(No Model.) 2 Sheets—Sheet 1.

J. F. THEURER & R. BIRKHOLZ.

BOTTLE SOAKING APPARATUS.

No. 467,137. Patented Jan. 12, 1892.

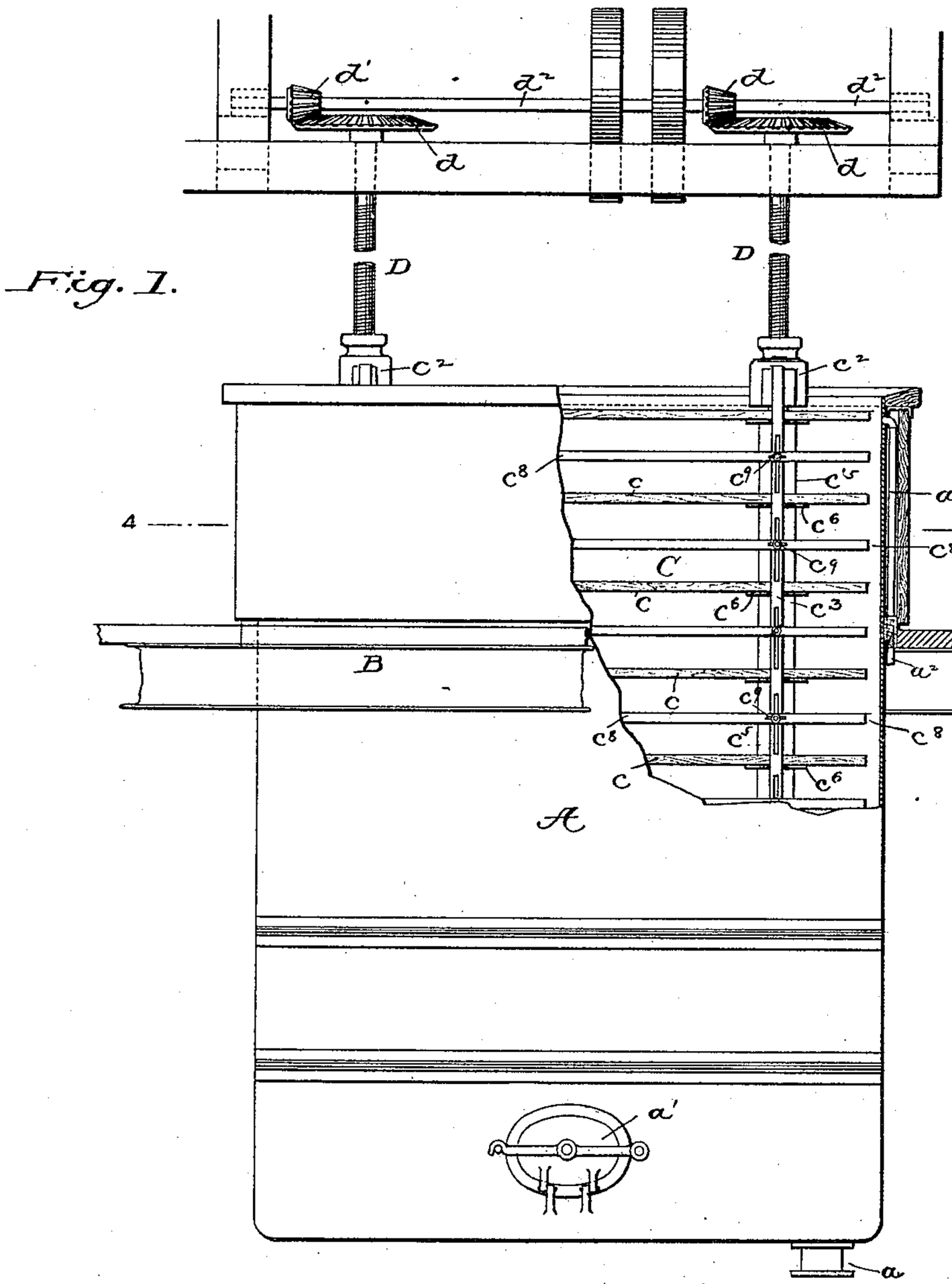

Fig. 1.

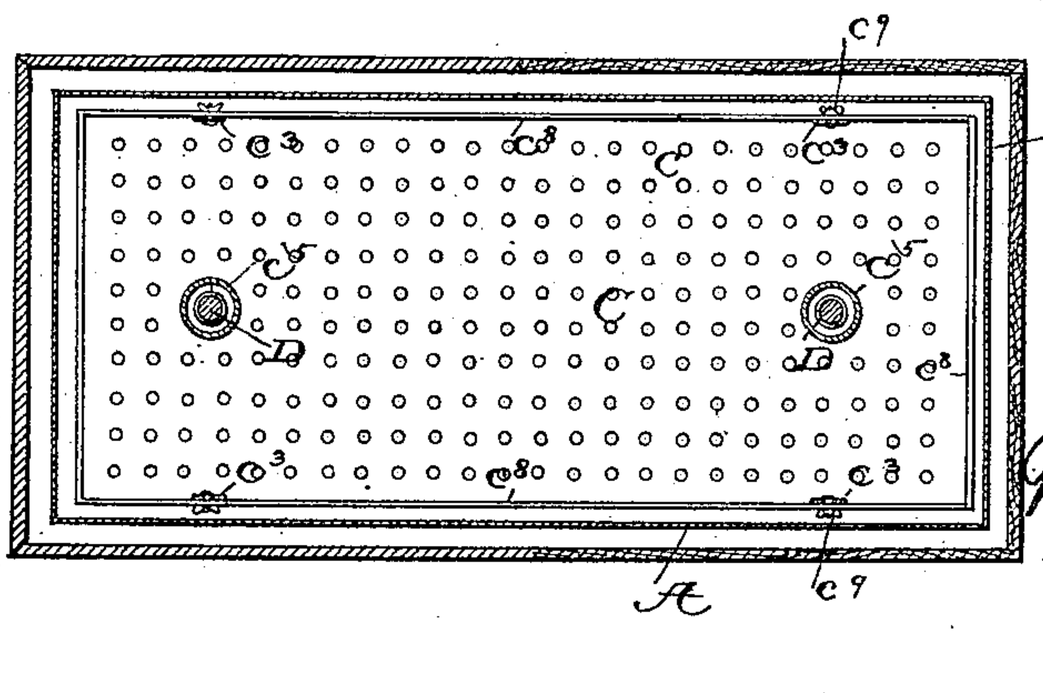

Fig. 4.
on line 4-4

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

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BOTTLE SOAKING APPARATUS.

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Fig. 2.

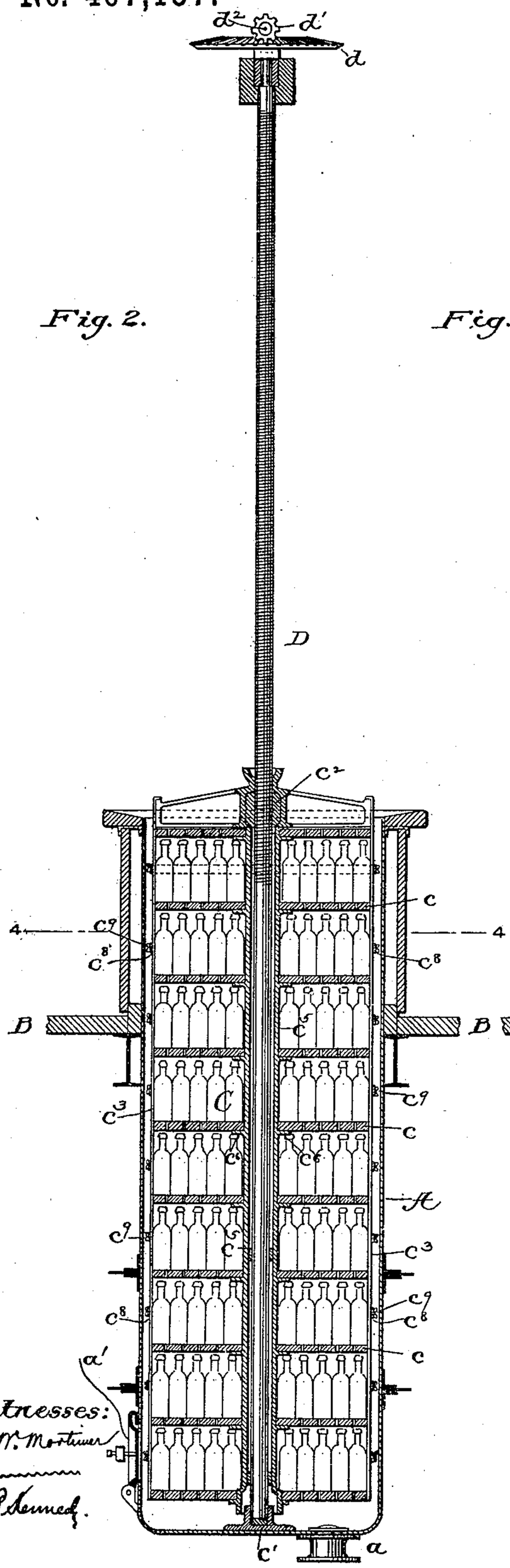
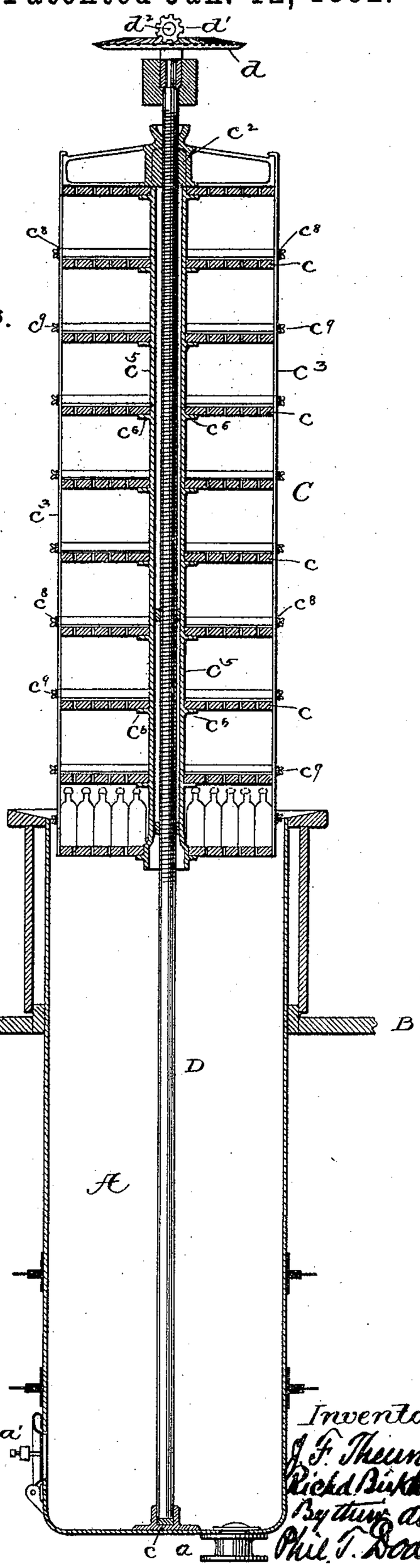


Fig. 3.



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UNITED STATES PATENT OFFICE.

JACOB FRED THEURER AND RICHARD BIRKHOLZ, OF MILWAUKEE, WISCONSIN.

BOTTLE-SOAKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 467,137, dated January 12, 1892.

Application filed May 20, 1891. Serial No. 393,441. (No model.)

To all whom it may concern:

Be it known that we, JACOB FRED THEURER and RICHARD BIRKHOLZ, of Milwaukee, county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Bottle-Soaking Apparatus, of which the following is a specification.

This invention relates to an apparatus for use in soaking bottles in large numbers, in order that all foreign matters may be readily removed therefrom in a subsequent washing operation preparatory to their being filled.

In practice it is found that many foreign substances adhere with great tenacity to the interior of bottles, so that it is necessary to immerse them for long periods of time in a suitable fluid in order to dissolve or soften the adhering matters that they may be removed.

In handling bottles on a large scale—as, for example, in breweries—the immersion and removal of bottles have been attended with great labor and expense and generally with unsatisfactory results, as the air imprisoned in the shoulder or bilge of the bottles frequently prevented the contact of the fluid with the entire surface. Now the present apparatus is intended to give support to a large number of bottles, to maintain them in an upright position, and to provide for their being lowered into and lifted out of the fluid in a convenient and rapid manner.

The apparatus consists, essentially, of a deep stationary tank adapted to contain the cleansing-fluid and of a skeleton frame or cage adapted to sustain the bottles, and screws or equivalent mechanism whereby said cage may be raised from or lowered into the tank at will.

The cage is constructed with a series of horizontal shelves or supports at different levels adapted to receive and sustain the bottles in an upright position, so that the operator, standing adjacent to the apparatus, may conveniently place the bottles upon and remove them from the successive shelves as the cage is raised and lowered, so as to bring the shelves one after another in convenient position.

Referring to the drawings, Figure 1 is a side elevation of the apparatus, with one end partly in section, the bottle-supports being lowered into the tank. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a similar section with the bottle-support partly elevated. Fig. 4 is a horizontal section on the line 4 4, Figs. 1 and 2, looking in a downward direction.

In the accompanying drawings, A represents a tank made of boiler-iron or other suitable material and of any appropriate size and form. In practice it is found that a depth of about twelve feet by a length of about ten feet are desirable dimensions. The tank may be sustained in any suitable manner; but it is recommended, as shown in the drawings, that it be suspended downward through the operating-floor B, with its upper edge about three feet above the floor. At or near the bottom the tank is provided with a branch pipe a, closed by a valve of any suitable character and with a man-hole a' to permit access to its interior for cleansing purposes. It is also provided with an overflow-pipe a^2 to regulate the height of the fluid therein.

C represents the bottle-supporting cage or frame, having a series of horizontal shelves c, on which the bottles are placed. The cage is supported by two or more vertical screws D, which are extended downward through the cage and stepped at their lower ends in bearings c', at the upper ends the screws being provided with gear-wheels d, engaging pinions d' on a shaft d^2, which may be operated by power or by hand, in order to rotate the screws in unison and thus raise or lower the cage bodily, thus causing their surface to appear above or disappear within the tank successively.

The cage may be variously constructed; but, as shown in the drawings, it consists of the internally-threaded yokes c^2, fitted upon the screws and giving support to a series of depending bars or rods c^3, which in turn give support to the outer edges of the perforated or slatted shelves c. Each screw is surrounded by a vertical tube or sleeve c^5, which is attached to the yoke and extended down through the cage and provided with the annular collars c^6 to assist in supporting the shelves. As the entire weight of the cage is sustained by the yoke above the tank, the thread of the screw is terminated above the

fluid-level, and it will be seen that owing to this fact corrosive fluids may be used without affecting the operative portion of the screw.

The shelves may be constructed of perforated sheet metal, metallic bars, or other suitable material, or they may consist of skeleton frames covered with wire-gauze, the only requirement being that they shall give proper support to the bottles and permit a free passage of the fluid to and fro.

In order to confine the bottles in position upon the shelves, a series of vertically-adjustable horizontal bands c^8 are extended around the cage and secured by thumb-screws c^9 or equivalent fastenings to the vertical bars c^3, so that they may be raised or lowered and fixed in position at will.

In making use of the apparatus the tank is filled with water, acid, or alkaline solutions or other suitable fluid. The cage is then lifted until its bottom shelf is above the fluid-level and in convenient reach of the attendant standing on the operating-floor at the side of the tank. The bottles are then placed in close order and in an upright position on the bottom shelf and the band c^8 lifted and fastened in position to prevent them from tipping or floating out of place. The cage is then lowered until the next shelf is brought into position to be filled, and so on repeatedly, the cage being thus lowered step by step until all of its shelves are occupied and immersed in the fluid, so as to retain the bottles in a vertical position, in which position all the contained air may escape past the bilge or shoulder, so that the bottles will be completely filled and every portion of the internal surface exposed to the action of the fluid. After the lapse of a suitable time the operation is reversed, the cage being lifted step by step and the bottles removed, the retaining-bands being first lowered out of the way.

Having thus described our invention, what we claim is—

1. In a bottle-soaking apparatus, the combination of a tank, a cage or frame to sustain the bottles, and mechanism for lowering the cage into and lifting it from the tank in a vertical direction and sustaining it at different heights, as demanded.

2. In a bottle-soaking apparatus, the combination of a deep tank, a cage or support for the bottles, having a series of shelves at different heights, means for confining the bottles laterally upon said shelves, and controllable mechanism for lowering said cage into and raising it out of the tank.

3. In a bottle-soaking apparatus, the combination of a deep tank, a cage or bottle support, vertical screws to support and guide said cage, and mechanism for operating the screws in unison.

4. In a bottle-soaking apparatus, and in combination with a tank, a vertically-movable cage or carrier having a series of horizontal shelves, and vertically-adjustable bands or hoops to confine the bottles laterally upon the shelves.

5. In a bottle-soaking apparatus, the combination of the tank, the vertical screws having their lower ends seated in bearings at the base of the tank, and a cage or bottle support guided upon the screws, and thread to engage the same above the fluid-level, whereby the cage is guided throughout its descent and the operative portion of the screw protected from injury by the fluid.

In testimony whereof we hereunto set our hands, this 16th day of April, 1891, in the presence of two attesting witnesses.

JACOB FRED THEURER.
RICHD. BIRKHOLZ.

Witnesses:
A. ZAUMEYER,
E. G. AUGER.