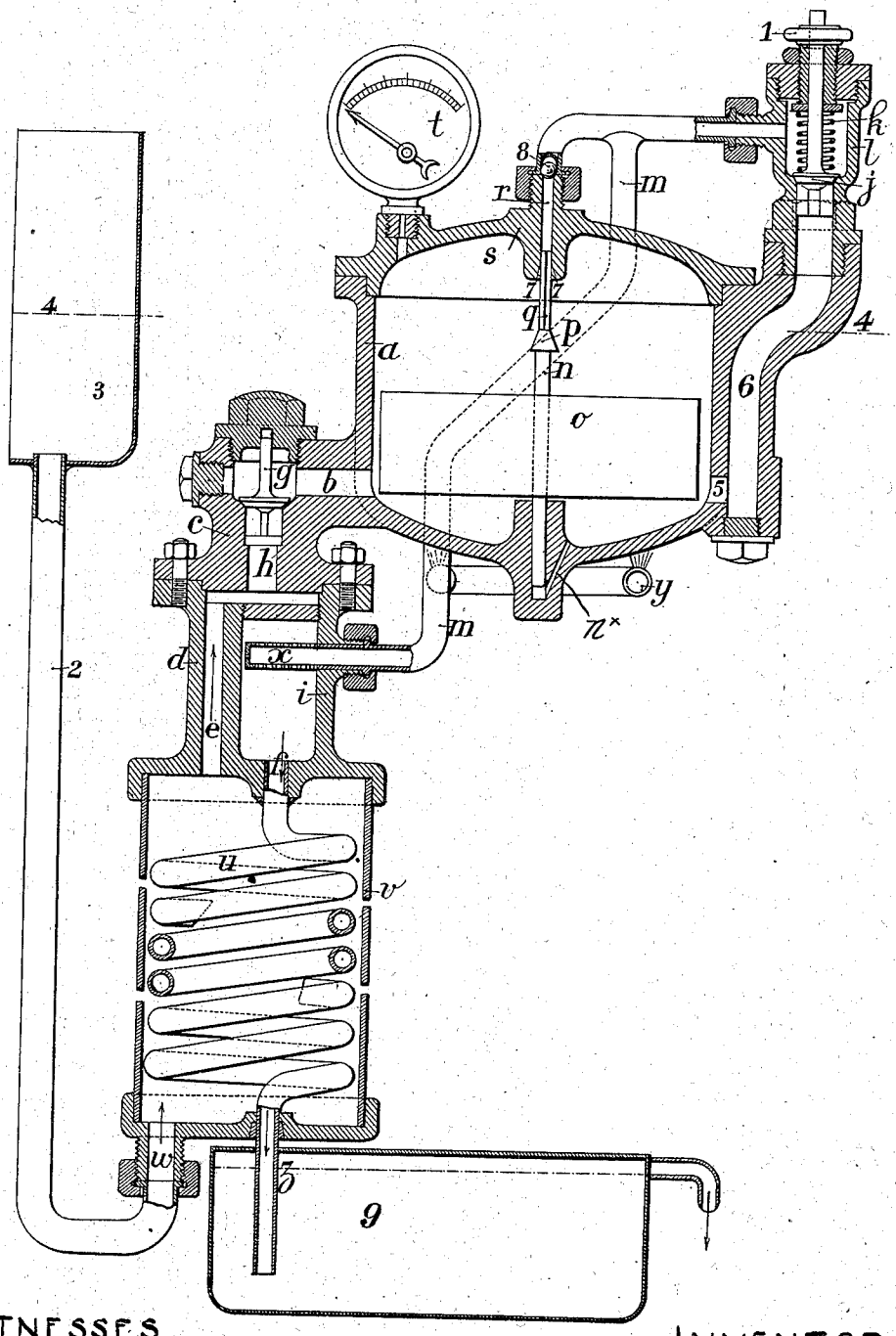
No. 729,732. PATENTED JUNE 2, 1903.

C. CAILLE.

APPARATUS FOR STERILIZING WATER OR OTHER LIQUIDS.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.



WITNESSES

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No. 729,732. Patented June 2, 1903.

UNITED STATES PATENT OFFICE.

CHARLES CAILLE, OF LE PERREUX, FRANCE.

APPARATUS FOR STERILIZING WATER OR OTHER LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 729,732, dated June 2, 1903.

Application filed December 8, 1902. Serial No. 134,376. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CAILLE, of No. 7 Rue des Vignes, Le Perreux, (Seine,) in the Republic of France, have invented certain new and useful Apparatus for Sterilizing Water or other 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 which is the subject of the present application for a patent refers to an apparatus for sterilizing water or any other liquid at any temperature whatever which is sufficiently high for the purpose.

My apparatus consists in principle of a receiver *a*, communicating on one side by means of a valve *g* with the source of liquid under a head and on the other side by means of a loaded valve *j*, which can be regulated, if necessary, with a chamber *i*, in which the gas, which is eliminated from the liquid by heat, normally accumulates, and since the sterilized liquid before its evacuation travels separately this chamber is for this reason connected to the receiver by a pipe *m r*, which a floating valve *p* closes or opens, according as the pressure in the receiver is less or more than the load on the valve *j*.

I have on the accompanying drawing shown as a representative example in sectional elevation the whole apparatus in a practical form for carrying out my invention.

a is the receiver, which communicates, by means of the pipe *b*, with a branch *c* of the receiver-casting. To this branch is secured a box *d*, in which are provided two passages *e* for the arrival of the non-sterilized liquid and *f* to carry the sterilized liquid away.

In the passage *h*, which is placed above and in communication with the passage *e*, and in the branch *c* a valve *g* is placed, which opens normally under the pressure of the non-sterilized liquid which comes with a head from any source whatever—as, for example, from a reservoir 3, which can be maintained at a constant level 4 4.

The receiver *a* communicates in its lower part by means of the channel 5 and the passage 6, in which the liquid constantly forms a liquid seal, and afterward by means of a valve *j*, placed above this seal, with the pipe *m*, opening into the chamber *i*. This chamber is shown as forming a portion of the box *d*. The spring-pressed valve *j* closes the communication between the valve-chamber *l* and the receiver *a* as soon as the pressure in the latter is less than the tension of the spring *k*, which can be regulated, if necessary, by the nut *l*.

The chamber *i* communicates by a pipe *m* with the upper portion of the receiver *a* and with the valve-chamber *l*. In the receiver is a float *o*, guided by a rod *n*. The rod *n* carries on its upper end a conical valve *p* and is prolonged by a rod of triangular section *q* and inserted into a cylindrical guiding-aperture *r* in the cover *s* of the receiver *a*. On this cover an indicator *t* is fixed, from which the pressures and the corresponding temperatures can be read. To the evacuation-pipe *f* is secured a helical coil *u*, inclosed in a casing *v*, which latter receives the non-sterilized liquid under a head through the pipe 2 and passage *w*.

The non-sterilized liquid entering through *w* rises in the casing *v*, cooling the helical coil *u*, then through the passages *e* and *h* into the receiver *a* by lifting the valve *g*. The float *o* in the receiver rises, and the valve *p*, pressing against its seat 7, placed in the cover *s*, closes the communication between the passage *m r* and the receiver. Equilibrium is then established between the liquid in the receiver and that in the source and the valve *g* closes. If the receiver *a* be heated by any suitable means of heating, (represented by *y*,) a disengagement of gas or vapor takes place and the pressure becomes greater. When this pressure is more than the tension of the spring *k*, the valve *j* opens and leaves a free passage from the receiver *a* for the liquid which has risen in the passage 6. In proportion as the sterilized liquid flows through *m* the float *o* sinks and the valve *p* gives free passage to the sterilized gas collected in the upper part of the receiver. This gas enters the chamber *i* by the passage *m r*, lifting on its way the non-return valve 8. Meanwhile the diminution of pressure in the receiver *a* caused by this escape results in the reclosing of the valve *j*. When the apparatus is in working order, the sterilized liquid enters the chamber *i*, on its way filtering through a

rose x, placed at the end of the pipe m, and thus becomes recharged with the sterilized gas which has accumulated in this chamber. The liquid sterilized under pressure thus recharged with its original gases also sterilized, which the heating had caused it to part from, is cooled again in the helical coil u, which is immersed in the non-sterilized liquid, and escapes through pipe z, from whence it is collected, preferably, in a collector 9, into which the end of the pipe z is immersed. As soon as the valve j closes again the pressure in the receiver a becomes less than that of the source, a fresh admission of non-sterilized liquid takes place through the valve g, the float o rises, the valve p closes, and the heated liquid creates an excess of pressure in the receiver, causing the valve j to open again, and the described operations take place in the same order as before.

It may be noted that any water collecting below the stem n will be free to be discharged into the receiver proper through a channel $n^{\times}$.

It goes without saying that the details of construction of the sterilizer—such as the arrangement of the chamber i in regard to the pipes for the arrival and escape of the liquid at e and f, the arrangement of the valve g, the shape of the float and its operation on the valve p, the means for regulating the valve j, &c.—can be varied without altering the principle of my invention. Also it is not indispensable to supply the apparatus by means of a reservoir, such as 3, maintained at a constant level. The liquid can come just as well from any other source, and the apparatus may be directly connected by a stop-cock. Finally it must be observed that the arrangement of the valve j, which can be regulated in the lateral passage 6, (which provides a liquid seal between the pipe m and the receiver—that is to say, between this latter and the chamber i,) is only indispensable if you wish to sterilize at a temperature higher than the temperature of boiling under atmospheric pressure. If it is sufficient to sterilize at a temperature equal to or less than the temperature of boiling under atmospheric pressure, the valve j can be omitted.

I claim—

1. A sterilizing apparatus comprising a receiver a, a supply connection leading thereto for the non-sterilized liquid, a lateral passage 6 connected with the receiver and containing a liquid seal, a chamber i, a connection between the said chamber i and the lateral passage to receive liquid therefrom, a port at the top of the receiver in communication with the chamber i for the passage of the gas from the top of the said chamber, a float in the chamber and a valve on the float for closing the gas-port, substantially as described.

2. A sterilizing apparatus comprising a receiver a, a supply connection leading thereto for the non-sterilized liquid, a lateral passage 6 connected with the receiver and containing a liquid seal, a chamber i, a connection between the said chamber i and the lateral passage to receive liquid therefrom, a valve controlling the flow of liquid from the lateral passage to the said chamber and means for regulating the resistance of said valve to the opening pressure of the liquid, a port at the top of the receiver in communication with the chamber i for the passage of the gas from the top of the said chamber, a float in the chamber and a valve on the float for closing the gas-port, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

CHARLES CAILLE.

Witnesses:
S. MOSTICKER,
AUGUSTUS E. INGRAM.