

(No Model.).

3 Sheets—Sheet 1.

R. DE L. KING.
DENTAL ENGINE.

No. 500,139.

Patented June 27, 1893.

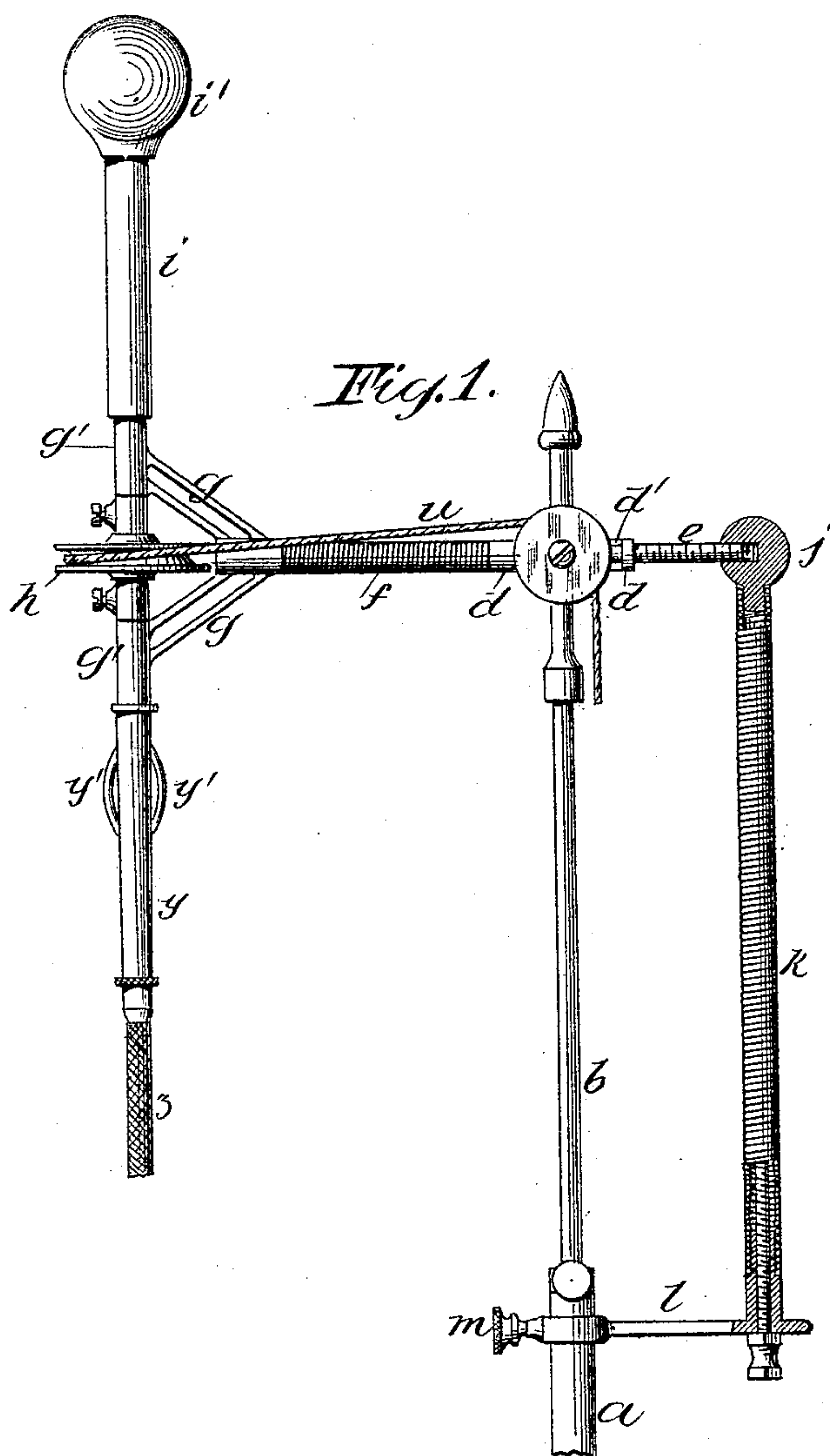
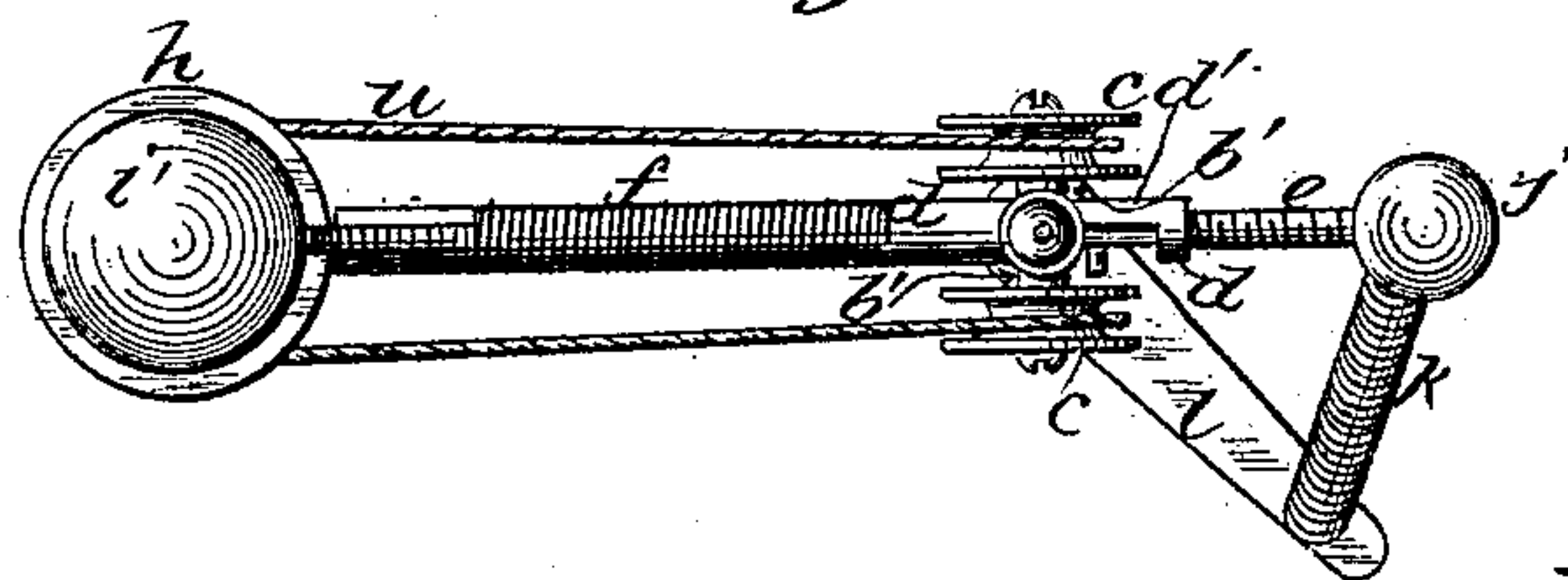


Fig. 2.



Witnesses.

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Inventor:

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By Emmett C. Webb atty.

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Fig. 3.

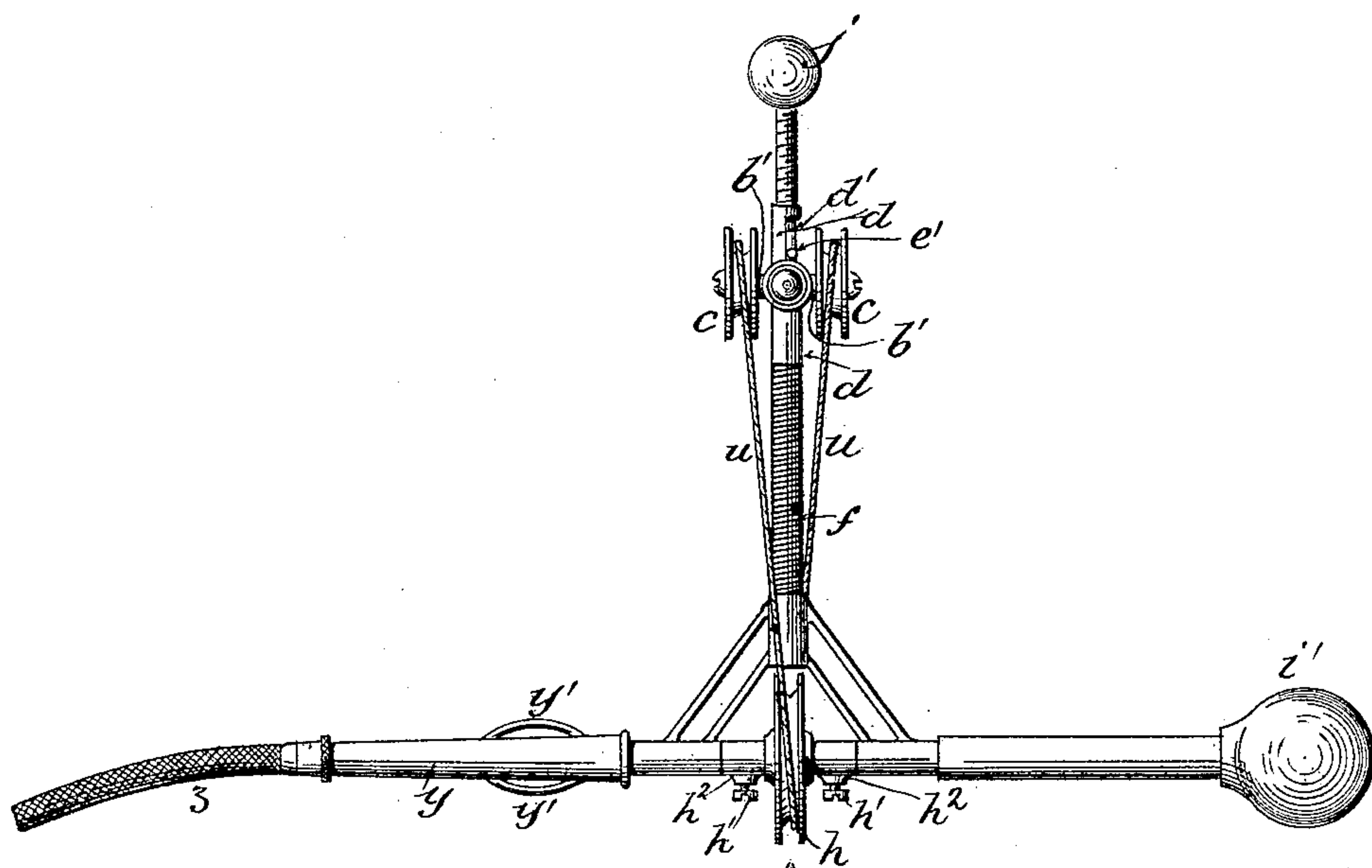
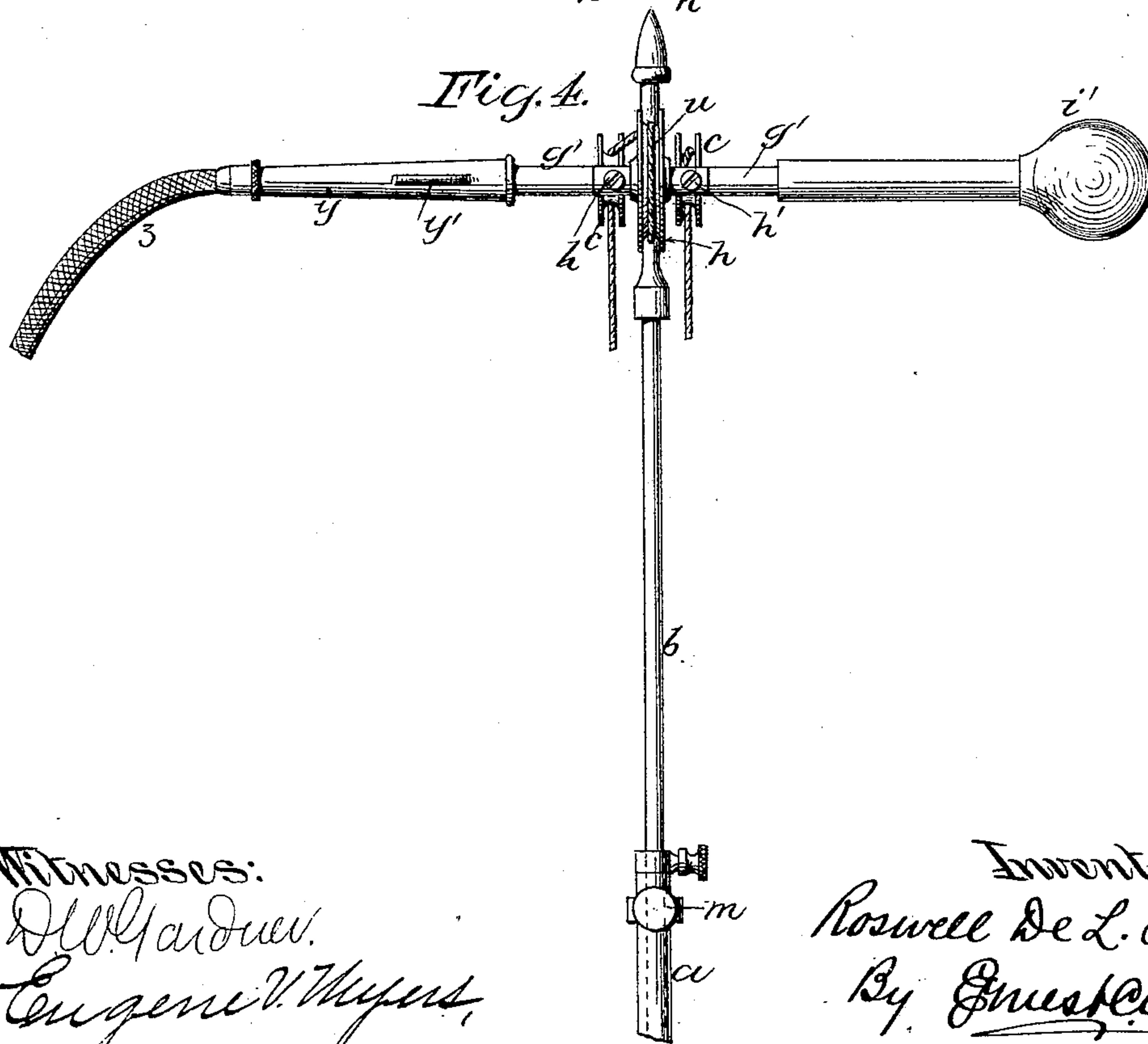


Fig. 4.



Witnesses:

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Eugene V. Myers.

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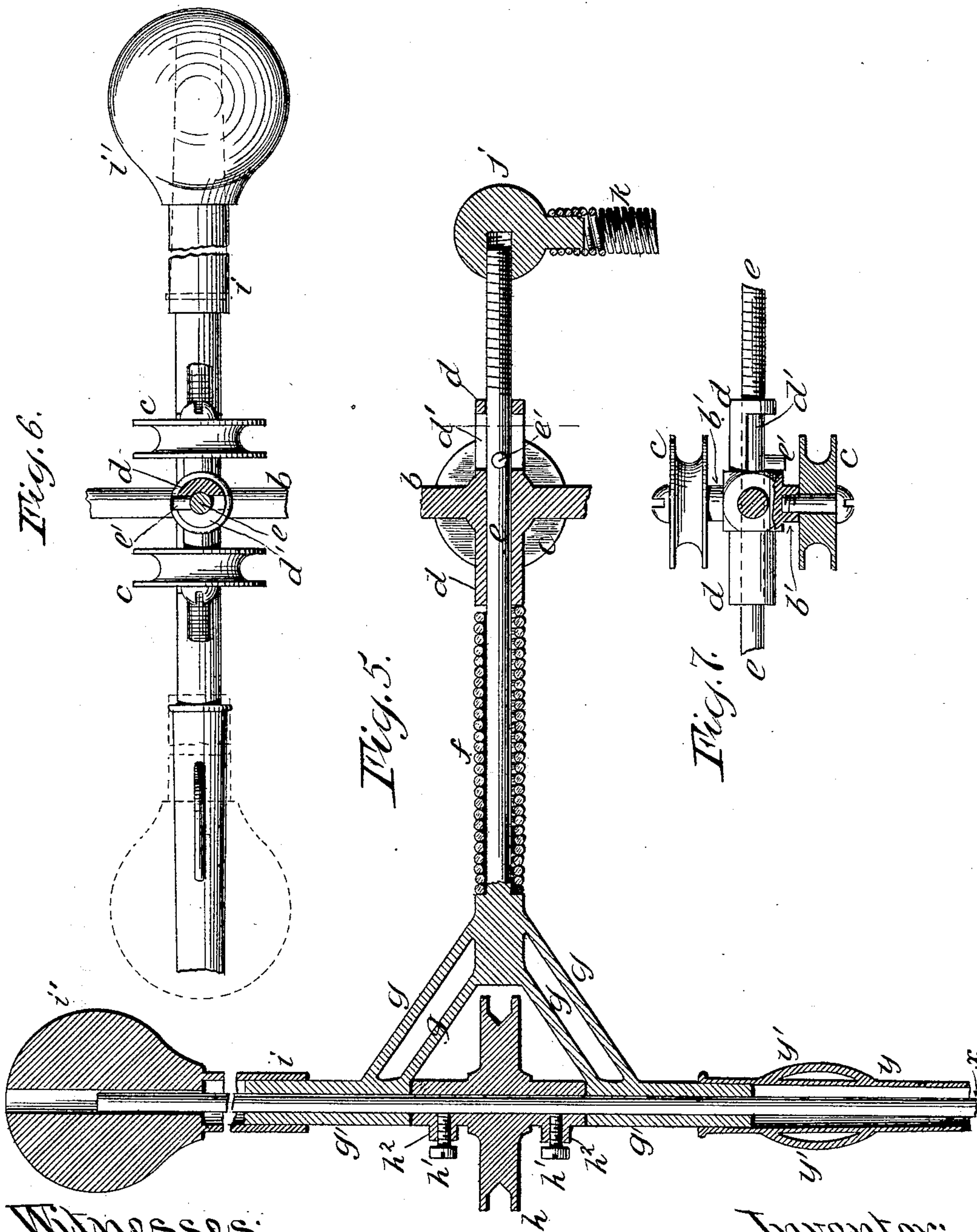
Roswell De L. King

By Gustav C. Webb

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UNITED STATES PATENT OFFICE.

ROSWELL DE L. KING, OF NEW YORK, N. Y.

DENTAL ENGINE.

SPECIFICATION forming part of Letters Patent No. 500,139, dated June 27, 1893.

Application filed September 24, 1892. Serial No. 446,749. (No model.)

To all whom it may concern:

Be it known that I, ROSWELL DE L. KING, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Dental Engines, of which the following is a specification.

This invention relates to improvements in dental engines, and has for its object the production of an engine in which the flexible shaft carrying the burr, drill, or other tool, will have an unusual latitude of movement in a vertical plane, at the same time relieving the operator from sustaining the weight of the shaft, its tube, and driving pulley, thereby permitting perfect freedom in handling the drill and lessening the liability to slipping of the instrument while in contact with a tooth, caused by the weight of the above enumerated parts.

The invention further consists in the arrangement and combination of parts making the engine light, strong and durable, and insuring the smooth and even rotation of the flexible shaft in any position it may assume.

To these ends my said invention consists in the details of construction and in the combination of parts, as hereinafter more particularly described and pointed out in the claims.

Referring to the accompanying drawings illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1, is a side elevation of the upper part of a dental engine embodying my invention, and showing the parts in their normal position, or in a state of rest. Fig. 2, is a top view thereof. Fig. 3, is a top view showing the engine in use and the flexible shaft and its tube in a horizontal position. Fig. 4, is a similar front elevation. Fig. 5, is an enlarged vertical sectional view of the engine in the position shown in Fig. 1. Fig. 6, is a fragmentary rear elevation, partly in section. Fig. 7, is a detail of the stop device.

It may be stated that the parts of the engine not particularly shown and described may be of the ordinary and well-known construction.

a , is a tubular standard having projecting therefrom the adjustable rod b , which is capable of being turned in the standard a , and which carries near its head the lateral lugs

b' , to which the opposite belt pulleys c , are attached, and also having the tubular or cylindrical cross-piece d , through which passes the horizontal arm e . The rearward portion of the tube d , is recessed or cut away for about two-thirds of its circumference, as shown at d' , Fig. 7, and the arm e , is provided with the pin or projection e' , which, by striking against one side or the other of said tube d , limits the rotary motion of said arm. The forward portion of arm e , is provided with a coil spring f , having a seat at one end against the tube d , and at the other end against the head of the arm. From the head of said arm e , extend the V-shaped projections g , at the outer ends of which are the tubular bearings g' , g' , through which the usual flexible shaft x , passes. h , is a belt wheel or pulley secured to the flexible shaft x , between the tubular bearings g' , g' , the axis of said pulley being hollow and surrounding said shaft, to which the pulley is secured by the screws h' , passing through the tapped lugs h^2 , on either side of said pulley and impinging against the shaft, (see Fig. 5,) which is contained for the greater part of its length in the usual tube z , having the ordinary metal termination y , of a size to surround and fit the lower tubular bearing g' , making what is known as a slip-joint, and to aid the operator in forming this connection and to prevent his hand from slipping on the smooth metal, I provide the metal portion y , with the elliptical projections y' .

i , is a tube terminating in a heavy counterbalance i' , which is also preferably bored to permit the shaft to extend up into it, as shown in Fig. 5. By this means an unusual length of shaft may be used, the extra length being utilized in case of breakage.

The rearward portion of arm e , is screw-threaded and has loosely screwed thereon the counterbalance j , having depending therefrom the coiled spring k , which is adjustably secured to the standard a , by the strip d , and set screw m .

The operation of my device is as follows:— Motion is communicated to the belt n , from any suitable source of power, as by a treadle and fly-wheel, or an electric or a water motor, &c., and the said belt passes over pulleys e , and around pulley h , thereby giving a rotary

motion to the shaft x . When the operator raises the free end of the tube z , from its normal position shown in Fig. 1, the counterbalance i' , is thrown to a horizontal position, as shown in Figs. 3, 4, and 6, and is stopped by the pin e' , on the arm e , coming in contact with one side or the other of the tubular cross-piece d . By means of this counterbalance the operator has but little weight to hold, and is not obliged to sustain the long shaft, its tube and driving pulley against the attraction of gravity, as is now the case. The engine may be left in one position and the operator work with equal facility on either side of the patient, the counterbalance i' , sustaining the weight of the shaft, tube and driving pulley, and the extreme positions of said counterbalance are shown by full and dotted lines in Fig. 6. Any inequalities in the belt, caused by splicing, &c., are compensated for by the spring f , which allows the arm e , carrying the operating parts a reciprocating motion, and the burr, drill, or other instrument fastened to the shaft, is thus given a steady and continuous movement. When the operator uses the instrument at an angle in a horizontal plane to the engine, the rod b , is rotated in its tubular standard, a , against the tension of the spring k , twisting said spring to one side or the other, as shown in Fig. 2, and as soon as the operator releases the instrument, said spring k , resumes its normal position, as in Fig. 1, the screw connection between arm e , and the balance j , being loose to permit perfect freedom of movement between the said parts, relatively to each other. The weight j , and spring k , which is normally at a slight tension, tends to counterbalance the weight of the forward portion of arm e , and the annexed parts, while, as before stated, the counterbalance i' , relieves the weight of the tube z , shaft x , and driving pulley h , but is not quite equal to the combined weight of said parts, so that when the operator drops the tube z , it will overcome the weight i' , and at once assume the perpendicular position shown in Fig. 1.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a dental engine, a swiveled upright support having a bearing for a horizontal arm, a rotatable arm extending through said

bearing and carrying at its front end a tool shaft and belt wheel, and at its rear end a pivoted weight or counterbalance having a depending spring adjustably secured to the said support, substantially as described and for the purpose set forth.

2. In a dental engine, a swiveled upright support having a bearing for a horizontal arm, a rotatable arm extending through said bearing and carrying at its front end a tool shaft provided with a removable counterbalance, and a belt wheel, and at its rear end a pivoted weight or counterbalance having a depending spring secured to the said standard, substantially as described for the purposes set forth.

3. In a dental engine, a tubular standard, an adjustable rotatable rod therein, carrying opposite upwardly inclined lugs, and a tubular cross or T-head; guide pulleys on said lugs, and a horizontal arm passing through the T-head and having at its front end bearings for the tool shaft; a shaft passing through said bearings, and a belt wheel mounted upon the shaft between the bearings, substantially as described.

4. In a dental engine, a tubular standard, a rotatable rod therein provided with a tubular cross head, having a portion of its circumference cut away, in combination with a horizontal arm mounted in said cross head, and having a pin or projection working in said cut away portion, whereby the motion of the said arm is limited, substantially as described.

5. In a dental engine, a support having a bearing for a horizontal arm, a rotatable arm mounted in said bearing and carrying at one end tubular bearings for a tool shaft; a tool shaft mounted in said bearings, and carrying a belt wheel, in combination with a weight or counterbalance having a tubular extension adapted to be passed over one of the bearings of the shaft, substantially as described for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 23d day of September, A. D. 1892.

ROSWELL DE L. KING.

Witnesses:

J. B. SABINE,
EUGENE V. MYERS.