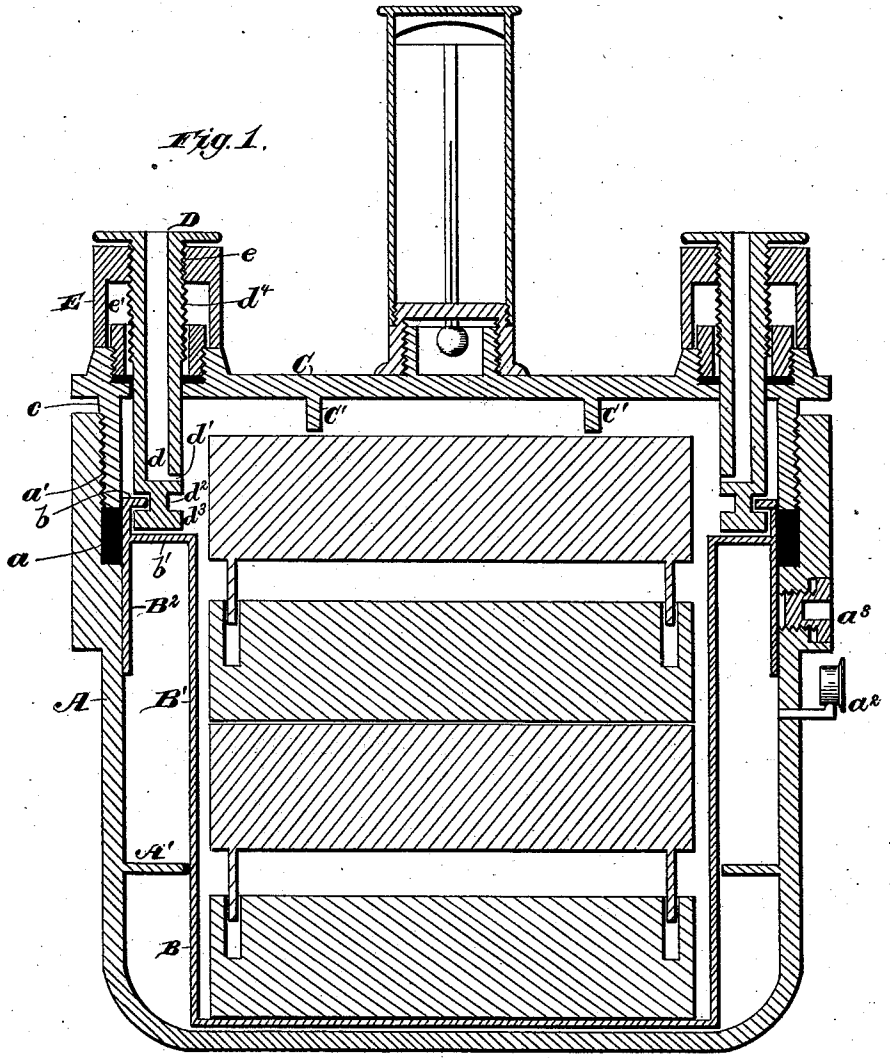
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G. P. RISHEL.

VULCANIZING AND CELLULOID APPARATUS.

No. 287,723. Patented Oct. 30, 1883.

Fig. 1.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

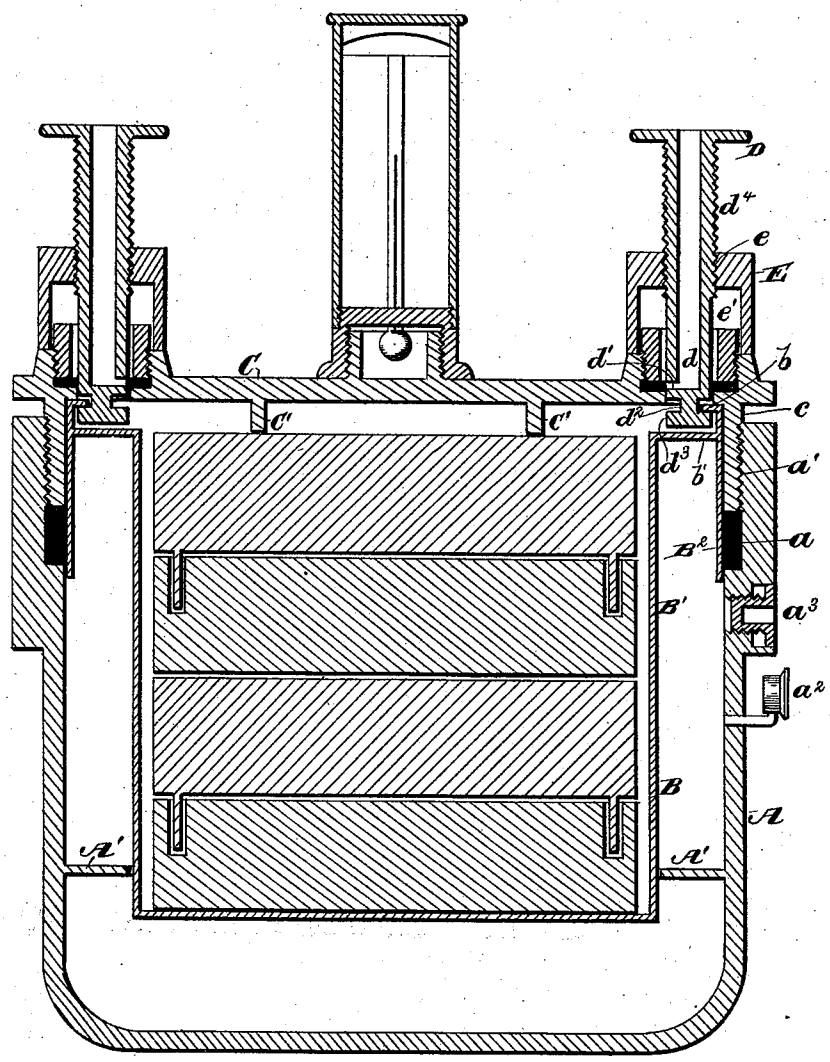
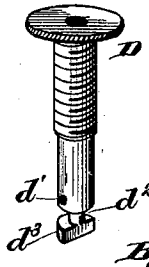


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE P. RISHEL, OF HORNELLSVILLE, NEW YORK.

VULCANIZING AND CELLULOID APPARATUS.

SPECIFICATION forming part of Letters Patent No. 287,723, dated October 30, 1883.

Application filed March 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. RISHEL, a citizen of the United States, residing at Hornellsville, in the county of Steuben and State of New York, have invented new and useful Improvements in Vulcanizing and Celluloid Apparatus, of which the following is a specification.

My invention relates to a vulcanizer and celluloid apparatus adapted particularly for dental use; and the novelty consists in the construction and arrangement of parts, as will be more fully hereinafter set forth, and specifically pointed out in the claims.

The object of the invention is to produce an apparatus that will generate steam for the treatment of rubber and celluloid in flasks or molds, the generated steam being utilized as a motor for pressing the flasks together; and to these ends the invention consists, essentially, in two cylindrical steam-tight compartments, one operating inside, the other as a piston, the space between the two being adapted to hold water for the generation of steam when heat is applied. The interior or piston cylinder is adapted to receive the flasks which contain the plaster molds into which the blanks are placed. The outer cylinder and a cap are secured firmly together by a screw-thread connection, and at this point packing is interposed to make a steam-tight joint. The flasks are placed within the piston or interior cylinder, which is forced upward until the top flask bears against the cap by the expansion of the steam in the chamber between the two cylinders, and means are provided for the escape of steam or air from the interior of the inner cylinder until the said inner cylinder has reached a predetermined point, or after the flasks have been closed by the pressure, and at this point in the operation of the devices means are provided for locking the flasks in that position until they are cooled. The heat produced by the generation of the steam in the flasks tends to soften the rubber or celluloid and at the same time to gradually and automatically close the flasks, the heat which generates the steam being continued until the material is cured.

The devices which comprise the invention are fully illustrated in the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a central vertical section with the flasks in position and the apparatus ready for heat to be applied. Fig. 2 is a similar view, showing the flasks closed, the inner cylinder at the end of the upstroke and locked. Fig. 3 is a perspective view of a detail.

Referring to the drawings, in which similar letters of reference indicate like parts in all the figures, A indicates the exterior cylinder, which, for convenience, will be hereinafter designated as the "boiler-cylinder," and B the interior cylinder, which, for the same reason, I will hereinafter designate the "piston-cylinder." The boiler-cylinder A, near its upper extremity, is of increased diameter to form a packing-chamber, *a*, and has an interior threaded portion, *a'*, which engages a threaded annular flange, *c*, upon the cap C. As the cap C is screwed down into the boiler-cylinder the annular flange *c* compresses the interposed packing in the chamber *a* and makes a steam-tight joint.

Formed upon the inner surface of the boiler-cylinder is a horizontal annular flange, A', which serves as a guide to the piston-cylinder B, which moves therein. The boiler-cylinder is provided with a suitable steam-gage, a^2, and a blow-off, a^3, for purposes which will be obvious.

The piston-cylinder B has a closed bottom, and is composed of a main cylindrical portion, B', which operates within the annular flange A', and a larger cylindrical portion, B^2, which is of slightly smaller diameter than the interior of the boiler-cylinder A and covers the packing-chamber *a*. From the upper edge of this portion B^2 a flange, *b*, projects inward, and parallel with this flange *b* is the web *b'*, which connects the portions B' and B^2 of the piston-cylinder.

As the cap C and boiler-cylinder A remain stationary and the piston-cylinder with closed bottom moves upward, it is obvious that means must be provided for the escape of the air and steam that is in the interior of the piston-cylinder. To this end I employ two metal bolts, D, which pass through proper apertures in the

cap C, each having a central longitudinal passage extending from the top to a point near the lower end thereof, as seen at d, and thence at right angles thereto, as seen at d', to connect with the interior space between the piston-cylinder B and the cap C. This passage $d\,d'$ in the bolt D will, it will be observed, connect with the outer air until the passage d' passes into the packing of the aperture in the cap C, through which the bolt passes, which will only occur when the cylinder is at or near the end of its upstroke, and further escape through the passages $d\,d'$ is not needed.

Below the channel or passage d' each bolt D is solid, and has a cylindrical neck or shank, d^2, and a locking-plate, d^3, all formed in a single piece. In one position the plate d^3 will pass readily by the flange b when a quarter-turn—that is say, one-fourth of a revolution—will bring said plate under the flange b, between it and the web b', and securely lock the parts D and B together.

The bolt D is provided with internal threads, d^4, which engage the threads e of a nut, E. This nut has a central chamber, e', and its lower edge finds a seat upon the cap C, as shown. By this means, when the piston-cylinder has completed its upstroke, the flasks are closed and the heat discontinued. The parts may be locked by screwing this nut E down upon its seat until the cooling process is effected.

In this art an even uniform temperature throughout the flask is not only desirable, but to secure good results necessary. In my construction the piston-cylinder gives the uniform heat of the boiler to bottom and sides of the flasks, and to provide for the same temperature over the tops of the flasks I provide the cap c with downwardly-extending projections c', which form a bearing for the upper surface of the flasks. It will therefore be observed that the heat may circulate over the tops of the flasks, and that the stroke of the inner or piston cylinder may extend above the top of the boiler cylinder and higher than the horizontal plane of the flasks. This is an important step in the art, and comprises a prominent feature in this invention. The steam, as it generates, imparts heat to the material being cured, and the gradual increase of pressure elevates the piston-cylinder; hence in the first stages in the generation of steam no steam-exit is required. For this reason I locate the blow-off a^3 in the boiler-cylinder opposite the cylinder B^2 of the piston-cylinder, as the steam-pressure will never require reduction until the said cylinder B^2 has uncovered the blow-off a^3.

Modifications in details of construction may be made without departing from the principle or sacrificing the advantages of my invention, the essential features of which will be readily understood from the foregoing description, taken in connection with the drawings.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a vulcanizing and celluloid apparatus, two concentric cylinders and a cap secured to the outer cylinder to form a steam-tight joint, the space between the two cylinders being formed into a boiler, and the inner cylinder being adapted to serve as a piston to press the material between its closed bottom and the cap as it is impelled by the steam generated in the boiler, combined with means for automatically allowing egress of gas, &c., from the inner chamber, substantially as described.

2. In a vulcanizing and celluloid apparatus, and in combination with the cylinder A, having guide-flange A', and the cap C, the piston-cylinder B, composed of the portions B' and B^2, and the web b', as and for the purpose set forth.

3. In a vulcanizing apparatus, as described, a hollow locking-bolt connecting the interior of the piston-cylinder with the outer air, combined with such piston-cylinder, and adapted to serve substantially as set forth.

4. In combination with the cylinder B, having flange b, the bolt D, having passages $d\,d'$ and plate d^3, and the cap C, as set forth.

5. In combination with the piston-cylinder, the cap, and the bolt D, the nut E, adapted to lock the cap and piston together, as set forth.

6. In a vulcanizing and celluloid apparatus, substantially as described, the cap C, having projections C', whereby the stroke of the piston may exceed the height of the flasks, as set forth, for the purposes described.

7. The combination of the boiler-cylinder A, having blow-off a^3, located as described, the piston having cylindrical portion B^2, as set forth.

8. In combination with the boiler A, having packing-chamber a and guide-ring A', the piston-cylinder B, as shown, the cap C, having projection C' and flange e, and blow-off a^3, as set forth.

9. In combination with the boiler-cylinder, piston-cylinder, and cap, as described, the bolt D and locking-nut E, as shown, all adapted to serve as and for the purpose set forth.

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

GEORGE P. RISHEL.

Witnesses:
HOMER HOLLIDAY,
WM. C. BINGHAM.