(No Model.) 2 Sheets—Sheet 1.

J. HOOD & S. H. REYNOLDS.

DENTAL ENGINE.

No. 548,989. Patented Oct. 29, 1895.

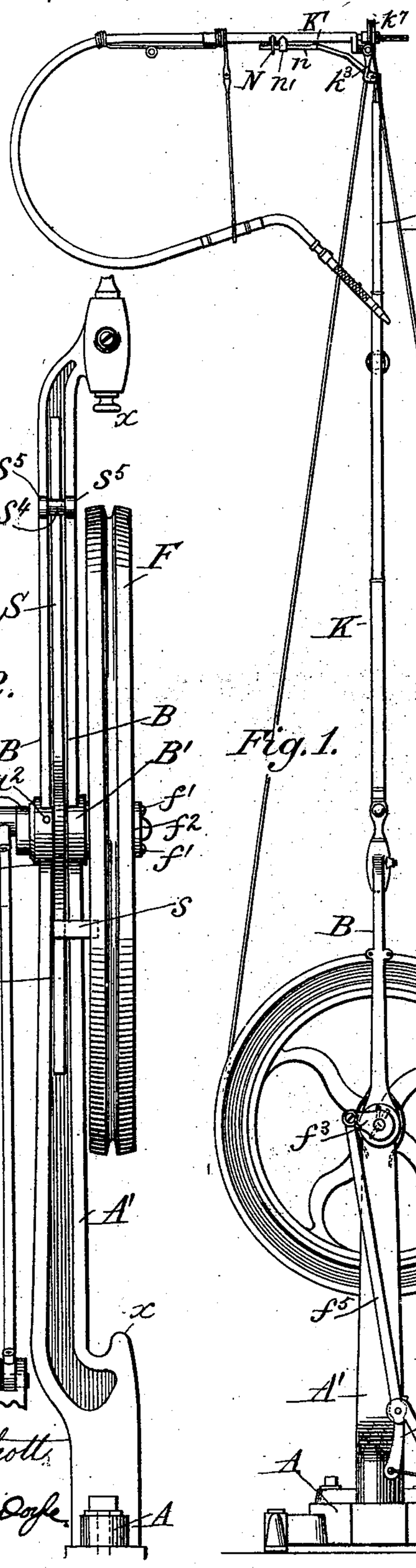

Fig. 2.

Fig. 1.

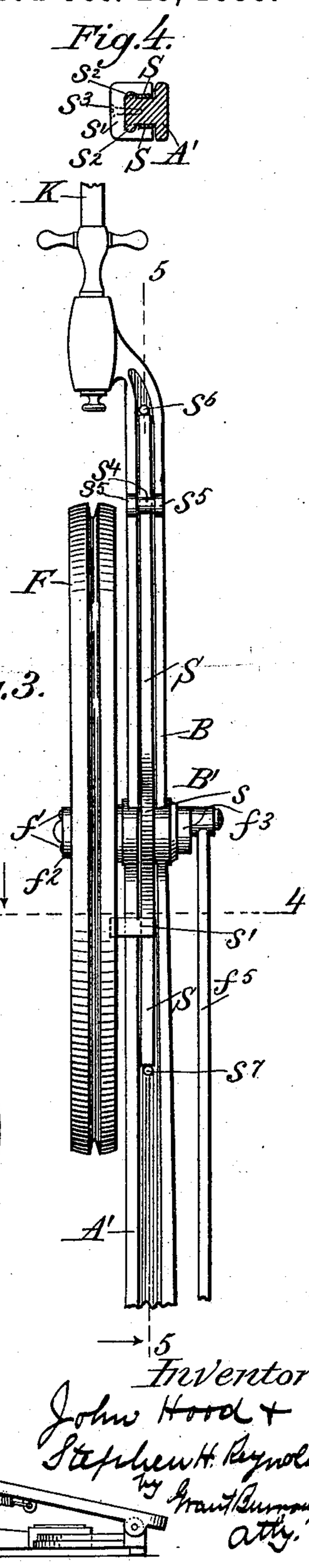

Fig. 3.

Fig. 4.

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Fig. 10.

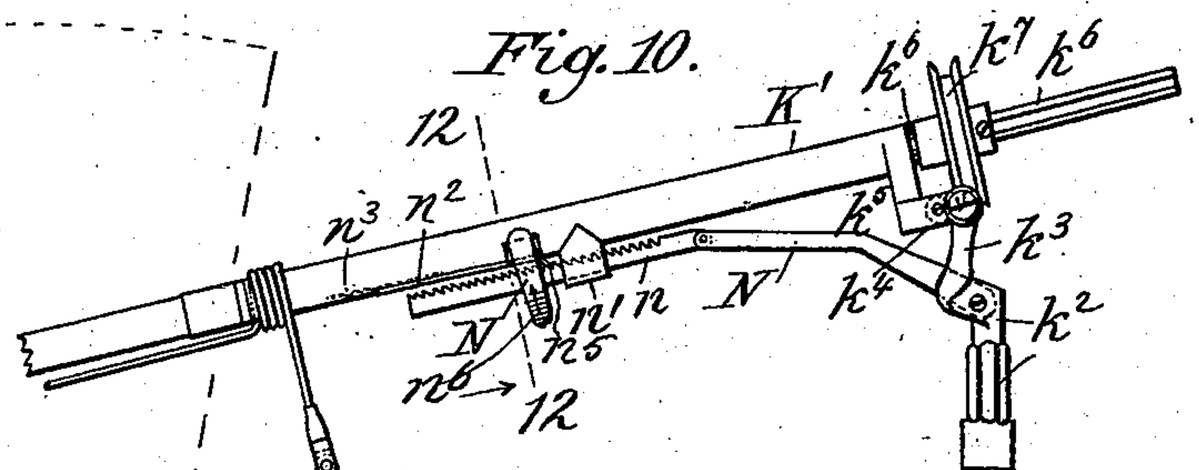


Fig. 12.

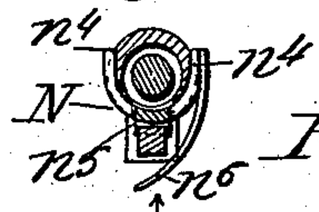


Fig. 11.

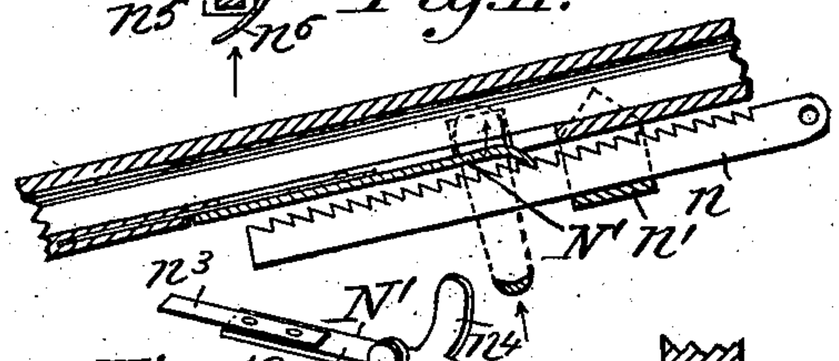


Fig. 13.

Fig. 6.

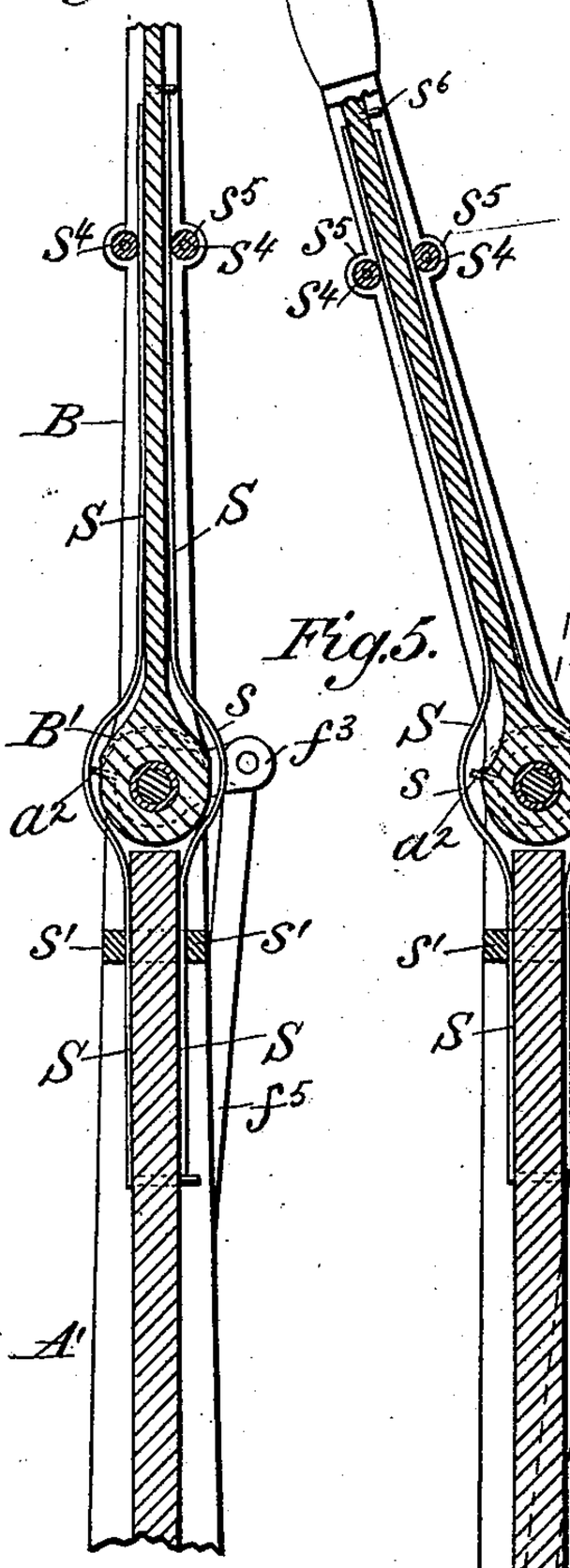


Fig. 5.

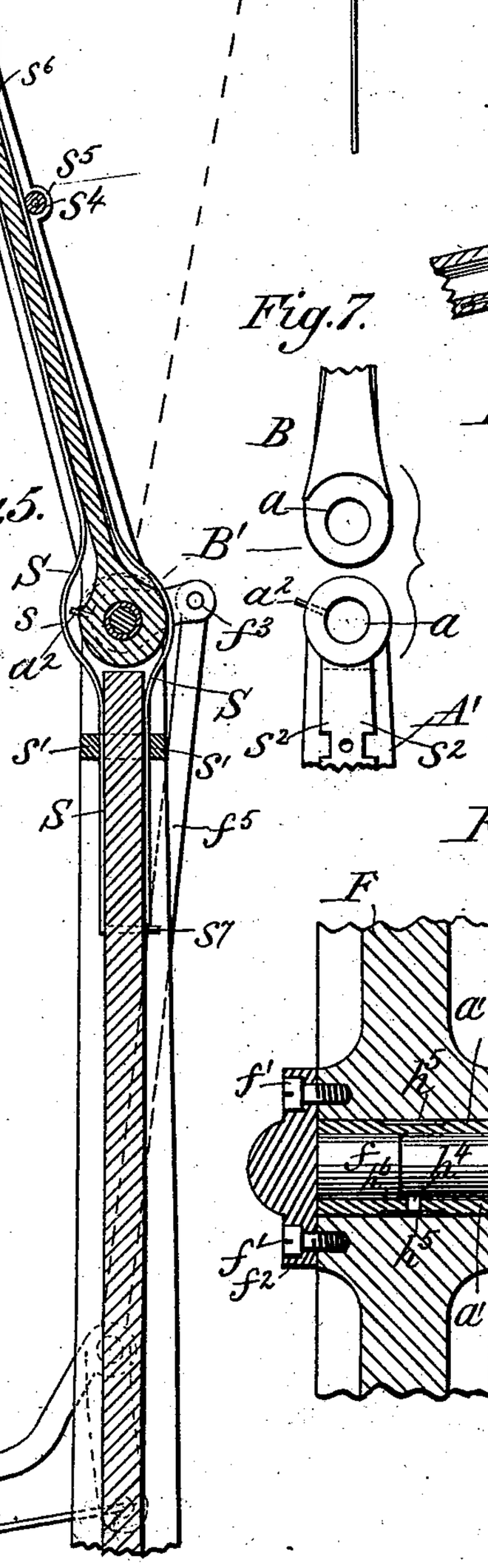


Fig. 7.

Fig. 8.

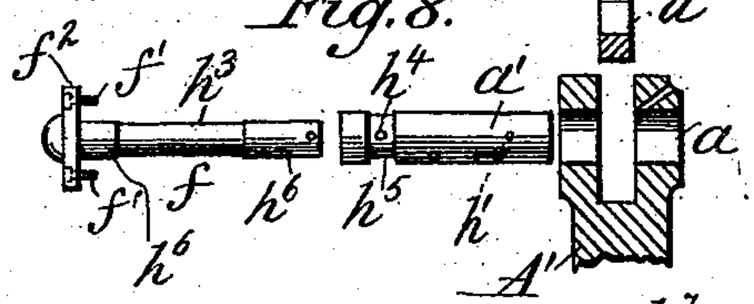


Fig. 9.

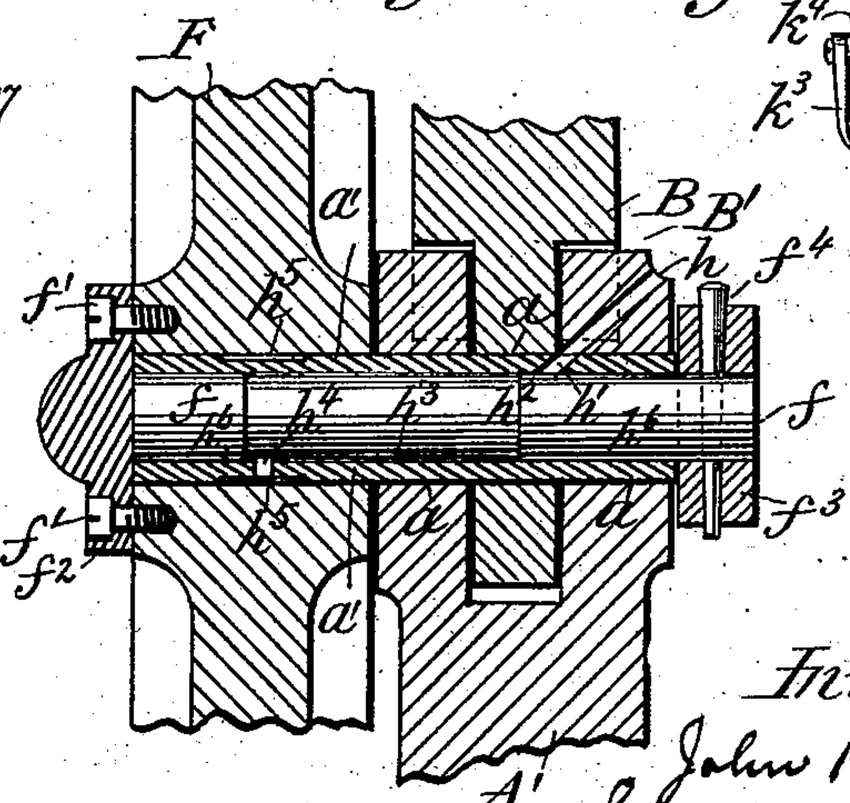
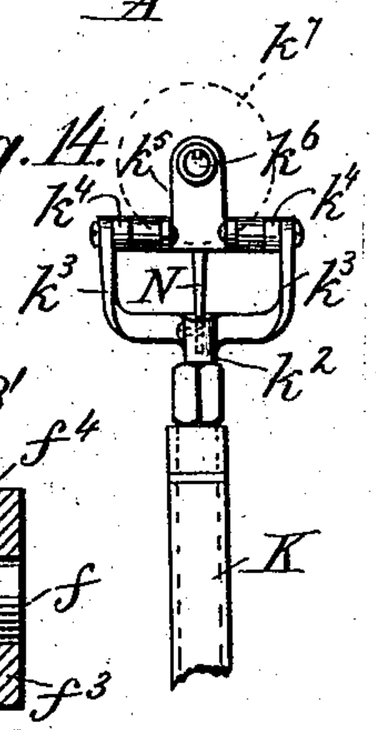


Fig. 14.



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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. 548,989, dated October 29, 1895.

Application filed April 20, 1895. Serial No. 546,463. (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, 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, reference being had to the accompanying drawings.

This invention relates to improvements in dental engines of that class in which the main upright consists of an upper and a lower standard hinged together.

It has for its object the construction of such a device whereby the upper standard, by the exertion of a slight force, can be moved relatively to the lower standard, and which, when free from such force, will assume its normal position, so that an operator can move the operating-tool to a position more favorable to his work without moving the whole machine and without ceasing from the manipulation of the operating-tool, whereby the upper standard can be moved concentric with the fly-wheel, so that the latter and the driving-pulley of the operating mechanism, carried by the upper standard, will always be the same distance apart and in substantially the same plane, and whereby the fly-wheel is supported independently of the crank-shaft.

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, in elevation, the hinged standards, the drive-wheel, &c. Fig. 3 is a similar view, showing the opposite side. Fig. 4 is a horizontal section on the line 4 4 of Fig. 3. Fig. 5 is a vertical section on the line 5 5 of Fig. 3, showing the upper standard inclined to one side. The angle of inclination to the other side is shown by a dotted line. Fig. 6 is a similar view, showing the upper standard in its normal position. Fig. 7 is a detail view showing the connecting ends of the standards disjointed. Fig. 8 is a detail view showing the crank-shaft, the sleeve, and the connecting ends of the standards, the latter being shown in section. Fig. 9 is an enlarged detail view, partly in section, showing the standards hinged and the wheel and its crank-shaft mounted in operative positions. Fig. 10 is an enlarged detail view showing the arm which carries the operative mechanism mounted on the upper standard. Fig. 11 is an enlarged detail view, partly in section, showing a portion of the arm and the spring-catch engaging with the rack-bar. Fig. 12 is a transverse section on the line 12 12 of Fig. 10. Fig. 13 is a perspective view showing the spring-catch. Fig. 14 is an enlarged detail view showing the connection between the arm carrying the operative mechanism and the upper standard.

Referring to the drawings by letter, A designates the base, of any construction suitable in the premises. To the base is bolted the lower standard A′. This standard has hinged to its upper end the upper standard B. The hinge B′, connecting the standards, in the present instance is formed by bifurcating the upper end of the lower standard and shaping the lower end of the upper standard so that it will register with the bifurcation. (See Figs. 7, 8, and 9.) The interlocking ends of the standards are provided with a transverse bearing *a*, in which is journaled the sleeve *a*′, which forms the pintle and completes the hinge. In constructing the standards the connecting ends are enlarged, so as not to be weakened by the loss of the metal cut away in forming the bearing *a*.

The opposite sides of the standards—those facing the directions in which the upper standard moves—are grooved. In these grooves are seated the springs S S, which extend along their respective grooves to a considerable distance above and below the hinge B′. They are respectively bent at *s* to pass the knuckle formed by the hinge. The springs are firmly secured at their lower ends to the lower standard by the clamp *s*′. This clamp is U-shaped, and its limbs are just far enough apart to firmly press the ends of the springs against the standard when it is in position. The ridges

s^2 s^2 of the standard are cut away to allow the passage of the clamp. The latter is secured in place by the set-screw s^3. (See Fig. 4.)

To permit the obviously-necessary longitudinal movement of the springs, they are held in place in the grooves in the upper standard by the friction-rollers s^4 s^4. These rollers are mounted between the edges of their respective grooves and their shafts are journaled in bearings formed in the projections s^5 s^5. The springs S S pass under the rollers, which allows a free longitudinal movement. The rollers and the sides of the grooves prevent any lateral movement.

The forward movement of the upper standard is limited by the lug a^2, projecting from the upper end of the lower standard and adapted to engage with a projection of the upper standard when the latter is moved far enough forward. (See Fig. 7.) The rearward movement of the upper standard is limited by the lug s^6, projecting from the upper standard a short distance from the upper end of the spring S on the rear side of the same. When the upper standard is moved backward far enough, the end of the spring will strike againt the lug, and as the longitudinal movement of the spring is arrested the standard cannot move any farther. This forms an elastic stop, as the spring will give somewhat at the turn where it passes the hinge. In case the clamp should not securely hold this spring when its upper end comes in contact with the lug s^6 a second lug s^7 is provided, and which projects from the lower standard, and against which the lower end of the spring abuts.

The fly-wheel F is journaled on a projecting end of the sleeve a'. (See Figs. 8 and 9 more particularly.) By so mounting the wheel its movement will be concentric with that of the upper standard. It is provided with a crank-shaft f, which is journaled in the sleeve. The shaft is secured to the fly-wheel by means of the screws f' f', passing through the flange f^2, projecting from the end or head of the shaft. The latter projects beyond the sleeve a' on the side opposite to that on which the wheel is mounted, and has secured on its projecting end the crank-arm f^3. The latter is secured in place by the pin f^4. By this construction each one of the moving surfaces turns on a stationary bearing—that is, the wheel is journaled on one end of the sleeve, which is fixed, the upper standard is journaled on the other end, and the crank-shaft is journaled within the sleeve.

It is obvious that the sleeve could be done away with to some extent and the crank-shaft journaled in the bearing formed in the standards and form thereby the pintle of the hinge connecting the two standards.

It is also obvious that the results would not be so good, for the wheel would have no independent bearing and its whole strain would have to be borne by the crank-shaft, and also the latter would be journaled in a bearing formed of two independent bodies—namely, the bearings formed in the interlocking ends of the standards, one of which is movable. It can be readily seen that such a mechanism would be objectionable, as the wearing parts would soon cut each other away, owing to the uneven surfaces and the irregular distribution of the strains. This is overcome to a great extent by the construction in the present instance, which gives each moving surface a stationary and a single surface to bear upon, and which distributes the strain much more evenly.

Means are provided whereby the several wearing-surfaces above mentioned are lubricated. A passage h leads through one of the bifurcations of the lower standard to the sleeve a', where it registers with a passage h', leading through the sleeve to the crank-shaft. (See Fig. 9 more particularly.) Oil on being introduced into the passage h will pass to the crank-shaft, and there distribute itself over the wearing-surface h^2. On its passage to the shaft some of it will enter between the sleeve and the surface of the upper standard. As the movement of the standard is very limited, very little oil will be required to lubricate the wearing-surface of the same. After reaching the crank-shaft much of the oil will collect in the annular recess h^3, formed in the crank-shaft, from which it will feed through the passage h^4 to the annular recess h^5, formed in the outer periphery of the sleeve, from which recess it will be distributed to the wearing-surfaces of the wheel and the sleeve. From the recess h^3 the oil will also be fed to the wearing-surface h^6 of the crank-shaft. By this construction the lubrication of the several wearing parts is much simplified.

The crank-arm is connected with the free end of the treadle by the connecting-rod f^5. The lower end of the latter is extended below the point where it is pivoted to the treadle, and its extreme end is connected by a spring f^6 to the treadle, which serves to keep the fly-wheel off dead-center.

The telescopic extension K is secured upon the upper end of the standard B, and it has swiveled on its upper end the arm K′, carrying the operating-tool and the mechanism for driving the latter. The connection between the rod k^2, which extends into the upper end of the telescopic extension and allows the arm K′ to be turned horizontally, and the arm K′ is a hinged joint that allows a vertical movement of the said arm K′. This joint consists of the arms k^3 k^3, which project from the upper end of the rod k^2 outwardly in opposite directions and then upwardly. To the ends of these are respectively pivoted the ends of the arms k^4 k^4. The latter arms project outwardly in opposite directions from the lug k^5 and then rearwardly to their points of connection with the first-mentioned arms. It is to be observed that the arms k^3 k^3 are curved so as to allow a free passage of the belt to the driving-pulley. The arms k^4 k^4 are angular

to give the proper clearance of the moving parts as the arm K′ is raised or lowered. The arm K′ is cylindrical and has mounted therein the driving-shaft k^6, which extends from the rear end of the arm and has mounted thereon the pulley k^7. The latter is so mounted as to allow the driving-shaft to move in and out as the helix to which it is connected shortens or lengthens. To the inside of the arms k^3 k^3 are mounted friction-rollers, against which the pulley k^7 bears when carried inwardly by the shaft. (See in dotted lines, Fig. 10.)

The adjusting-brace N is hinged to the upper end of the rod k^2 between the diverging arms k^3 k^3. It serves to support the arm K′ in its vertical adjustment. The free end of the brace has pivoted thereto the rack-bar n. The latter moves in the guide n', attached to the under side of the arm K′. A spring-catch N′ is provided which is adapted to engage with the rack-bar. (See Fig. 10.) The catch is substantially cruciform in shape, and it is mounted in a slot formed in the under side of the arm K′. The shank n^2 of the catch is secured to the inner face of the cylindrical arm by the spring n^3, which gives it the necessary resilience. The arms n^4 n^4 of the catch are curved so as to conform with the transverse shape of the arm and serve to hold the catch in place. The extension n^5 is bent so as to readily engage with the rack-bar n. To the end of one of the arms n^4 n^4 the finger-piece n^6 is attached. The latter curves beneath the rack-bar and forms a means whereby the catch can be readily disengaged from the rack-bar and thereby allow the arm K′ to be lowered. It offers no opposition to the elevation of the arm.

It is to be observed that the standards A′ and B have offsets at x x. This allows the fly-wheel and the driving-pulley to be mounted in substantially the same vertical plane.

It is obvious that the construction hereinbefore described can be departed from to a considerable extent without departing from the spirit of the invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is as follows:

1. In a dental engine, the combination of the lower standard, the upper standard hinged thereto, the springs placed on opposite sides of the said standards to normally hold the same in substantially the same straight line, the mechanism securely fastening the springs to one of the standards, and the mechanism holding the springs in close contact with the other of the said standards and at the same time allowing free longitudinal movement of the springs on the latter standard, substantially as described.

2. In a dental engine, the combination of the lower standard, the upper standard hinged thereto, the springs placed on opposite sides of the said standards to normally hold the same in substantially the same straight line, the clamp securing the springs to one of the standards, and the mechanism holding the springs in close contact with the other of the said standards and at the same time allowing a free longitudinal movement of the springs on the latter standard, substantially as described.

3. In a dental engine, the combination of the lower standard, the upper standard hinged thereto, the springs placed on opposite sides of the said standards to normally hold the same in substantially the same straight line, the mechanism securing the springs to one of the said standards, and the anti-friction rollers holding the springs in close contact with the other of the said standards and at the same time allowing a free longitudinal movement of the springs on the latter standard, substantially as described.

4. In a dental engine, the combination of the lower standard, the upper standard hinged thereto, the springs placed on opposite sides of the said standards to normally hold the same in substantially the same straight line, the clamp securing the springs to one of the said standards, and the anti-friction rollers holding the springs in close contact with the other of the said standards and at the same time allowing a free longitudinal movement of the springs on the latter standard, substantially as described.

5 In a dental engine, the combination of the lower and upper standards hinged together, the sleeve forming the pintle for the said connection, the fly-wheel journaled on the said sleeve, and the crank-shaft secured to the fly-wheel and journaled in the said sleeve, substantially as described.

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

JOHN HOOD.
STEPHEN H. REYNOLDS.

Witnesses:
EUGENE H. MOORE,
GEO. L. RIDLEY.