Oct. 13, 1925. 1,557,164

F. J. HOFSCHNEIDER

LIQUID CONTROLLING MEANS FOR DENTAL ENGINES

Filed Dec. 9, 1924 2 Sheets-Sheet 1

Fig. 1

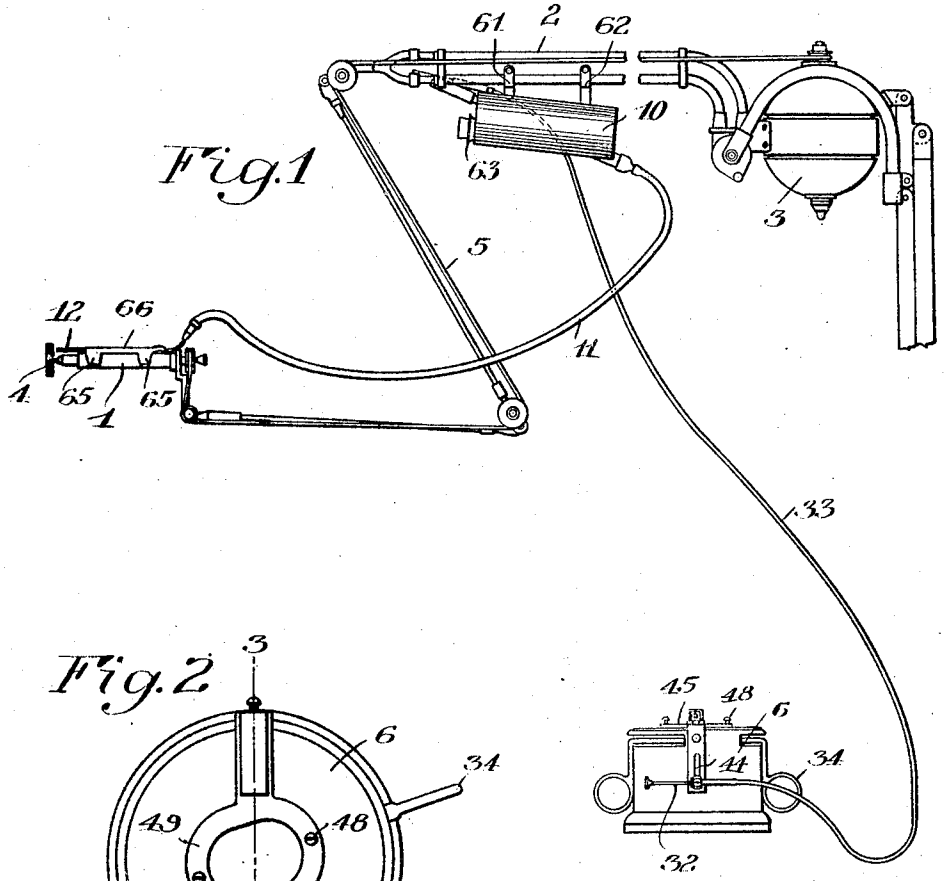
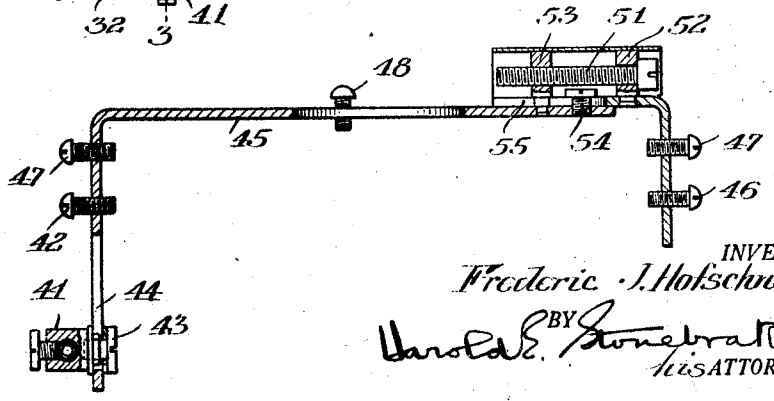


Fig. 2

Fig. 3



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Fig. 1

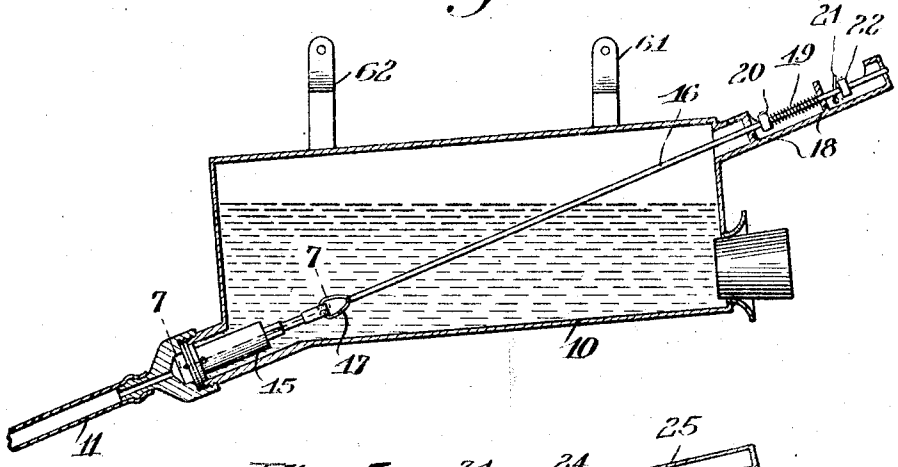


Fig. 5

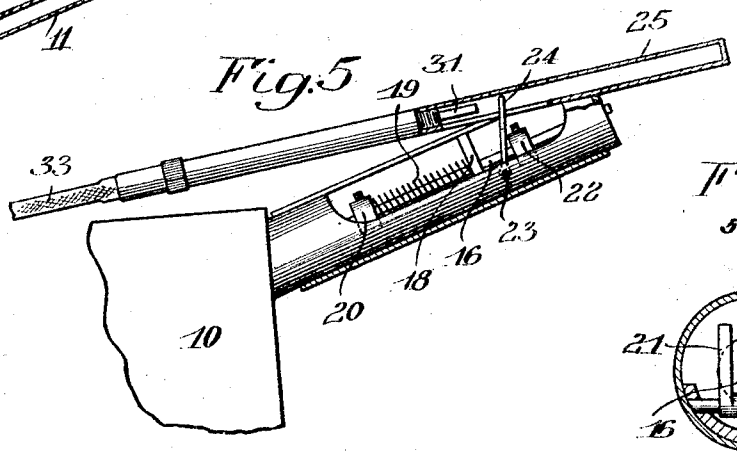


Fig. 6

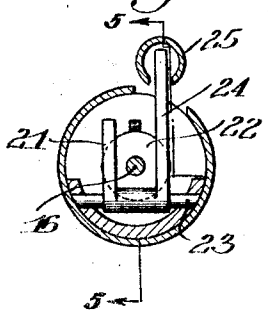


Fig. 7

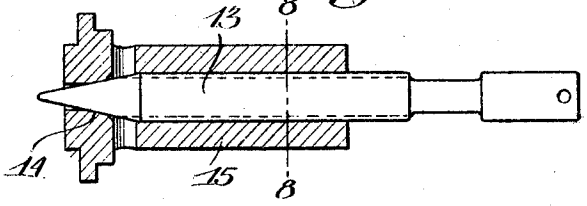
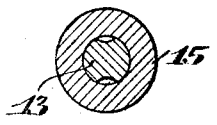


Fig. 8



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UNITED STATES PATENT OFFICE.

FREDERIC J. HOFSCHNEIDER, OF ROCHESTER, NEW YORK.

LIQUID-CONTROLLING MEANS FOR DENTAL ENGINES.

Application filed December 9, 1924. Serial No. 754,751.

To all whom it may concern:

Be it known that I, FREDERIC J. HOFSCHNEIDER, a citizen of the United States of America, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Liquid-Controlling Means for Dental Engines, of which the following is a specification.

My invention relates to liquid controlling means for dental engines, and has for its purpose to afford a mechanism of few parts and which will operate dependably and efficiently to govern a supply of water or other liquid to the hand piece, where it is desirable to moisten the tool continuously and automatically during operation of the engine.

The present structure eliminates all electrical devices in the control of the liquid supply, and affords a structure that is entirely mechanical, as distinguished from electrical, in the operation of the liquid governing valve, thus providing a mechanism that is extremely economical to produce and which can be readily applied to various standard types of dental engines.

Another purpose of the invention is to afford mechanism that insures positive opening of the liquid supply during operation of the engine and closing such supply at other times, making an automatic control entirely independent of the motor and electric circuit which controls the engine.

An additional object of the invention is to supply liquid to the tool from a gravity tank and govern the flow of water from the tank by a valve that is opened through the instrumentality of mechanical devices extending from the valve to the foot switch of the motor for the engine, where it is engaged and moved by the foot switch.

With these ends in view, my invention will be understood more clearly from the following description when read in conjunction with the accompanying drawings, the novel features of which are pointed out at the end of the specification.

In the drawings:

Figure 1 is a side elevation showing a preferred embodiment of my invention as adapted to a conventional type of dental engine;

Figure 2 is an enlarged plan view of the usual foot controller, showing the application of my improvement thereto;

Figure 3 is a sectional view on line 3—3 of Figure 2;

Figure 4 is a vertical sectional view taken centrally of the liquid supply tank;

Figure 5 is a sectional view on line 5—5 of Figure 6;

Figure 6 is a transverse sectional view;

Figure 7 is a sectional view on line 7—7 of Figure 4, and

Figure 8 is a sectional view on line 8—8 of Figure 7.

The invention may be carried out in a variety of ways as an illustration of one practical embodiment, I have disclosed its application to a conventional type of dental engine including a hand piece 1, supporting bracket 2, electric motor 3, which drives the tool 4 through a cable 5, and a foot controller 6 for the motor 3.

To furnish a supply of liquid to the tool, I employ gravity controlled means including a tank 10 located above the hand piece and tube 11 leading therefrom to a nozzle 12, constituting an outlet adjacent to the tool 4. Flow of liquid from the tank 10 is permitted by a valve 13, which engages a seat 14 to cut off the liquid supply, and is movable within a housing 15.

It is desirable to open the valve 13 automatically when the foot controller is operated to start the motor 3, and to close the valve when the motor 3 is stopped. To accomplish this, I employ operating means including a movable actuator located in the path of the foot switch and movable therewith to effect opening of the valve. The valve 13, which is located at the bottom of the tank 10, has connected thereto a valve rod 16 by a universal joint 17, the valve rod 16 extending upwardly through the tank 10 to the top thereof and moving in suitable stationary guides 18, while 19 is a spring located between one of the guides 18 and a collar 20 fixed to the valve rod 16, and operating to hold the valve normally closed.

The valve is opened through the medium of a rock arm 21 which engages a collar 22 also fixed on the valve rod 16. The rock arm 21 is pivoted at 23 and has formed integral therewith a second rock arm 24, the

outer extremity of which moves in a housing 25, where it is engaged by the actuator. The actuator includes a rod 31 at one end and a rod 32 at the opposite end connected by a flexible spring controlled member that is movable within and guided by a flexible tube 33 in accordance with the conventional flexible push-and-pull construction.

The rod 32 is mounted in the path of the foot switch 34 of the controller, so that as the switch is operated to start motor 3, rod 32 is pushed, causing a corresponding movement of rod 31 and a corresponding rocking of the arms 24 and 21. The parts remain in this position and hold the valve 13 open as long as the switch 34 is held in circuit closing position, and when the switch 34 is released, returning to the position shown in Figure 1, the actuator for the valve is likewise released and returns to its normal position, while spring 19 closes the valve.

Rod 32 of the actuator is held in proper position on the foot controller in a clamp 41 which is adjustable vertically on the arm 42 by means of a set screw 43, cooperating with a slot 44. The arm 42 is part of a bracket 45 which includes a second arm 46 and screws 47 engaging under the shoulder of the conventional foot controller, while 48 are screws on the top of the bracket at opposite sides of an enlarged portion 49 and which serve to engage the top of the controller and hold the bracket in horizontal position thereon. The arm 46 is adjustable with reference to the body of the bracket by means of an adjusting screw 51 passing through a lug 52 carried by the arm 46 and having threaded engagement with a lug 53 stationarily mounted on the bracket 45, while 54 is a guide pin engaging the slot 55 in the arm 46.

The gravity tank 10 may be mounted upon the wall or at any other suitable point above the hand piece in order to afford a gravity feed and one convenient assembly embodies mounting the tank 10 upon the bracket 2 by means of arms 61 and 62, the latter being preferably longer in order to lower the outlet end of the tank 10. 63 is a filling opening for the tank, it being understood that the bracket 2 and the tank 10 can be swung to vertical position to permit filling the tank. The nozzle 12 may be attached to the hand piece in any convenient way, and I have disclosed a simple and exceedingly practical arrangement including clips 65 formed on a holder 66 carried by the nozzle and adapted to have detachable engagement with the hand piece 1.

While I have described the invention with reference to a particular embodiment, it is not confined to the details herein disclosed, and this application is intended to cover such changes or departures as may come within the intent of my improvements or scope of the following claims.

I claim:

1. The combination with a dental engine including a hand piece, an electric motor, a switch for the motor, of gravity controlled liquid supply means for the hand piece, and devices governing the liquid supply including a valve, and valve operating means located in the path of said switch and movable when the switch is actuated, the valve operating means being connected to the valve and acting to open the valve when the switch is moved.

2. The combination with a dental engine including a hand piece, an electric motor, a foot switch for the motor, of gravity controlled liquid supply means for the hand piece, and devices governing the liquid supply including a valve, and valve operating means located in the path of said switch and being moved thereby when the switch is actuated, said valve operating means being connected to the valve and acting to open the valve when the switch is moved.

3. The combination with a dental engine including a hand piece and an electric motor, of liquid supply means for the hand piece, devices for governing the liquid supply including a valve, a foot switch for the motor, and a reciprocatory actuator located in the path of said foot switch and operatively connected with the valve, the actuator when moved by the foot switch operating to move and open the valve.

4. The combination with a dental engine including an electric motor and hand piece, a foot switch for the motor, gravity controlled liquid supply means for the hand piece, a valve governing the liquid supply, and a reciprocatory actuator for the valve located in the path of said switch, the actuator being operatively connected to the valve and serving to move the latter in accord with the movement of the switch.

5. The combination with a dental engine including an electric motor and foot switch, of a hand piece and gravity controlled liquid supply means for the hand piece, a valve governing the liquid supply, and a reciprocatory flexible actuator located in the path of the switch and operable thereby, said actuator having its opposite end operatively connected to the valve so as to move the latter in accord with movement of the switch.

6. The combination with a dental engine including an electric motor and foot switch, of a hand piece and liquid supply means for the hand piece, a valve governing the liquid supply, of movable operating means located in the path of the switch and extending from such point to the valve, said movable operating means being connected with the

valve so as to move the latter in accord with movements of the switch.

7. The combination with a dental engine including an electric motor and foot switch, of a hand piece and gravity controlled liquid supply means for the hand piece including a liquid tank, a valve located at the bottom of said tank, a valve rod extending through the tank to a point adjacent the top thereof, and movable operating means located in the path of the switch and extending from such point to the valve rod, the movable operating means being connected to the valve rod so as to move the latter in accord with movements of the switch.

In witness whereof, I have hereunto signed my name.

FREDERIC J. HOFSCHNEIDER.