and burrs, drills, or other rotating tools may be driven. When a plugger is used the clutch H is moved downward into engagement with the eccentric d^1. The piston s is thus reciprocated, and the air in the tube p, and also in the tubular plugger, (not shown,) is vibrated, so as to rapidly reciprocate the mallet by alternately sucking it back and forcing it forward against the cap of the tool-holder.

Any undue vacuum formed in the cylinder G is supplied by air entering the cylinder through the valve q. This valve is held to its seat by the spring r with sufficient force to always insure a partial vacuum that will withdraw the mallet from the head of the plugger after each stroke.

The rapidity of the action of the engine is controlled by introducing one or more of the resistance-coils g into the electric circuit.

When it is desired to expose the working parts for any purpose the cover d^2 is raised from the frame A.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The auxiliary shaft for driving rotating tools, and a clutch for engaging the said shaft, in combination with an electro-magnetic engine, arranged to drive a pneumatic plugger, substantially as shown and described.

2. The dome-shaped case d^2, containing the driving mechanism, and the surmounting tubular portion m, in combination with the vertical independent shafting D D′, extending through the same, and provided with a coupling, and the vertical clutch-operating rod g', extending up through the portion m, and having a projecting handle, h', substantially as and for the purpose described.

3. The combination, with the electro-magnetic engine and the resistance-coils g arranged in circuit, as described, and having contact-points 1 2 3 4 5, of the case d^2, and tube m, the elbow-lever i i^1, and the rod l, extending up through the tubular case, and having projecting handle m, substantially as and for the purpose described.

4. The combination, with the vertical rotating shaft D, having an eccentric, d^1, of the eccentric-rod w, elbow-lever b^1 u, piston, and rods s t, and the pneumatic cylinder G, substantially as and for the purpose described.

5. In a dental engine, the air-forcing cylinder G, arranged to communicate with the plugger, and provided with an inwardly-opening loaded valve, substantially as described.

JULIUS M. STEBBINS.

Witnesses:

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GEO. M. HOPKINS.