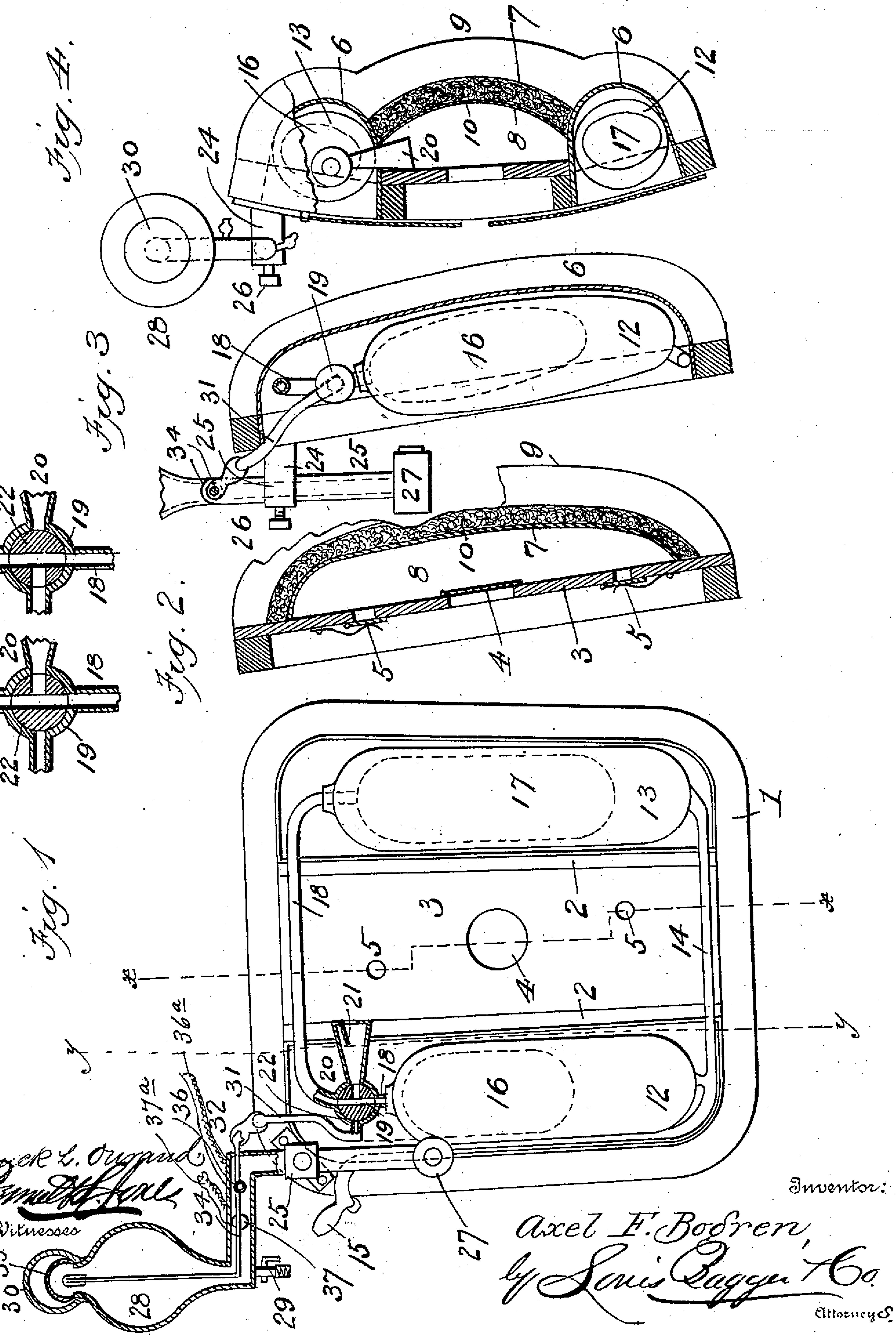
No. 624,425. Patented May 2, 1899.

A. F. BOGREN.
DENTAL OPERATING CHAIR.

(Application filed Apr. 23, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

AXEL FREDRIK BOGREN, OF MALMÖ, SWEDEN.

DENTAL OPERATING-CHAIR.

SPECIFICATION forming part of Letters Patent No. 624,425, dated May 2, 1899.

Application filed April 23, 1898. Serial No. 678,582. (No model.)

To all whom it may concern:

Be it known that I, AXEL FREDRIK BOGREN, a subject of the King of Sweden and Norway, residing at Malmö, Sweden, have invented new and useful Improvements in Dental Operating-Chairs, of which the following is a specification.

My invention relates to dental operating-chairs; and its object is to provide an improved construction of the same by means of which a current of temperately-heated water can be automatically forced into the mouth of a patient to clean out cavities in the teeth by the pressure of the patient resting against the back of the chair and a jet of air also forced into the mouth to dry the cavities after having been washed out.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a rear view, partly in section, of the upper part of a dental chair provided with my improvements. Fig. 2 is a vertical section of the same on the line $x\,x$, Fig. 1. Fig. 3 is a similar view on the line $y\,y$. Fig. 4 is a plan view, partly in horizontal section. Figs. 5 and 6 are detail sectional views of the valve connected with the compressing-chambers.

In the said drawings the reference-numeral 1 designates an open frame approximately rectangular in shape and provided with two vertical bars 2, to the inner sides of which is secured a vertical plate 3, provided with an inwardly-opening air-valve 4 and two safety-valves 5, for a purpose hereinafter described. At opposite sides of the said plate 3 is a vertical semicylindrical casing 6, secured to which is a curved spring-plate 7, thus forming a central air-compressing chamber 8.

The numeral 9 designates the cushion or back of the chair, which may be of any ordinary or suitable construction, and interposed between the same and the plate 7 is an elastic packing 10. This construction is such that when a person bears back against the cushion the plate 7 will be pressed inwardly, compressing the air in the chamber 8. Located in each of the casings or receptacles 6 is an air-chamber 12 and 13, connected together at their lower ends by a pipe 14, provided with a nozzle 15 at the outer end leading to the atmosphere. Located in said chambers are two receivers 16 and 17, communicating with the upper ends of which are two pipes 18, which are connected with a valve-casing 19, which in turn communicates with the compressing-chamber 8 by a pipe 20, provided with a valve 21. The valve-casing 19 is provided with a turning plug or valve 22, so constructed that when turned in one direction it will establish communication with the compressing-chamber and the air-receivers and when turned in the opposite direction will establish communication between said receivers and a tube hereinafter described.

Secured to the frame 1 is an arm 24, formed with an aperture, through which passes a vertically-adjustable tube 25, held in position by a set-screw 26. The lower end of this tube is closed and is provided with a small stove or heater 27 of any suitable character. Said tube at the upper end is extended outwardly at a right angle and is connected with a globular water-reservoir 28.

The numeral 29 designates a stop-cock, through which water may be forced up into the reservoir. The upper end of the reservoir is provided with a removable spherical cap or top 30, by removing which water may be also placed in the reservoir.

Connected with valve-casing 19 is a pipe 31, which is connected by a hose or flexible coupling 32 with a tube 34, extending up into the water-reservoir to near the top thereof, and located above this tube is a flexible hood or diaphragm 35. Communicating with this tube 34 is a nipple 36, adapted to have connected therewith a hose 36^a, carrying at its opposite end a nozzle for directing a current of air from said tube into the mouth of a patient. A similar nipple 37 is provided for the tube 25, also adapted to have a hose 37^a connected therewith for spraying water into the cavity of a tooth.

The operation is as follows: A patient when resting against the back of the chair will force the curved plate 7 inward, compressing the

air in the compressing-chamber and forcing it through the pipe 20 into the air-receivers, the valve 22 being in the position shown in Fig. 5, and valve 21 preventing the air from escaping back into the compressing-chamber. During this operation the air-receivers will be distended or expanded, forcing the air out of the reservoirs surrounding the same. When it is desired to spray water into the cavity of a tooth, the valve 22 is turned to the position shown in Fig. 6, whereby communication is established between the air-receivers and the tube extending up into the water-reservoir, and the air escaping from said tube will press upon the surface of the water, forcing it out of nipple 37 and through the hose to the mouth. For forcing air into the mouth for drying the cavities in the teeth the nozzle on the hose connected with said nipple is closed by a suitable cock or simply by placing the finger over the end of the same, when the air from the air-receivers will be forced through the nipple 36 to the hose connected therewith.

The water in the reservoir should be heated to a temperate degree by the heater at the lower end of the vertically-movable tube, which heater may be a gas, oil, or any other found desirable or convenient.

The object of the safety-valves is to open and relieve the pressure in the compressing-chamber should it become too great.

Having thus fully described my invention, what I claim is—

1. In a dental chair, the combination with the frame, the back thereof provided with an air-inlet valve and a safety-valve, the curved elastic front plate forming a compressing-chamber, the air-receivers, the pipes provided with a valve connecting the same and the pipe extending from the said pipes to the compressing-chamber, of the water-reservoir, the tube connected therewith and provided with a nipple, the tube located in said reservoir provided with a nipple, and the pipe connected therewith and with said valve, substantially as described.

2. In a dental chair, the combination with the frame, the back thereof provided with an air-inlet and a safety valve the curved elastic front plate forming a compressing-chamber, the valve connected with said chamber, the air-receivers and the pipes connected therewith and with the valve, of the vertically-movable tube provided with a heater at the lower end, the reservoir having a stop-cock connected with said tube, the tube extending up into said reservoir provided with a nipple, the flexible coupling connected with said last-mentioned tube, and the pipe connected with said coupling and the turning plug or valve, substantially as described.

3. In a dental chair, the combination with the frame, the back thereof provided with an air-inlet and a safety valve, the elastic front plate forming a compressing-chamber, the valve connected with said chamber, the pipes connected therewith, the pipe provided with a check-valve and the air-receivers, of the tube provided with a heater at its lower end and a water-reservoir at its upper end, the spherical cap at the upper end of said reservoir, the flexible diaphragm, the tube located in said reservoir, the flexible coupling connected therewith, the pipe connected with said coupling and valve, and the nipples connected with said tubes, substantially as described.

4. In a dental chair, the combination with the frame, the back thereof provided with an inlet and a safety valve, the elastic front plate forming a compressing-chamber, the air-receivers, the pipes connecting the same, the valve, the pipe having a check-valve connecting said valve and chamber, the tube having a heater at the lower end and a water-reservoir at the upper end, the tube located in said reservoir, the pipe connected therewith and with said valve, the nipples connected with said tubes, the air-reservoirs surrounding said air-receivers, and the pipe connecting the same and leading to the atmosphere, substantially as described.

5. In a dental chair, the combination with the frame, the back provided with the air-inlet and the safety valve, the elastic front plate forming a compressing-chamber, the semi-cylindrical casings at opposite sides of said chamber, the air-reservoirs located therein, the pipe connecting the same and leading to the atmosphere, the air-receivers located in said reservoirs, the pipes connecting the same, the valve, and the pipe provided with a check-valve connecting said valve and compressing-chamber, of the vertically-movable tube, the heater at the lower end thereof, the water-reservoir at the upper end provided with a spherical cap and a flexible diaphragm, the tube located in said reservoir, the flexible coupling, the pipe connected therewith and with said valve, and the nipples connected with said tubes, substantially as described.

6. In a dental chair, the combination with an air-compressing device, of a water-receptacle connected therewith provided with an escape-outlet, substantially as described.

7. In a dental chair, the combination with an air-compressing device, a water-receptacle provided with an escape-outlet connected therewith and means for heating the water therein, of the pipe connection between said compressing device and water-receptacle and a hose connected with the water-receptacle, substantially as described.

8. In a dental chair, the combination with the air-compressing device adapted to be operated by the pressure or weight of a person occupying the chair, of the air-receiver, the

water-receptacle, the pipe connecting said water-receptacle and air-receiver and a valve connection between said pipe, receiver and compressing device, substantially as described.

9. The combination with a dental chair, of an air-compressing device and a water-receptacle, a pipe connection with said compressing device extending up into the water-receptacle, and said water-receptacle provided with an escape-outlet, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

AXEL FREDRIK BOGREN.

Witnesses:

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