M. W. OLSON.

VULCANIZER.

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1,107,441. **Patented Aug. 18, 1914.**

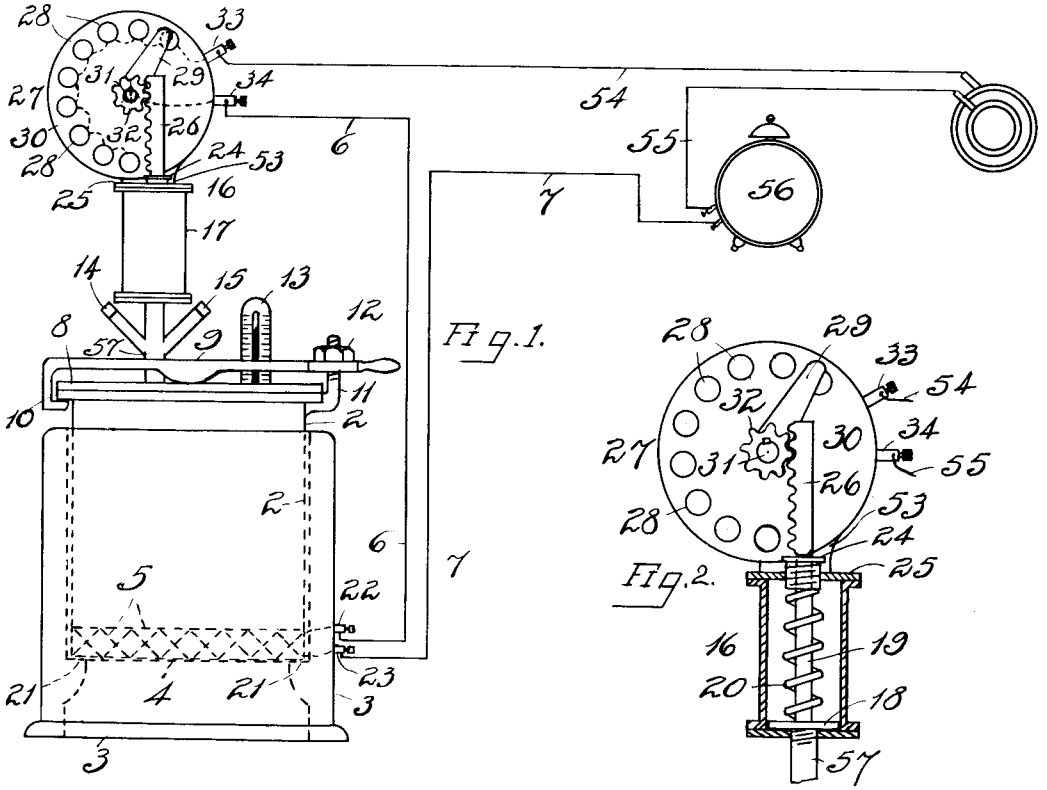


Fig. 1.

Fig. 2.

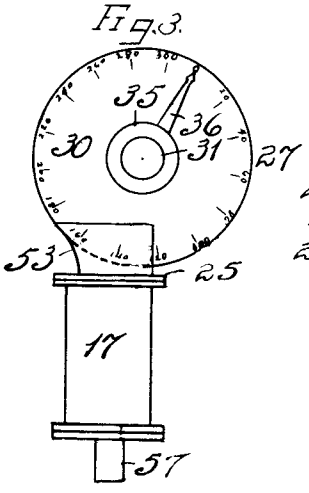


Fig. 3.

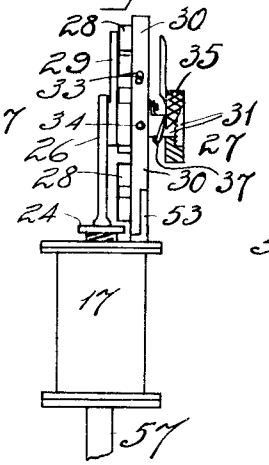


Fig. 4.

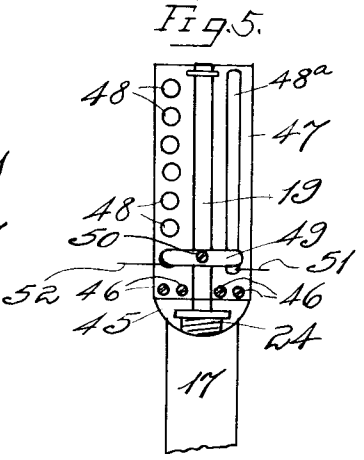


Fig. 5.

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UNITED STATES PATENT OFFICE.

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VULCANIZER.

1,107,441. Specification of Letters Patent. Patented Aug. 18, 1914.

Application filed March 17, 1913. Serial No. 754,813.

To all whom it may concern:

Be it known that I, MAURITHZ W. OLSON, a citizen of the United States, and a resident of Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Vulcanizer, of which the following is a specification.

The invention relates to novel electrically heated and controlled means for vulcanizing rubber contained in a flask within the apparatus, and the primary object is to provide an apparatus of the character described which is capable of producing a superior class of work, and which is especially adapted for use in dentistry.

For the purpose of illustrating my invention I have shown in the accompanying drawings a preferred and a modified construction thereof, either of which will be found practical, but it will be understood that the several instrumentalities of which the invention consists may be otherwise arranged, and organized, that some of the parts may be used without the others, and that some may be supplanted by others of a similar character; therefore I do not consider the scope of the invention or of the claims as limited to the structure shown and described, but contemplate it as covering all such changes as fairly fall within the general idea thereof, considered in its broadest aspect.

In said drawings: Figure 1 is a front elevation; Fig. 2, an enlarged detail comprising an elevation of the rheostat and a vertical, central sectional view of the piston or valve case or cylinder; Fig. 3, a rear elevation of the rheostat; Fig. 4, an edge view thereof; and Fig. 5, a modified construction of rheostat.

Referring to the drawings by numerals, and uniformly employing the same one thereof to designate the same part in the different figures, 2 indicates a retort, tank, pot, or other suitable container, removably seated on an internal ring 21 in a base 3 having a chamber for the reception thereof. On the floor 4 of this chamber is placed any suitable electric heating element 5 which is connected with insulated wires 6, 7 through the base 3 by binding posts 22, 23, respectively. The retort is equipped with a steam-tight top 8 which is removable therefrom but which may be locked in position by a clamp 9, the bent tip of which hooks beneath a flange 10 and the handle end portion of which is provided with an aperture which receives a locking bolt 11 fixed to the retort, a nut 12 being threaded thereon to complete the lock.

13 is a thermometer, 14 a blow-off valve, and 15 a safety valve, any one of which may be of any suitable type.

16 is a regulator or controller comprising a cylinder 17, piston 18, piston rod 19 embraced by an expansion spring 20, thumb screw 24 threaded into the cylinder head 25 and axially bored for the passage of the rod 19, apertured cylinder head 25, rack 26 integral with the rod 19, and rheostat 27, which in the principal figures comprises a disk 30 having contact-points 28, a contact-shoe or arm 29 fixed on a spindle 31 to which it is keyed, a pinion 32 also fixed on said spindle by said key, and binding posts 33, 34.

35 designates a button fixed on the rear end of the spindle 31 and is provided with a needle 36 which is adapted to indicate one of the numbers on the scale shown in Fig. 3 on said rheostat.

37 is a pressure spring interposed between the rheostat and the button 35. The spindle 31 is slidably and revolubly mounted in the disk 30, for a purpose presently described.

In Fig. 5 I have shown a rheostat comprising a base 45 to which is secured by screws 46 a plate 47 carrying a series of contact-points 48 and a contact-plate 48ª. 49 is a contact-shoe which is insulated from but secured to the piston rod 19 by a set-screw 50. 51 and 52 indicate current-carrying wires. The body of each rheostat is of some such insulating material as fiber, as are also parts of the contact-shoes. 53 is a bracket suitably secured on the cylinder head and supporting the disk 30. 56 is a time-switch to which the wires 7 and 55 are connected. 57 is a pipe providing communication between the flask container 2 and the cylinder. The top of the container is provided with suitable recesses for the reception of this pipe and for the thermometer, and the rheostat is in practice to be provided with the usual resistance coils which it has not been necessary to herein describe nor in the drawings illustrate, inasmuch as they in themselves constitute no part of the invention.

I now proceed to describe the operation: A small quantity of water is placed in the

container 2 and the rubber to be vulcanized is placed within flasks in said container, the top of which is then closed by the locking means, and an electric current turned onto the heating element 5, causing heat to be generated. This will convert the water, or a part thereof into steam. As is well known, to vulcanize rubber, especially for dental purposes, the temperature of the water and steam in the container must be maintained at a certain point and for a definite period of time. As the steam pressure increases it bears against the piston 18, and when it has become sufficiently great the piston and rod will be thereby moved upwardly to move the rack 26 and actuate the pinion 32 to rotate the spindle 31 and thereby the arm 29 to cut in more resistance in the heating element's circuit by the electrical connection established through the wires 6—7 and 54—55, which are connected in series with the heating element 5. This causes a change in the current flow and a similar change in the heat applied, thereby regulating or governing the temperature of the contents of the container. The operation of the blow-off valve will be the usual one, as will also that of the safety valve. The temperature of the contents of the container will be indicated by the thermometer 13.

The mechanical action caused by the steam pressure in the container 2 upon the piston, causing it to raise, compress the resistance spring 20, and elevate the rack 26 to operate the pinion 32, spindle 31, shoe or arm 29 and needle 36 will be evident. To manually operate said shoe and needle without affecting the rack, the operator will push upon the button 35 to thrust the spindle 31 forwardly; and this carrying the shoe 29 with it will throw the pinion 32 out of gear with the rack 26, whereupon the button may be rotated to adjust the needle and shoe to any desired position. Adjustments of the nut 24 will bring the spring 20 to the desired tension to resist the steam-pressure on the valve 18.

Having thus described the nature of my invention, and having illustrated preferred means for carrying it into effect, I claim as new and desire to secure by Letters Patent the following, namely:

1. In a vulcanizer, a hermetically sealed water-container, a source of electric supply from which it may be heated, a removable top for said container, means for locking it thereon, a cylinder in communication with said container, a piston operated by the fluid generated in said container and adapted to open and close communication between it and said cylinder, and a rheostat governed by said piston.

2. In a vulcanizer, a hermetically sealed water container, a flask therein, a source of electric supply from which the contents of said container may be heated, means for controlling the amount of current, and a piston for actuating the last recited element, the movement of said piston in one direction being controlled by the fluid generated in said container.

3. The combination in a vulcanizer, of a hermetically sealed water container, a removable steam-tight cover therefor, a hermetically sealed flask adapted to contain rubber to be vulcanized, disposed in the fluid contained in said water container, a source of electric supply from which said water and thereby the contents of said flask may be heated, an element movable by the fluid generated in said container, and means for controlling the amount of current.

In witness whereof I hereunto subscribe my name, in the city, county and State above written, this 25th day of February, 1913.

MAURITHZ W. OLSON.

Witnesses:
H. M. Richards,
C. S. Richards.