No. 621,154. Patented Mar. 14, 1899.

F. F. SCHOLL.

DENTAL ENGINE.

(Application filed Oct. 5, 1897.)

(No Model.) 3 Sheets—Sheet 1.

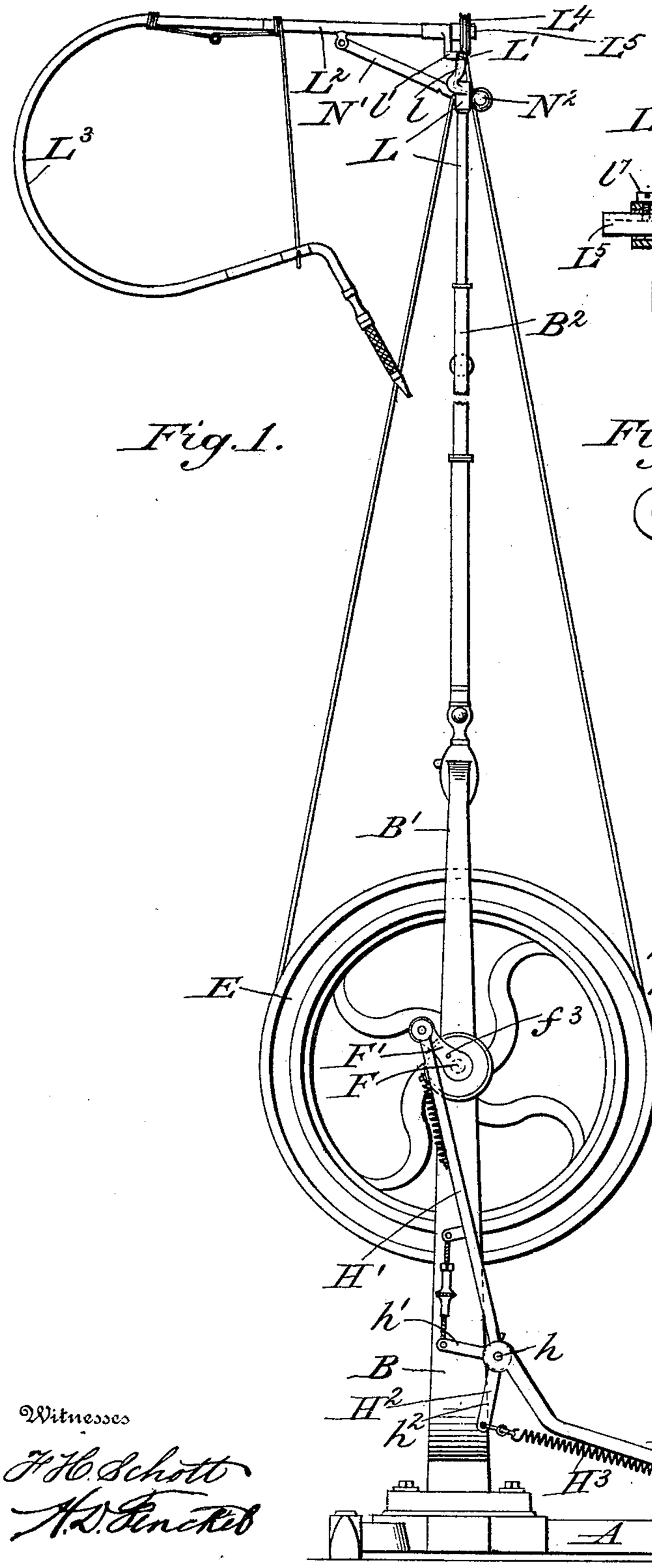

Fig. 1.

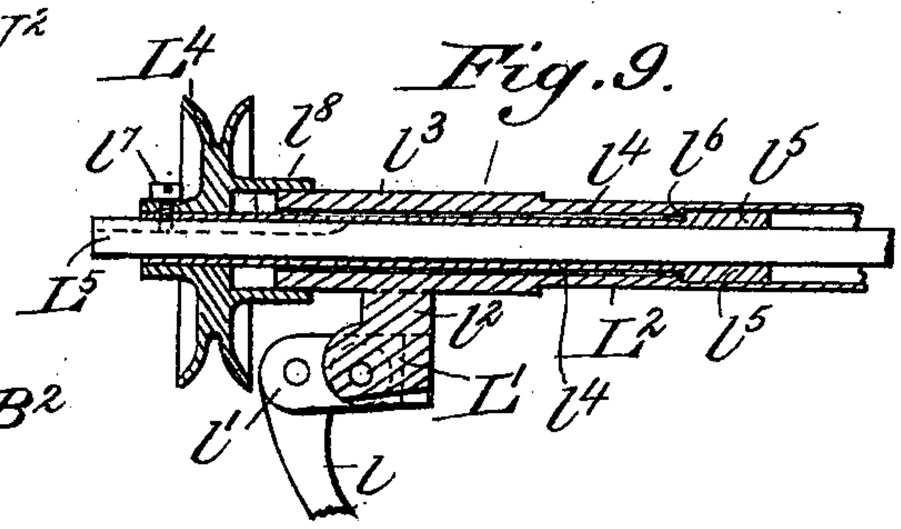

Fig. 2.

Fig. 9.

Fig. 3.

Witnesses

F. H. Schott

H. D. Fenckel

Inventor

Frederick F. Scholl

by Grant Burroughs

Attorney

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Fig. 4.

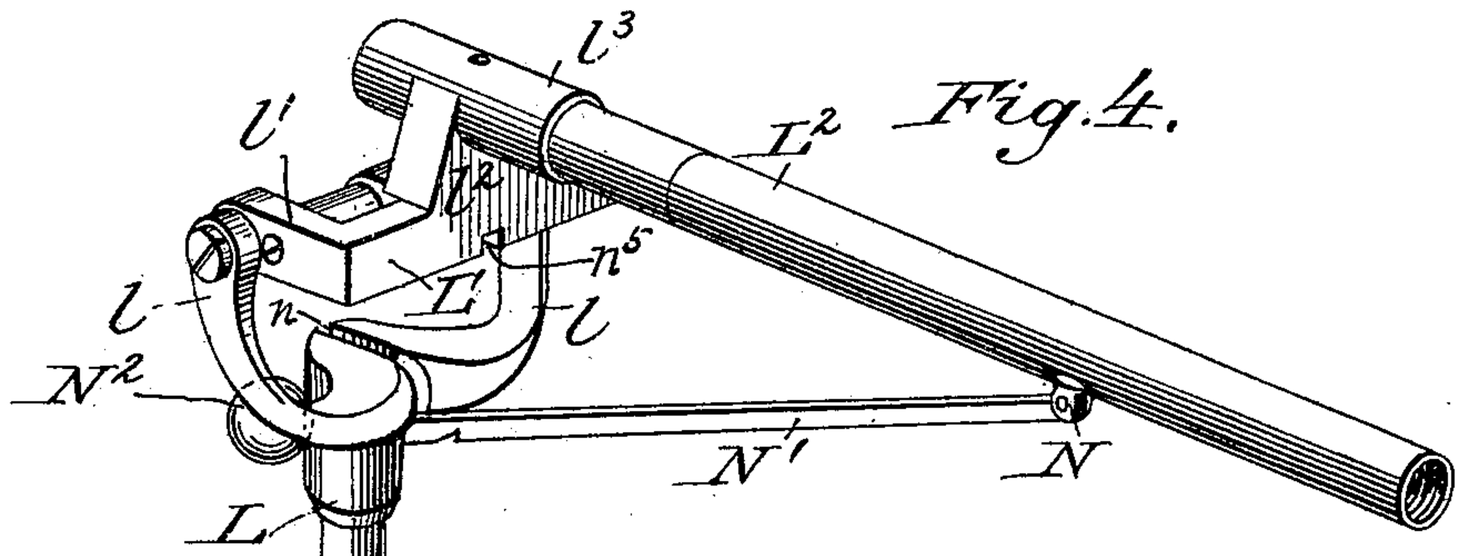
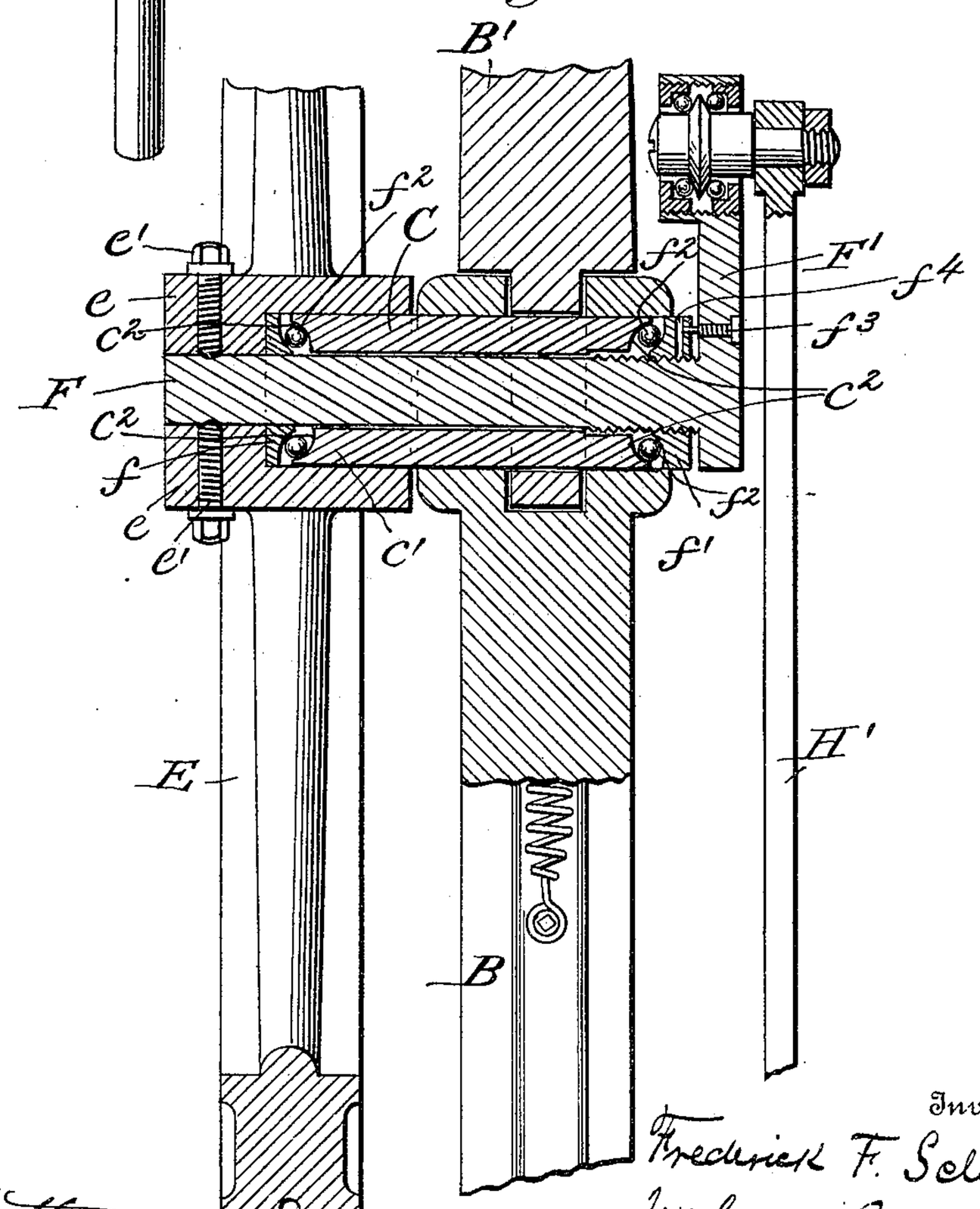


Fig. 5.



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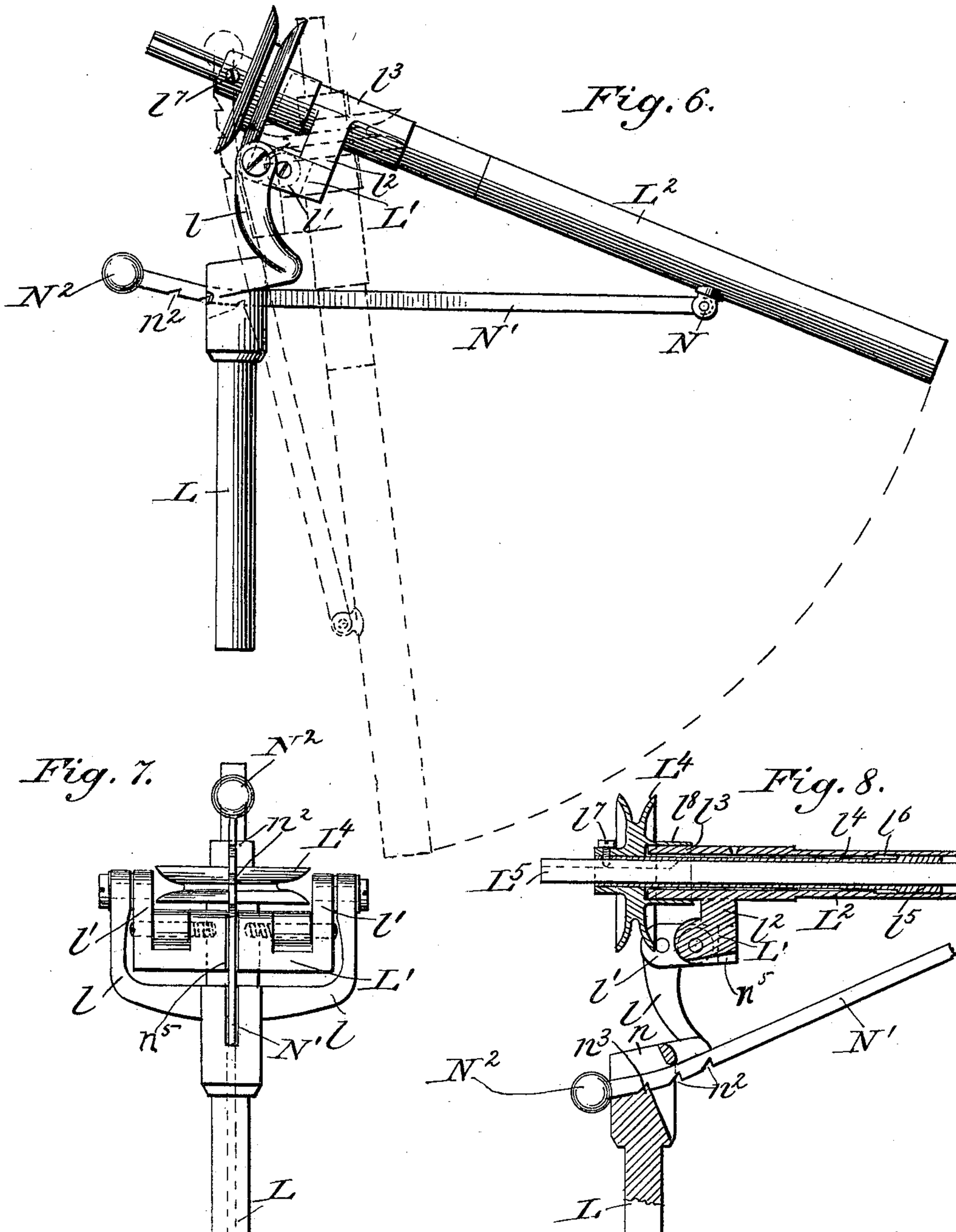

Fig. 6.

Fig. 7.

Fig. 8.

Witnesses

F. H. Schott

H. W. Sinnickson

Inventor

Frederick F. Scholl

by Grant Burroughs

Attorney

UNITED STATES PATENT OFFICE.

FREDERICK F. SCHOLL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO JOHN HOOD & CO., OF SAME PLACE.

DENTAL ENGINE.

SPECIFICATION forming part of Letters Patent No. 621,154, dated March 14, 1899.

Application filed October 5, 1897. Serial No. 654,167. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK F. SCHOLL, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Dental Engines, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in dental engines, and more particularly to the dental engines shown and described in Patent No. 548,989, granted October 29, 1895, and in the application for patent filed by John Hood and Stephen H. Reynolds November 18, 1896, having Serial No. 612,536.

The invention has for its objects the provision of a mechanism whereby the tension of the spring for throwing the crank-shaft off dead-center can be regulated and the provision of a mechanism for preventing oil from escaping from the bearing-sleeve intermediate of the pulley and the rod connected with the inner helix of the flexible shafting.

In dental engines where the pitman and treadle are connected by a spring for throwing the crank-arm off dead-center, after the spring has been in use for some time it becomes stretched, and consequently does not serve its purpose so well. In the present instance it is proposed to obviate this objectionable feature by providing an adjusting mechanism, so that the tension of the spring can be regulated. Furthermore, in dental engines where the sleeve in which is mounted the rod connected with the inner helix of the flexible shafting and on which is mounted the driving-pulley and where said sleeve has a movement endwise in the casing in which it is journaled has more or less of its surface covered with oil exposed. As the said sleeve is driven at a high rate of speed, the oil is often thrown off and soils surrounding objects. In the present instance this is obviated by providing a sliding cover or shield that prevents any part of the sleeve from becoming exposed and at the same time allows the sleeve to move back and forth to accommodate the pulley to the adjustments of the operating-arm.

The invention consists in the novel construction, combination, and arrangement of parts, such as will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a side elevation of a dental engine embodying the invention. Fig. 2 is an enlarged detail view showing a side elevation, partly in section and broken away in parts, of the pitman, treadle, and the spring regulating device. Fig. 3 is a similar view showing a front elevation of the same. Fig. 4 is a detail perspective view showing the adjusting-bracket for the arm supporting the flexible shafting. Fig. 5 is an enlarged detail sectional view showing the hinge connection between the main and rocking standards, the crank-shaft, and the bearing for the latter. Fig. 6 is an enlarged detail view showing a side elevation of the arm for supporting the flexible shafting in connection with the upper standard and the adjusting-bracket. In this view the arm is shown in a depressed position by dotted lines. Fig. 7 is a similar view of the same, showing a rear elevation with the arm depressed. Fig. 8 is a sectional view of the same. Fig. 9 is a similar view showing the telescopic covering for the sleeve extended.

Referring to the drawings, A designates the base, which may be of any construction in the premises. The lower or supporting standard B is secured to the base in any suitable manner, and it has hinged to its upper end the upper or rocking standard B′. The hinge-joint between the two standards is formed by bifurcating the upper end of the supporting-standard and shaping the lower end of the rocking standard to fit the bifurcations. The interlocking ends of the standards are provided with a transverse bearing in which is mounted the sleeve C. The latter forms the pintle for the hinge-joint. The two standards are held in alinement by any of the well-known spring mechanisms used for the purpose. The mechanism shown in the said application is an instance.

The sleeve C is extended at one end *c′* and projects into the hub of the fly-wheel E. In

the sleeve is journaled the driving-shaft F, which has an end extended beyond the sleeve and secured in the hub *e* of the fly-wheel by the screws *e'*. In each end of the sleeve an annular recess c^2 is formed in the inner periphery of the same. These recesses constitute bearing-surfaces. On the ends of the shaft F are mounted the bearing-cones *f* and *f'*. The bearing-cone *f* is seated on the shaft within the hub of the fly-wheel and is held thereby in its proper relative position. The bearing-cone *f'* is adjustably mounted on the shaft by being screwed thereon. Interposed between the bearings formed in the ends of the sleeve C and the bearing-cones are the bearing-balls f^2. By means of the adjustable bearing-cone *f'* the wear between the several parts can be taken up. By this construction the shaft F bears on no part of the sleeve C, as it is entirely supported by the bearing-balls.

The crank-arm F' is made integral with the shaft F. By making the two integral all danger of the two parts working loose is obviated. In assembling the parts the cone *f'* has to be placed on the shaft before the latter is mounted in its bearings. As the cone *f'* cannot be placed on the shaft from the crank end, it is put on the opposite end and is moved on the shaft toward the crank end until it engages with the screw-threads, when it is turned until it comes against the crank-arm. The diameter of the smooth portion of the shaft is less than the screw-threaded portion. This allows the bearing-cone to be moved along the shaft until it engages with the threaded portion. After the bearing-cone *f'* has been placed on the shaft the latter is passed through the sleeve C and the bearing-cone *f* and secured to the fly-wheel E by the screws *e'*. The bearing-balls having been previously put in place the several parts are snugly brought together by the adjustable bearing-cone *f'*. The latter is secured against accidental displacement by the screw-pin f^3, passing through the crank-arm and engaging with a hole in the said bearing-cone. A hole f^4 in the periphery of the bearing-cone allows the use of a tool for turning the said bearing-cone. In this way a hinge-joint between the standards and an antifriction-bearing for the crank-shaft is secured which allows a free movement of the rocking shaft, an easy running of the crank-shaft, and secures the crank-arm against slipping on the crank-shaft.

The shaft F is driven by the pedal H, pivoted on the base and connected with the crank-arm F' by the pitman H'. The lower end of the pitman is hinged to the free end of the treadle by the pintle *h*. On this pintle an angular lever H^2 is also pivoted. The latter is pivoted at its angle and is recessed to receive the lower end of the pitman. The angular lever has two arms *h'* and h^2. The arm h^2 is connected with the under side of the pedal by the spring H^3. Intermediate of the ends of the pitman a lug h^3 projects and is connected with the arm *h'* by an adjusting mechanism, whereby the tension of the spring H^3 can be regulated. This tension mechanism consists of the screw-threaded rod h^4, hinged at an end to the lug h^3, the rod h^5, oppositely threaded to the rod h^4, hinged at an end to the arm *h'*, and the double nut h^6, suitably threaded to receive the ends of the oppositely-threaded rods. By turning this nut one way or the other the inner ends of the rods are either brought together or separated. This bringing together or separating of the rods moves the angular lever H^2, and thereby regulates the tension of the spring H^3. A lock-nut h^7 is provided for securing the double nut against accidental displacement. By providing the spring with this tension device as it becomes stretched by use the elongation can be taken up and the force with which the spring acts to throw the crank-arm off dead-center can be regulated.

To the upper end of the rocking standard B' is attached the telescopic extension B^2. In the upper end of the latter is swiveled the rod L, the upper end of which is bifurcated and formed into the curved arms *l*. Between the said arms are pivoted the ends of the arms *l'* of the plate L'. In the extension l^2, projecting from the upper face of the plate, is secured the casing L^2, which carries the flexible shafting L^3 and in which is mounted the mechanism for conveying motion to the inner helix of said shafting. The end l^3 of the casing projects to the rear of the extension l^2. In the casing is journaled the sleeve l^4, having a movement back and forth therein as well as a rotary movement. The movement of the sleeve toward the end l^3 of the casing is limited by the collar l^5 engaging with the shoulder l^6. The sleeve projects from the end l^3 of the casing and has secured thereon the pulley L^4. A screw-pin l^7 passes through the hub of the pulley and engages with an opening in the side of the sleeve. By striking against the end of the casing the pulley limits the forward movement of the sleeve. In the sleeve is the rear end of the rod L^5, that drives the inner helix of the flexible shafting. It is splined therein by the end of the screw-pin l^7 projecting into the sleeve l^4 and engaging with a groove in the said rod. The movement of the sleeve endwise in the casing allows the pulley to automatically regulate itself to accommodate the belt leading from the fly-wheel as the casing is moved up or down or as the rod L^5 moves in or out. As there is considerable friction between the sleeve l^4 and the casing, considerable oil is introduced between the two for lubricating purposes. This oil spreads over the sleeve, and as the latter moves back and forth in the casing more or less of its oiled surface is exposed at the end on which the pulley is mounted. As the sleeve is rotated at a high rate of speed, the oil has a tendency to escape from the exposed surface. This is prevented by the annular flange or shield l^8, pro-

jecting from the pulley and extending over the casing to form a telescopic covering for the exposed surface of the sleeve projecting from the casing. The length of this flange is such as to always extend over the casing no matter to what extent the sleeve may project from the casing. The annular flange or shield covers that part of the sleeve that would otherwise be exposed and prevents the escape of the oil.

It is to be observed that the hinge connection between the casing L^2 and the upper standard is such that when the sleeve is depressed it supports the flexible shafting almost vertically.

A mechanism is provided for adjustably supporting the casing L^2. From the under side of the casing a lug N projects and has hinged thereto an end of the bar N′. The free end of the latter passes through a slot n, formed in the upper end of rod L, immediately below the place where the arms l come together. The under edge of the bar is notched at n^2, so that it will engage with the catch n^3, projecting into the slot n. The slot is of such formation as to give free play to the bar as the casing is either raised to a horizontal position or depressed to an almost vertical position. The upward movement of the casing is limited by the ball N^2 on the free end of the bar coming into contact with the standard. The under face of the plate L′ is grooved at n^5 to receive the arm when the casing is depressed. The ball N^2 has considerable weight and serves to normally hold the free end of rod N′ depressed, and thereby obviates the use of a spring for the same purpose.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a dental engine, the combination of the treadle, the pitman hinged to the said treadle, the pintle connecting said treadle and said pitman, the angular lever pivoted on the said pintle, a spring connecting one arm of the said lever with the treadle, and a tension-regulating device connecting the other arm of said lever with said pitman.

2. In a dental engine, the combination of a treadle, a pitman, a pintle connecting said treadle and said pitman, an angular lever pivoted on said pintle, a spring connecting one arm of said lever with said treadle, and means for connecting the other arm of said lever with said pitman.

3. In a dental engine, the combination of a casing, a rotatable sleeve journaled in said casing and projecting at an end from said casing, means for moving said sleeve endwise in said casing, a shield having a telescopic connection with said casing and extending over the end of said sleeve projecting from said casing, and means for moving said shield with said sleeve.

4. In a dental engine, the combination of a casing, a rotatable sleeve journaled in said casing and projecting at an end from said casing, means for moving said sleeve endwise in said casing, a pulley mounted on the end of said sleeve projecting from the casing, and a shield extending from said pulley over the projecting end of said sleeve and having a telescopic connection with said casing.

5. In a dental engine, the combination of a casing, a sleeve journaled in said casing and having an endwise movement therein and projecting at an end from said casing, a rod splined in said sleeve and having an endwise movement therein, a pulley mounted on the end of said sleeve projecting from the casing, a shield extending from said pulley over the projecting end of said sleeve and having a telescopic connection with said casing.

6. In a dental engine, the combination of a casing, a rotatable sleeve journaled in said casing and having a limited endwise movement therein, a pulley carried by said sleeve, a driving-rod mounted in said sleeve and having an endwise movement therein, and means for connecting said sleeve with said rod so that rotatable motion will be conveyed from one to the other and so as to allow said rod to move longitudinally in said sleeve.

7. In a dental engine, the combination of a casing, a rotatable sleeve journaled in said casing and having a limited endwise movement therein, a driving-rod having an endwise movement in said sleeve and having a longitudinal groove in its periphery, and a screw-pin passing through said sleeve and registering with said groove.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

FREDERICK F. SCHOLL.

Witnesses:

H. H. NEWCOMB,

M. C. DUFFY.