March 22, 1932. A. DANZER 1,850,923

STERILIZER CABINET

Filed Nov. 8, 1928 2 Sheets-Sheet 1

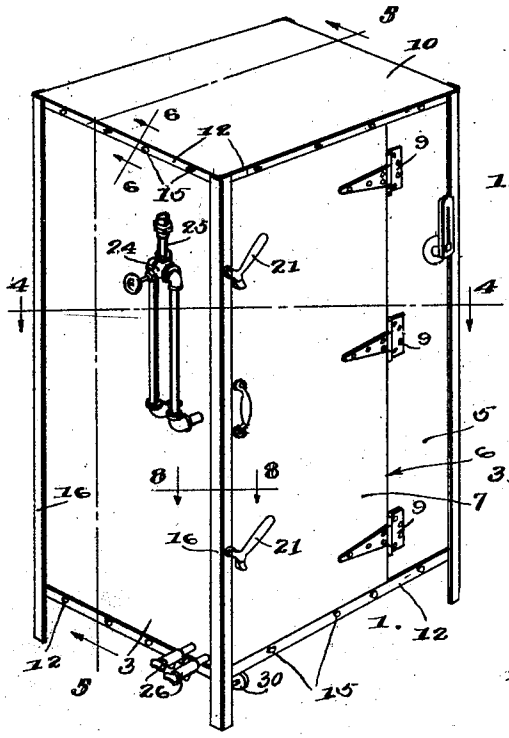


Fig. 1.

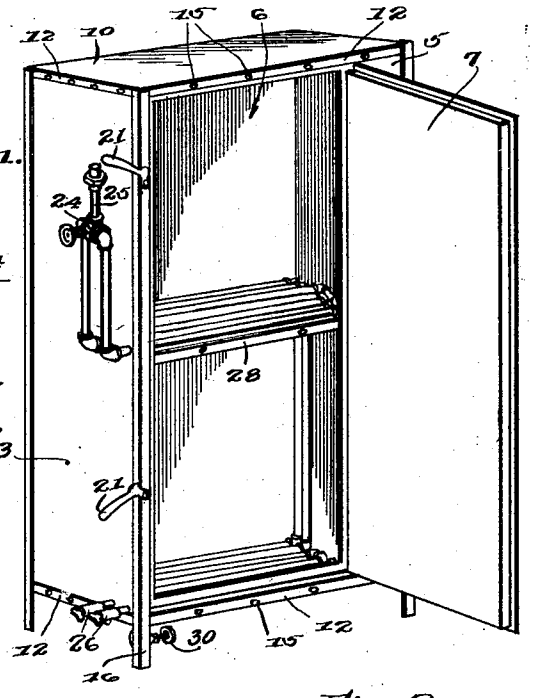


Fig. 2.

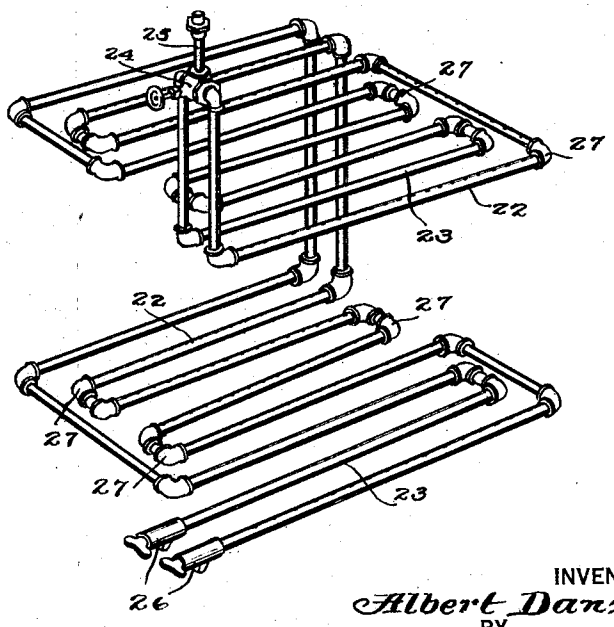


Fig. 3.

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Fig. 4.

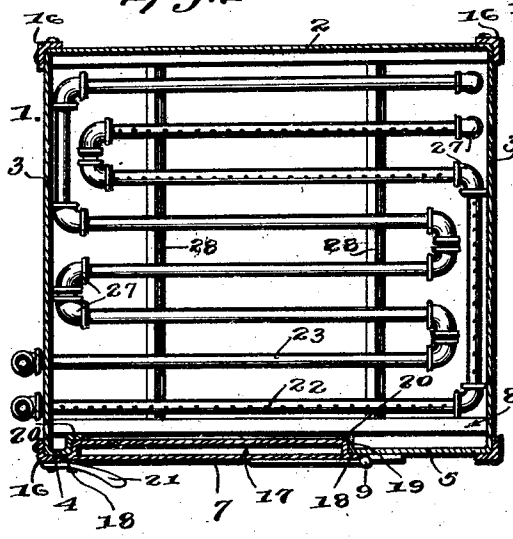
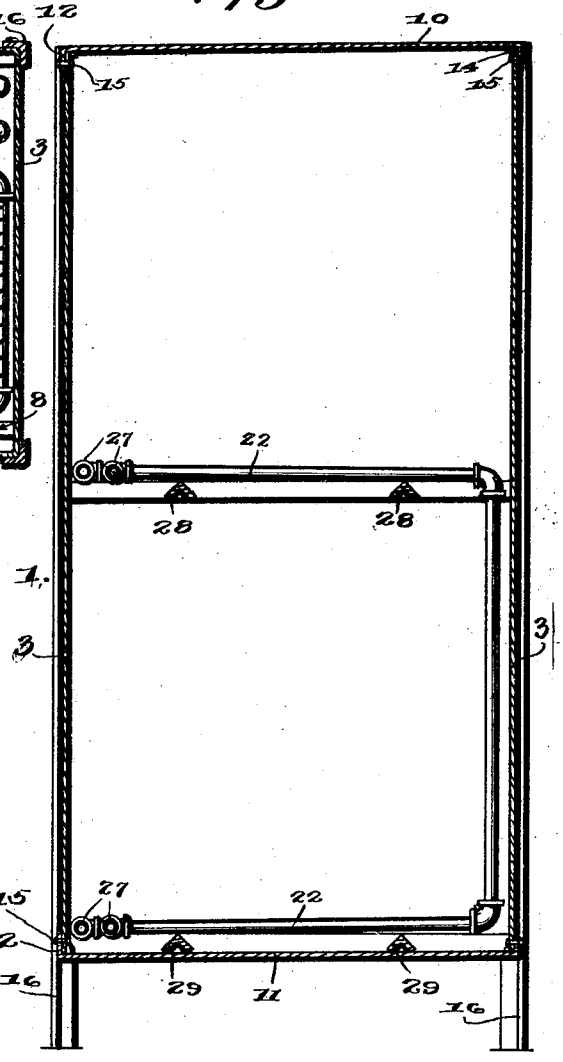


Fig. 5.



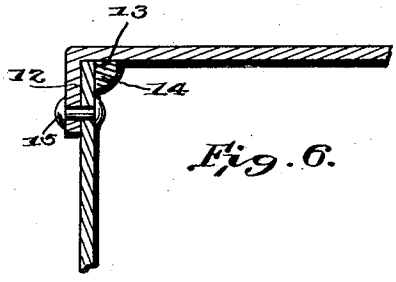


Fig. 6.

Fig. 7.

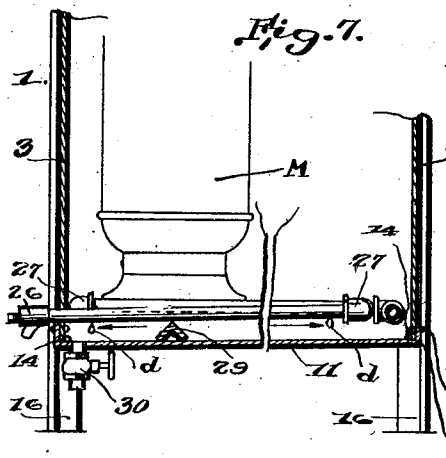
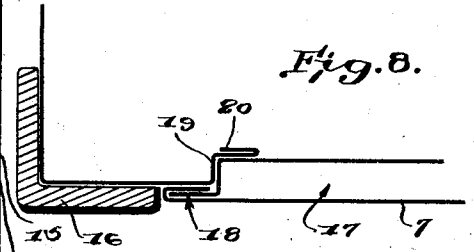


Fig. 8.



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UNITED STATES PATENT OFFICE

ALBERT DANZER, OF HAGERSTOWN, MARYLAND; THE HAGERSTOWN BANK AND TRUST COMPANY, OF HAGERSTOWN, MARYLAND, ADMINISTRATOR OF SAID ALBERT DANZER, DECEASED, ASSIGNOR TO ROY DANZER, OF HAGERSTOWN, MARYLAND

STERILIZER CABINET

Application filed November 8, 1928. Serial No. 318,066.

This invention relates to improvements in sterilizers, and it consists of the constructions, combinations and arrangements herein described and claimed.

An object of the invention is to provide an all-metal cabinet for sterilizing milk cans, dairy utensils of all sorts, etc. by the alternate use of what may aptly be termed live steam and dry heat.

Another object of the invention is to provide a sterilizing cabinet having an arrangement of perforate and imperforate coils into which steam is alternately turned from a common source, first to fill the cabinet with live steam, next to dry the interior of the cabinet.

A further object of the invention is to slightly pitch the pipe components of each coil for the double purpose of causing the drainage of the interior of the coils and of causing the moisture accumulating on the outside of the coils to run down toward the sides of the cabinet where the various elbows or joints will act as drip edges.

A further object of the invention is to provide a sterilizing cabinet in which the door is hinged upon a front wall of a substantial width, the arrangement making the door opening as narrow as possible so that the loss of heat will be reduced to a minimum when the necessity for opening the door arrives.

A further object of the invention is to control the flow of steam to the perforate and imperforate coils with a single two-way valve.

Other objects and advantages appear in the following specification, reference being had to the accompanying drawings in which,

Figure 1 is a perspective view of one type of sterilizer cabinet, the door being closed,

Figure 2 is a perspective view of the same cabinet, the door being open,

Figure 3 is a perspective view of the perforate and imperforate coils,

Figure 4 is a horizontal section taken on the line 4—4 of Figure 1,

Figure 5 is a vertical section taken on the line 5—5 of Figure 1,

Figure 6 is a detail cross section taken on the line 6—6 of Figure 1,

Figure 7 is a detail sectional view particularly illustrating how the water of condensation will run down the pitched pipe components of each coil,

Figure 8 is a detail horizontal section taken on the line 8—8 of Figure 1.

The increasingly rigid requirements in many communities for the importation of milk of a low bacterial count, commonly known as grade "A" milk, imposes the necessity of sterilizing the cans or other containers in which the milk is transported. The sterilizing cabinet herein disclosed meets all of the requirements of a device for the purpose stated, but in doing this it has been made a consideration to produce a cabinet of an extremely simple construction, yet of such a construction that its simplicity contributes largely to the efficiency of the cabinet, rather than detract therefrom.

Another large contribution toward the efficiency of the cabinet resides in the particular mode of handling the steam which is used as the sterilizing element. Live steam is first turned into the cabinet, thus to fill the cabinet and have its sterilizing effect upon the milk cans. For this purpose one of two sets of coils on which the cans rest is made perforate. The flow of steam is presently diverted to the other and imperforate set of coils. Heat is then radiated from the latter set of coils for the purpose of drying up the moisture in the cabinet.

With these brief statements attention is directed to the drawings. The cabinet is generally indicated 1. In practice it is capable of production in a number of styles or types, but the following principles are common in all of the types. It comprises back and side walls 2 and 3 (Fig. 4). These walls are formed from a single sheet of material. They stand vertically, and the bends at which the back and side walls are defined form the rear vertical corners of the cabinet. This sheet of material is also bent to form front portions 4 and 5. The bends by which these portions are formed comprise the front vertical corners of the cabinet.

The portion 5 is wider than the portion 4. It is herein known as a front wall of substantial width. Its purpose is to reduce the width of the opening 6 in which the door 7 swings as much as possible, so that the loss of heat from the cabinet will be reduced to a minimum when the door is swung open. The door must be opened from time to time to exchange cans. The front wall 5 and adjacent side wall 3 define a closed corner 8 within the cabinet and adjacent to the hinges 9 of the door which will serve to pocket the hot air and prevent the entire volume of hot air from escaping.

Plates 10 and 11 form the top and bottom of the cabinet. All four edges are capped over the various walls of the cabinet as at 12. The portions designated 12 are flanges which fit down over the outside of the walls of the cabinet. They might be fitted on the inside but it is preferable to have them on the outside for the following reasons:—The corners 13 formed by the two plates and side walls (Fig. 6) are permanently sealed and rounded off by fillets 14 of solder. The flanges 12 and side walls are first riveted at 15. The rivets and solder fillets not only compose indestructible joints but also joints which are readily cleaned out.

At each corner a heavy angle iron bar 16 is riveted or otherwise secured to the cabinet and extends below the bottom plate 11 to provide legs. The bars reinforce the vertical corners previously mentioned. They make the cabinet absolutely rigid so that the cabinet will not be rendered shaky in ordinary use. Reverting to the door 7, it is to be observed in Figure 8 that this is composed of two thicknesses of material, separated a given distance to define a dead air space 17. The four edges of the door are flanged as shown in one instance at 18 in Figure 8. These flanges contact the front of the cabinet when the door is closed.

In order to provide the door with an abutment the portions surrounding the openings 6 are bent in and flanged as shown in one instance at 19 and 20 in Figure 8, the door fitting within the bent in portions 19 and bearing against the flanges 20. Suitable fasteners 21 seal the door tightly within its opening. The arrangement provides a two-point contact when the door is closed, the use of the fasteners 21, which in practice will be cam operated latches, will establish an almost air tight seal for the door.

Two sets of coils occupy the cabinet. They are so associated that they form rests upon which milk cans can be stood in the inverted position. A milk can M is so shown on one of the rests in Figure 7. The sets of coils are spaced from each other in the vertical direction thus to form top and bottom platforms. One set of coils 22 is perforated, and when steam is turned into the set the interior of the cabinet and the can M will be filled with steam. The other set of coils 23 is imperforate, and when steam is turned into this set the dry heat radiating therefrom will dry up the moisture within the cabinet.

The upper extremities of the coils 22 and 23 terminate at the opposite port of a two-way valve 24 the upper central port of which has a single pipe connection 25 to the source of steam. A turn of the valve handle to the right will direct the steam into the coils 22, and a turn to the left will direct it into the coils 23. A single control accomplishes the purpose. The lower extremities of the coils terminate in pet cocks 26.

These will be opened either to drain the coils or to permit the escape of entrapped air. For example, the filling of the imperforate coils 23 with steam would be impeded if a pet cock were not provided for the purpose of letting out the air. Upon turning the handle of the valve 24 to the left the appropriate pet cock 26 should be opened until steam blows out. The pet cock should then be closed, and the operator will know that the heating coil is filled with steam.

Generally the so-called platforms will be substantially level. But the pipe components of the coils will be given slight pitches in opposite directions for two purposes, first to cause the complete drainage of the pipes when the cabinet is temporarily out of operation, second to cause the moisture condensed upon the coils to run down toward the sides 3 of the cabinet. Here the various elbows 27 will act as drip edges.

There is a very definite advantage in so leading the water of condensation to the sides of the cabinet. The water should not be permitted to drip to the bottoms of the cans. Usually milk cans either have concavities in the bottoms or are ribbed to form depressions. If the water were permitted to drip from the coils in the central portions of the cabinet it would form pools in the bottoms of the cans and set up an objectionable condition when removing the cans from the cabinet.

By giving the components the slight pitch mentioned, the water is led off to the sides where it can drip down beside the cans, settle on the bottom of the cabinet and thus assure a perfectly dry condition of the cans when the time for removal arrives. Reference is made to Figure 7. The pitch of the pipe components of the lower coils is plainly indicated. The directions of movement of the drippings *d* is also indicated. These drippings will stop when the end elbows 27 are reached, and will drop off from the edges of the elbows.

Racks 28 and 29 support the pipe components of the top and bottom platforms (Fig. 5). These racks may be constructed in any suitable manner, the use therein of angle irons being preferable principally because of

the strength and cheapness thereof. The ends of the angle irons in the top rack are supported in any known manner. The angle irons of the bottom rack are simply laid on the bottom 11. The spacing of the bottom coils from the bottom plate facilitates the cleaning of the cabinet. The angle irons are of V-shape, and being inverted to support the coils from watersheds for moisture accumulating thereon.

A cock 30 permits the drainage of the cabinet. The bottom plate 11 is pitched toward the outlet. In practice the cock 30 will be connected to a point of discharge remote from the cabinet, particularly in instances where the cabinet is a permanent installation. The cabinet may be moved around from place to place, when the cock 30 would not have a permanent off take connection, and when steam would be let to the pipe connection 25 through a flexible hose.

The operation of the sterilizer cabinet is readily understood. Milk cans M or other receptacles and utensils will be rested upon the top and bottom platforms defined by the two sets of coils 22 and 23. One of these has holes while the other has not. After the cabinet is loaded with cans and the like the door 7 is closed. The arrangement of flanges in Figure 8 provides a practically air tight joint.

Turning the handle of the two-way valve 24 to the right steam is let into the perforate coils 22. The interior of the cabinet will be filled with steam as will also the interior of the cans. The latter are stood upside down on the platforms. After a given period the handle of the valve will be turned to the left. Steam will now fill the imperforate coils 23. Dry heat will be given off, and the heat will dry up the moisture from the cans and other parts of the cabinet.

Any water of condensation on the pipe components of the coils will be directed toward the elbows 27 adjacent to the sides 3 of the cabinet. The water will drip off from certain edges of the elbows and drop directly to the bottom of the cabinet. Thus the collection of pools of water on the bottoms of the cans is avoided, and upon opening the door 7 the cans will be taken out in a perfectly dry condition.

The front wall 5 keeps in much of the hot air. Of course the door 7 must be opened at times and some of the hot air will escape. But the front portion or wall 5 restricts the door opening 6 to the narrowest possible width, and reduces the loss of hot air to a minimum.

By virtue of the latter provision the required temperature may be reached in a much shorter time than if the door 7 were hinged at the corner of the cabinet, and the required temperature can be maintained with a lower boiler pressure than otherwise. The importance of soldering all internal joints of the cabinet has been emphasized. The lodging of grease, dirt or germs that might interfere with thorough sterilization is prevented.

No wood is used in the construction of the cabinet. All of the parts are made of metal. But these parts are relatively few in number so that a simple construction is arrived at, and they are put together in such a way that the cabinet has all requisite strength.

While the construction and arrangement of the improved sterilizing cabinet is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:—

1. A sterilizer comprising a cabinet, perforate and imperforate coils within the cabinet, and a two-way valve to the opposite ports of which the coils are connected, the central port being the terminal of a source of steam.

2. A sterilizer comprising a cabinet, and a coil comprising connecting elbows and pipe components which the elbows connect, the various pipe components being pitched in respect to the elbows so that moisture collecting on said components will run down to the elbows and drip off at certain edges thereof.

3. A sterilizer comprising a cabinet, and a coil in a substantially horizontal plane to form a platform for a receptacle to be sterilized, said coil comprising pipe components having connecting means adjoining opposite sides of the cabinet, said pipe components being alternately pitched toward said sides and connecting means so that moisture condensing on said components will run to opposite sides of the cabinet and drip off from said connecting means at places adjacent to the sides of the cabinet and avoid collecting a pool of water upon said receptacle.

4. A sterilizer comprising a cabinet having a peripherally flanged top and bottom, back, side and front portions to which the top and bottom are applied and over which the flanges extend forming corners around the inside of the cabinet at the ends, means by which the flanges are secured to said portions, and fillets of solder running along said corners supplementing the securing of the flanges and making sealed joints.

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