

No. 614,130.

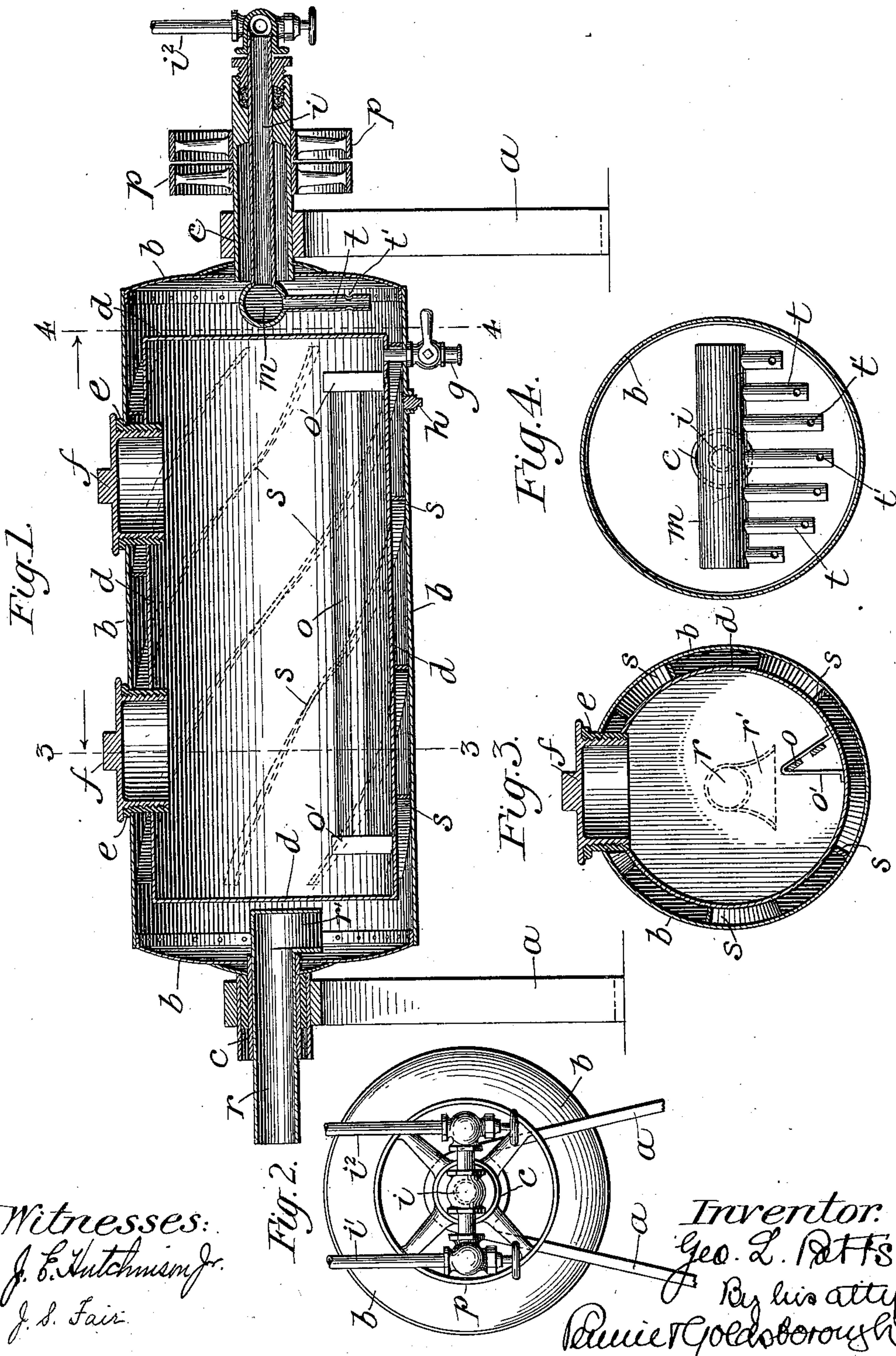
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G. L. POTTS.

APPARATUS FOR PASTEURIZING OR STERILIZING LIQUIDS.

(Application filed July 21, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PASTEURIZING OR STERILIZING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 614,130, dated November 15, 1898.

Application filed July 21, 1898. Serial No. 686,492. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. POTTS, a citizen of the United States, residing in Appleton, in the county of Outagamie and State of Wisconsin, have invented certain new and useful Improvements in Apparatus for Pasteurizing or Sterilizing Liquids; and I do hereby 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.

The invention relates more especially to apparatus intended to pasteurize or sterilize milk, cream, and liquids of like description; but it is not restricted to any particular application, and it is adapted to other liquids as well.

The invention consists in the improved apparatus illustrated in the accompanying drawings, forming part of this specification, and described and claimed as follows.

In the drawings, Figure 1 is a vertical central longitudinal section of the complete device ready for operation. Fig. 2 is an elevation of the right-hand end of Fig. 1. Fig. 3 is a vertical cross-section of Fig. 1 on the line 3 3. Fig. 4 is a similar section on the line 4 4.

Referring to the views, *a a* denote portable standards adapted to be set up in any suitable place and to be bolted to a floor or other foundation. At the apex of the standards there are provided bearing-boxes of any suitable construction for the bearings of the rotary parts of the apparatus, which will now be described.

The letter *b* denotes a horizontally-arranged cylinder, from the heads of which project the journals *c c*, that are supported by and rotate in the bearings just described. Within the cylinder is located a smaller cylinder *d*, there being a free open space between them entirely surrounding the inner cylinder at the sides and ends. This inner cylinder is the one to receive the liquid to be treated, and it is provided with openings *e e* for introducing the material and a valved pipe and nozzle *g* for drawing off the contents. The filling-openings are provided with tight covers *f*, adapted to screw on or be fastened down in any preferred manner, and the outer cylinder *b* has a stoppered opening by means of

which it may be cleaned and its contents emptied.

The journal *c* at one end of the cylinder is provided with fast and loose pulleys *p*, as shown in Fig. 1, by means of which the cylinders may be rotated. Through this same journal a pipe *i* extends into the space between the cylinders, a suitable stuffing-box being provided to permit the rotation of the journal, while preventing the escape of steam. Connected to the outer end of this pipe are two pipes *i'* *i''*, with a suitable cock, so that either may be used alone, and the pipe *i'* being for water and the other, *i''*, for steam. At the inner end of the pipe *i* and located within the space between the heads of the two cylinders is a muffler *m*, consisting of a drum extending diametrically across the cylinder-heads and having a series of tubes *t* depending from it, said tubes having open ends and perforations *t'* near the ends. At the opposite end of the cylinders an open pipe *r* leads from the space between the cylinders through the hollow journal to the atmosphere, and the inner end of this pipe has a depending flaring mouth *r'*, as indicated in dotted lines in Fig. 3.

Along the sides of the cylinders, in the space between them, extend spiral fins or strips *s*, these strips being secured to the outer surface of the inner cylinder *d* and preferably extending the full length of the cylinders. They divide the annular space between the cylinders into spiral passages, but they do not extend across or into the space at the heads of the cylinders.

For the purpose of agitating the liquid in the cylinder *d* as it revolves there is secured to its inner wall a stirrer *o*, the same consisting of blades or strips running lengthwise the cylinder and secured at opposite ends to cleats or standards *o'*.

The mechanical construction of the apparatus being as above described the operation of the same is as follows: The liquid to be sterilized having been put into the inner cylinder and the covers of the openings being fastened down air-tight water is run through the pipe *i''* into the space between the cylinders until it rises to the level of the hollow journals. Power is then applied to the pulleys and the cylinders are revolved. The

cock in the water-pipe i^2 having now been turned off steam is admitted into the water-space through the pipe i' and is continued until the temperature of the water is raised to about 150° Fahrenheit, which usually requires six or seven minutes. At this time the steam is shut off and the revolution of the cylinders is continued for about twenty minutes, which is sufficient to thoroughly rid it of all germs, bacteria, &c. The pipe i^2 is then opened and the hot water in the space between the cylinders is driven out and replaced by cold water and the machine preferably kept in motion until the temperature of the liquid has been reduced to about 45° Fahrenheit, when it is ready to be drawn off through the cock g into storage or shipping packages.

Were the steam not delivered from the pipe i through the muffler below the water-level there would be but little circulation of the water and it would require much more time to heat the water, as the steam would pass over the surface and out of the pipe at the other end; but by the employment of the described muffler I not only prevent disagreeable noises, but create and maintain a positive circulation of water, and this is further insured by the spiral fins or strips s on the sides of the inner cylinder. As the cylinders revolve, these strips cause the water to pass from one end of the apparatus to the other, thus keeping the same constantly in motion and greatly hastening heating the same.

Having thus described the invention, what I claim is—

1. In a pasteurizing or like apparatus, the combination of a pair of rotary receptacles, one inclosed within the other and adapted to be closed air-tight, a water-space surrounding the inner receptacle, a valved water-pipe communicating with said space, and a valved steam-pipe also communicating with said space and extending below the water-level, whereby water may be introduced into the space and heated by the introduction of steam.

2. In a pasteurizing or like apparatus, the combination of a pair of rotary receptacles, one inclosed within the other and surrounded by a water-space, a water-pipe communicating with said space and spirally-arranged strips secured in the space between the receptacles and running longitudinally thereof.

3. In a pasteurizing or like apparatus, the combination of a pair of rotary receptacles, one inclosed within the other and surrounded on all sides by a water-space, a pipe for the introduction of water into the space between the receptacles, means for introducing and drawing off from the inner receptacle the material to be treated, an agitator in the in-

ner cylinder, and means for insuring a circulation of water in the space between the receptacles.

4. In a pasteurizing or like apparatus, the combination of a pair of rotary receptacles, one inclosed within the other and surrounded by a water-space, a water-pipe communicating with said space at one end of the receptacles, a pipe for drawing off water from said space at the other end of the receptacles, a steam-pipe extending into the water-space, and a muffler in said space connected with the steam-pipe and extending below the water-line.

5. An apparatus for pasteurizing or sterilizing liquids, consisting of suitable standards, a pair of rotary cylinders journaled in bearings in the standards, one of said cylinders inclosed within the other and surrounded by a water-space, spiral strips arranged in the water-space along the sides of the cylinders, a stirrer or agitator secured within the inner cylinder, means for introducing and drawing off the liquid from the inner cylinder, a cleaning-opening in the outer cylinder, a pipe extending through the bearings at one end of the cylinders, separate water and steam pipes connected thereto, a muffler located in the water-space and connected to the pipe that passes through the cylinder-journal and depending below the water-line, a pipe leading from the water-space and passing through the journal at the opposite end of the cylinders, and means for rotating the cylinders.

6. In a pasteurizing or like apparatus, the combination of a pair of rotary cylinders, one inclosed within the other and surrounded by a water-space, a water and steam pipe communicating centrally with the space at one end of the cylinders, and a muffler connected to the end of the pipe and consisting of a drum extending diametrically across the cylinder-heads and having perforated pipes depending therefrom below the water-line.

7. In an apparatus for pasteurizing liquids, the combination of a pair of cylinders, one arranged within the other with a water-space surrounding it, means for rotating the cylinders, air-tight closures for the inner cylinder, means for introducing and drawing off liquid from the inner cylinder, a stoppered opening into the water-space for cleaning and drawing off the contents, pipes at one end of the cylinders for introducing steam and water into the space between them, and a pipe at the opposite end of the cylinders.

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

GEO. L. POTTS.

Witnesses:

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