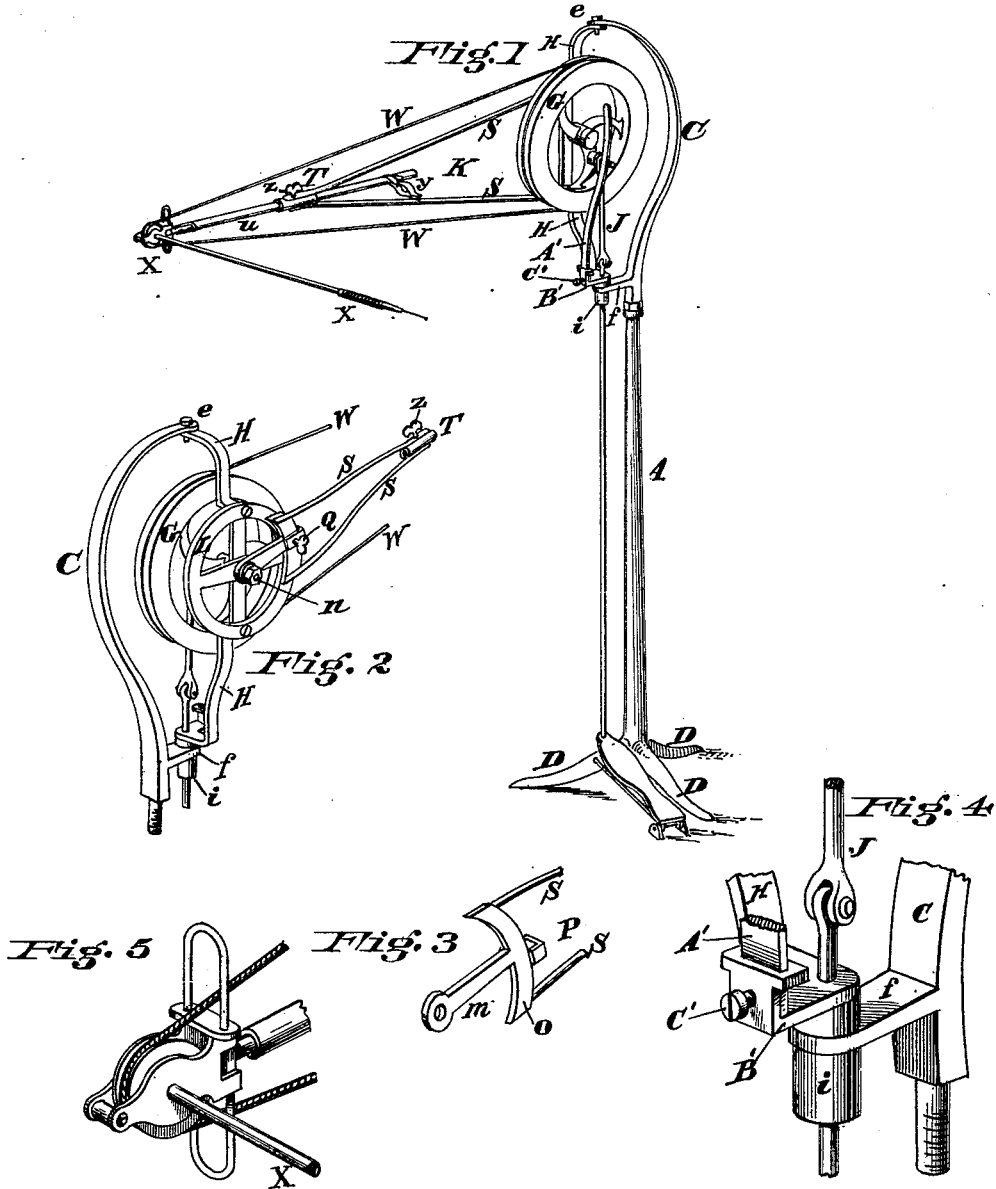


J. HERON.
Dental-Engine.

No. 220,834.

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Attest

Edgar J. Gross

Edw. Gurney.

Inventor

John Heron.

By Noed & Ellsworth

His Attorneys.

UNITED STATES PATENT OFFICE.

JOHN HERON, OF MOUNT CARMEL, INDIANA.

IMPROVEMENT IN DENTAL ENGINES.

Specification forming part of Letters Patent No. **220,834**, dated October 21, 1879; application filed March 29, 1879.

To all whom it may concern:

Be it known that I, JOHN HERON, of Mount Carmel, in the county of Franklin and State of Indiana, have invented certain new and useful Improvements in Dental Engines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of a dental engine constructed in accordance with my invention. Fig. 2 is a rear perspective view of the driving-wheel and its connections. Fig. 3 is a perspective view of the shank and cross-head of the extension-arm. Fig. 4 is an enlarged perspective view, showing the connections at the top of the standard, and Fig. 5 is a similar view of the small pulley and its connections.

Similar letters of reference indicate the same parts in the several figures of the drawings.

My invention has for its object to improve the construction and operation of dental engines, for the purpose of increasing their efficiency and capacity for use; and to this end it consists, first, in the driving and operating mechanism of the engine, mounted upon its support or standard at or near its top, so as to swing horizontally in the required position for use in front of the patient, and to be moved to and from the point of operation in horizontal lines without binding the parts or causing unnecessary friction upon the driving cord or belt by deflecting it from its direct course over the driving-pulleys, and to be adjusted vertically.

It also consists in a rigid upright, upon which the driving-wheel and the lateral arm carrying the drill and operating mechanism are swiveled so as to turn in a horizontal plane, combined with the means for raising and lowering the outer end of the arm.

It also consists in certain details of construction, as I will presently describe.

In the accompanying drawings, A is the metal standard, of the usual or any preferred form, supported by bracing-feet D, and C is an upright secured to or made in continuation of the standard at the proper height, and bent

or curved laterally, so as to form an upper and lower bearing, *e f*, in the same vertical plane. G is the driving-wheel, mounted upon a lateral stud in the side of an upright frame, H, whose upper and lower ends are journaled in the upper and lower bearings, respectively, of the upright C in any suitable or convenient manner. As shown in the example of my invention, the frame is curved at its ends, and the lower journal, *i*, is stepped in the lateral bearing *f* of the upright, while the upper end is formed with an eye to receive a bolt or pin in the upper bearing, *e*.

The driving-wheel is driven by a jointed connecting-rod, J, from a treadle at the foot of the standard, said rod passing through the lower journal of the frame, which is made hollow for this purpose.

The outward curvature of the upright allows the frame to turn freely in its bearings, and thus swing the wheel horizontally, while the position of the frame upon one side of its journals places the wrist of the driving-wheel and the connecting-rod in the axial line of such journals. The wheel is therefore driven by the treadle and connecting-rod while freely swinging about the center formed by the rod and journals of the frame.

The connecting-rod may be provided with a swivel-connection at any point of its length, or it may be swiveled in the treadle, or arranged to turn in any other convenient manner when the wheel-frame is turning on its axis.

As a modification in the means for swiveling the wheel upon the standard, the upright C and frame H are dispensed with, and in their place a bifurcated standard carrying the wheel between its arms may be stepped into a socket in the main frame or standard, or a single short upright, with the wheel hung on one side, may be employed.

K is the arm which carries the drilling mechanism, and it is arranged to turn on the center of the driving-wheel in the following manner, so as to adapt its outer end for vertical adjustment: The back of the frame carries a circular guide-rim, L, secured thereto, and the stud or journal of the driving-wheel extends through a central cross-piece of this rim to receive the shank *m* of the arm, the con-

nection being formed by a nut and washer, *n*, by which the shank is supported, and at the same time permitted to turn without binding.

The outer end of the shank carries a curved cross-head, *O*, corresponding to the arc of the circular rim, and its extreme end is bent or carried over the edge of such rim to form a loop or guide, *P*, as shown in Fig. 3. The cross-head and shank are thus allowed to move freely around the center of the driving-wheel, being guided by the loop *P*, and secured in the desired position upon the rim by a thumb-screw, *Q*, which passes through the cross-head. Conveying-arms *S S* project from the ends of the cross-head to support a tube, *T*, through which passes the extension-arm *u*, carrying the small pulley and guides for the driving-cord *W*, such cord also passing around the driving-pulley.

The drill-arm, socket, and flexible connections therewith are shown at *X*, being of the usual form, and operated from the pulley in the usual manner.

The inner end of the extension-arm *u* carries a spring-clip, *y*, for supporting the end of the drill-arm, and it is adapted for adjustment within the tube *T*, to tighten the driving-belt, by a set-screw, *z*.

By means of the swiveled frame the whole arm can be swung horizontally in front of the patient occupying a dental chair into the proper position for use without twisting or binding the driving-cord or otherwise interfering with the freedom of its movements, and by means of its center connections it can be raised or lowered to place its other end in the proper place for convenient use of the drill.

It will be observed that the position of the driving-wheel and the mechanism operated thereby are placed high up on the standard, and that therefore the arm can be swung over the lap of a patient without touching his clothing and interfering with the movements of the machinery.

A' is a flat spring, secured at its lower end in a lateral loop, *B'*, on the standard or upright, near the lower pivot, and connected at its upper end to the wrist of the driving-wheel in any suitable manner. The object of this spring is to prevent the crank or wrist from stopping on the center, so that it shall always be in position for starting by the treadle.

A set-screw, *C'*, passes through the side of the loop, to bear against the lower end of the spring, by which its tension is adjusted.

Any of the well-known forms of treadles may be employed; but I prefer to use a treadle

which is pivoted to the foot of the standard, so that it can be moved from side to side for the convenience of the operator.

The dental engines as usually constructed carry the operating mechanism in an upright arm pivoted to a standard, which sustains the driving-wheel near its base, in such a manner that it cannot swing laterally. The change of direction of the drill must therefore depend upon the adaptation of the upright to swing in a vertical plane and the arm carrying the drill to articulate upon the end of the upright. For this reason the drill cannot be carried to the front of the patient without great difficulty, and then always at such an angle as to render its use exceedingly awkward.

If the upright is deflected by any means, the direct line of the driving-cord is correspondingly deflected, because of the inability of the driving-wheel to swing in any direction, and the whole mechanism is thus caused to run hard and with a large amount of friction. By my improvements all these objections are overcome and the engine rendered easy of operation and adaptation to the proper positions for performing the best work.

Having thus described my invention, what I claim is—

1. A dental engine in which a horizontally-swinging driving-wheel and an extension-arm carrying the drill mechanism are mounted upon a standard at or near its top, to swing in front of a patient occupying a dental chair, said extension-arm being positively adjustable vertically, substantially as described, for the purpose specified.

2. The combination, with the standard *A*, of the swiveled upright *C* and frame *H*, carrying the extension-arm and the driving-wheel, substantially as described, for the purpose specified.

3. The circular rim *L* and the adjustable shank and guide-rim *m L*, combined with the extension-arm and the driving-wheel *G*, substantially as described, for the purpose specified.

4. The driving-wheel *G* and the extension-arm *K*, swiveled to the top of the standard *A* so as to swing horizontally, combined with a treadle at the foot of the standard, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand this 4th day of March, 1879.

JOHN HERON.

Witnesses:

L. M. HOSEA,
E. A. ELLSWORTH.