(No Model.) 2 Sheets—Sheet 1.

J. HOOD & S. H. REYNOLDS.

DENTAL ENGINE.

No. 388,200. Patented Aug. 21, 1888.

Fig. 1.

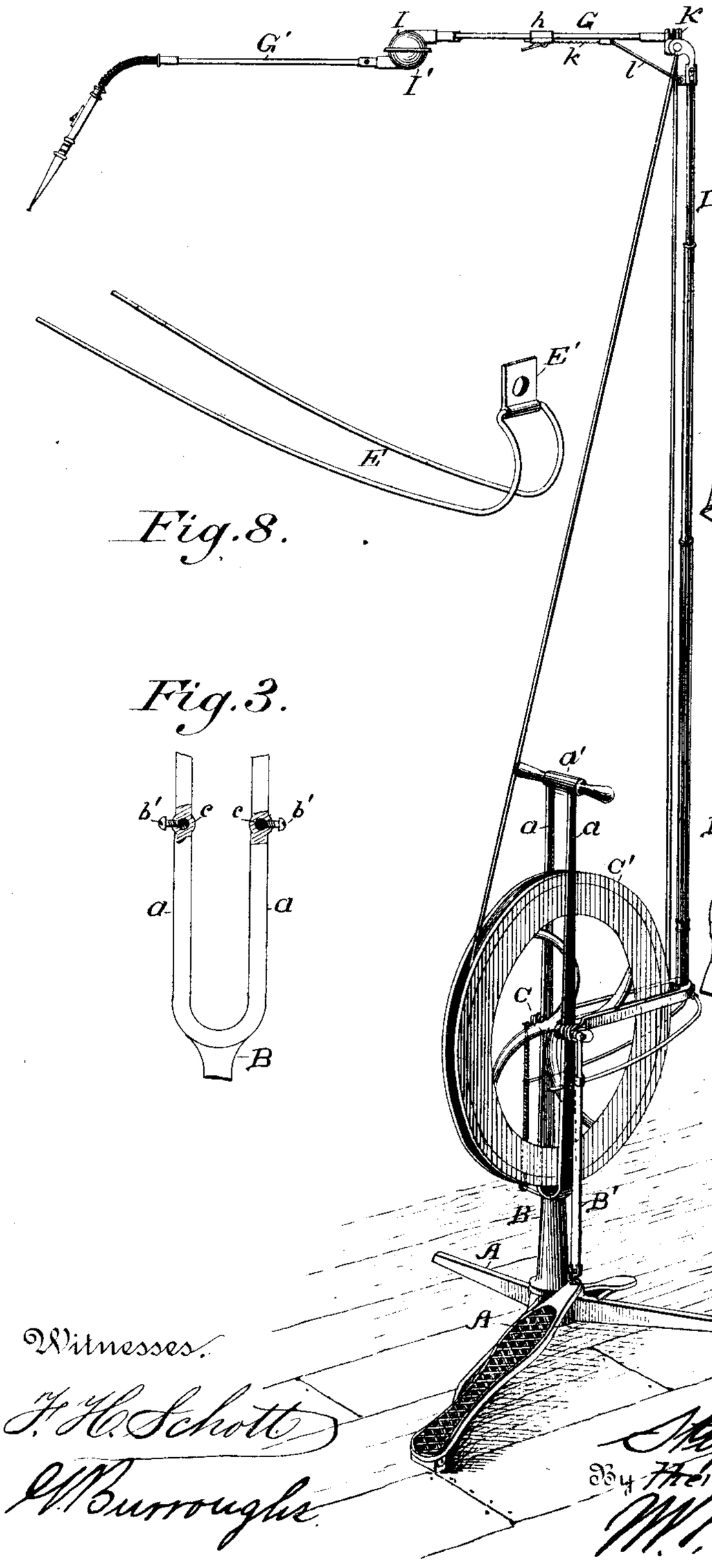
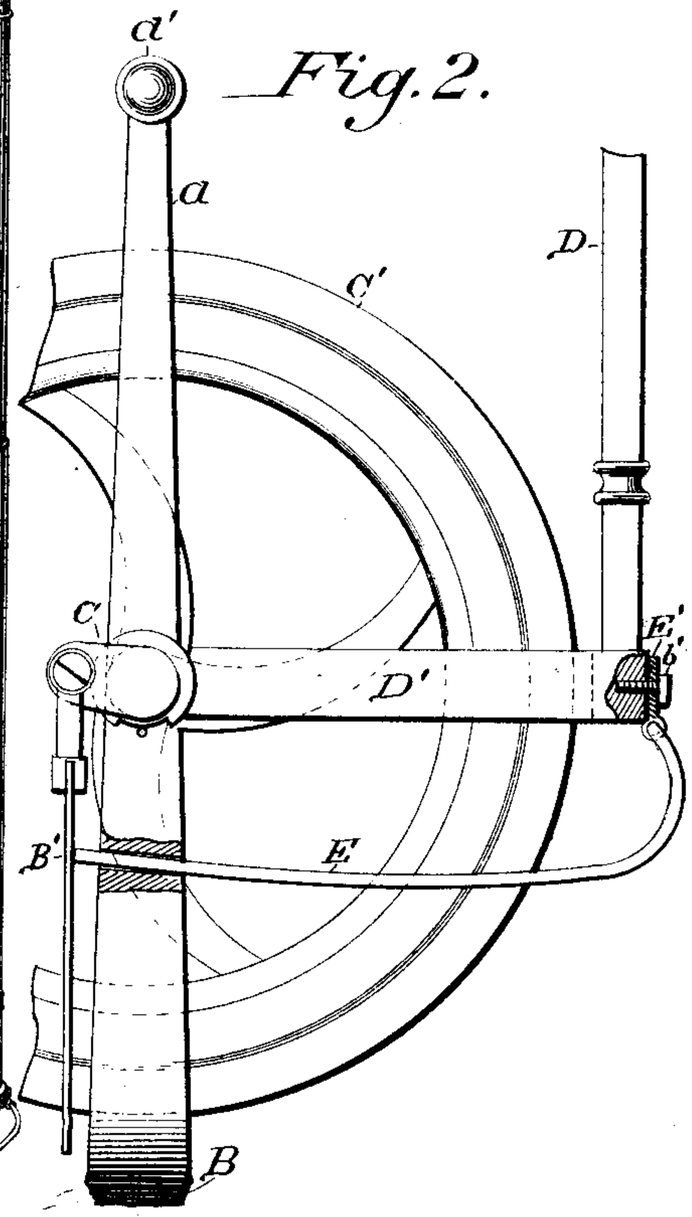


Fig. 8.

Fig. 3.

Fig. 2.



Witnesses.
F. H. Schott
W. Burroughs.

Inventor,
John Hood.
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By their Attorney
W. E. Chandler.

(No Model.) 2 Sheets—Sheet 2.

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DENTAL ENGINE.

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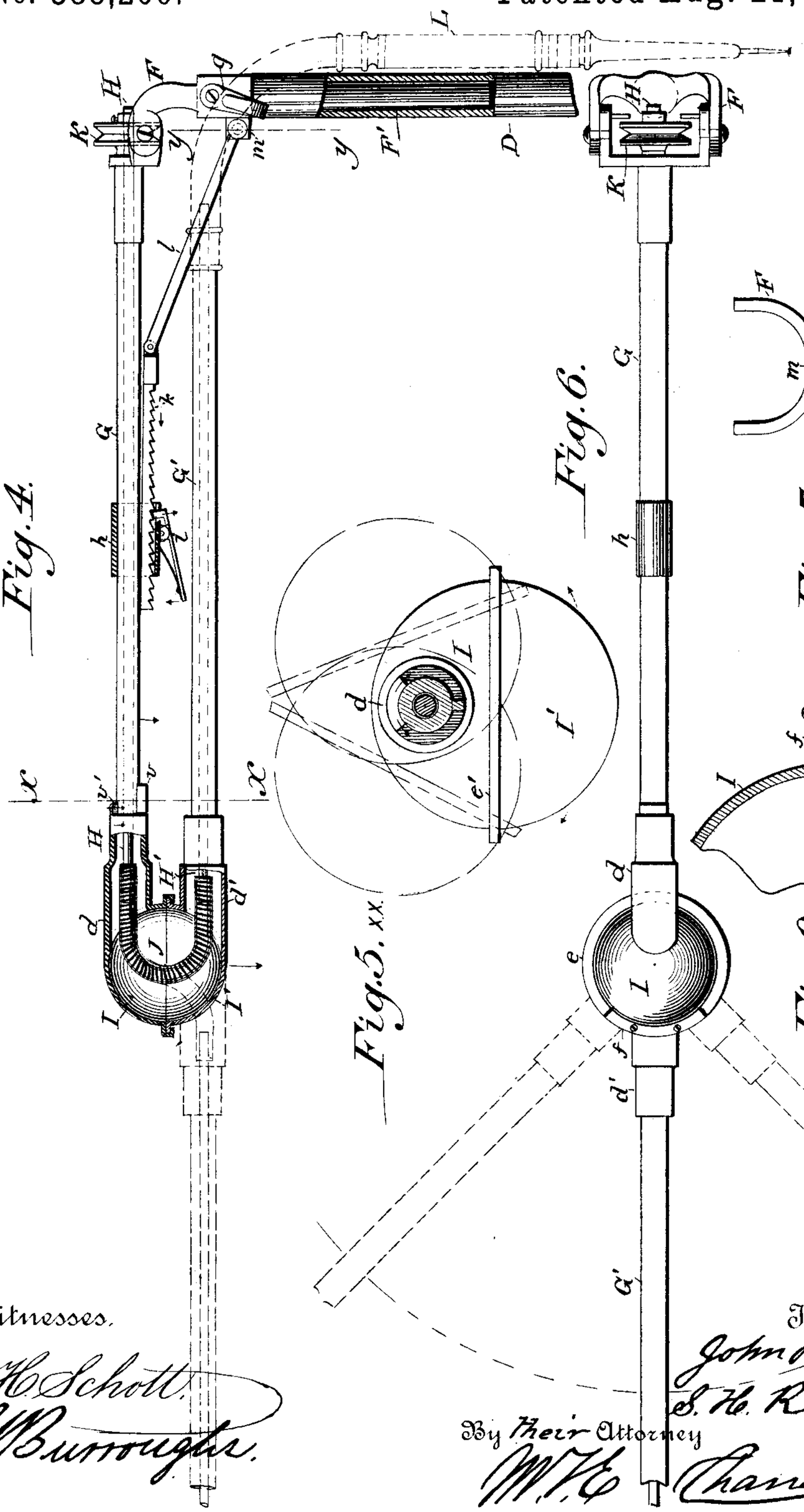

Fig. 4.

Fig. 5. x x.

Fig. 6.

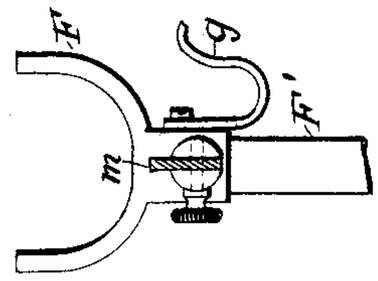

Fig. 7. y y.

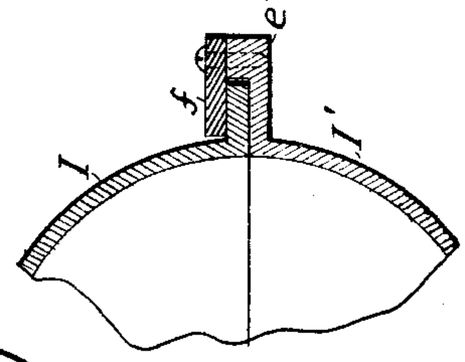

Fig. 9.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN HOOD AND STEPHEN H. REYNOLDS, OF BOSTON, MASSACHUSETTS.

DENTAL ENGINE.

SPECIFICATION forming part of Letters Patent No. 388,200, dated August 21, 1888.

Application filed January 12, 1888. Serial No. 260,480. (No model.)

To all whom it may concern:

Be it known that we, JOHN HOOD and STEPHEN H. REYNOLDS, citizens of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Dental Engines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to the construction of dental engines; and it consists in certain improvements on the engine for which a patent, No. 381,783, was granted to me on the 24th day of April, 1888.

These improvements relate especially to the construction and arrangement of the spring by which the extension-bar is supported to the upward extension of the arms of the standard above the fly-wheel to receive a handle by which the machine may be lifted and carried when it is desired to change its position, to the peculiar construction of the universal joint in the arm which carries the operating-tool, and to the adjustable brace for supporting said arm, all as will be hereinafter fully described, and illustrated in the drawings forming a part of this specification, in which drawings—

Figure 1 is a perspective view of the engine complete. Fig. 2 is an enlarged side elevation showing the method of applying the spring which supports the extension-bar. Fig. 3 shows the bifurcated portion of the standard with the spring attachments. Fig. 4 is a side elevation, partly in section, of the upper end of the extension-bar and tool-carrying arm folded and resting upon its supporting-hook as when not in use. Fig. 5 is a cross-section of the arm on the line $x\ x$, with the universal joint in different positions. Fig. 6 is a plan showing the arm extended, the outer part beyond the joint being shown by dotted lines in different positions. Fig. 7 is a side elevation of the upper part of the extension-bar with the supporting-hook and brace attachment. Fig. 8 is a perspective view of the spring employed to support the extension-bar. Fig. 9 is an enlarged section of the globular universal joint, showing the manner of connecting its two halves.

In the different views of the machine, A represents the base, and B the standard, which parts may be made adjustable one upon the other or secured together in a fixed position. The base carries the treadle A′, by which motion is communicated to the moving parts of the machine. The standard is bifurcated, its two arms $a\ a$ extending upward above the fly-wheel C′, and are provided at their upper ends over said fly-wheel with the connecting cross-piece or handle a', by which the machine may be readily lifted when it is desired to change its position.

Journaled in the arms $a\ a$ is the crank-shaft C, connected with the treadle A′ by a suitable pitman, B′, through which motion is transmitted from said treadle to the fly-wheel.

The extension-bar D is forked at its lower end, forming the arms D′ D′, extending at right angles to the body of the bar and embracing the fly-wheel. The ends of these arms D′ are journaled upon the crank-shaft, so that the extension-bar may be moved or swung in the plane of the fly-wheel's rotation.

In order to support this bar ordinarily in a vertical or nearly vertical position, we employ the spring E, formed, as shown in Fig. 8 of the drawings, of a piece of steel or other wire having suitable resilient properties and secured at its middle in the clamp E′, which is in turn secured by a screw or bolt, b, to the end of the extension-bar. The two ends of the spring are bent to a right angle at each side of the clamp, extend parallel with each other beneath the arms D′, and have their extremities passed through suitable slots or openings, $c\ c$, in the arms $a\ a$ of the standard B, and in which they may be secured at any desired point by set-screws b', thus enabling the operator to change the normal position of the extension-bar as well as swing it back and forth to a certain extent when the machine is in use or at rest. This extension-bar D is tubular and receives in its upper end the stem F′ of the bracket F, between the upwardly-projecting ears of which is pivoted one end of the tubular casing G, which, with the casing G′, forms the sheath within which the rotating shaft H, giving motion to the implement used,

is incased. Motion is imparted to this shaft by a band running in a groove in the periphery of the fly-wheel and over the grooved pulley K, secured upon the end of said shaft between the ears of the bracket F.

The two parts G and G′ of the tubular shaft-case are each provided with one of the hemispherical cups I or I′, the part G being connected to the cup I by means of the sleeve *d*, which is allowed to turn on the ends of said case G through at least two-thirds of a circle, as illustrated in Fig. 5, which shows a section of the sleeve and case at their junction, the sleeve being prevented from making a complete revolution on the case G by the key *v*, attached to and projecting from said case, which key comes in contact with a projection, *v′*, of the sleeve *d*. The cup I′ is connected with the casing G′ by a sleeve, *d′*, secured to said casing by a set-screw or other suitable means, but without motion thereon. These two hemispherical cups I and I′ are secured together by forming an outwardly-extending flange, *e*, upon the part I and upon the cup I′ a similar outwardly-extending flange, *e′*, of greater width, which extends beyond the outer edge of flange *e* and returns over it, thus forming a recess entirely surrounding the cups, within which the flange *e* is free to turn.

In order to allow the two cups to be taken apart for repairs or other purposes, a part of the flange *e′*, as *f*, is made removable, being secured in place by screws or other suitable devices. When this part *f* is removed, the flange on the cup I may be drawn out of the recess in the flange of the cup I′, thus disconnecting the two parts G and G′ of the shaft-case and allowing access to the interior. The shaft H terminates in the sleeve *d*, where it is connected to the flexible shaft or wire coil J, the opposite end of which coil is secured to the end of the shaft H′ in the sleeve *d′*. This shaft H′ passes through the tubular case G′ and is connected with the coil and shaft in the hand-piece L in the usual manner. It will be seen that this arrangement of the shafts, their casings, and their globular connection makes a complete universal joint, allowing the arm to be doubled back and the hand-piece suspended from the hook *g*, attached to one side of the bracket F, as shown in Fig. 4 of the drawings, or to be moved in any direction necessary during the manipulation of the machine by its operator.

In order to support the part G of the shaft-carrying arm in any desired position, a sleeve, *h*, is secured thereon, which sleeve extends down beneath the arm far enough to allow the toothed rack *k* to slide therein beneath the arm. One end of this rack is pivoted to a connecting-rod, *l*, the opposite end of which is carried by the lug *m*, projecting from the bracket F. This rod acts as a brace to support the arms, the position of which is adjusted by means of a spring-dog, *i*, pivoted upon the under side of the sleeve *h*, its toe passing through an orifice in the same, so as to engage with the tooth of the rack *k*, and thus hold the arms at any desired elevation.

The method of operation of machines of this class is well known, and does not therefore need to be described in detail, the novel points in this engine being the addition of the handle to the standard for convenience in changing its position, the construction and arrangement of the spring by which the extension-bar is supported, the devices for adjustably holding up the shaft-carrying arm, and the globular universal joint in the same, by means of which the operator is given a better control over the machine and the instrument in use.

Having thus described our invention, we claim as new, and desire to secure by Letters Patent, the following:

1. In a dental engine, the combination of the base A, a bifurcated and rotating standard, B, the extension-bar D, with bifurcated arms extending at an angle from and pivoted to the bifurcations of said standard, and the handle *a′*, connecting the two parts of the standards above its attachment to the extension-bar, substantially as shown and described.

2. In a dental engine, the combination, with the standard and extension-bar having a bifurcated connection with said standard at right angles to the body of the bar, of the double spring E, attached to the bar and adjustable upon the standard, as specified.

3. In a dental engine, the combination of the extension-bar D with the shaft-carrying case G, the sleeve *h*, placed upon said case, the spring-dog *i*, attached to the sleeve, the rack *k*, sliding through the sleeve and engaging with the spring-dog, and the connecting-rod *l*, pivoted at one end to the rack and at the other to the extension-bar to form an adjustable brace for retaining the shaft-case G in any desired position with relation to the extension-bar, as specified.

4. In a dental engine, the combination of the shaft-cases G and G′ with the cups I and I′, attached by sleeves to said cases and connected together by flanges, forming a universal joint, the parts being adapted to turn one upon the other, substantially as shown and described.

5. In a dental engine, the shaft-cases G and G′, united by a globular universal joint, in combination with the shaft inclosed in said cases, consisting of two rigid parts, H and H′, within the cases, and the flexible wire coil J, connecting the rigid parts within the globular joint, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN HOOD.
STEPHEN H. REYNOLDS.

Witnesses:
JOHN MAY,
WM. H. COOK.