E. P. RYDER.

DENTAL-ENGINE.

No. 169,375. Patented Nov. 2, 1875.

Fig. 1

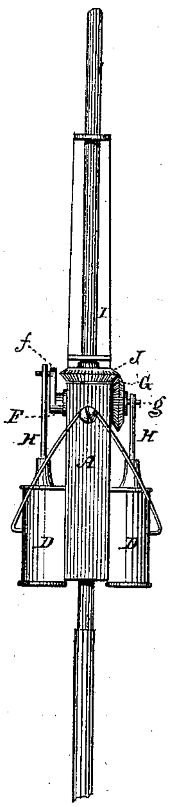


Fig. 2.

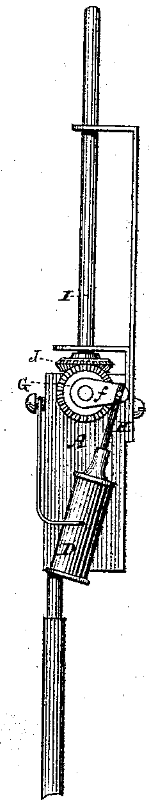


Fig. 3

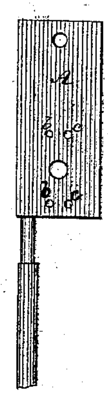


Fig. 4

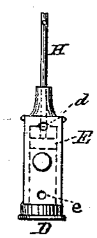
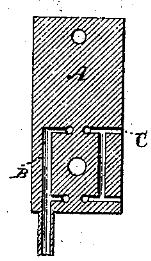


Fig. 5



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD P. RYDER, OF BROOKLYN, NEW YORK, ASSIGNOR TO SAMUEL S. WHITE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN DENTAL ENGINES.

Specification forming part of Letters Patent No. **169,375**, dated November 2, 1875; application filed May 20, 1874.

To all whom it may concern:

Be it known that I, EDWARD P. RYDER, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Dental Engines, of which the following is a specification:

My invention relates to an engine of the class by which dental instruments are automatically driven while the engine is held by the operator by means of a frame or hand-piece, upon which the engine is mounted.

The subject-matter claimed will hereinafter specifically be designated.

The accompanying drawings represent so much of an apparatus embodying my invention as is necessary to illustrate the subject-matter claimed, Figure 1 being a plan view, Fig. 2 a side view, and Figs. 3, 4, and 5 detail views thereof.

An air chest or chamber, A, has induction and exhaust ports B C, and inlet and outlet valves *b b b b c c c c*, arranged as shown in the drawings. On each side of the air-chest a cylinder, D D, is mounted, on a trunnion or otherwise, so that it may oscillate freely, while its inner surface fits closely upon the adjacent surface of the air-chamber. Each cylinder is perfectly fitted with a piston, E, and has two valves, *d e*, one near each end, for the passage of the air to and from the respective ends of the cylinder. As the cylinders oscillate, their valves come alternately opposite the inlet and outlet valves of the air-chest, and the piston is driven to and fro as the air is admitted at one end and driven out at the other, the same as would be the operation if steam were used, and as is well understood. A crank-shaft, F, is mounted in bearings at the front end of the air-chamber, and carries on one end a crank, *f*, and on the other end a pinion, G, to which a crank-pin, *g*, is fastened. A piston-rod, H, from each of the cylinders D D, extends to and works upon the pins of the cranks, respectively. A spindle, I, constituting a holder for a dental tool, is mounted in bearings in an arm to which the air-chamber is attached, and is supported in line therewith. The arm and its bearings, it will be seen, constitute both a frame, upon which the engine is mounted, and a hand-piece in which the tool-holder is supported, and by which the engine is held. The rear end of the tool-holding spindle carries a pinion, J, which meshes with the pinion G, and the spindle and tool are thus rotated by the revolution of the crank-shaft, as will be readily understood.

Obviously, the bearings for the tool-holder or spindle I may be constructed so as to inclose it, instead of supporting it at two points only, as shown.

The dental tool may be fitted to the spindle in any of the well-known ways that combine a firm hold with ease of removal. The air-supply pipe is flexible, to admit of the required movements of the engine by the operator.

Whenever it may be desired to suspend the rotation of the instrument while the generation of power continues, or to suspend the application of the power while the instrument is being adjusted, a simple shipping-device may be used to throw the pinion J out of gear with the pinion G by sliding the spindle forward in its support, or a valve in the air-chamber or in the supply-pipe may be closed, so as to shut off the power.

I claim as my invention—

The dental air-engine hereinbefore described, consisting of the combination of the air-chamber, the oscillating cylinders, the pistons, the crank-shaft, the gearing, the tool-holding spindle, and the frame constituting both a hand-piece and a support for the engine, these members being constructed and operating in combination, substantially as set forth.

EDWARD P. RYDER.

Witnesses:

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