L. S. PFOUTS.

SUPPORTING MEANS.

APPLICATION FILED JAN. 25, 1909.

1,183,764.

Patented May 16, 1916.

4 SHEETS—SHEET 1.

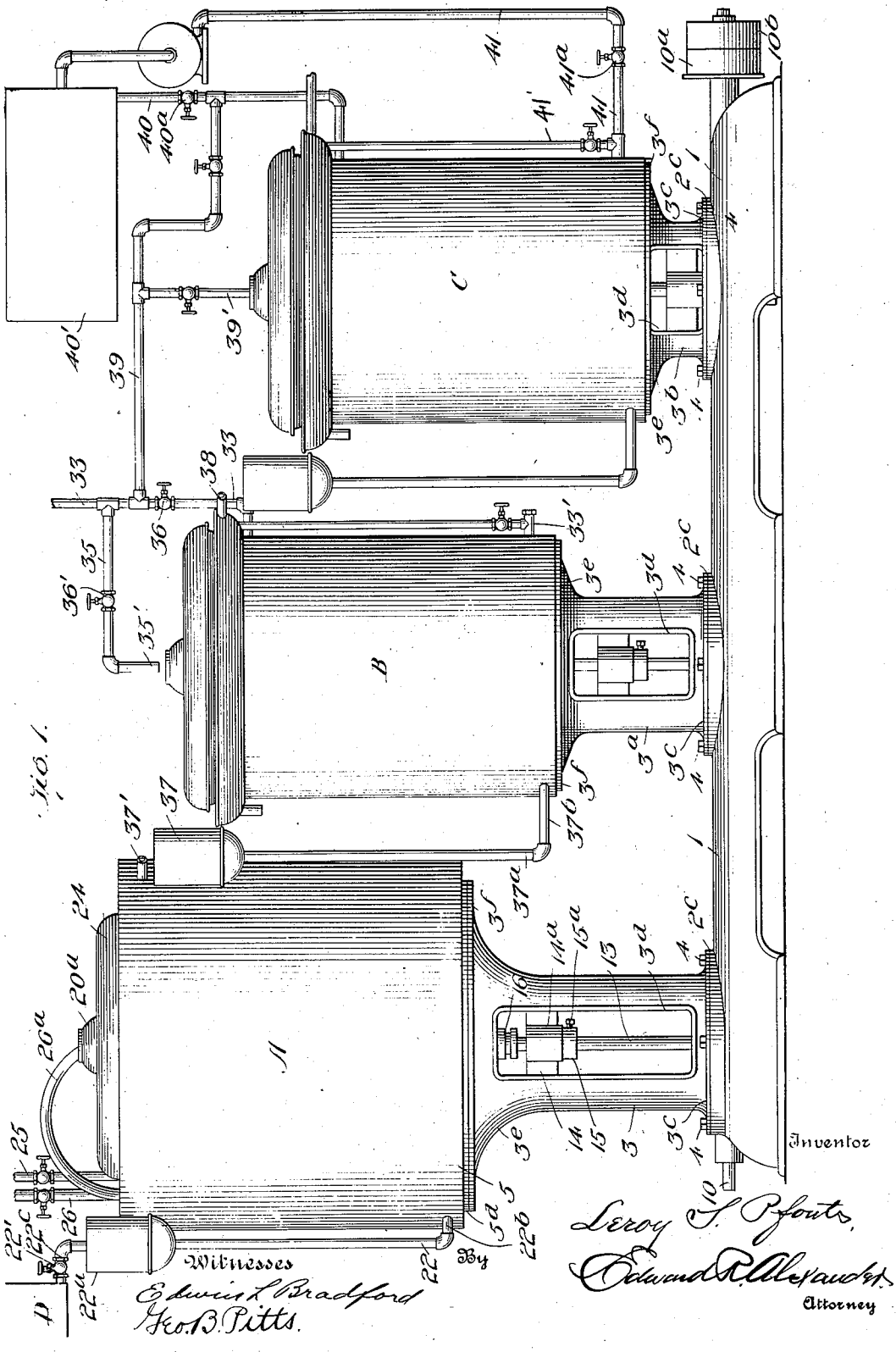


Fig. 1.

L. S. PFOUTS.

SUPPORTING MEANS.

APPLICATION FILED JAN. 25, 1909.

1,183,764.

Patented May 16, 1916.

4 SHEETS—SHEET 2.

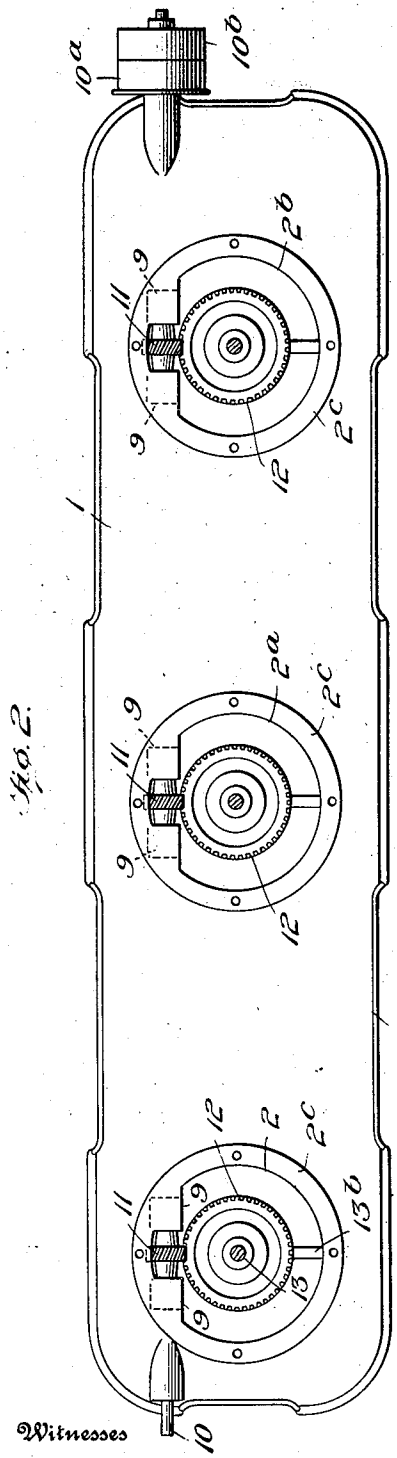


Fig. 2.

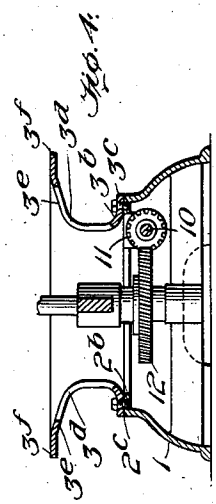


Fig. 4.

Fig. 3.

Witnesses

Edwin L. Bradford

Geo. B. Pitts

Inventor

Leroy S. Pfouts.

By Edward R. Alexander

Attorney

L. S. PFOUTS.

SUPPORTING MEANS.

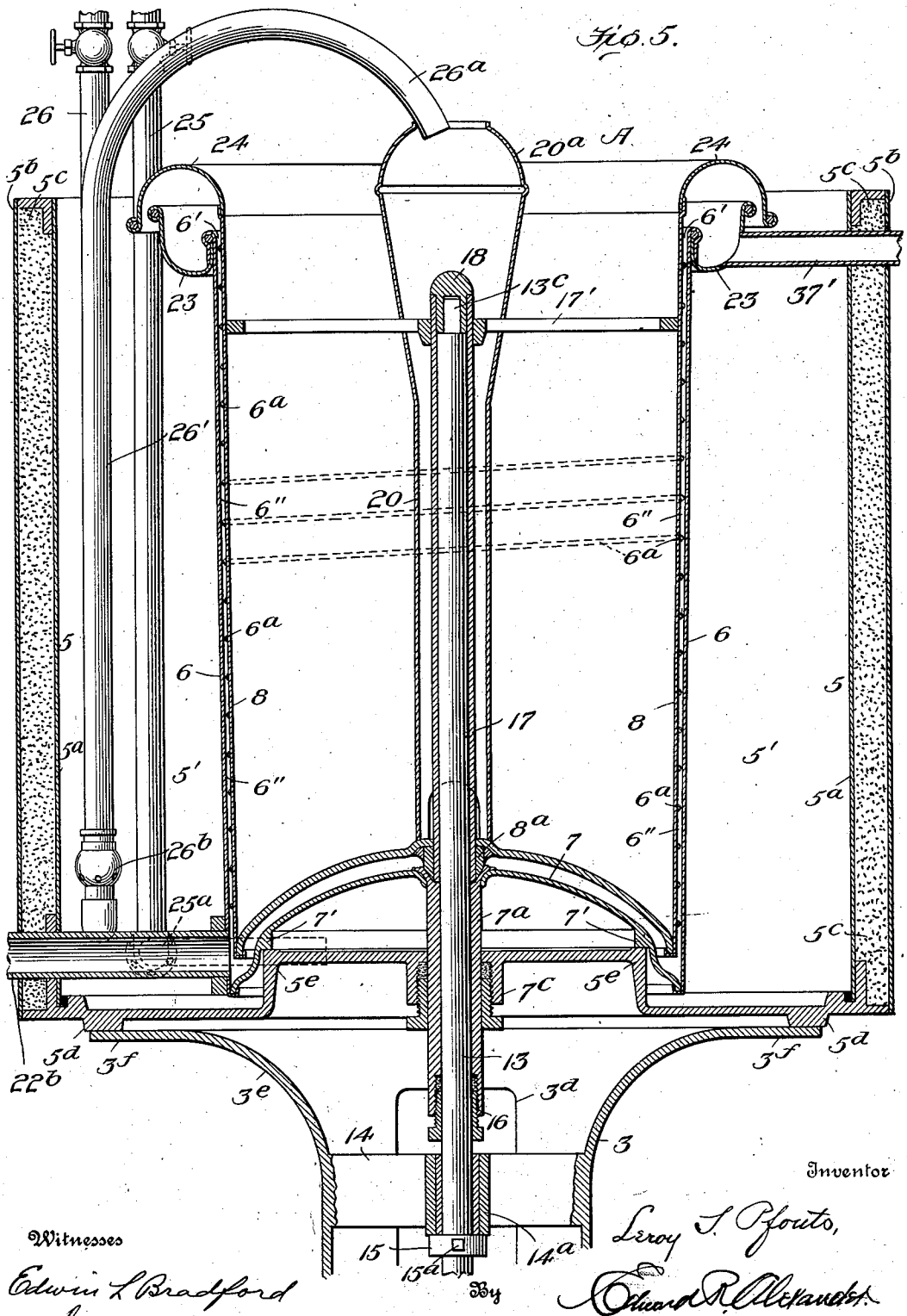
APPLICATION FILED JAN. 25, 1909.

1,183,764.

Patented May 16, 1916.

4 SHEETS—SHEET 3.

Fig. 5.



Witnesses

Edwin L Bradford

Geo. B. Pitts.

Inventor

Leroy S. Pfouts,

By Edward R. Alexander

Attorney

L. S. PFOUTS.

SUPPORTING MEANS.

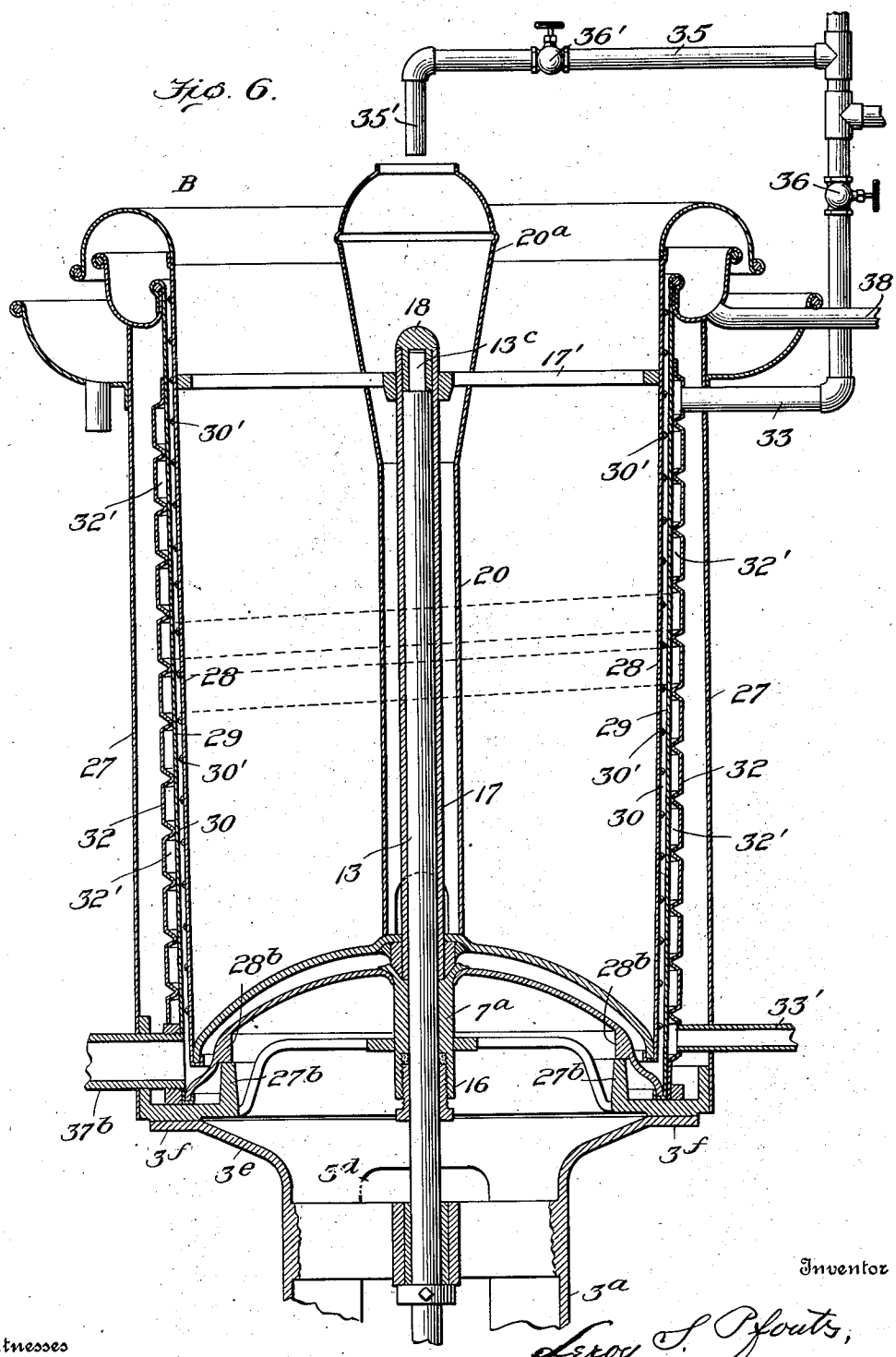
APPLICATION FILED JAN. 25, 1909.

1,183,764.

Patented May 16, 1916.

4 SHEETS—SHEET 4.

Fig. 6.



Inventor

Leroy S. Pfouts,

By Edward R. Ellsworth

Attorney

Witnesses

Edwin L. Bradford

Geo. B. Pitts.

UNITED STATES PATENT OFFICE.

LEROY S. PFOUTS, OF CANTON, OHIO, ASSIGNOR TO THE MILLER PASTEURIZING MACHINE COMPANY, OF CANTON, OHIO, A CORPORATION OF NEW JERSEY.

SUPPORTING MEANS.

1,183,764. Specification of Letters Patent. Patented May 16, 1916.

Application filed January 25, 1909. Serial No. 474,128.

To all whom it may concern:

Be it known that I, LEROY S. PFOUTS, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Supporting Means, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a pasteurizing apparatus, and particularly to that type of pasteurizer shown and described in Letters Patent No. 878,225, issued to John C. Miller, February 4, 1908.

One object of the invention is to provide in pasteurizing apparatus having underneath driving or power transmitting mechanism a durable, rigid, simple and sanitary mounting for the heating and cooling apparatus, either or both, and for the driving or power transmitting devices.

Another object of the invention is to provide a base and a series of pedestals of novel construction, mounted on the base, to rigidly support the heating and cooling apparatus in a vertically descending series.

Another object of the invention is to provide improved supporting devices between certain parts of either or both of the heating apparatus and the cooling apparatus.

Further objects of the invention consist in the combination or combinations of parts and devices hereinafter disclosed and described.

Figure 1 is a side elevation of a liquid treating apparatus embodying my invention. Fig. 2 is a top plan view of the base for supporting the series of liquid treating devices, vertical shafts being shown in section. Fig. 3 is a longitudinal section of the base and the standards supported thereon. Fig. 4 is a transverse section of the base and one of the standards. Fig. 5 is a central vertical section of the heater. Fig. 6 is a central vertical section of a cooler.

In the drawings A, B and C indicate, respectively, the heating, preliminary cooling and final cooling apparatus of my pasteurizer.

D indicates a milk containing receptacle which supplies milk to the heating apparatus.

1 indicates a base cast or otherwise formed of suitable metal. This base is adapted to rest on a floor or other plane surface and is preferably curved transversely to give it great strength and supporting capacity consistent with lightness in weight and economy of space and metal.

2, 2^a, 2^b indicate openings formed in the upper surface of the base. Surrounding each of the said openings is a horizontal supporting surface or boss 2^c, preferably ring-shaped and formed integral with the base 1.

3, 3^a, 3^b indicate a series of pedestals or standards, preferably tubular in form, and each provided at its lower end with a flange 3^c. The flange 3^c corresponds in shape to and rests on the supporting boss 2^c of the base 1. The pedestals are preferably formed with openings or cut-away portions 3^d to reduce their weight and to economize metal, as well as to facilitate the cleaning of the pedestals.

4 indicate bolts extending through apertures in the supports or bosses 2^c and flanges 3^c for securing the pedestals in upright position on the base.

The pedestals 3, 3^a, 3^b are of different heights and arranged in descending order on the base so that the heating and cooling apparatus A, B and C are supported at different levels, whereby the liquid to be treated may flow by gravity from the heater A which is supported on the highest pedestal, 3, first to the cooler B, which is supported on the next highest pedestal, 3^a, and finally to the cooler C supported on the pedestal 3^b. The standards 3, 3^a, 3^b, at or near their upper ends, are enlarged or flared outwardly, as shown at 3^e, and terminate at their upper edges in peripheral flanges 3^f to form suitable mountings for the heater A and coolers B and C, respectively.

The heaters and coolers may be of any preferred construction. For illustration, I have shown the heater A comprising an outer vessel 5, an inner vessel 8, and an intermediate vessel 6. The intermediate vessel 6 is somewhat smaller than the vessel 5 to form therewith a water containing space or chamber 5′. The vessels 6 and 8 are of such size relative to each other that they form a reduced or narrow circulating space 6′ for the liquid to be treated between their adjacent walls.

6^a indicates a helical rib, mounted in the circulating space 6′. This rib is preferably carried by the vessel 6, and extends across

the space between the two vessels to form a helical conduit 6'' between them from the bottom of the said space 6' to the top thereof.

The vessels 5 and 8 are adapted to contain water or other suitable heating medium so that the liquid flowing through the conduit 6'' in a thin film or ribbon will be quickly, uniformly and thoroughly heated to the desired temperature. The walls of the vessel 5 preferably comprise an inner cylinder 5^a, and an outer cylinder 5^b, with an insulating jacket 5^c of cork or other suitable non-conductor of heat between them. The bottom of the vessel 5 is provided with an annular boss 5^d adapted to rest on the pedestal 3, and a stepped or raised portion 5^e concentric with the center of the vessel.

7 indicates the bottom of the vessel 6, preferably concavo-convex in form.

7' indicates an annular boss or supporting rib, preferably formed integral with the bottom 7, and having a flat lower surface arranged to rest on the upper surface of the stepped portion 5^e of the vessel 5. The purpose of this construction is to insure and maintain the support of the vessels 6 and 8 in concentricity throughout their length with the axis of the vessel 5 during the operation of the movable parts of the heater.

7^a indicates a sleeve secured to the intermediate vessel 6 and extending downward through the bottom 5^e of vessel 5.

7^c indicates a packing gland around the sleeve 7^a to prevent loss of the heating medium which may escape past the support or boss 7'.

8^a indicates a bearing block between the water containing vessel 8 and the vessel 6 and arranged to hold the bottoms of the said vessels slightly separated, each from the other.

9 indicates a plurality of bored ears or lugs, preferably formed integral with the base 1 on its inner or lower surface and adapted to support a main driving shaft 10.

10^a, 10^b indicate fast and loose pulleys, respectively, on the shaft 10.

11 indicate a plurality of worms fixed to the shaft 10 and arranged below the heater A and coolers B and C. The worm 11 below the heater A meshes with a gear 12, which is fixed to a vertical shaft 13. The shaft 13 is mounted at its lower end in a bearing 13^a carried by or formed in a transverse bar or member 13^b which is formed integral with or secured to the base 1.

14 indicates a cross bar or member arranged within the pedestal 3.

14^a indicates a bearing for the shaft 13 mounted centrally in the cross member 14 of the pedestal 3.

15 indicates a collar, carried by the shaft 13 and provided with a set screw 15^a for locking it to the shaft. This collar engages with the under side of the cross member 14 or bearing 14^a and prevents the shaft from moving endwise in an upward direction.

16 indicates a stuffing box at the lower end of the bushing or sleeve 7^a.

17 indicates a relatively long hollow shaft arranged within the cylinder 8. This hollow shaft is secured at or near its lower end to the bottom of the said cylinder and the bearing block 8^a, and at or near its upper end to a spider 17' carried by the cylinder 8 near its open end. The hollow shaft 17 fits snugly around the shaft 13 and operates to keep the cylinder in perfect alinement.

18 indicates a socket piece of any suitable construction adapted to fit over an irregular shaped part or plug 13^c formed on the upper end of the shaft 13. The socket piece 18 operates to lock the shaft 13 and hollow shaft 17 together and thus communicate motion from the said shaft to the cylinder 8.

20 indicates a conduit, provided with a funnel 20^a at its upper end, surrounding the hollow shaft 17 and preferably supported in position by the spider 17'. The conduit preferably extends to the bottom of the vessel 8 and is provided with an opening or openings at its lower end to permit the escape of liquid therefrom into the vessel 8. The heating medium delivered into the funnel 20^a is directed by the conduit 20 to the bottom of the vessel 8 and is allowed to rise therein.

22 indicates a delivery or supply pipe for the liquid to be pasteurized, having a funnel or receiving receptacle 22^a at its upper end and a connection 22^b leading through the lower part of the vessels 5 and 6, and communicating with the helical conduit 6''

22^c indicates a conduit leading from the supply tank D to the funnel 22^a and controlled by a valve 22'.

23 indicates a trough surrounding the upper end of the vessel 6 and into which the treated liquid is delivered from the helical conduit 6''.

24 indicates an annular cover for the trough 23. It is preferably supported and carried by the vessel 8. The purpose of the cover 24 is to convey water overflowing from the vessel 8 to the vessel 5, while precluding its getting into the trough 23.

The water circulating means for the heater A comprises two steam pipes 25, 26, which are connected with a suitable supply. The pipe 25 leads into the vessel 5 and is provided with a distributer or water heater 25^a preferably arranged near the bottom of the said vessel 5. As the steam passes through the pipe 25 into the distributer 25^a water in the vessel 5 is sucked into the distributer or heater and ejected therefrom. The steam pipe 26 extends down into the

vessel 5 below the water level therein, and is then connected with an up-take pipe 26′ which terminates at its free end in a nozzle 26^a. The nozzle 26^a discharges the water and heating medium into the funnel 20^a.

26^b indicates an ejector carried by the pipe 26 below the water level in the vessel 5. By means of this ejector steam from the pipe 26 is caused to elevate water from the vessel 5 and direct it through the nozzle 26^a into the funnel 20^a. This arrangement and operation of the steam pipes, heater and ejector produces a circulation of the water around the chamber 5 and between the cylinders 5 and 8 and facilitates the maintenance of substantially uniformly heated water in each of said cylinders.

The preliminary cooler B comprises a series of vessels, 27 being the outer vessel, 28 the inner vessel, and 29 the intermediate vessel arranged concentrically and one within the other. The vessels 28 and 29 are preferably of a size relative to each other so that there is formed between their opposing walls a reduced passageway 30 for the liquid to be treated. Within the passageway is preferably provided a helical rib 30′ to form a helical conduit from the bottom to the top thereof. The outer vessel 27 rests directly upon the pedestal 3^a.

27^b indicates an annular boss or ring preferably formed integral with the bottom of the vessel 27. The upper surface of the boss 27^b is preferably flat.

28^b indicates an annular rib secured to or formed integral with the under surface of the bottom of the intermediate vessel 29. The lower surface of the rib 28^b is preferably flat and rests on the annular boss 27^b of the vessel 27. This construction of support operates to maintain the vessels 28 and 29 concentric with the axis of the vessel 27.

32 indicates a metal cylinder arranged between the outer vessel 27 and the intermediate vessel 29. This cylinder is bent or pressed to form a helical groove 32′ surrounding the cylinder 29 and extending from one end to the other of the said cylinder.

33 is an inlet pipe communicating with the top convolution of the groove 32′ and supplies the cooling medium thereto.

33′ indicates the outlet for the cooling medium leading from the lower convolution of the groove 32′.

The driving mechanism for the preliminary cooler B and the connections of the inner cylinder 28 therewith are like similar parts for the heater A, already described, so that no further description of them is required; and the same may be said of the trough at the top of the helical passageway and the overhanging guard therefor.

35 indicates a branch pipe leading from the inlet pipe 33 and provided with a nozzle 35′ arranged to discharge the cooling medium into the funnel 20^a of the inner vessel 28.

36, 36′ indicate valves, carried by the pipes 33 and 35, respectively, to control the flow of the cooling medium therethrough.

37 indicates a funnel or receptacle arranged to receive the liquid being treated from a discharge pipe 37′ which leads from the trough 23 of the heater.

37^a indicates an outlet pipe for the receptacle 37, connected by a pipe 37^b to the lower end of the passageway 30 between the vessels 28, 29.

38 indicates a pipe for conveying the liquid from the trough 23 to the final cooler C. The final cooler C is of identically similar construction to the preliminary cooler B.

The cooling medium for the final cooler C may be water. For this purpose there is connected with the supply pipe a valve-controlled pipe 39, provided with a valve-controlled branch 39′ which conveys water to the inner cylinder 28 and the helical groove 32′, respectively. I prefer, however, to use brine as a cooling agent for the final cooler C, in which case the inlet pipe has connected to it a pipe 40, leading from a brine supply tank 40′.

41 indicates an outlet pipe for the brine connected with the discharge pipe 41′.

40^a and 41^a indicate respectively valves for controlling the flow of brine to and from the cooler C.

It will be noted that the connection between the inner rotatable cylinder and the driving shaft is such that the inner cylinder may be freely drawn upwardly for the purpose of removing it when it is desired to clean the walls of the helical passageway through which the liquid to be treated is caused to flow. Besides being simple of operation, this driving connection between the rotatable cylinder and the driving shaft is a substantial and durable one and lends itself admirably to the maintenance of concentricity between the rotatable vessel and the intermediate vessel.

In operation, in pasteurizing a liquid, the apparatus herein described operates in the well known manner of the apparatus described and patented in Letters Patent No. 878,225 issued to John C. Miller, hereinbefore referred to, so that it is not deemed necessary to describe in detail the course of a charge of milk or other liquid to be treated through the apparatus.

Many alterations in the construction, and many apparently widely differing embodiments and applications of my invention will suggest themselves to those skilled in the art to which this invention pertains without departing from the spirit and scope thereof. My disclosures and description herein are purely illustrative and are not intended to be in any sense limiting.

No claim is made herein to the disclosed subject-matter relating to the construction of liquid treating apparatus, the invention therein being claimed by me in a divisional application filed on the 27th day of March, 1916, Ser. No. 87,016.

What I claim is:

1. In apparatus of the character described, the combination of a base provided with a series of ring shaped bosses, a series of hollow pedestals having flanges on their lower ends adapted to rest on said bosses, the said pedestals being of different heights and flaring outwardly at their upper ends to form supports, and means for securing the flange of each pedestal to the adjacent boss.

2. In apparatus of the character described, the combination of an elongated base curved on transverse lines to provide a convexed surface and formed with a series of alined openings, horizontally arranged bosses surrounding said openings, hollow pedestals having flanges on their lower ends arranged to rest on said bosses, and means for securing the flange of each pedestal to the adjacent boss.

3. In apparatus of the character described, the combination of an elongated base curved on transverse lines to provide a convexed surface and formed with a series of openings, horizontally arranged bosses surrounding said openings, hollow pedestals of different heights having flanges on their lower ends arranged to rest on said bosses, the upper ends of the pedestals flaring outwardly to form supports for a liquid treating apparatus, and means for securing the flange of each pedestal to the adjacent boss.

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

LEROY S. PFOUTS.

Witnesses:
DAVID B. DAY,
CHARLES M. STELLING.