(No Model.)

J. F. H. GRONWALD & E. H. C. OEHLMANN.

STERILIZING APPARATUS.

No. 459,284. Patented Sept. 8, 1891.

Fig. 1.

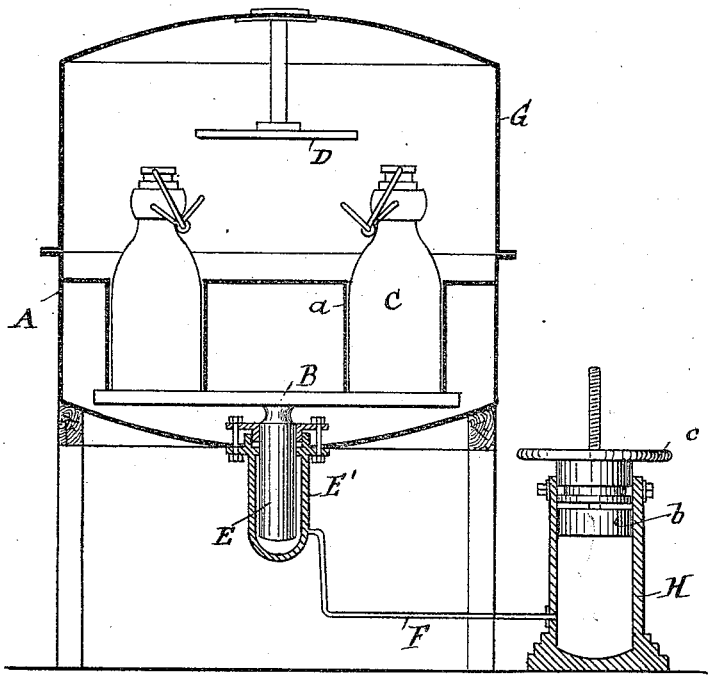
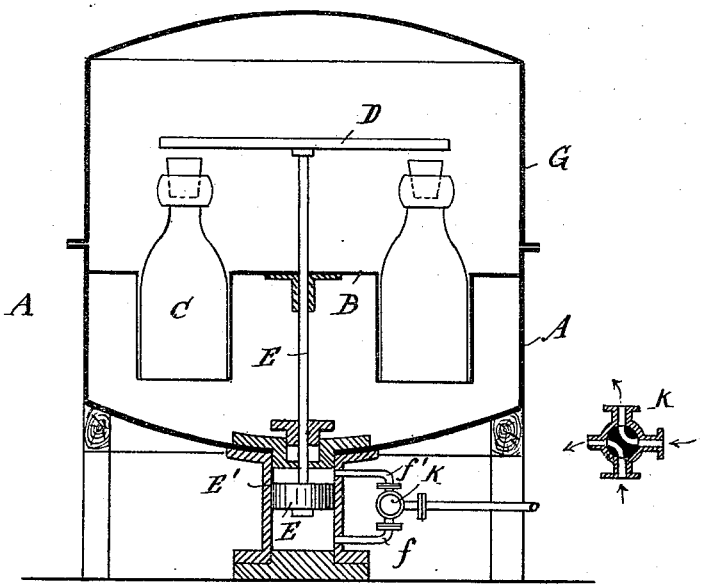


Fig. 2.



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UNITED STATES PATENT OFFICE.

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STERILIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 459,284, dated September 8, 1891.

Application filed June 14, 1890. Serial No. 355,497. (No model.)

To all whom it may concern:

Be it known that we, JOHANN FRANZ HUGO GRONWALD and EMIL HEINRICH CONRAD OEHLMANN, subjects of the King of Prussia, Empire of Germany, and residents of Berlin, Germany, have invented certain new and useful Improvements in Sterilizing Apparatus; and we declare the following to be a full, clear, and exact description of the same.

The improvements herein described appertain to sterilizing apparatuses in which the vessels in the interior of the apparatus are closed by a device consisting of a press, also on the inside of the apparatus, in which, however, the presser works, not directly, but indirectly from the outside, and a closing of the vessels is thereupon effected, also indirectly, through the nominal assistance of an energetic medium, such as liquid, steam, compressed air, &c., which mediums are also brought to bear from the outside.

Two processes are given in the accompanying drawings as examples.

Figure 1 shows the application of water or a fluid as a medium of pressure, while in Fig. 2 is shown the application of pressure by water, steam, or compressed air.

In both processes either the support containing the vessels may be firmly fastened and the press be movable, or vice versa.

The bottom of the apparatus supports the table B in the heating-chamber, which table is provided in the regular manner with troughs *a* for the vessels C.

After the table containing the vessels has been arranged so as to be movable and the press D has been firmly fastened, Fig. 1, or vice versa, Fig. 2, the table B or the presser D, as the case may be, is provided with a piston-rod E, which, passing through the bottom of the heating-chamber A, Fig. 1, or through the support B for the vessels and then through the bottom of the heating-chamber A, Fig. 2, runs into a cylinder E′, fixed on the bottom of the lower half of the apparatus A. The pipe F, conducting the medium designed to act on the support B or on the presser D, leads into this cylinder.

The working of this apparatus is as follows: The heating-chamber A is filled with water, which is made to boil by steam or it is heated directly by steam. The vessels C (shown in the drawings) being filled with milk are placed in this chamber and the stoppers are loosely laid directly in the mouths of the vessels, so that their fastening-wires may be engaged by the press D. The upper part G of the heater A is then placed on the lower part. A hermetical fastening of the two to one another is not necessary, because of the steam arising from the sterilizing process, which drives out the air in the interior of the apparatus and completely guards against the forcing in of fresh air into the apparatus.

The sterilizing process finished, to bring the medium to bear on the piston-rod is the next step in the process set forth in Fig. 1. When the piston *b* is forced down into cylinder H by means of hand-wheel *c*, the medium (in this case liquid—*e. g.*, water) which is in cylinder H underneath the piston *b* exerts a pressure through the pipe F under the piston E. The table B is pushed upward and the fasteners of the stoppers of the vessels are brought into contact with the presser D and close the vessels when the table is raised higher. The piston is now screwed back and the table B descends in consequence of its specific gravity and forces the energetic medium, attracted also by suction of the piston *b*, back into cylinder H. In place of cylinder H and piston *b* we may substitute a hand-pump.

In the process shown in Fig. 2 steam, compressed air, water, and the like are used as energetic mediums, and here one should be able to move the press D in both directions, up and down, through the cylinder. To accomplish this a four-way cock K is inserted in the tube F, from which the branch *f* conducts the medium under and the branch *f′* conducts it over the piston E. The presser is thus forced upward during the corresponding position of the four-way cock and is forced downward by its opposite movement, and thus the closing of the vessels is brought about.

What we claim is—

1. In an apparatus for closing bottles or other vessels, the combination of a closed chamber, a table within the chamber on which are placed the bottles or other vessels, a press-

er-plate D, also within the chamber, and a piston and cylinder with suitable pipe connections arranged outside of the chamber and adapted to cause the said table and presser to approach each other to close the bottles, substantially as set forth.

2. In a sterilizing apparatus, the combination, with the heating-chamber A, of the movable presser D, fixed support B, piston-rod and piston E, cylinder E′, and a supply-pipe leading to said cylinder and having a cock interposed in its length to control the movements of said piston, substantially as set forth.

In witness whereof we have hereunto set our hands in presence of two witnesses.

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Witnesses:
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