No. 642,536. Patented Jan. 30, 1900.

C. C. SOUTHWELL.

COMBINED DENTAL ENGINE AND CHAIR.

(Application filed Sept. 14, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 4.

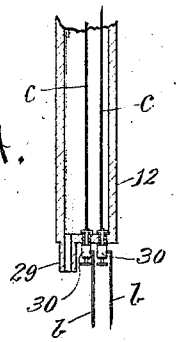

Fig. 1.

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Fig. 2.

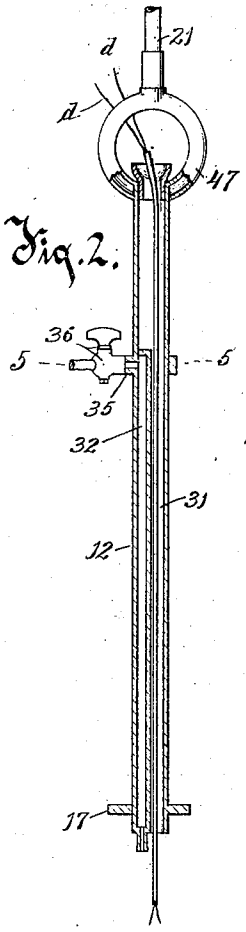


Fig. 3.

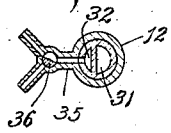


Fig. 5.

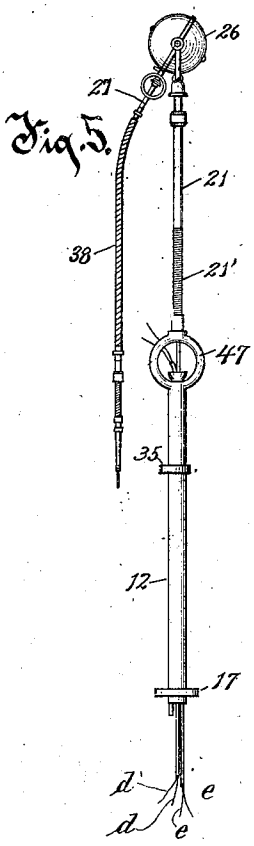


Fig. 6.

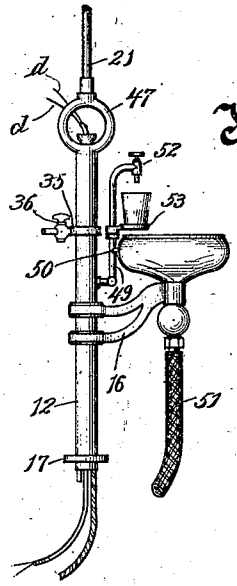
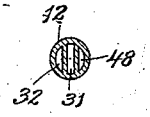


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

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COMBINED DENTAL ENGINE AND CHAIR.

SPECIFICATION forming part of Letters Patent No. 642,536, dated January 30, 1900.

Application filed September 14, 1898. Serial No. 690,968. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. SOUTHWELL, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in a Combined Dental-Engine and Chair, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in combined dental engines and chairs.

The primary object of my invention is to provide a construction whereby dentists or others having use for a chair of the kind referred to in this application are enabled to dispense with the unsightly cumbrous rubber tubing or metal pipes in conducting compressed air, and are also enabled to hide unsightly wires, thereby not only adding to appearances, but also protecting the patient from the danger of receiving an electrical shock from exposed wires, the parts referred to at the same time being capable of following all the movements of the chair with the different adjustments of said chair.

A further object is to provide a standard or support attached to an adjustable chair in combination with a dental-engine arm secured to the standard or support and a prime motor carried by the standard or support and unconnected with any exterior fixed point to thereby adapt the motor to freely follow the movements of the chair with the different adjustments of said chair.

With the above primary and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a side view of my improvements shown as applied to a dental chair of an ordinary and well-known form of construction, said chair being illustrated by dotted lines. Fig. 2 is an elevation of one form of the upright standard or support, being the form shown in Fig. 1, with parts broken away. Fig. 3 is a cross-section on the line 5 5 of Fig. 2. Fig. 4 is a fragmentary sectional view of another form of upright standard or support. Fig. 5 is an elevation showing a modified form of upright standard or support in which the motor is supported at the upper end of said standard or support. Fig. 6 is an elevation of still another modified form of upright standard or support, and Fig. 7 is a cross-section through Fig. 8.

Referring to the drawings, the numeral 10 indicates an ordinary form of dental chair of the type which is vertically adjustable as well as revolubly adjustable. Any ordinary form of adjustable chair may be employed, the only requirement being that said chair shall be provided with a projecting arm or bracket or any other suitable device for carrying my improved attachments. In the accompanying illustration of my invention I have shown a projecting arm or bracket from the chair and have designated the same by the numeral 11. The outer end of this arm or bracket is bifurcated, and each furcate part is provided with an eye through which an upright standard or support 12 passes and is fast therein. This standard or support, as is usual in this class of attachments, carries a swinging table-bracket arm 13 on which the table 14 is mounted and below said table-bracket arm a swinging glass-holder 15 and below the latter a swinging cuspidor-holder 16. My improvements, however, contemplate that this standard or upright shall serve as a means for carrying the motor for running the dental engine. These motors have never heretofore been carried by an adjustable chair and thereby rendered capable of following the different adjustments of the chair, but have usually been placed on the carpet or on a clumsy stand or in an adjoining room, or, again, have been suspended from a bracket by a cord, said bracket being entirely independent of and unconnected to the chair. One of the novel features, therefore, of my invention is to connect the motor directly to a standard or support, which is connected to an adjustable chair, and in Fig. 1 I have shown said standard or support as having connected thereto near its lower end a collar 17, from which are suspended a series of rods 18, which are connected to the top of the motor 19. Any desirable means for connecting the motor, however, may be employed, and also any desirable form of motor may be used.

The numeral 20 indicates the pulley mount-

ed on the motor-shaft; and the letters *a a* indicate the electrical wires running from any suitable source of electrical supply and connected with binding-posts on the motor, so as to cause the rotation of the mortor-shaft when the current is completed. The mounting of the motor on the upright standard or support also carries with it another novel feature of my invention—viz., the connecting of the operative parts of a dental engine with an upward extension from the standard or support, in combination with means for operating said dental engine from the motor so mounted on the standard or support. As is well known to those skilled in the art to which this invention relates, dental engines heretofore have not been carried by an adjustable chair. Referring to this feature of the invention, the numeral 21 indicates the extension of the upright standard or support, and to the upper end of this extension may be connected any approved form of engine-head. In the Fig. 1 illustration I show a well-known form comprising the engine-arms 22 and 22′, a handpiece 23, and the dental tool 24. This tool is rotated by means of an endless cord 25, which is passed around the motor-pulley 20, thence upwardly over two pulleys at the upper end of the extension 21, thence over two pulleys at the end of the arm 22, and finally around a pulley at one end of the dental tool.

While in Fig. 1 the motor is shown as suspended from the lower end of the upright standard or support, yet I do not wish to be understood as limiting myself to this exact location of the motor, as it will be obvious that said motor may be connected to the standard or support at any other desirable point. For instance, in Fig. 5 I show a modified arrangement, wherein the motor is connected to the upper end of the extension 21. I have illustrated in said figure a common form of motor in this class of machines in which the motor is inclosed in a spherical shell, (indicated by the numeral 26.) The shaft 27 of this motor extends out through the shell and is connected to a flexible shaft which passes through a flexible tubing 38, said flexible shaft being finally connected to the dental tool. This form of motor of course dispenses entirely with the necessity of employing the endless cord 25, as in the Fig. 1 form. In the Fig. 5 construction also it is advisable to form the extension 21 with a lower flexible portion 21′ in order to permit of a certain amount of yield or flexibility.

The letters *e e* in Fig. 5 indicate the wires which pass through the tubular standard and lead to the motor.

There are various ways in which the standard or support may be formed for providing for the passage therethrough of the air and of the electrical wires. Fig. 4 of the drawings shows a simple embodiment of my invention in this respect. In this figure the standard or support is provided with top and bottom pieces, and the bottom piece may be formed with a depending nipple 29, to which a flexible tubing leading from an air-compressor may be attached. The air may be conducted out of the tubular standard or support in any suitable manner. In this form the wires leading from a source of electrical supply and designated by the letters *b b* are connected to binding-posts 30 30, which binding-posts pass through the bottom piece of the standard or support and are so fitted in openings therefor as to render the escape of air at this point impossible. Other wires *c c* are arranged in the standard or support and connected at their lower ends to the binding-posts and extended upwardly and connected to similar binding-posts, which pass through openings in the top of the standard or support and render said openings air-tight. Other wires (not shown) are connected to the latter binding-posts and lead to the electrical device.

It will also be obvious that, if desired, a tubular standard or support may be employed having open ends. In this case the flexible tubing for the air would pass directly through the standard or upright and the electrical wires would also extend therethrough In Figs. 1 and 2 I show the standard or support as formed with two chambers, one for the electrical wires extending throughout the length of the standard or support (designated by the numeral 31) and the other as a passage for the air, said passage advisably terminating short of the upper end of the standard or support and designated by the numeral 32. To the lower end of the standard or support in the Figs. 1 and 2 construction is connected a flexible tubing 33, which is so connected to said standard or support as to convey air into the chamber or passage 32. This flexible tube leads to and is connected with any suitable form of air-compressor. The electrical wires in Figs. 1 and 2 and also in Figs. 5 and 6, which lead from any suitable source of electrical supply and pass through the passage 31 of the standard or support, are indicated by the letters *d d*. These wires extend out through the upper end of the tube and are adapted for heating various kinds of electrical appliances used in dentistry or otherwise. In the illustration of my invention they are shown as leading to an air-heater 34. These wires may also be used for heating an annealing-slab or may be used for the purpose of being connected to a cataphoric outfit. By providing for the wire and tubing passing through a tubular standard or support the wires are confined and prevented from passing over the patient's lap, and the whole arrangement is simplified and convenience promoted. In the Figs. 1 and 2 construction a short tube 35 is shown as leading from the air-passage 32, and in this short tube is arranged a two-way cock 36. Connected to the short tube are two flexible tubes, (designated, respectively, by the numerals 37 and

38.) The latter tube extends to and communicates with one end of the air-heater 34. From the opposite end of said air-heater extends another flexible tube 39. When the two-way cock is turned in one direction, the air passing through the air-passage 32 and entering the short tube 35 is free to pass into and out of the flexible tube 37. This air-blast is used for the purpose of blowing away chips, &c., from around the tooth operated upon. If it is desired that a blast of warmer air be directed into the mouth of the patient for the purpose of not only blowing away chips, but also of warming the cavity, the two-way cock is turned in a reverse direction, so as to permit the air to pass into the flexible tube 38. Said air will then enter the air-heater 34 and will pass into and out of the flexible tube 39 in a heated condition.

Where the extension 21 of the upright standard or support is employed, I prefer to connect said extension to the upright by means of the interposed ring 47. By this construction free access can be had to the wires at any time. It is not absolutely essential for this purpose, however, that the connection 47 should be in the form of a complete circle, inasmuch as a connection of half-circular or half-square form would answer the same purpose.

In Fig. 8 of the drawings I show still another modified form of the invention, wherein the upright standard or support is provided not only with separate passages 31 and 32 for the electrical wires and for the air, respectively, but also an additional passage 48 for the entrance of water into the tube. The standard or upright is also shown as supporting a so-called "fountain-spittoon," and a pipe 49 extends from the passage 48 and is adapted to conduct water to the fountain-spittoon by a small branch pipe 50. The water is discharged from the spittoon in any desirable manner. I show for this purpose a flexible discharge-tube 51 leading from the bottom of the spittoon. The pipe 49 is also extended upwardly and provided with a faucet or cock 52, which is adapted when opened to discharge water into a glass carried by a glass-holder 53, extending from said pipe 49.

In the use of my invention it will be evident that that feature thereof which comprehends the carrying of the motor by the upright standard or support and the connection of the operative parts of the dental engine to an upward extension from said standard or support provides a most convenient arrangement, inasmuch as compactness is not only secured, but at the same time the motor is conveniently located, and said motor as well as the dental engine are caused to follow all the movements or adjustments of the chair.

The feature of my invention which comprehends the employment of a tubular standard or support for the passage therethrough of electrical wires and for forming passage for air, &c., is also a most advantageous arrangement, as will be readily understood from the preceding explanation.

While I have herein shown the tubular standard or upright as connected to a dental chair, yet I do not wish to be understood as limiting my invention in all its phases to such particular adaptation. It is possible that the invention will be found of considerable utility in surgical chairs and chairs of like character, wherein a tubular standard or support may be connected thereto and said standard or support adapted for the passage therethrough of wires, or of air or water, or of all of these elements. I furthermore wish to be understood as not limiting myself to two flexible tubes extending from the air-passage of the tubular upright, inasmuch as where warm air is not used merely a single tube may be provided, or where only warm air is desired to be used likewise merely a single tube may be provided.

While I have herein shown the invention as applied to an adjustable chair capable of adjustment both vertically and revolubly, yet I do not wish to be understood as restricting myself to that particular adaptation, inasmuch as I desire to cover my invention also, if useful in such relation, in its application to an adjustable chair capable of merely a vertical adjustment or a chair capable of only revoluble adjustment.

It will be seen from the drawings that the bracket 11, which supports the standard 12, is pivoted on a bolt 54. By this arrangement the standard is permitted to swing in the arc of a circle, whereby the parts carried by the standard can be brought closer to or farther away from the chair and enabling the dentist to work with much more convenience.

What I claim as my invention is—

1. The combination, of an adjustable chair, a standard or support carried thereby, and adapted to follow the different adjustments of the chair, said standard or support provided with an upward extension, a dental-engine arm secured to said extension, a prime motor carried by the standard or support, and unconnected with any exterior fixed point, to thereby adapt said motor to freely follow the movements of the chair with the different adjustments of said chair, means for operating the motor, and a connection between the motor and the tool of the dental-engine arm, said connection adapted for transmitting the rotation of the motor-shaft to the dental tool.

2. The combination, of an adjustable chair, a tubular standard or support carried thereby, an air-conduit leading to or through the tubular standard or support, and a suitably-connected tube for finally receiving the air and for discharging the same.

3. The combination, of an adjustable chair, a tubular standard or support carried by said chair, electrical conductors extending through the tubular standard or support, an electrical device with which the electrical conductors are connected, an air-conduit leading to or

through the tubular standard or support, and a suitably-connected tube for finally receiving the air and for discharging the same.

4. The combination of an adjustable chair, a tubular standard or support carried thereby, said standard or support adapted to serve as a passage for air, tubings leading therefrom, a heater to which one of said tubes leads, means for causing the air to pass into either of the tubes, and means for permitting the flow of the air out of the heater.

5. The combination, of an adjustable dental chair, a tubular standard or support carried thereby, said standard or support serving as a conduit for electrical wiring, and formed or provided with an upward extension or continuation thereof, said extension being joined to the standard or support proper by an open connection, whereby free access to the wiring may be had, and an engine-arm connected to the upward extension of the standard or support.

6. The combination, of an adjustable dental chair, a tubular standard or support carried thereby, said standard or support formed or provided with an upward extension, electrical conductors extending through the tubular standard or support, an electrical device with which the electrical conductors are connected, an air-conduit leading to or through the tubular standard or support, a suitably-connected tube for finally receiving the air and for discharging the same, a dental-engine arm connected to the upward extension, a motor carried by the standard or support, and a connection between the motor and the dental tool of the dental-engine arm, for transferring the rotation of the motor to said tool.

7. The combination, of an adjustable chair, a tubular standard or support carried thereby, said standard or support provided with a plurality of passages, electrical conductors extending through a passage of the tubular standard or support, and adapted to be connected to an electrical device, an air-conduit leading to or through one of the passages of the tubular standard or support, a suitably-connected tube for finally receiving the air and for discharging the same, a water-pipe connected with one of the separate passages of the standard or support, a spittoon carried by the tubular standard, means for conducting the water from the water-passage of the tubular standard or support into the spittoon, and means for discharging the water from the spittoon.

8. The combination, of an adjustable chair, a tubular standard or support carried thereby, an air-conduit leading to or through the tubular standard or support, a tube connected thereto, a heater carried by the standard or support, and to which heater said tube connects, and means for causing the air to leave the heater.

9. The combination with an adjustable chair, of a standard carried thereby and adjustable therewith and having suitable attachments connected thereto, said standard being pivotally secured so as to have an independent swinging movement.

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

CHARLES C. SOUTHWELL.

Witnesses:
A. L. MORSELL,
ANNA V. FAUST.