

Dec. 15, 1925.

H. D. GARRETSON

DENTAL X-RAY SYSTEM

Filed Feb. 6, 1924

1,566,198

2 Sheets-Sheet 1

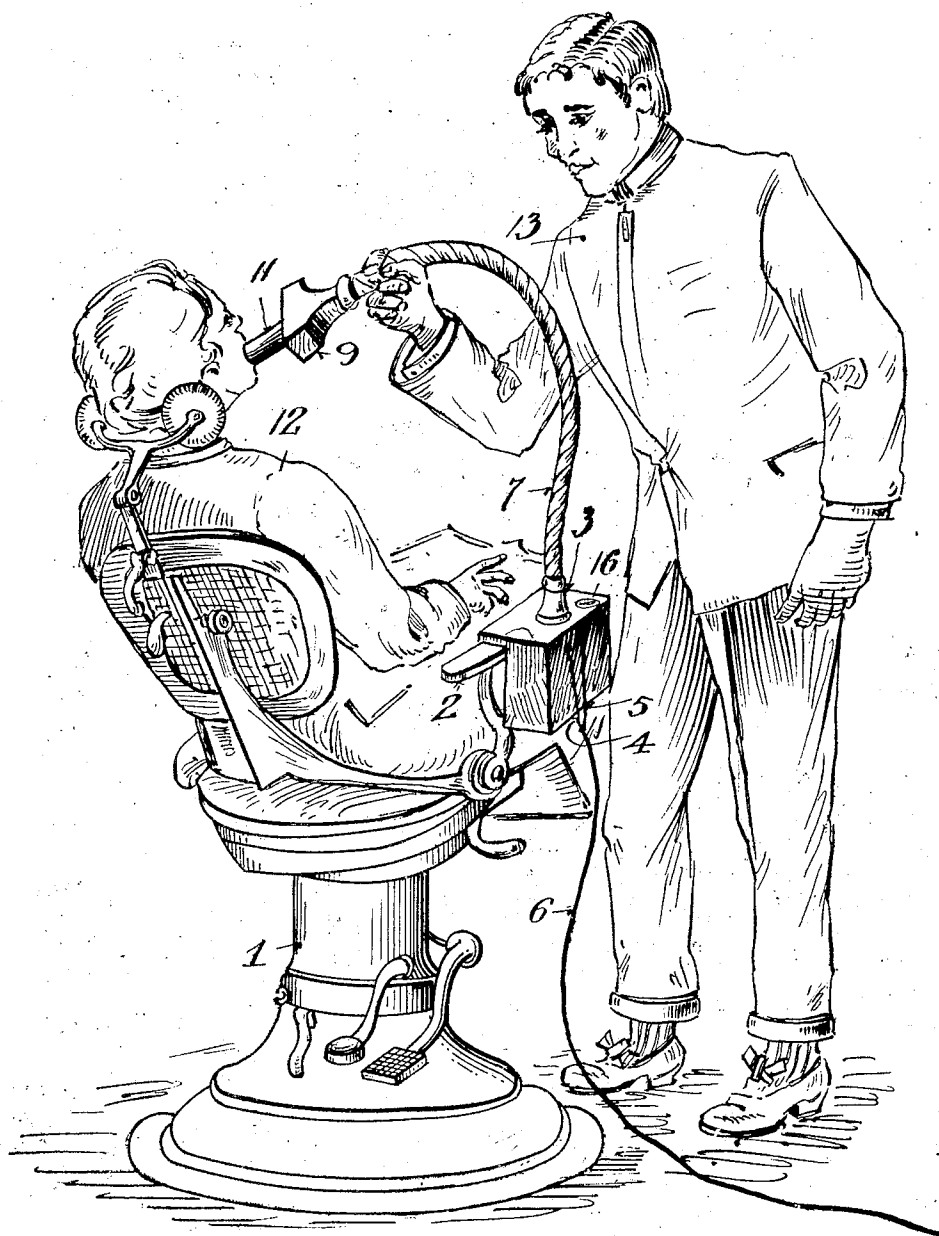


Fig. 1.

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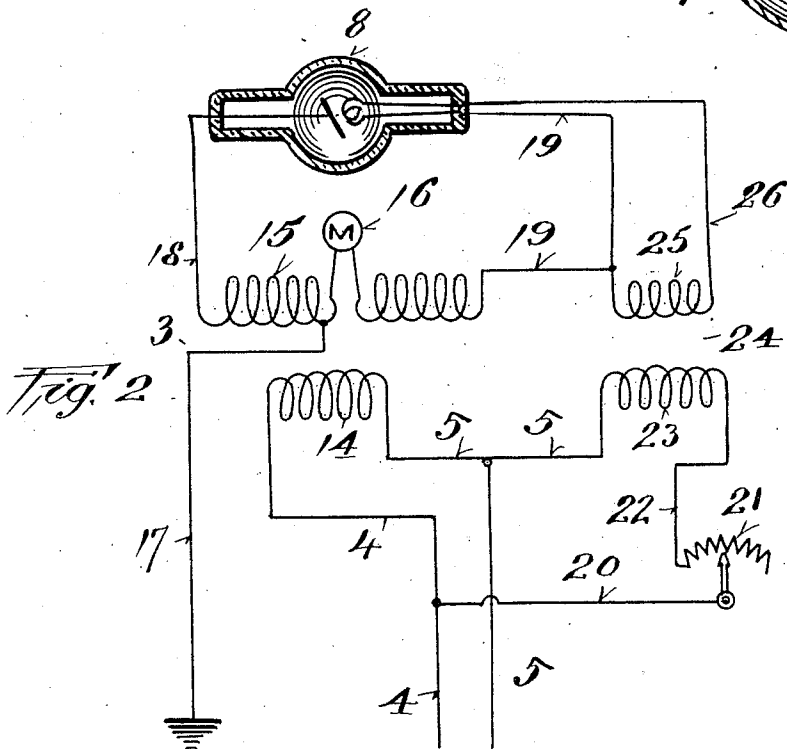
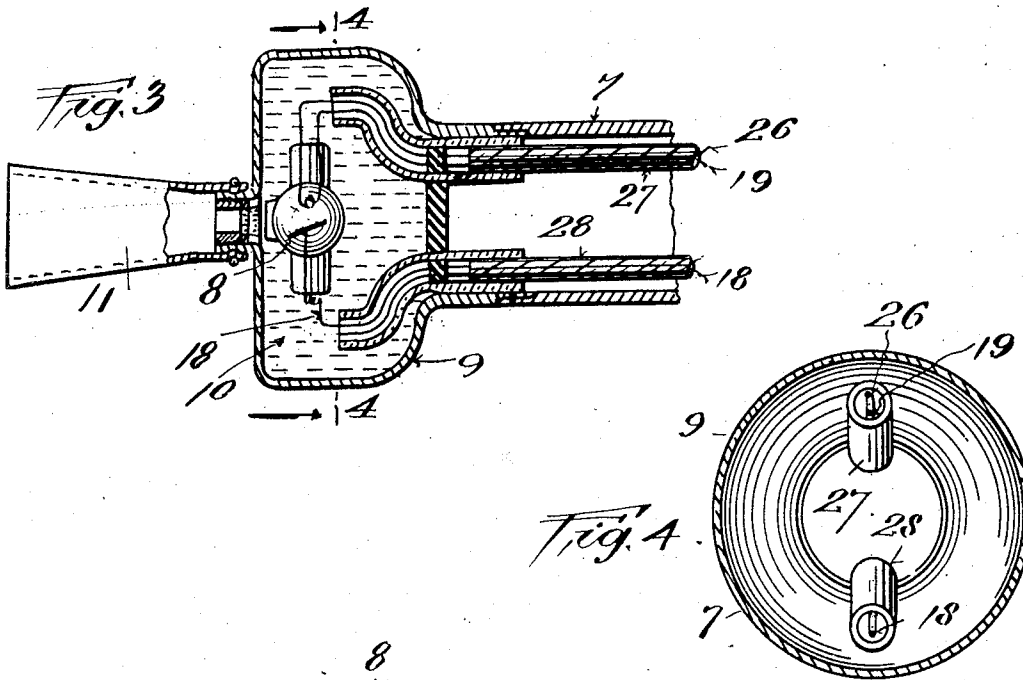
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UNITED STATES PATENT OFFICE.

HARRY D. GARRETSON, OF NEW YORK, N. Y.

DENTAL X-RAY SYSTEM.

Application filed February 6, 1924. Serial No. 690,909.

To all whom it may concern:

Be it known that I, HARRY D. GARRETSON, a citizen of the United States, and a resident of the city, county, and State of New York, have invented a new and useful Improvement in Dental X-Ray Systems, of which the following is a specification.

The object of my invention is to provide a system of this class which may be used in the smallest possible space and which may be readily detached and removed when not in use and particularly a system in which a transformer may be put on an arm of a dentist chair and there clamped and the X-ray tube be connected to this transformer by means of a flexible connection which can be handled so that under all circumstances it is possible to take small radiographs without inconvenience or danger due to the high potential currents employed. This and other objects are accomplished by my invention, some embodiments of which are hereinafter more particularly set forth.

For a more detailed description of my invention, reference is to be had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a perspective view of my improved apparatus in use.

Figure 2 is a diagrammatic view showing the electrical connections and circuits.

Figure 3 is a longitudinal section of the tube and the parts which enclose it.

Figure 4 is a sectional view, taken on the line 4—4 of Figure 3, looking in the direction of the arrows.

Throughout the various views of the drawings, similar reference characters designate similar parts.

In the preferred embodiment of my invention, a dentist chair 1 has an arm 2 on which is clamped a suitable transformer 3 which is supplied by power through wires 4 and 5 which are preferably low potential wires joined in a cable 6 in the conventional manner. The transformer is a small step up transformer with high potential wires which pass through a flexible tube 7 to the X-ray tube 8 in a suitable protecting casing 9 where the tube is immersed in oil 10 and so arranged and disposed that X-rays may be projected through a funnel 11 and through a patient 12 while held by a dentist 13, as indicated in Figure 1. In the embodiment of this invention shown in Figure 2, power

is supplied through the lead in wires 4 and 5 which power runs to the transformer 3 which has a primary 14 and a secondary 15 with a milliamperemeter 16 at the neutral point and also a ground 17 at the neutral point. From this secondary 2, wires 18 and 19 are connected to the anode and cathode of the tube 8.

The wire 4 is also connected to a wire 20 which runs to a small rheostat 21 which is connected by a wire 22 with the primary 23 of a step down transformer 24 which also has a connection with the wire 5, as shown. The secondary 25 of this step down transformer 24 has two wires, one of which is connected to the wire 19 and the other wire 26 runs to the cathode of the tube 8. From the transformer 3 extend the wires 18 and 19 and the wire 26 is brought close to the wire 19 and both are encased in a flexible tube 27 while the wire 18 is encased in a tube 28.

In view of the foregoing, the operation of my improved system will be readily understood. The cable 6 is connected to a switch, not shown, and placed in any desired location or adjacent to the transformer 3 and this transformer is clamped to an arm 2 and then the projection 11 is pressed against the patient. The rheostat 21 is manipulated until the milliamperemeter 16 gives the desired reading and thereafter the exposure is had at the requisite time, preferably governed by an automatic switch, not shown. The grounding of the center of the step up transformer reduces the effective voltage between the conductors 19 and 18 and the casing, thus reducing the insulation to half, so that if say forty thousand volts are required to operate the tube 8, the insulation required between the conductors 19 and 18 must be sufficient for twenty thousand volts on each and if this be the case there will be no short circuiting. To provide this insulation, carefully prepared insulating material is inserted in two metal tubes 27 and 28, as above described. The result is that the tube 7 and its contents may be flexed as much as desired. The oil 10 surrounding the tube 8 is sufficient to keep the terminals thoroughly insulated.

While I have shown and described one embodiment of my invention, it is obvious that it is not restricted thereto, but that it is broad enough to cover all structures that

come within the scope of the annexed claims.

Having thus described my invention, what I claim is:

- 5 1. In an apparatus of the class described, a transformer, a flexible tube connected to said transformer, an X-ray tube connected to and carried by said flexible tube and means for supplying the X-ray tube with power through said flexible tube.
- 10 2. In an apparatus of the class described, a step up transformer, means for supplying the same with power, a flexible tube connected to said transformer, high potential conductors in the said flexible tube, a casing carried by said flexible tube and at the free end thereof and an X-ray tube employed in said casing and connected to said high potential conductors.
- 15 3. In an apparatus of the class described, a step up and step down transformer adapted to be secured to the arm of a dentist chair, means for supplying the transformer with power, means for regulating the cur-

rent of the step down part of the transformer, high potential wires running from said transformer adapted to carry an X-ray generating current and a cathode heating current, a flexible tube containing said wires and an X-ray tube connected to said wires and carried by said flexible tube, whereby a high potential current may be passed to the tube and X-rays generated while the tube is supported manually.

4. In an apparatus of the class described, a step up transformer, a flexible tube connected to said transformer, high potential wires passing from said transformer, a ground for the neutral point of the step up coil of the transformer and an X-ray tube connected to said high potential wires at the other end of the tube and carried by this tube.

In testimony whereof, I have hereunto set my hand this 23 day of January, 1924.

HARRY D. GARRETSON.