(No Model.)

J. F. THEURER.

APPARATUS FOR STERILIZING AIR.

No. 413,983. Patented Oct. 29, 1889.

Fig. 1.

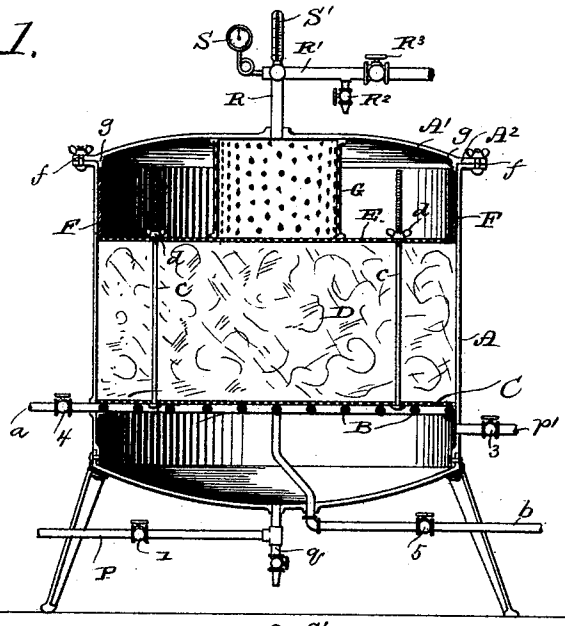
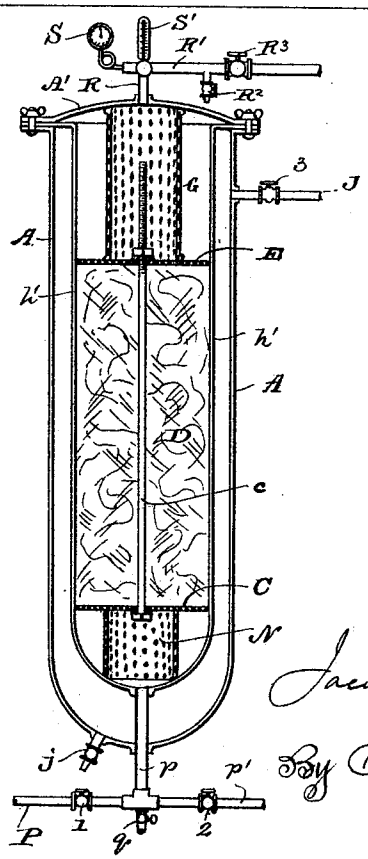


Fig. 2.



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UNITED STATES PATENT OFFICE.

JACOB F. THEURER, OF MILWAUKEE, WISCONSIN.

APPARATUS FOR STERILIZING AIR.

SPECIFICATION forming part of Letters Patent No. 413,983, dated October 29, 1889.

Application filed March 29, 1889. Serial No. 305,275. (No model.)

To all whom it may concern:

Be it known that I, JACOB F. THEURER, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Apparatus for Sterilizing and Filtering Air; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to devices for sterilizing air for various uses and will be fully described hereinafter.

In the drawings, Figure 1 is a vertical central section of one form of my device, and Fig. 2 is a like view of a modified form thereof.

A is the tank, in which is arranged a steam-coil B, which latter supports a perforated floor or diaphragm C. The coil receives its steam from pipe *a* and exhausts through pipe *b*. Upon floor C is placed a raw-cotton filling D, and above this filling and resting on it is a perforated diaphragm E, and rods *c*, that are headed at their lower ends and screw-threaded at their upper ends, are passed up through the floor C and diaphragm E, and then, by means of nuts *d*, which are placed on the screw-threaded portions of rods *c*, the diaphragm is drawn down on the cotton, so as to compress it as solidly as possible. A ring of metal F is then inserted in the tank above the diaphragm, its lower edge resting on the outer edge of the diaphragm, and upon the center of the diaphragm is placed an open-ended cylinder G, the sides of which are perforated, as shown. The top A′ is then placed on the tank, its flange A^2 resting upon a like flange of the tank, to which it is secured by bolts *f* and their nuts. On the under side of top A′ an annulus *g* is formed, and this annulus, when the top is in place, rests upon ring F and holds it down on the diaphragm and contributes to the pressure upon the cotton.

In Fig. 2 I show a modified form of filter, in which there are two concentric walls A and *h*′, with a space between them for heating steam, and there are two diaphragms E C, inclosing the cotton between them. The two diaphragms are drawn together by a rod *c*, and the lower diaphragm is supported by a perforated cylinder N, while a like cylinder G rests on this upper diaphragm and is held down upon it by the top A′, which is secured in place as in Fig. 1.

J, Fig. 2, is a steam-pipe that performs the work of pipe *a* in Fig. 1. This pipe enters the space between the walls A *h*′ and conveys steam thereto, that is exhausted through cock *j*.

P in Figs. 1 and 2 is a steam-pipe which leads into a pipe *p*, that opens up in the filter in the space under the lower diaphragm, and *p*′ is an air-pipe that opens into the same space from the side of the filter in Fig. 1, and in Fig. 2 this pipe leads into the coupling that connects pipes P and *p*′ together. *q* is a drain-cock for the bottom of the filter.

R is an outlet-pipe that extends up from the top of the filter, and this pipe carries a steam-gage S and thermometer S′. This last-named pipe is connected with the receptacle in which the purified air is to be used by another pipe R′, in which is a valve R^2 and cock R^3.

The pipe P is provided with a valve 1, pipe *p*′ with a valve 2, pipe J with a valve 3, and pipes *a* and *b* with valves 4 and 5, respectively.

The figures of the drawings show the arrangement of parts in my filter when ready for use; but the filtering material must be free from germs before use. Therefore valve 4 is opened and steam is let into coil B and at the same time live steam is let into the bottom of the filter through pipe P, which last-named steam, passing up through the cotton D, is allowed to escape through pipe R and cock R^2, and the temperature is raised by the steam in coil B to about 150° Celsius. After about an hour and a half the valve 1 is closed and the cotton is dried by admitting air through pipe *p*′, which, escaping through cock R^2, dries the cotton which has been degerminated by the heat and steam. The valves may now all be closed, except 3 in pipe *p*′ and R^3 in pipe R′, which leads to the receptacle in which the air is to be used.

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

1. The combination, with the diaphragms and inclosed filtering material, of the compressing-rods, superimposed perforated cylin-

der, and ring and top adapted for being clamped in place on the tank, substantially as set forth.

2. The combination, in a vessel containing a fibrous filtering material, of a steam-coil, an inlet for conveying steam directly to the filtering material, an inlet for the air to be filtered, and outlets for the steam and air, substantially as described.

3. In an apparatus for sterilizing and filtering air, the combination, with a tank, of two loose perforated diaphragms, a fibrous filtering material contained between them, a steam-conductor arranged adjacent to the said filtering material, a steam-inlet for conveying steam directly thereto, an inlet for the air to be filtered, outlets for the steam and air, and one or more compressing-rods extending from the lower to the upper diaphragm and provided with a compressing and tightening nut or nuts, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

JACOB F. THEURER.

Witnesses:
WILLIAM KLUG,
S. S. STOUT.