

G. L. BRUCE.
DENTAL VULCANIZER.
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1,034,764.

Patented Aug. 6, 1912.
2 SHEETS—SHEET 2.

Fig. 2

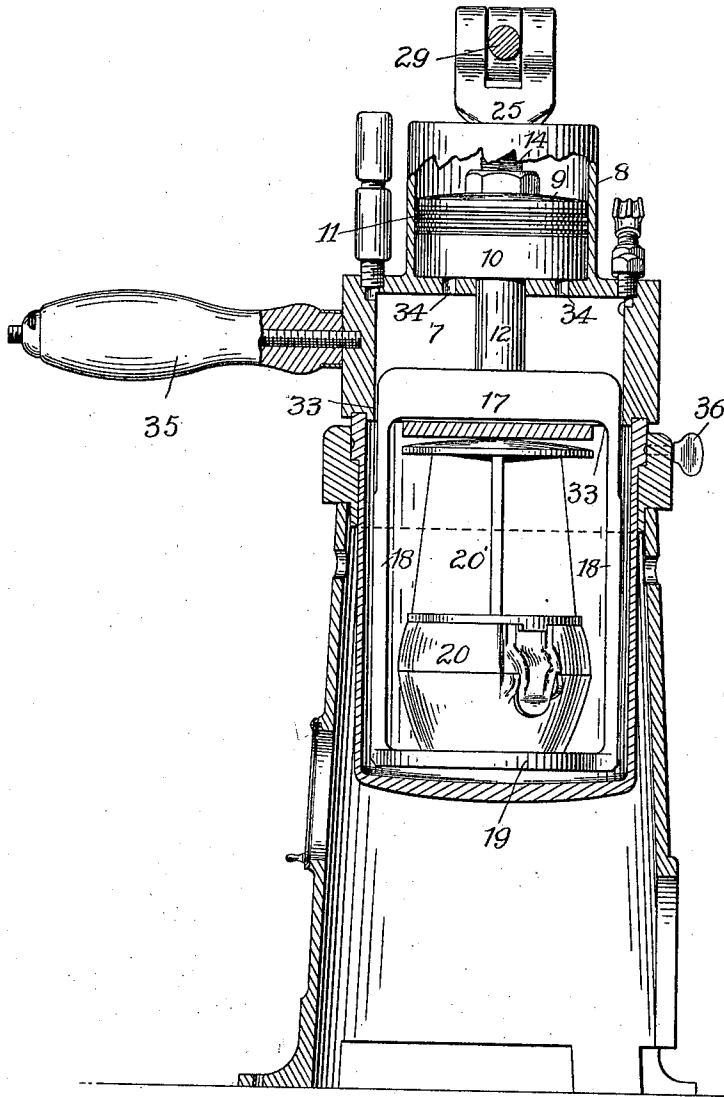
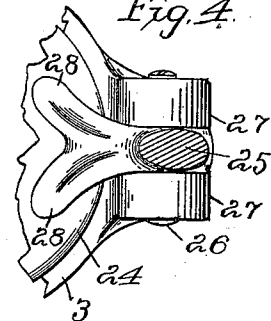


Fig. 4



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UNITED STATES PATENT OFFICE.

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DENTAL VULCANIZER.

1,034,764.

Specification of Letters Patent.

Patented Aug. 6, 1912.

Application filed June 19, 1909. Serial No. 503,163.

To all whom it may concern:

Be it known that I, GEORGE L. BRUCE, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Dental Vulcanizers, of which the following is a specification.

It is the object of my invention to provide a vulcanizing apparatus for the use of dentists, with which the vulcanizing operation may be quickly and effectively performed, and the invention consists in the features and combination and arrangement of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings Figure 1 is a vertical sectional view of the apparatus with parts in elevation; Fig. 2 is a view similar to Fig. 1 at a quarter turn in relation thereto. Figs. 3 and 4 are detail views relating to the clamping means.

In these drawings, 1 indicates the base of the apparatus supported upon feet 2, the said base or cylinder being slightly tapered upwardly and being of a form adapted to receive or be placed over any suitable heating flame or device. Upon the top of this heating chamber or cylinder a ring 3 is supported, and this ring carries the steam generating chamber 4 which is of substantially cup shape, and depends below the ring and into the heating chamber 1 extending about half way down the same. The wall of the generating chamber extends slightly above the upper surface of the ring 3 at the point 5, and this projecting edge is adapted to receive a cap plate 6 of circular form and which has an upwardly extending neck 7 at its central portion which supports a cylinder 8 which is considerably larger in diameter than the width of the neck portion 7 of the cap plate. This cap plate is also grooved for the purpose of seating properly upon the upper edge 5 of the generating chamber. The cylinder 8 contains within it a piston made up of an upper member 9 of disk form, and a lower member 10 of substantially cup form. The upper member 9 is slightly conical in form, and it has its edge beveled downwardly and inwardly, while the edge of the cup-shaped member 10 is beveled upwardly and inwardly, and between these two beveled edges a metallic packing ring 11 is arranged. The piston is carried by a stem or piston rod 12, the upper end of which is reduced or shouldered at 13,

furnishing a bearing for the cup-shaped member 10 and having also a screw-threaded projection 14 passing through the piston members, a nut 15 being employed to clamp the member 10 against the shoulder 13, and a nut 16 being employed to clamp the upper member 9, together with the metallic packing ring, against the upper beveled edge of the lower member 10. The piston rod 12, at its lower end, is connected with a yoke 17, the lateral arms 18 of which lie in close proximity to the inner surface of the generating chamber, the said arms, at their lower ends, being connected with a plate or disk 19 upon which the flask or flasks are placed for the vulcanizing operation, one of such flasks being indicated at 20. There is room within the yoke for receiving more than one flask arranged one above the other, but where only one flask is being used, a suitable block 20' may be employed to fill the space between the upper surface of the flask and the pressure plate 21, which is connected with the stationary cap plate 6, and is intended to afford the upper bearing or surface through which the necessary pressure is exerted upon the flasks in conjunction with the lower plate 19 during the vulcanizing operation. This upper plate or disk 21 is supported by a screw 22 passing there-through and into a plate or disk 23 which, in turn, is screwed as at 24 to the cap plate or head 6. The screw 22 for suspending the upper pressure plate 21 passes through an opening of somewhat larger size than the screw, the said opening having a lower flaring portion larger than the head of the screw, this construction permitting the pressure or equalizer plate to have a certain amount of free movement in order to adjust itself initially to any irregularities in the position of the cover of the flask, the arrangement being such, however, that when the final pressure is applied, the pressure plate will transmit the pressure to secure a proper seating of the cover of the flask.

In order to hold the cap plate or cover, together with the cylinder, the piston and the suspending yoke all in position, I provide clamping arms or levers 25 pivoted at 26 to ears 27 extending upwardly from the ring 3, each of said levers having an arm 28 reaching inwardly and over the top of the cover plate 6 to bear thereon, and to clamp the same against the upper edge of the generating chamber when pressure is

applied through the screw-threaded bar 29 pivoted at 30 to the upper end of one of the clamping arms and passing through the forked upper ends 31 of the other clamping arm, and having a nut or hand wheel 32 on its threaded end for drawing the clamping levers toward each other and forcing the cover plate firmly to its seat.

One object of my invention is to provide such an arrangement of cylinder and piston as will avoid initial friction between the piston and the cylinder, so that as soon as the steam pressure begins to rise, the piston will be free to move upwardly in the cylinder and lift the yoke, together with the lower pressure plate, to clamp the flasks and apply pressure thereto through the upper swiveled pressure plate 21, and I desire that this upward movement take place gradually and freely while the pressure of the steam is rising, and that when the steam pressure has risen to the desired point, the piston will then be steam tight within the cylinder.

With these objects in view, I have provided the piston arrangement described which fits sufficiently loose within the cylinder as to allow free initial movement. The lower cup-shaped member is, for instance, of cast brass, while the upper conical plate or disk, for example, is of yellow brass, and has greater freedom of expansion than the lower cast brass cup. From this arrangement and the employment of the metallic packing with the beveled contact edges in conjunction with the beveled edges of the members 9 and 10, the piston may be fitted to respond readily, though gradually, to the rise of steam in the steam chamber, and when the operation is about to be completed, the heat transmitted to the piston will cause an expansion of the upper member 9, and this, together with the slight flexing of both members due to the steam pressure, and their beveled edges, acting on the metallic packing, will cause the same to expand and make a steamtight fit on the inner wall of the cylinder, thus utilizing the full force of the steam pressure within the generating chamber. As shown in Fig. 2, the steam from the generating chamber is free to pass up through the openings at 33 through which the yoke arms 18 pass, and thence through the hollow neck 7 and the openings 34 into the cylinder. Any suitable form of steam gages or relief valves may be employed, as ordinarily, in connection with the apparatus. A handle 35 may be attached to the end of the neck portion 7 for convenience in handling the apparatus.

It will be seen from Fig. 2 that the neck 7 is elongated laterally, and it forms a guide for the upper cross bar of the yoke. The steam chamber is seated in the ring 3, and may be held by a set screw 36, Fig. 2. The

cover plate 6, together with the cylinder piston, and yoke or carrier, for the flask, may be lifted out of the steam chamber as one body by using the handle 35.

One object of the invention is to avoid the use of a tight packing when the vulcanizing operation is started, and after the steam pressure has risen to the required point and the clamping effect has progressed the object is to then have the packing of a steamtight character, so as to secure the full effect of the steam pressure on the piston to exert mechanical pressure upon the flasks while the material therein is vulcanizing. The objection to an initially tight packing held in strong frictional contact with the walls of the cylinder is that the compressing effect on the flasks will not be progressive, but the piston, by reason of its frictional contact with the walls of the cylinder, will remain substantially fixed until a considerable steam pressure has been generated in the cylinder, and then the piston will be forced suddenly upwardly and extreme pressure brought with shock upon the flasks, resulting in damage to the material being vulcanized. With my arrangement the piston is sensitive in its movement to the action of the steam pressure, and the mechanical pressure upon the flasks is exerted gradually and progressively from beginning to end of the operation.

It will be observed from Fig. 4 that the clamping feet 28 are bifurcated so that their ends contact with the cover or clamping means 6 at separated points.

I claim as my invention:—

1. In combination with the steam generating chamber, a cylinder connected therewith, a carrier for the flasks, and a piston connected with the carrier, said piston having upper and lower members with beveled edges and a packing ring between having beveled edges and adapted to expand by pressure exerted thereon from the upper and lower members, substantially as described.

2. In combination with the steam chamber and flask carrier, a cylinder and a piston therein having upper and lower members with beveled edges and a packing ring between with upper and lower beveled edges, the said upper member being of arch shape and under expansion serving to expand the packing ring against the wall of the cylinder, substantially as described.

3. In combination the heating chamber, a ring resting thereon, a steam generating chamber seated in the ring, a cover plate carrying a cylinder, a carrier for the flasks, a movable member in the cylinder connected with the carrier, and clamping levers pivoted to the ring and reaching over the cover plate, with means for drawing the levers together, substantially as described.

4. In combination a steam chamber, a
cover plate having an upwardly extending
neck surmounted by a cylinder, a movable
member therein, a flask carrier having a
5 cross bar extending through the neck and
connected with the movable member, a cross
plate extending over the lower opening in
the neck below the cross bar, and a pressure
plate centrally and movably mounted on
said cross plate, substantially as described. 10
In testimony whereof, I affix my signature
in presence of two witnesses.

GEORGE L. BRUCE.

Witnesses:

GEO. W. CARRICK,
JESSIE M. CARRICK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."