(No Model.)

2 Sheets—Sheet 1.

E. T. STARR

DENTAL ENGINE.

No. 418,901. Patented Jan. 7, 1890.

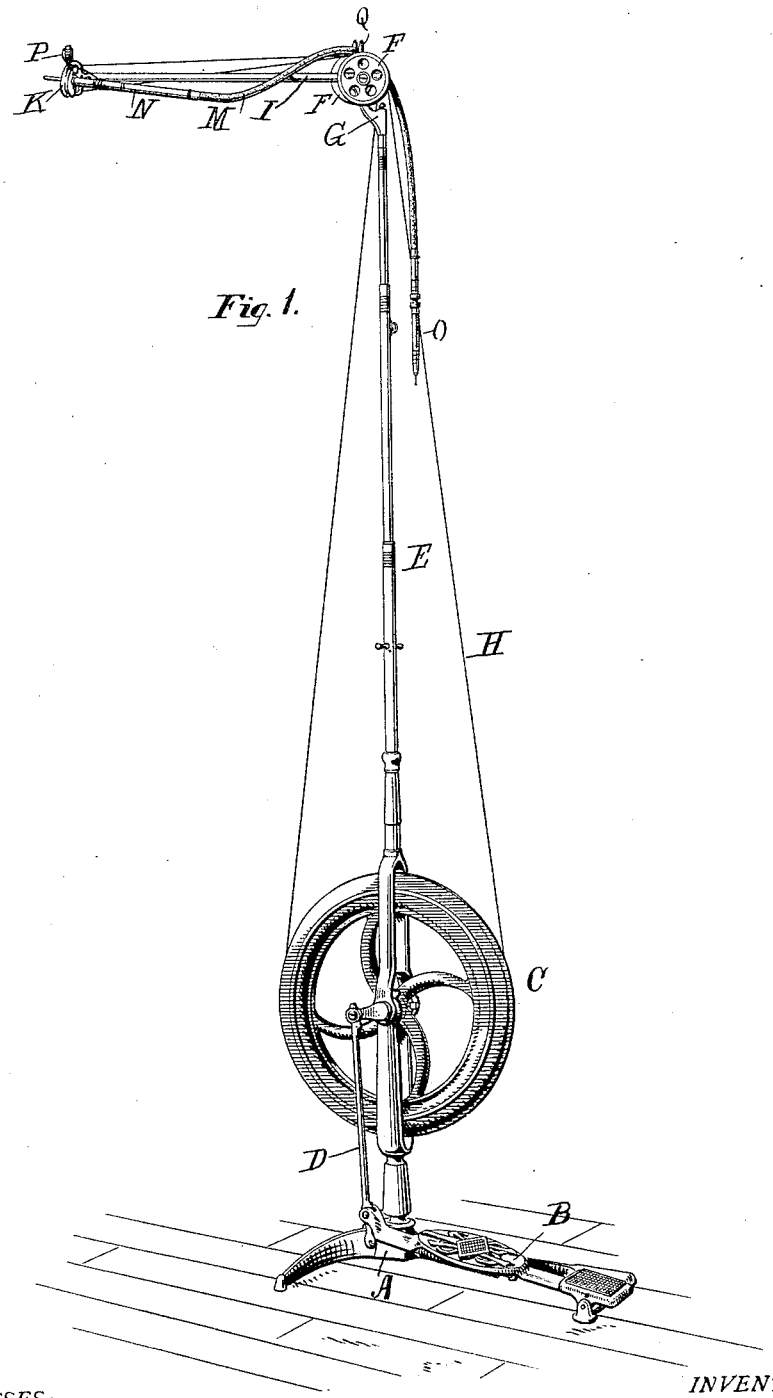

Fig. 1.

WITNESSES:

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By Atty J. L. Boyston

(No Model.) 2 Sheets—Sheet 2.

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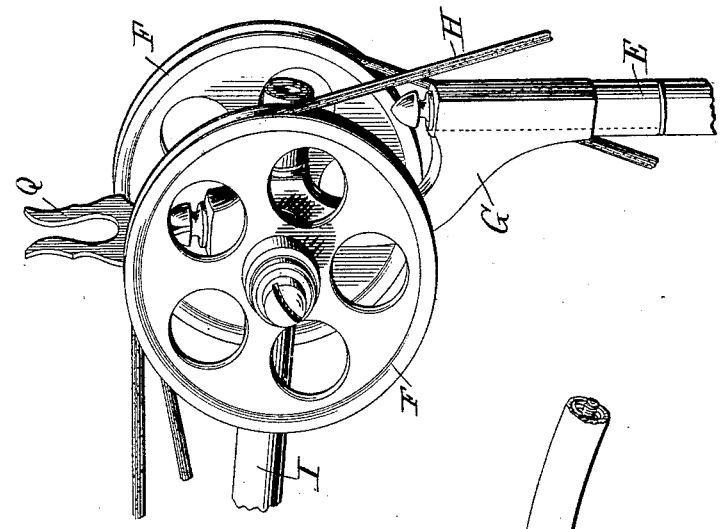
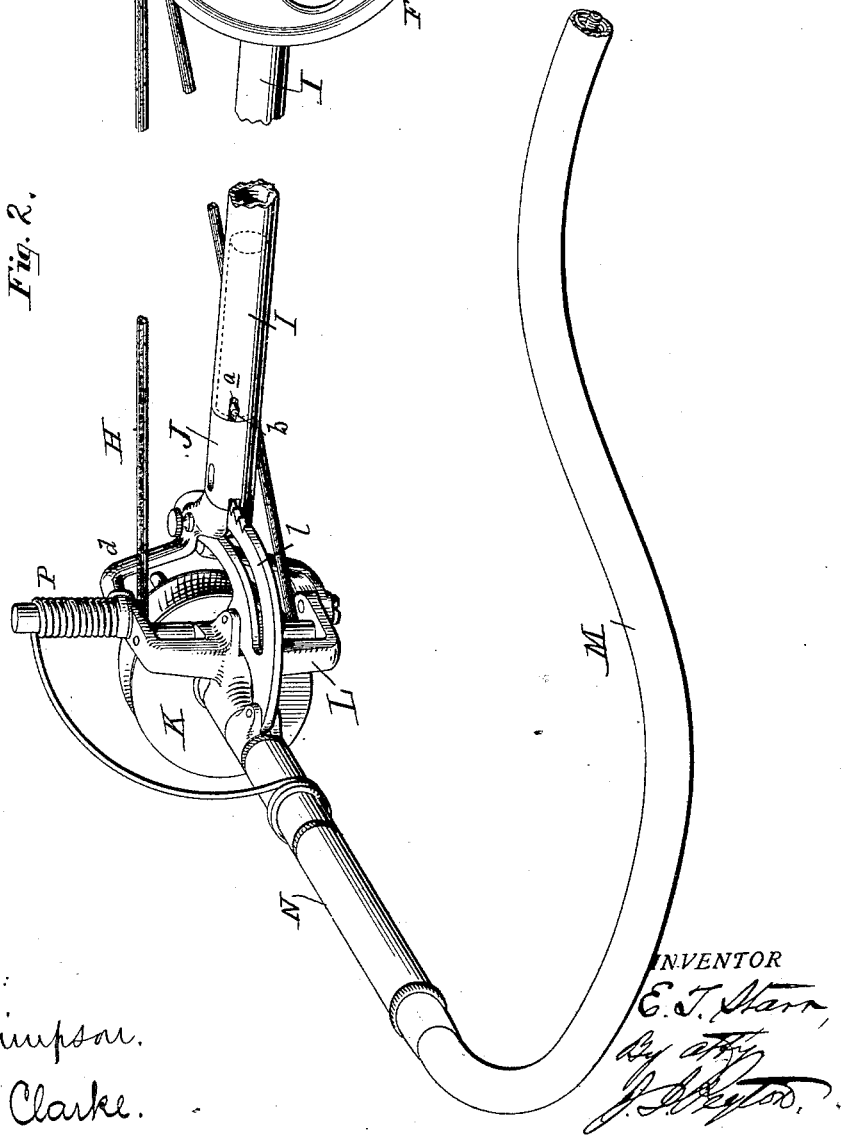


Fig. 2.



WITNESSES:

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Arthur C. Clarke.

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UNITED STATES PATENT OFFICE.

ELI T. STARR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE S. S. WHITE DENTAL MANUFACTURING COMPANY, OF SAME PLACE.

DENTAL ENGINE.

SPECIFICATION forming part of Letters Patent No. 418,901, dated January 7, 1890.

Application filed November 7, 1889. Serial No. 329,493. (No model.)

To all whom it may concern:

Be it known that I, ELI T. STARR, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Dental Engines, of which the following is a specification.

My invention relates to improvements in engines of the class employed by dentists for imparting rotary motion to various instruments used in performing operations upon the teeth in the mouths of patients, and is particularly applicable to the type known as "fixed-standard engines."

My objects are to provide a dental engine of simple, economic, and durable construction in which provision is made for readily adjusting and supporting in working condition the usually-employed flexible driving-shaft in the various positions required in performing dental operations.

In the accompanying drawings, Figure 1 is a view in perspective of the improved engine; and Fig. 2, a similar view on an enlarged scale, with portions broken away, showing the upper end of the standard and the parts supported thereby.

The base A, treadle B, driving-wheel C, actuated by way of the pitman D by the treadle, the extensible fixed standard E, intermediate or guide pulleys F F, supported at the top of the standard by the horizontally-turning bracket G, and the driving-belt H, are provided, as shown. A horizontally-extending supporting-arm is rigidly secured to the turning bracket G, being either made separately therefrom and firmly attached thereto, or, as hereinafter described, may be in part constituted by a portion of said bracket. In accordance with the construction preferred and illustrated the supporting-arm is made in sections, and is of a length such that its outer end may be brought opposite to and conveniently near the face of the patient seated in the dentist's chair for treatment. The section I of the supporting-arm, rigid with the turning bracket, is made hollow at its outer end and for a portion of its length inward therefrom, or throughout its entire length, as shown, is preferred, and affords at its outer end a bearing, in which is adjustably fitted the other section J, which is formed by a short arm which may be turned and locked in the fixed section. A slot *a* in the outer end of the supporting-arm section I is engaged by a stop-pin *b*, fixed to the adjustable section of the arm, which is thus normally prevented from turning. When it is desired to turn this adjustable section of the arm, it is drawn outward far enough to free the stop-pin from the slot, when it may be oscillated freely, the stop-pin moving in contact with the end of the fixed section of the supporting-arm.

The supporting-arm carries the driven pulley K by its adjustable section, and around this pulley the belt H passes. The driven pulley has bearing in the vibrating yoke L, which is provided with the curved and slotted guide-arm *l*.

The flexible shaft M, connected at its inner end with the stiff sleeve-section N, attached to the driven-pulley shaft, is provided at its outer end with a hand-piece O and operates in a well-known way.

A spring P is coiled a number of times to fit loosely around a bolt forming an extension of the fixed pivot which connects the upper arm of the yoke L with the fork *d* of the adjustable section J of the supporting-arm. This spring is secured at the bottom of its coil to the fork *d*, and from the top of its coil it is curved and extended to form an arm engaged with the stiff sleeve-section N, as plainly shown. The spring acts with a tendency to maintain the pivoted yoke L in the position in which it is shown in Fig. 2 at the limit of its outward movement, while allowing the yoke to be rocked inward or toward the supporting-arm in adjusting or directing the hand-piece. By providing the spring with a long coil, as shown, it is given the proper resiliency and its durability increased.

A holder Q on top of the bracket G serves to support the flexible shaft when out of use and swung around to rock the yoke inward, as shown by Fig. 1.

From the above description it will be seen that the driven shaft may be steadily sup-

ported in conveniently near proximity to the face of the patient whose teeth are being operated upon, and that the turning movements of the yoke about its hinged connection with the supporting-arm and its rocking movement with the adjustable section of this arm provide for a wide range of movement of the flexible shaft and tool operated thereby. Moreover, by the employment of the long rigidly-supported arm swinging about the top of the fixed standard, instead of, as heretofore, a rocking standard carrying at its top the driven pulley to which the flexible shaft is connected, I avoid the injurious abrupt bending of the flexible shaft, sometimes resulting in binding it in its sheath, which bending arises from the strain exerted upon the shaft in directing the hand-piece to points requiring the flexing of the shaft.

Instead of constructing the sectional supporting-arm precisely as hereinbefore described and rigidly attaching it, as before explained, to the turning bracket at the top of the standard, obviously the one section of the supporting-arm may be constituted by a sleeve or long hub-like bearing forming a part of the turning bracket, and the other section adapted to be turned and locked in said sleeve-section.

I claim as my invention—

1. The combination of the base, the standard, the turning bracket at the top of the standard, the long sectional supporting-arm consisting of the turning section and the section rigid with said bracket, the vibrating yoke carried by the turning section of the supporting-arm, the driven pulley carried by the yoke, means for rotating this pulley, and the flexible shaft actuated by connection with the driven pulley, substantially as and for the purpose set forth.

2. The combination of the base, the standard, the turning bracket at the top of the standard, the supporting-arm carried by the turning bracket, the vibrating yoke carried at the outer end of the supporting-arm, the driven pulley carried by the yoke, means for rotating this pulley, the flexible shaft, the stiff sleeve-section connecting it with the driven pulley, and the coiled spring carried by the supporting-arm and acting on the stiff sleeve-section with a tendency to maintain the yoke at the limit of its outward movement, substantially as and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name.

ELI T. STARR.

Witnesses:
E. H. LAWRENCE,
MILTON A. GREEN.