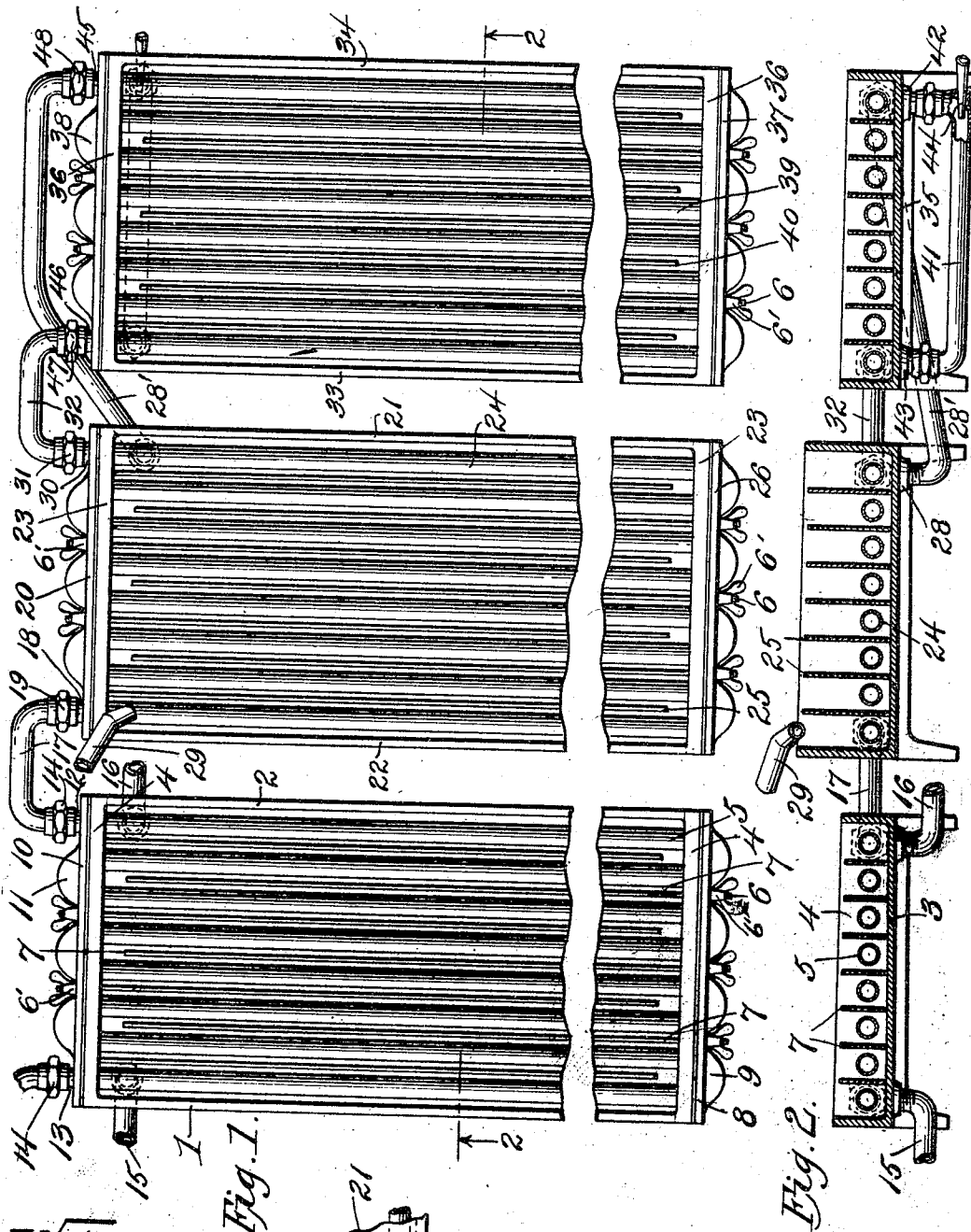


H. O. FISHER.
PASTEURIZER.
APPLICATION FILED MAY 31, 1910.

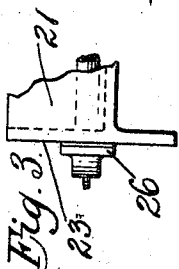
1,046,577.

Patented Dec. 10, 1912.



Witnesses:

A. L. Lord.
G. H. Truck.



Inventor.
Homer O. Fisher,
by
B. W. Brockett.
Attorney.

UNITED STATES PATENT OFFICE.

HOMER O. FISHER, OF CHAGRIN FALLS, OHIO.

PASTEURIZER.

1,046,577.

Specification of Letters Patent.

Patented Dec. 10, 1912

Application filed May 31, 1910. Serial No. 564,291.

To all whom it may concern:

Be it known that I, HOMER O. FISHER, a citizen of the United States, residing at Chagrin Falls, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pasteurizers, of which the following is a specification.

This invention relates broadly to pasteurizing apparatus and particularly to that class of such devices used in treating milk.

More specifically the invention relates to apparatus of the character described comprising a cooler section, a regenerative section for heating the incoming milk and reducing the temperature of the pasteurized milk, and a heater section, the latter being provided with a suitable device for bringing about a forced circulation.

The invention may be further briefly summarized as consisting in the construction and combinations of parts hereinafter set forth in the following description, drawings and claims.

Referring to the drawings, Figure 1 represents a top plan view of my device; Fig. 2 is a longitudinal sectional view taken upon the line 2-2 of Fig. 1 and looking in the direction of the arrows indicated in Fig. 1; and Fig. 3 is a sectional view of one of the end portions of the regenerative section.

In carrying out the invention any preferred form and construction of parts may be employed so long as they possess the necessary characteristics, but I have shown one form in the drawings which is highly effective in operation, and in such embodiment 1 and 2 represent the side portions of the cooler, 3 represents the bottom, and 4 the end plates which are provided with openings in which are secured tubes 5 which extend from one plate to the other. These plates 4 are still further provided with bolts 6 for receiving nuts 6' and for a purpose to be described and upon the inside of the pan formed by these parts the end plates 4 are provided with baffles or partitions 7 which alternate from the two end plates 4 and fall short of reaching the opposite end plate so that a single circuitous passage is formed in the vessel or pan about the pipes or tubes 5 so that the circulating medium when it enters at one end of the circuitous passage, must traverse along the entire length of the pipes or tubes before it can pass out.

Secured to the right-hand end plate 4,

as shown in Fig. 1, is a header plate 8 provided with return bend pocket portions 9 which establish a passage from one tube 5 to the next tube 5 thereby forming a single continuous milk passage through the entire pan. The opposite end plate 4, as shown in Fig. 1, is provided with a header plate 10 having return bend pocket portions 11 in the center and at one end with an inlet pipe connection 12 and at the other with an outlet pipe connection 13. Suitable unions 14 are supplied to these connections for a purpose to be described.

It will be seen from the foregoing that when the milk or other liquid enters through the connection 12 it passes through one continuous circuitous route in the tubes 5 and pocket portions formed in the headers, to the outlet connection 13. In the meantime, however, a cooling medium, preferably in the form of a liquid, is supplied through the pipe 15 at a point near the milk outlet 13 to the inside of the pan, and it passes out through a pipe 16 in the bottom of the pan and adjacent to the inlet 12 so that the cooling liquor follows the tubes in its circulation.

Connected to the cooler section, by the union 14, is a suitable pipe or other connection 17 which is connected to a pipe connection 18 by a suitable union 19, and this connection 18 is secured in a header 20 similar in all respects to the header 10 of the cooler section. This regenerative section is composed of a pan formed with sides 21 and 22 and cast end plates 23, all of which are preferably higher than the corresponding parts of the cooler section for a purpose to be described. Tubes 24 are arranged in this section in a manner similar to those in the cooler section, and partitions or baffles 25 are provided to direct the circulation of the milk, or other liquid, along the pipes or tubes. One end portion 23 of this section is secured to the header 20 while the other end is provided with a header 26 these headers being similar in all respects to those used in the cooler section. This pan is further provided with a discharge connection 28 located preferably at the upper left-hand corner, as shown, and in the bottom of the pan. The raw milk or other liquid is supplied through a tube 29 at the lower left-hand corner and at the beginning of the circuitous route on the outside of the tubes. It passes through the circuitous route formed by the baffles or partitions and over the tubes

24 and from thence passes down through the connection 28 and through a pipe 28' to the heater section to be described. The heated milk enters this regenerative section through
 5 a connection 30 provided with a union 31 which connects it with a pipe 32 leading to the outlet of the heater section. The inlet connection 30 of the regenerative section is preferably arranged at that part of the pan adjacent to the outlet 28 in the bottom through
 10 which the milk, or other liquid, on the outside of the tubes in the regenerative section passes.

It will be seen that, as the raw milk passes
 15 in through the tube 29 at one end of the circuitous route on the outside of the tubes and from thence flows through this route and out through the tube 28', its temperature will be raised by the hot milk or other
 20 liquid, which passes in through the inlet connection 30 through the tubes and out through the connection 18 to the cooler.

The heater section is similar in general construction to the cooler section and comprises sides 33, 34 and a bottom 35 as well as end plates 36 to which are secured the headers 37 and 38, the latter being similar in all respects to the headers 10 and 20. This section is also provided with tubes 39
 30 which receive the milk and with partitions 40 forming a circuitous route for the heating medium which is, in this instance, hot water, circulated by means of a pipe 41 secured in a connection 42 at the beginning
 35 of the circuitous route and in this instance at the upper left-hand corner of the heater section, and to enter a connection 43 at the other end of the circuitous route. This pipe 41 is provided with a steam jet 44
 40 which projects a supply of steam into the pipe 41 so that hot water is drawn through the connection 42 and from the upper end of the circuitous route and forced up through the connection 43 to the lower end
 45 of the circuitous route. In this way the heating medium, or hot water, is delivered at its highest temperature to the lower end of the heater section. The milk enters the tubes 39 from the pipe 28' through a connection 45 and passes through the tubes 39
 50 through a connection 46 to the pipe 32 from whence it flows into the regenerative section. Unions 47 and 48 are supplied to these sections whereby the parts may be removed and
 55 cleaned.

Each of the sections is provided with bolts 6 which receive suitable ring nuts 6' for holding the headers in place.

Having described my invention, I claim:—

60 1. A pasteurizer comprising a heater section consisting of a pan, horizontally disposed tubes arranged in said pan and forming a single circuitous liquid passage, means

for supplying a heating medium to said pan, a regenerative section consisting of a pan, 65 tubes arranged therein and forming one circuitous liquid passage, means for maintaining a level of liquid in the regenerative pan above the level of the liquid in the tubes, means for causing the liquid
 70 uid in the pan to follow the course of the tubes in one circuitous course, and a cooler section consisting of a pan and a plurality of tubes arranged to form one circuitous liquid passage, means for supplying
 75 ing a cooling medium to said cooling section so as to follow in one circuitous course the tubes in such cooling section, and suitable connections between the several sections.

2. A pasteurizer comprising a heater section consisting of a pan, a plurality of tubes extending from one end of the pan to the other, a suitable header on each end of the pan and connecting the tubes at the ends in
 80 a manner to form one continuous liquor passage through the tubes in the pan, means for supplying a heating medium to said heating section, a suitable connection at each end of the tubular passage, a regenerative section
 85 consisting of a pan having liquor tubes extending from one end of the pan to the other, said pan being greater in height than the heater pan, a header on each end of the regenerative pan and forming with the
 90 tubes one continuous circulation for the liquid to be treated, a connection between one end of the regenerative tubular passage and the outlet of the heater, means for supplying the liquor to be treated to the
 95 regenerative pan on the outside of the tubes therein, a suitable connection between the regenerative pan and the inlet of the heater section, and a suitable cooler connected to the discharge from the tubes of the regenerative section.

3. A heater section for a pasteurizer comprising a pan having therein suitable tubes forming one continuous circulation through the pan, and partitions extending alternately from opposite ends of the pan and between the tubes and forming one continuous course with the course of circulation through the tubes, a suitable connection in the pan adjacent the ends of the continuous course formed by the partition, a
 110 suitable steam jet entering said connection and adapted to cause circulation in said connection and in the circuitous route formed in the pan.

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

HOMER O. FISHER.

Witnesses:

ALTON H. BEMIS,
 CHRISTINE H. TRESCH.