July 20, 1937

A. F. PIEPER

2,087,654

DENTAL UNIT

Filed Nov. 23, 1933

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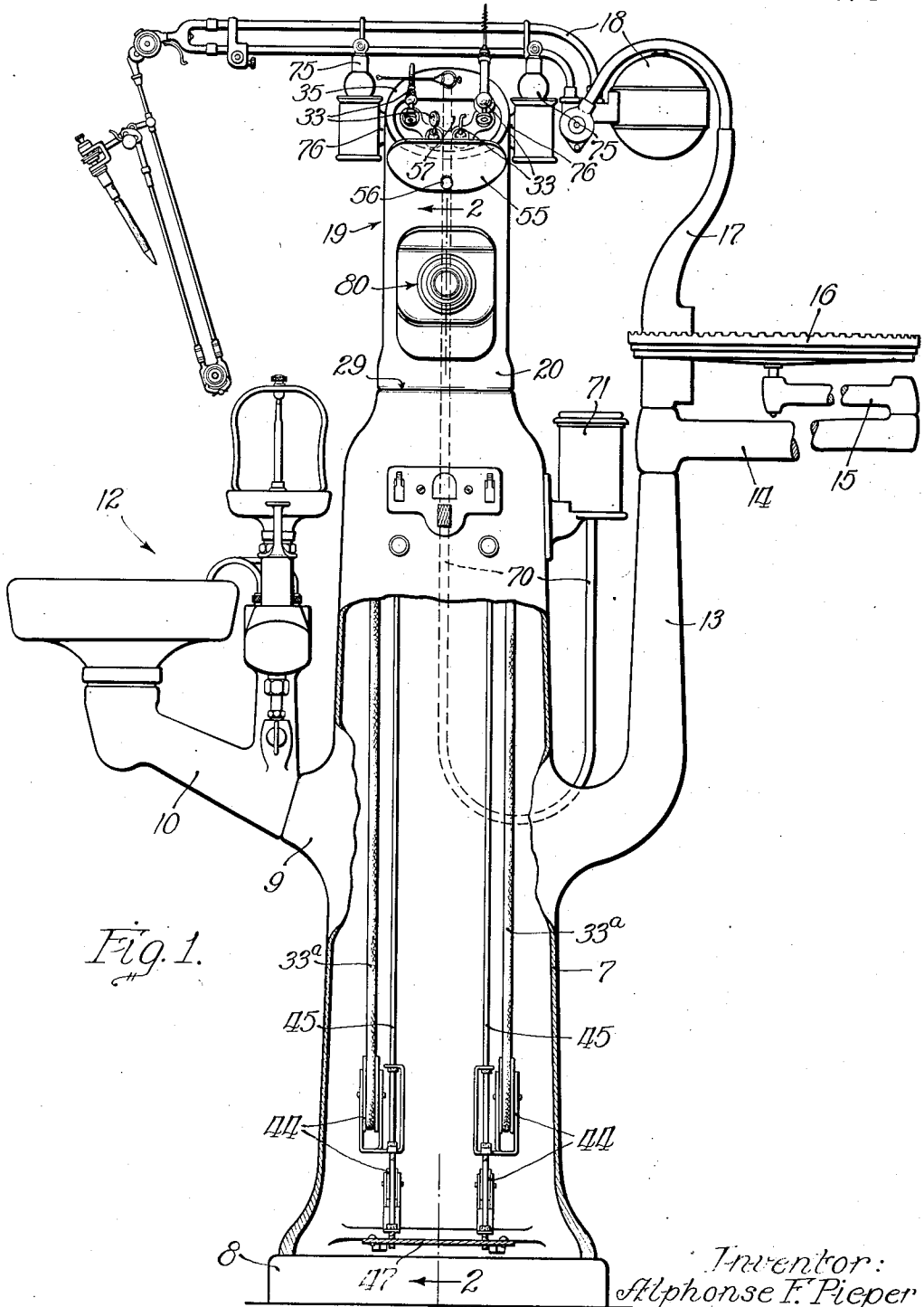


Fig. 1.

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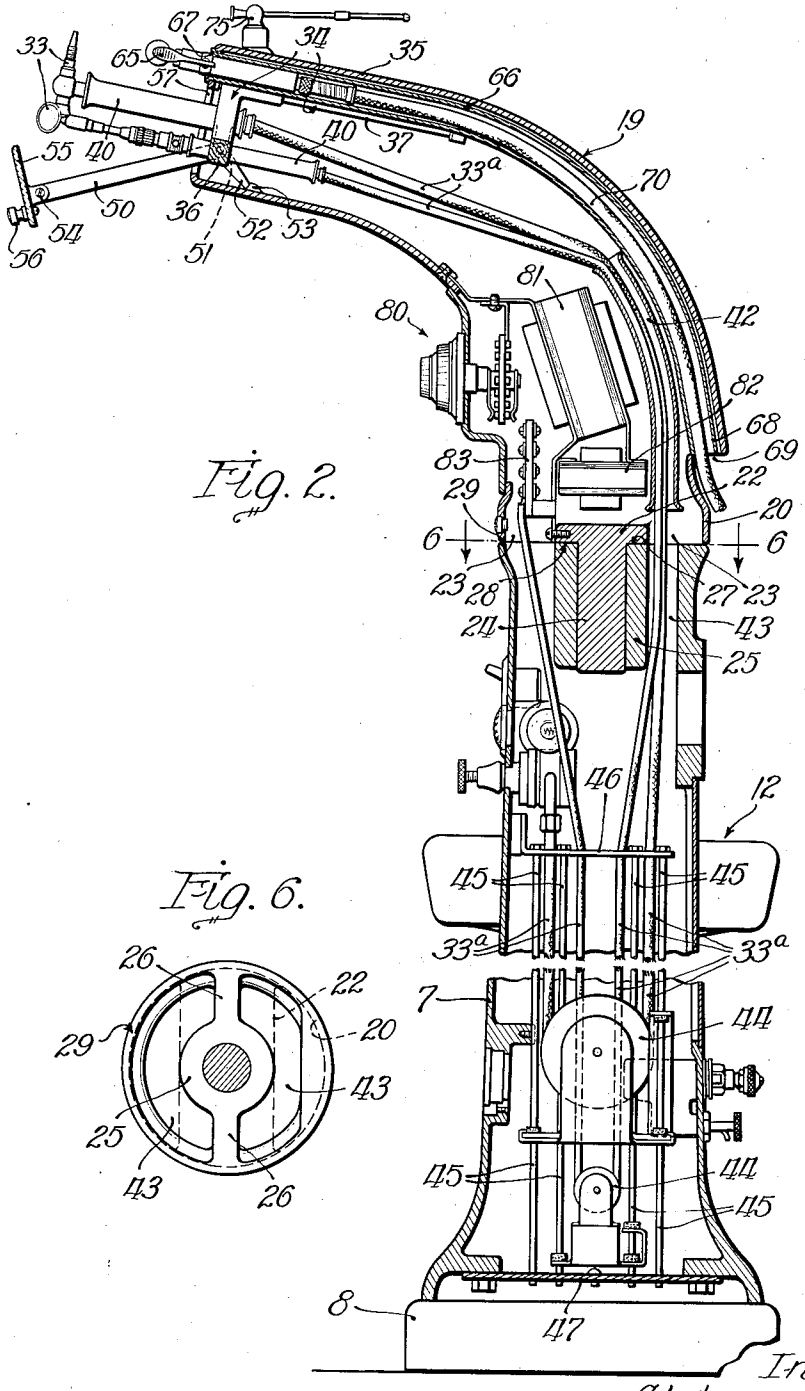


Fig. 2.

Fig. 6.

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Fig. 3.

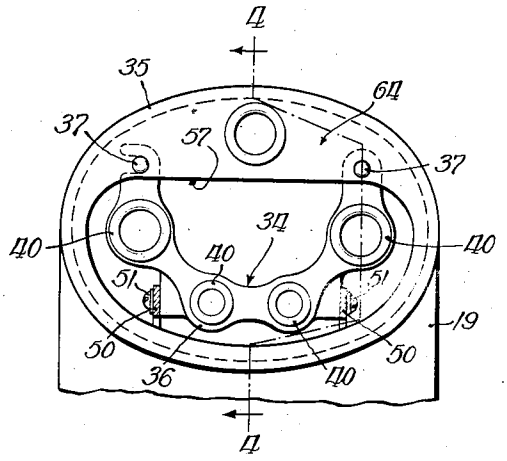


Fig. 4.

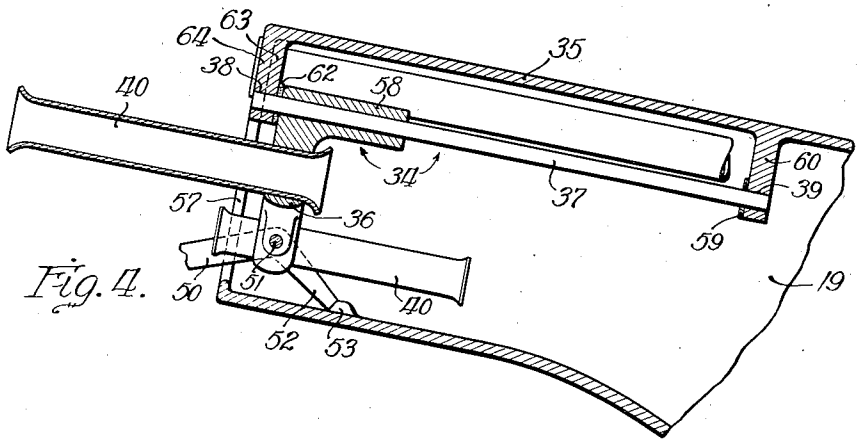
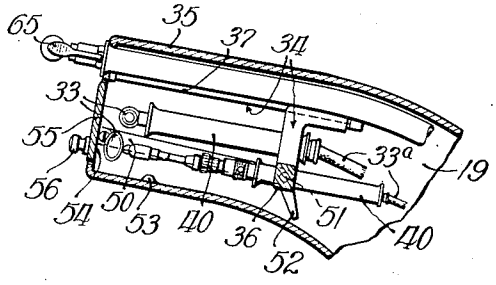


Fig. 5.



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UNITED STATES PATENT OFFICE

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DENTAL UNIT

Alphonse F. Pieper, Rochester, N. Y.

Application November 23, 1933, Serial No. 699,310

5 Claims. (Cl. 32—22)

This invention relates to dental apparatus, and contemplates a new and improved form of dental unit to be placed adjacent a patient's chair and having various electrical, compressed air, water and gas appliances that are utilized by a dentist during operations.

In units of this type, it is customary to provide, in one structure, a dental engine, a fountain cuspidor, a bracket table, spray bottle warmers and various other appliances, such as mouth instruments, operated by air and electric current, and the unit also embodies a switchboard and regulating means whereby the electrically operated instruments may be connected in circuit, disconnected, or otherwise suitably controlled.

The object of the instant invention is to facilitate the use of certain of the instruments, particularly to dispose them within handy reach of the dentist at all times during operations, and I have provided an improved structure, with related mechanical details whereby this may be brought about.

In the drawings:—

Figure 1 is a front elevational view of the dental unit, partially broken away and in section;

Figure 2 is a vertical sectional view of the dental unit, on a somewhat larger scale, taken substantially on the plane of the line 2—2 of Figure 1;

Figure 3 is an enlarged elevational view of the front end of the instrument supporting means, the instruments having been omitted therefrom;

Figure 4 is a longitudinal sectional view through the forward end of the instrument supporting means, taken substantially on the plane of the line 4—4 of Figure 3;

Figure 5 is a sectional view similar to Figure 4, but illustrating the instruments in place and in retracted or housed position; and

Figure 6 is a horizontal cross sectional view, taken substantially on the plane of the line 6—6 of Figure 2, illustrating the pivotal mounting of the head upon the pedestal, as will be described.

The main supporting element of the dental unit is a hollow pedestal 7 mounted upon a base 8, the latter being adapted to rest upon and be secured to the floor. On one side of the pedestal 7 (Figure 1) a boss 9 is provided for suitably receiving and supporting the arm 10 of a fountain cuspidor 12. The opposite side of the pedestal 7 is provided with an outwardly and upwardly extending arm 13 which carries the horizontally swinging arms 14 and 15 that support the bracket table 16. In addition, the arm 13 carries a rotatable vertical arm 17 upon which the dental engine 18 is mounted.

As best illustrated in Figure 2, an upwardly and forwardly curved instrument arm 19 is mounted, to swing on a vertical axis upon the upper end of the pedestal 7, this arm forming a continuation of the contour of the upper end of the pedestal, as is best illustrated in Figures 1 and 2.

The arm 19 is mounted upon the pedestal 7, for movement relative thereto, in the following manner:—

The arm is of hollow construction terminating at its lower end in a circular skirt 20. The latter is provided with a base 22 in the form of a horizontally disposed central web which extends between opposite portions of the skirt, thereby leaving diametrically opposite semi-circular openings 23 in the base for a purpose to be explained presently. A vertically disposed stub shaft 24 projects downwardly from the base 22 and fits for axial rotation in a bearing 25 formed integrally with the walls of pedestal 7, and axially of the latter, by means of connecting webs 26, as shown in Figure 6. The whole weight of the instrument arm 19 and its associate parts is supported upon the upper face 27 of the bearing 25, by means of the shoulder 28 of the base 22. Thus the stub shaft 24 and bearing 25 function to permit swinging of the instrument arm relative to the pedestal, on the vertical axis, and the upper face 27 of the bearing and the shoulder 28 of the base 22 cooperate to dispose the skirt 20 in a position where it will substantially contact the upper peripheral edge 29 of the pedestal, the edge 29 being of the same circular contour as the skirt 20.

The several mouth instruments 33 are associated with guide means 34 carried within the outer forward end 35 of the instrument arm 19. The guide means comprises a crosshead 36 slidably mounted upon spaced rods 37, the latter being suitably secured within the instrument arm at 38 and 39 (Figures 3 and 4). The crosshead 36 is provided with fixedly connected sleeves 40 having flared ends, the sleeves being adapted to receive and hold the different instruments 33 when they are not in use, while instrument cables 33a, such as conductor cords and tubes, leading from the instruments, trail substantially horizontally through the sleeves 40, arm 19, and into a common sleeve 42 which houses the conductor cords and tubes and leads them through one of the openings 23, in the base portion of the head, into the pedestal.

As the conductor cords and tubes of the several instruments pass downwardly out of the instrument arm they enter the pedestal 7 through one of the semi-circularly formed openings 43, in the top of the pedestal, and pass down and around the weighted pulleys 44 which reverse the direction of the conductor cords and tubes, the ends of the latter then being fixedly connected to various points within the pedestal such as electric terminals, or air terminals, as the case may be. The weighted pulleys 44 are guided vertically within the pedestal upon rods 45 secured to the pedestal at their upper ends by means of a bracket 46 and

at their lower ends by means of a plate 47. With this construction, the instruments 33, when not in use, are at all times urged into the sleeves 40 of the cross-head 36 by means of the weighted pulleys 44, but are, at the same time, capable of being withdrawn when they are needed. The openings 23 in the head and the openings 43 in the pedestal register and leave plenty of play so that the conductor cords and tubes will not hinder the swinging of the arm.

Referring now to Figures 2 and 5, it is to be noted that the instruments 33 are capable, because of the guide means 34, of occupying two positions relative to the end 35 of the instrument arm 19, i. e., the instruments 33 may be disposed and maintained outwardly of the end 35 of the instrument head, so as to be readily available for use by the operator, in the manner shown in Figure 2, or the instruments and their supporting means may be bodily displaced to bring the instruments within the housing when not in use, as illustrated in Figure 5.

This is accomplished by pivotally securing links 50 to the opposite sides of the crosshead 36 as at 51. At one end the links are angularly extended beyond their respective pivotal points 51 to form dogs 52 for cooperating with catch lugs 53 on the inside of the instrument arm 19, while the other ends of the links are connected at 54 to a cover 55 which has the finger button 56. In order to displace the instrument assembly from the position it occupies in Figure 2 to the housed position illustrated in Figure 5, the operator grasps the button 56 and moves it downwardly until the dogs 52 clear the catch lugs 53. He may then move the assembly all the way in, but it will be clear that the weighted pulleys 44 will urge the crosshead inwardly and the operator therefore need only release the dogs from the catch lugs and finally guide the cover 55 into the end opening 57 in the end 35 of the instrument arm. In order that the door 55 will be halted exactly when it reaches a position within the opening 57, the crosshead 36 is provided with a projecting boss 58 adapted to strike a cushion piece 59 disposed adjacent the lug 60 that supports the ends 39 of the rods 37.

In reversing the operation, the operator takes hold of the button 56 and pulls the crosshead out until it strikes the cushion piece 62 adjacent the boss 63 on the end wall 64 of the instrument head, at which point the dogs are again seated against the lugs 53.

In addition to having the instruments 33 supported upon the swinging arm 19, as above described, the water syringe 65 is carried thereby within a guide tube 66 suitably mounted as illustrated in Figure 2. The tube 66 has its upper end 67 secured within and protruding through an opening in the wall 64 of the instrument arm, the tube being flared at this point to receive the syringe, while the lower end 68 of the tube, suitably fixed in the arm, communicates with an opening 69 provided in the lower rear end thereof. The syringe hose 70 leads from the syringe 65 through the tube 66 to the water heater 71 (Figure 1).

A pair of spray bottles 75 are supported at 76 on the opposite sides of the end 35 of the instrument arm.

The electric regulator 80, low voltage transformer 81, tooth tester transformer 82, and the connection block 83 are all mounted within the base end of the instrument arm 19 and move with the latter as it swings.

I claim:—

1. In combination, in a dental unit, a pedestal, an upwardly and outwardly curved instrument supporting arm mounted on the top of said pedestal to swing relative on the axis thereof, a water syringe, a water heater fixedly secured to said pedestal, a water hose connecting said syringe with said heater, and means carried by said arm for supporting said syringe and the adjacent end of the hose comprising a tube disposed within the arm, said tube having one end secured to and protruding through the outer free end of said arm and adapted for receiving and holding said syringe externally of the head and having its other end secured within and projecting downwardly through said arm, the lower end of said arm having a portion offset outward from the upper end of said pedestal, adjacent the lower end of said tube, providing an opening accommodating said hose.

2. In a dental unit, a pedestal, a bracket table mounted thereon, an arm mounted on the upper end of said pedestal for turning movement concentrically therewith, said arm being curved lengthwise upward and outward of said pedestal, the outer end of said arm being a substantial distance above said bracket table, dental instruments removably carried by said arm at said outer end thereof, and retrievable conductor cords connecting said dental instruments with apparatus within the structure.

3. In a dental unit, a pedestal, a bracket table mounted thereon, an arm mounted on the upper end of the pedestal for turning movement on the axis thereof, said arm being curved upward and outward of the pedestal with its outer end a substantial distance above said bracket table, electrical apparatus mounted within said structure, dental instruments carried by and insertible into and removable from said outer end of said arm, and retrievable electric cords connected to the respective instruments and passing downward through said arm and secured to said electrical apparatus.

4. In a dental unit, a stationary hollow pedestal housing portion, a hollow arm housing portion mounted on the top of said pedestal housing portion as a continuation thereof, said arm housing portion extending upwardly and laterally from said pedestal housing portion and being capable of swinging on a vertical axis through said pedestal housing portion, dental instruments removably carried at the outer end of said arm housing portion, and retrievable conductor cords extending respectively from said instruments inwardly through said arm housing portion and into said pedestal housing portion wherein they are looped, and apparatus contained in said housing and with which said conductor cords are connected.

5. In a dental unit, a pedestal, a bracket table mounted thereon, a hollow arm mounted on and extending upwardly and forwardly of said pedestal, the outer end of said arm being a substantial distance above said bracket table, dental instruments removably carried by said arm at said outer end, and retrievable conductor cords fastened to said instruments, said instruments and cords being movable substantially longitudinally and horizontally out of and into said hollow arm at said outer end and said cords connecting said dental instruments with apparatus within the structure.

ALPHONSE F. PIEPER.