

(No Model.)

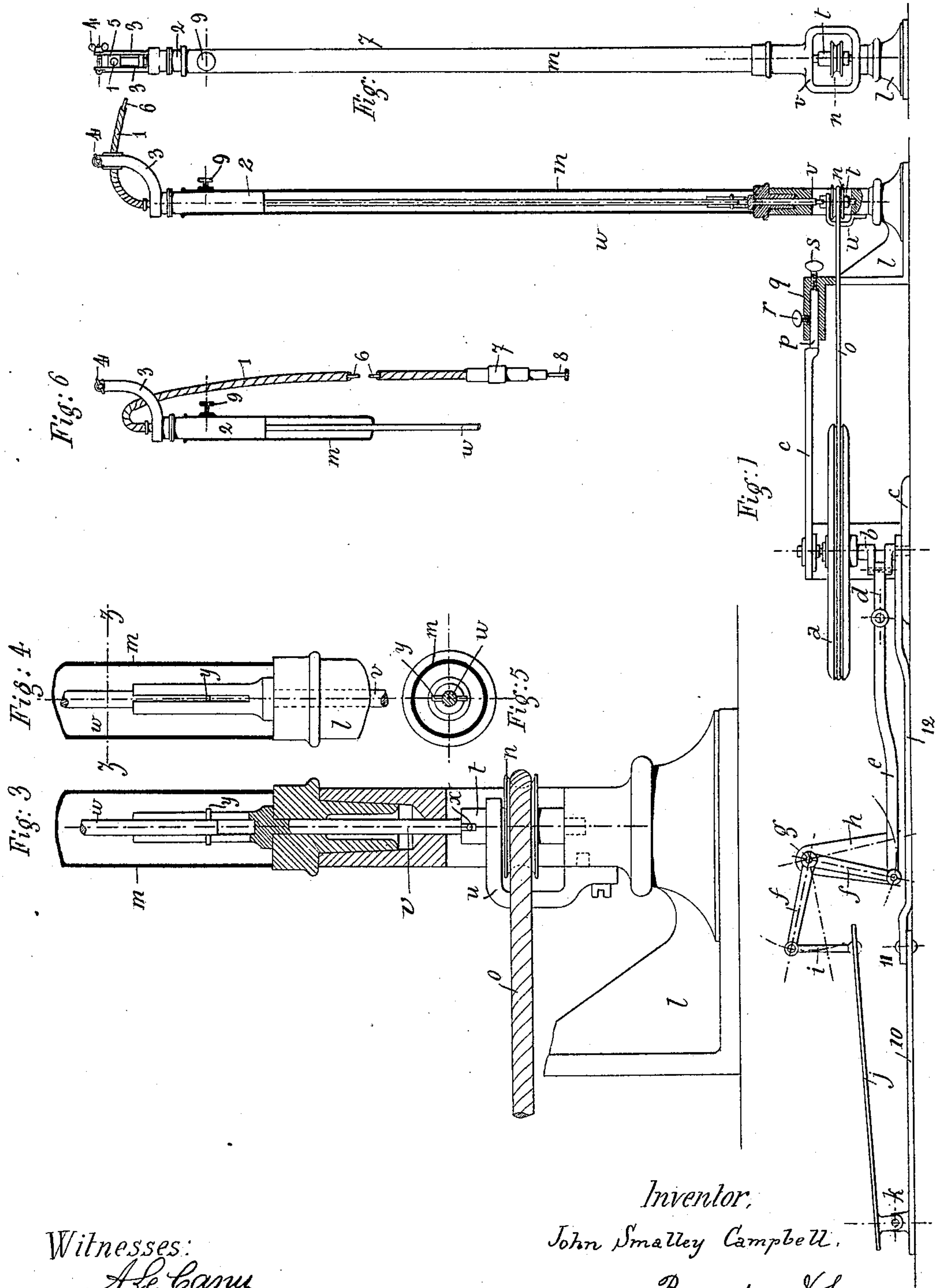
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J. S. CAMPBELL.

DENTAL ENGINE.

No. 397,169.

Patented Feb. 5, 1889.



Witnesses:

*A. E. Camp*  
*W. H. Camp*

Inventor,  
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per *Brandon & Son*  
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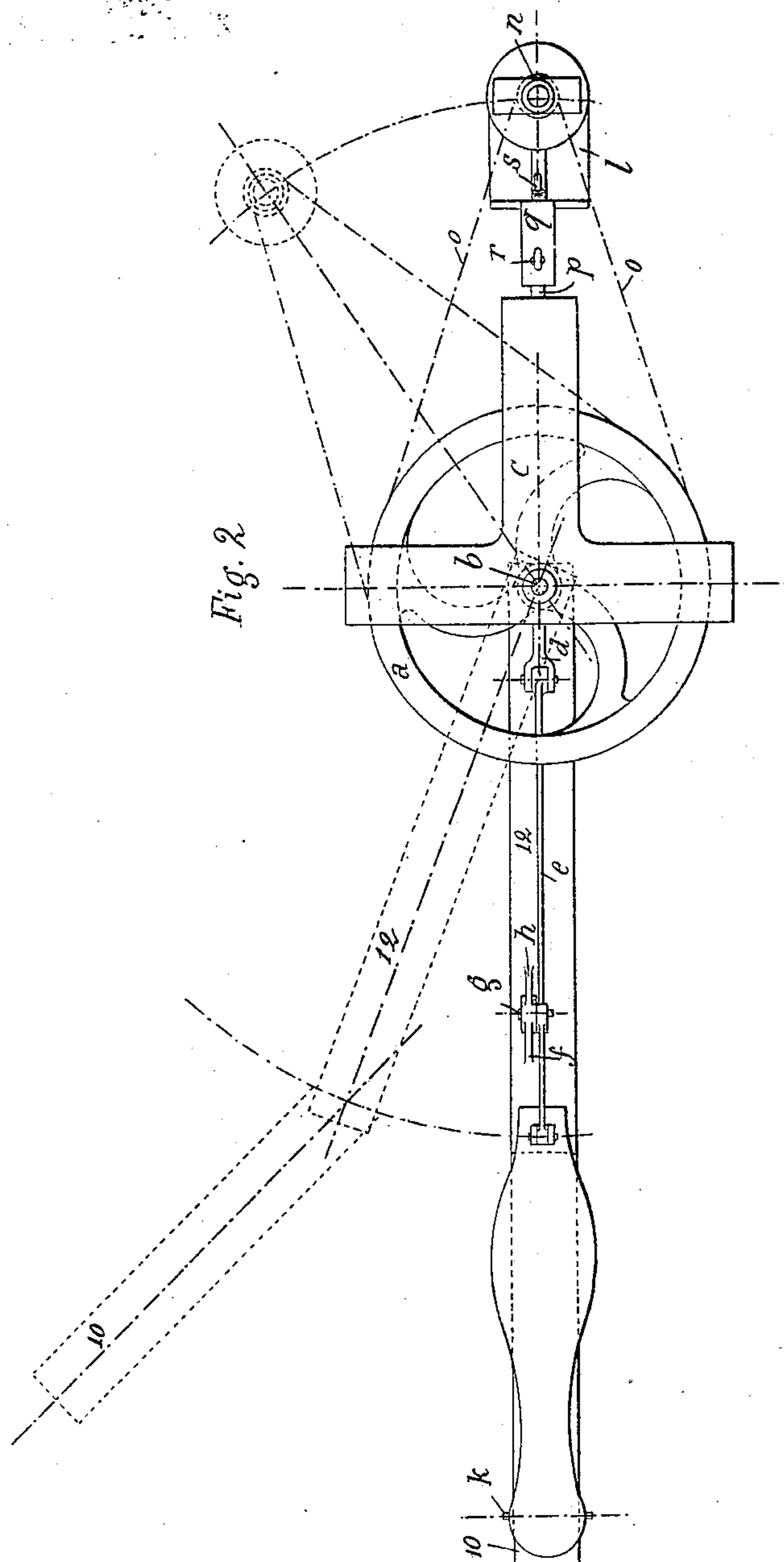
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J. S. CAMPBELL.

DENTAL ENGINE.

No. 397,169.

Patented Feb. 5, 1889.



Witnesses:

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Inventor:

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per *Brandon & Son*  
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# UNITED STATES PATENT OFFICE.

JOHN SMALLEY CAMPBELL, OF LONDON, ENGLAND.

## DENTAL ENGINE.

SPECIFICATION forming part of Letters Patent No. 397,169, dated February 5, 1889.

Application filed April 30, 1888. Serial No. 272,326. (No model.) Patented in England March 26, 1888, No. 4,574, and in France May 31, 1888, No. 190,926.

*To all whom it may concern:*

Be it known that I, JOHN SMALLEY CAMPBELL, dentist, a citizen of the United States, residing at present in London, England, 10 Park Square West, Regent's Park Northwest, have invented certain new and useful Improvements in Dental Engines, (patented in Great Britain, No. 4,574, dated March 26, 1888, and in France, No. 190,926, dated May 31, 1888;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My improvements refer to that class of dental engines which are operated by the foot of the dentist. The engine to which I refer more particularly is composed of a vertical stand or frame onto which is fitted, on a horizontal crank-shaft, a fly-wheel or driving-wheel operated from a treadle and imparting rotary motion by means of a cord to a pulley on an axis at the top of the frame. The said axis is connected to the dental tool by a spiral spring, which transmits the rotary motion to the said tool.

My object is to improve this class of engines with a view of dissimulating most of its bulky parts under the foot-board of a dental chair, so as to conceal them to a great extent from the eyes of the patient.

In the accompanying drawings, Figure 1 is an elevation of the improved engine, partly in section. Fig. 2 is a top view, and Figs. 3, 4, 5, 6, and 7 are detail views.

*a* is the driving-wheel, fast on a vertical crank-shaft, *b*, fitted in suitable bearings held by the framing *c*. The crank of the shaft *b* is connected by links *d e* to a bell-crank lever, *f*, fitted onto an axis, *g*, secured to an arm, *h*. The bell-crank lever *f* is connected by a link, *i*, to the pedal *j*, pivoted at *k*.

*l* is the frame for the stand *m*. The frame *l* carries a pulley, *n*, to which the rotary motion of the wheel *a* is imparted by a cord, *o*. Both frames *c* and *l* are adjustably connected, as shown, in order to regulate the tension of the driving-cord at will. The adjustment herein shown is composed of a part, *p*, held in a socket, *q*, by means of a set-screw, *r*, the

requisite tightening of the cord *o* being obtained by a screw, *s*.

The pulley *n* is fast on an axis, *t*, the lower end of which rests in a socket of the frame *l*, while the upper end is held by a bracket, *u*, fastened to the said frame *l*, as shown in Fig. 3, which, together with Figs. 4 and 5, is on a larger scale than Figs. 1 and 2.

The upper end of the axis *t* is hollowed out and slotted for receiving the lower end of the axis *v*, the top portion of which is tubular and slotted for receiving the end of the internal rod or shaft, *w*. The connection between the bottom end of the axis *v* and the top end of the axis *t* is effected by means of a cross-pin, *x*. The connection between the lower end of the rod *w* and the top end of the axis *v* is likewise effected by means of a cross-pin, *y*, Figs. 3, 4, and 5, Fig. 5 being a cross-section of Fig. 4 on the line *z z*.

The internal rod, *w*, extends upward to the spiral spring, which is inside an ordinary sheathing, 1, the rod *w* and spring being connected in any known manner. The rod *w* is held in a tube, 2, the upper end of which terminates in a curved bracket composed of two cheeks, 3 3, united at the top by a set-screw or thumb-screw, 4. The space between the two cheeks 3 3 is for allowing the free passage of a slide-piece, 5, provided with a central hole for the sheathing 1. The spiral spring (shown at 6, Fig. 6) is connected by an ordinary hand-piece, 7, to a dental tool, 8. By means of this stand the operator is enabled to set the sheathing 1 in the most convenient position for his work by simply slackening the thumb-screw 4, setting the slide-piece 5, and then tightening the said screw. Moreover, this construction enables the sheathing 1 to be set almost parallel to the stand, (see Fig. 6,) thus affording every facility for folding the engine in case it requires to be carried.

The stand can be set at any suitable height for the operator by raising the tube 2 and parts thereto attached, and then setting by means of a screw, 9. In rising the tube 2 carries with it the rod *w*, which then slides at its lower end out of the tubular portion of the axis *v*, without, however, being put out of gear



therewith. Moreover, the entire stand may be taken out of its socket in the frame *l* by simply raising it by hand, the connection between the lower end of the axis *v* and the axis *t* being such as to enable this motion to take place.

The most important feature of this dental engine resides, however, in this, that the pedal is fitted on a bar, 10, connected by a pivot, 11, to a second bar, 12, connected in its turn with the frame *c* by another pivot, which in this case is the lower end of the crank-shaft *b*. On the other hand, the frame *l*, with its stand, is likewise pivotally connected to the remainder of the engine by means of the frame *c*, as shown. By this means the engine is composed of three elements, which are pivotally connected to each other and can be made to assume angular positions to each other, as shown in dotted lines in Fig. 2.

In practice the whole engine forms one whole device, of which the drawing-wheel *a* and attached parts are entirely concealed under the foot-board of a dental chair; and as to the frames *c* and *l* they are mostly concealed at one side of the chair, and the treadle *j* mostly at the other side.

Having now described my improvements, I wish it to be clearly understood that the stand *m*, which is new in itself, and which is claimed hereinafter, can be replaced by any other stand known without otherwise taking away any of the characteristics of the dental engine. I wish it also to be understood that if it is not desired to have a stand being adjustable in height the ordinary stands of the well-known Shaw and S. S. White engines can be substituted. In this case the driving-cord would reach up to the top of the stand and pass over a pulley after first passing over a couple of pulleys placed in the same horizontal plane as the driving-wheel *a*.

I claim—

1. In combination with a dental engine, a

treadle, *j*, connected with the crank of the driving-wheel *a* and centered on the free end of a bar, 10, pivoted to a bar, 12, which is itself pivoted to the axis of said driving-wheel, all as and for the purposes set forth.

2. A dental engine having a horizontal driving-wheel, *a*, fitted in a frame, *c*, the axis of said frame being adjustably connected on one side with a pivoted frame, *l*, carrying a suitable stand, and on the other side with a treadle, *j*, pivoted bars 10 and 12, on one of which the treadle is centered, and intermediate gearing, *i f e d*, substantially as described and shown.

3. A dental engine having its main driving-wheel placed horizontally on a short vertical axis near the floor, said wheel being operated by a treadle fulcrumed on a base-bar, 10, pivoted to a bar, 12, pivoted on the axis of said wheel, substantially as shown and described.

4. The combination in a dental engine of two adjusting-frames, *t* and *c*, with a suitable stand, a treadle, *j*, driving-wheel *a*, pulley *n*, and cord, substantially as shown and described.

5. The combination of an extensible stand consisting of an adjustable frame, *l*, pulley *n*, axis *t*, axis *v*, rod *w*, tube *m*, sliding tube 2, cheeks 3 3, set-screw *q*, spring 6, and sheathing 1, with an adjustable frame, *c*, horizontal driving-wheel *a*, treadle *j*, and gears *i f e d b*, all substantially as shown and described.

6. A stand for the spring provided with an adjustable spring-supporter held between two cheeks, 3 3, and provided with a screw, 4, whereby it may be adjusted up or down, substantially as shown and described.

In witness whereof I have hereunto set my hand this 14th day of April, 1888.

JOHN SMALLEY CAMPBELL.

Witnesses:

FRANCIS W. FRIGOUT,  
H. H. NEWMAN.