

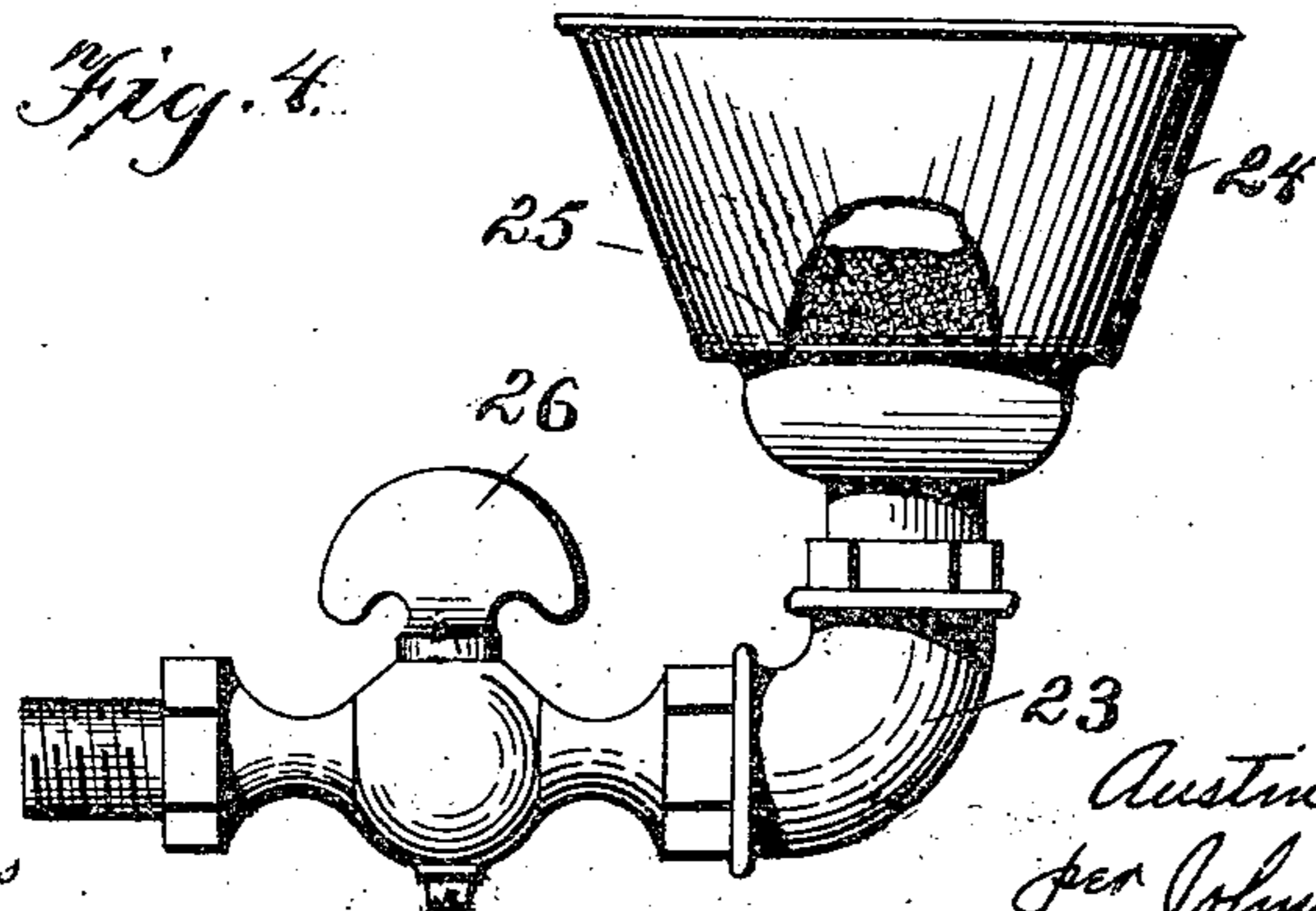
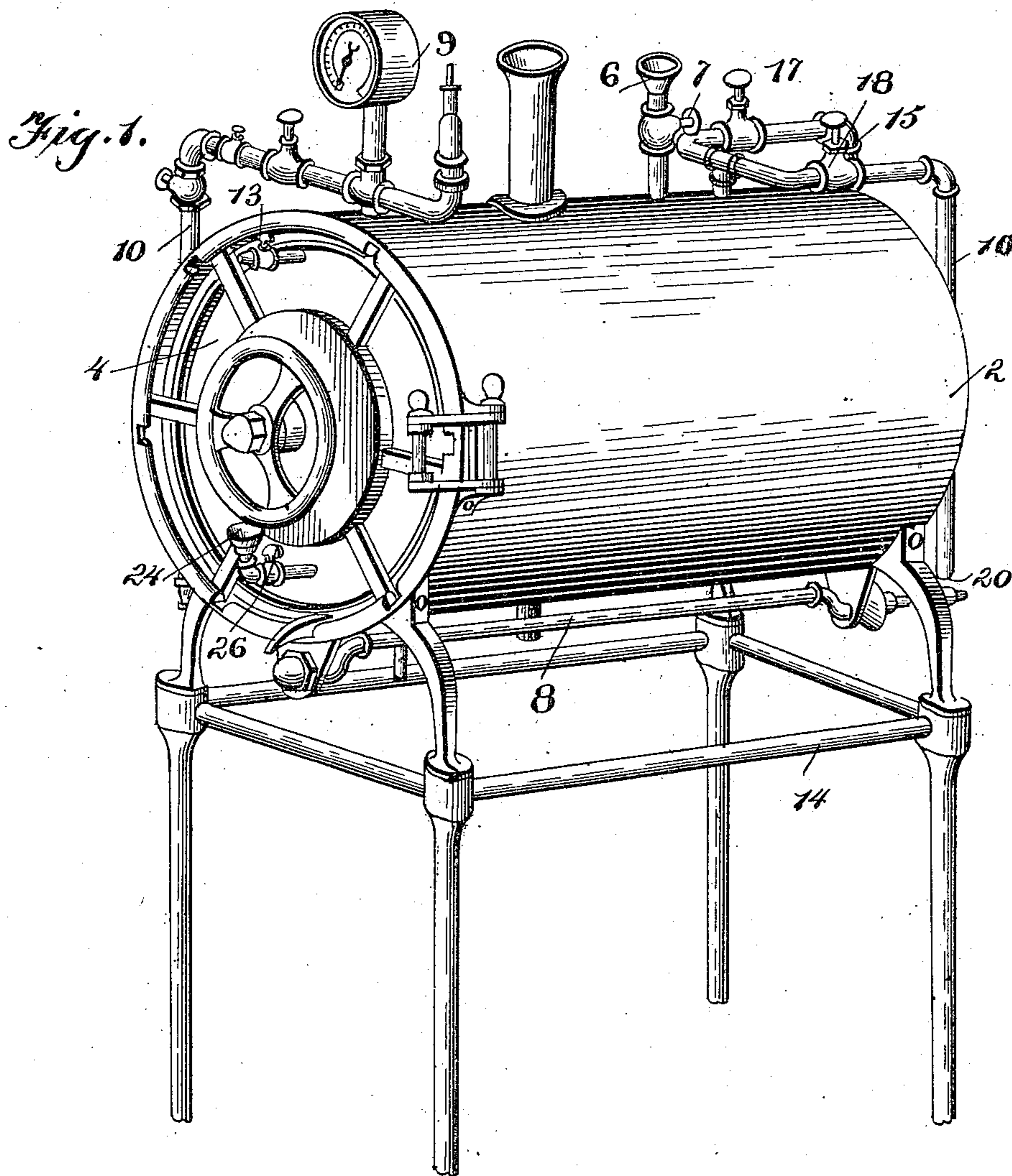
(No Model.)

2 Sheets—Sheet 1.

A. V. M. SPRAGUE.
STERILIZING APPARATUS.

No. 583,514.

Patented June 1, 1897



Witnesses
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Inventor
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Attorney

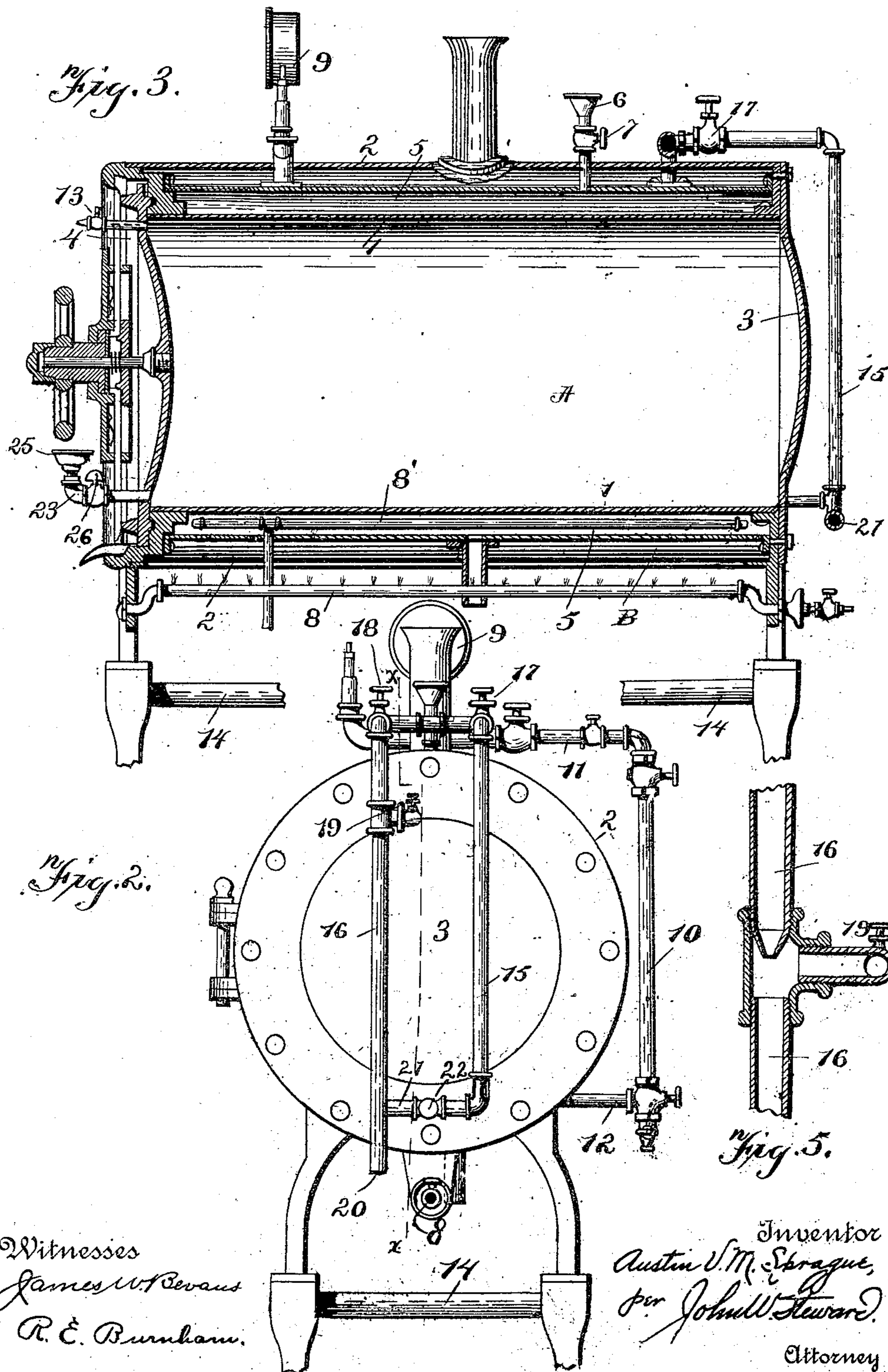
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UNITED STATES PATENT OFFICE.

AUSTIN V. M. SPRAGUE, OF BROOKLYN, NEW YORK.

STERILIZING APPARATUS

SPECIFICATION forming part of Letters Patent No. 583,514, dated June 1, 1897.

Application filed February 18, 1897. Serial No. 623,936. (No model.)

To all whom it may concern:

Be it known that I, AUSTIN V. M. SPRAGUE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Sterilizing Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to sterilizers, and it may be referred to the class of sterilizers which are employed by physicians and surgeons for the purpose of sterilizing surgical instruments, dressings, and other articles of like character.

My invention relates particularly to sterilizers in which steam is employed as the sterilizing agent; and the object of the invention is to provide means for previously exhausting all air from the sterilizing-chamber, so that the steam, when admitted, may be free to penetrate all parts of the said chamber and the articles contained therein; and the object is also to prevent any moisture from collecting upon the articles during the process of sterilization by providing means by which the steam which is present in the chamber may be first exhausted therefrom before opening said chamber, so that the consequent admission of comparatively cold atmospheric air will not cause condensation. I accomplish these objects by the use of an ejector. Said ejector is made to perform the double function of exhausting the air from the chamber previously to the admission of steam thereto and of exhausting the steam from said chamber previously to the admission of the air from the atmosphere when the chamber is opened. The exhaustion of the steam from the chamber produces a vacuum therein, which vacuum must be overcome before the door of the apparatus can be opened. To destroy this vacuum air is admitted to the chamber, but it is obviously undesirable to admit any but purified air, and this fact gives rise to a further object of invention—viz., means for filtering the air before its admission to the sterilizing-chamber. The various elements which I have provided for accomplishing these objects and their arrangements will be hereinafter more fully described with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the apparatus provided with my improvements. Fig. 2 is a rear view of my improved apparatus. Fig. 3 is a longitudinal sectional view of the improved apparatus on line *x x* of Fig. 2, and Figs. 4 and 5 show the construction of certain details involved in my invention.

In said drawings, 1 and 2 are respectively the interior and exterior casings, having a common wall 3 and forming the sterilizing-chamber A and the combustion-chamber B. The chamber B is open at the bottom and is provided with a chimney at the top for the emission of the products of combustion.

The casing 2 extends somewhat beyond the casing 1 at the front end and is provided with a door 4, which is so constructed with a suitable locking device as, when closed and locked, to be practically proof against the escape of air or steam.

The inner chamber 1 is surrounded by a steam-jacket 5, into which water may be poured through a funnel 6, which extends upwardly through the top of the casing 2 and is provided with a valve 7. The chamber or jacket 5 has an outlet-pipe at the bottom for draining the water from said jacket.

Any suitable heating apparatus may be employed. I have shown herewith two forms of heating devices, the one, 8, being a simple Bunsen burner suitably secured beneath the opening in the bottom of the outer casing and the other, 8', consisting of a steam-coil loop which enters the jacket 5 and lies in the bottom thereof. Either of these two forms are respectively adapted to be detachably connected to a source of gas or steam, so that either or any other suitable heating apparatus may be used.

A gage 9 for indicating steam-pressure surmounts the apparatus, and a water-gage 10 is hung in brackets 11 12 at the side thereof, so as to indicate the amount of water present in the steam-jacket.

Communicating through the top of the door with the chamber A is a common petcock 13, the opening of which is adapted to indicate the presence of steam in said chamber.

A suitable frame 14 serves to support the apparatus at a height which is most convenient to the operator.

The device for exhausting the steam or the air, as the case may be, from the sterilizing-chamber may be described as follows: At the

back of the apparatus are the vertically-arranged parallel pipes 15 and 16. Both pipes extend over the top of the apparatus and communicate with the steam-jacket. Communication through these pipes is controlled by the cut-off valves 17 and 18, respectively. The pipe 15 communicates with the sterilizing-chamber A, which chamber it enters at the back and at the lowest point thereof. The pipe 16 likewise communicates with chamber A at the back thereof, but at its highest point, the communication from said chamber to this pipe being controlled by a valve 19. The pipe continues downwardly and terminates in a discharge 20 at a point below the outer casing. Before the discharge is reached, however, the pipe 16 communicates with the other pipe 15 through a tube 21, controlled by a valve 22. Through this tube 21 any condensation in the pipe 15 may be allowed to escape at the discharge 20 if the valve 21 is open. The tube 16 contains an ejector, and by means of this ejector, when the valves 18 and 19 are open, the steam or air which is present in the chamber A is exhausted therefrom. Secured near the bottom of the door and communicating through the same when closed with the chamber A is the air-filtering device, which consists of a tube 23, that projects outwardly. Its free end is provided with a cup 24, containing a strainer 25, upon which raw cotton is placed as the filtering medium. Communication through the tube 23 is controlled by a valve 26. The function of this filtering device may be best described in connection with the description of the operation of my improved apparatus. The operation may be described as follows: Steam being generated in the chamber or jacket 5, the articles to be sterilized are placed in the sterilizing-chamber A. The valve 18, controlling the escape of steam through the pipe 16, is opened, and also the valve 19, controlling communication between the pipe 16 and chamber A. The ejector in pipe 16 then operates to draw off all of the air in the chamber A. The valves 18 and 19 are then closed. As soon as the valve 17 is opened, so as to permit steam to pass from the steam-jacket to chamber A through the pipe 15, the process of sterilization commences, the presence of steam in said chamber being indicated by opening the petcock at the top of the door. When the sterilization is complete, the valve 17 is closed, shutting off the supply of steam to chamber A. It being undesirable at this stage of the operation to open the door, for the reason that the admission of cold air from the atmosphere will produce a condensation which will more or less moisten the articles, the ejector is again operated, this time to exhaust the steam instead of the air in chamber A. The steam having been exhausted a vacuum results, and to destroy this vacuum and at the same time admit air for that purpose which is free from impurities the valve 26 on the air-filtering device is opened to permit the air

to enter the chamber. The air having been filtered in passing through the cotton in the cup of the filtering device is rendered entirely free from impurities and cannot injuriously affect the articles which have been sterilized.

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

1. In a sterilizing apparatus, a chamber for the reception of the articles to be sterilized, a source of steam having communication with said chamber, and means for exhausting the air from said chamber previously to the admission of the steam and for exhausting the steam previously to the opening of said chamber, substantially as described.

2. In a sterilizing apparatus, the combination of a sterilizing-chamber, a steam-generating chamber surrounding, and adapted to heat, the same, and an ejector for the sterilizing-chamber having its feed-pipe communicating with the steam-generating chamber, substantially as described.

3. In a sterilizing apparatus, the combination of a sterilizing-chamber, a steam-generating chamber surrounding, and adapted to heat, the same, an ejector for the sterilizing-chamber having its feed-pipe communicating with the steam-generating chamber, and means for admitting purified air to said sterilizing-chamber, substantially as described.

4. A sterilizer consisting of a chamber provided with a tightly-fitting door and adapted to receive the articles to be sterilized, a steam-jacket surrounding said chamber, a pipe providing communication between the top of said steam-jacket and said chamber, an ejector-pipe communicating with said steam-jacket and with the chamber and adapted to withdraw steam and air from said chamber and to produce a vacuum therein, an air-admission tube situated on the door and adapted to communicate with said chamber when the door is closed so that said vacuum may be destroyed and the door opened, said tube being provided with an air-filtering substance consisting of cotton, substantially as described.

5. In a sterilizer, a chamber adapted to receive the articles to be sterilized, a steam-jacket surrounding said chamber, vertical pipes communicating with said steam-jacket, one of said pipes being adapted to conduct steam from said jacket to the lowest point in the chamber and the other of said pipes being provided with an ejector for producing a vacuum in said chamber, and means for destroying the vacuum in said chamber, said pipes being so connected at their lower ends that the ejector-pipe may carry off any condensation which may exist in the other pipe, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

AUSTIN V. M. SPRAGUE.

Witnesses:

G. B. McCAFFERTY,
JOHN W. STEWARD.