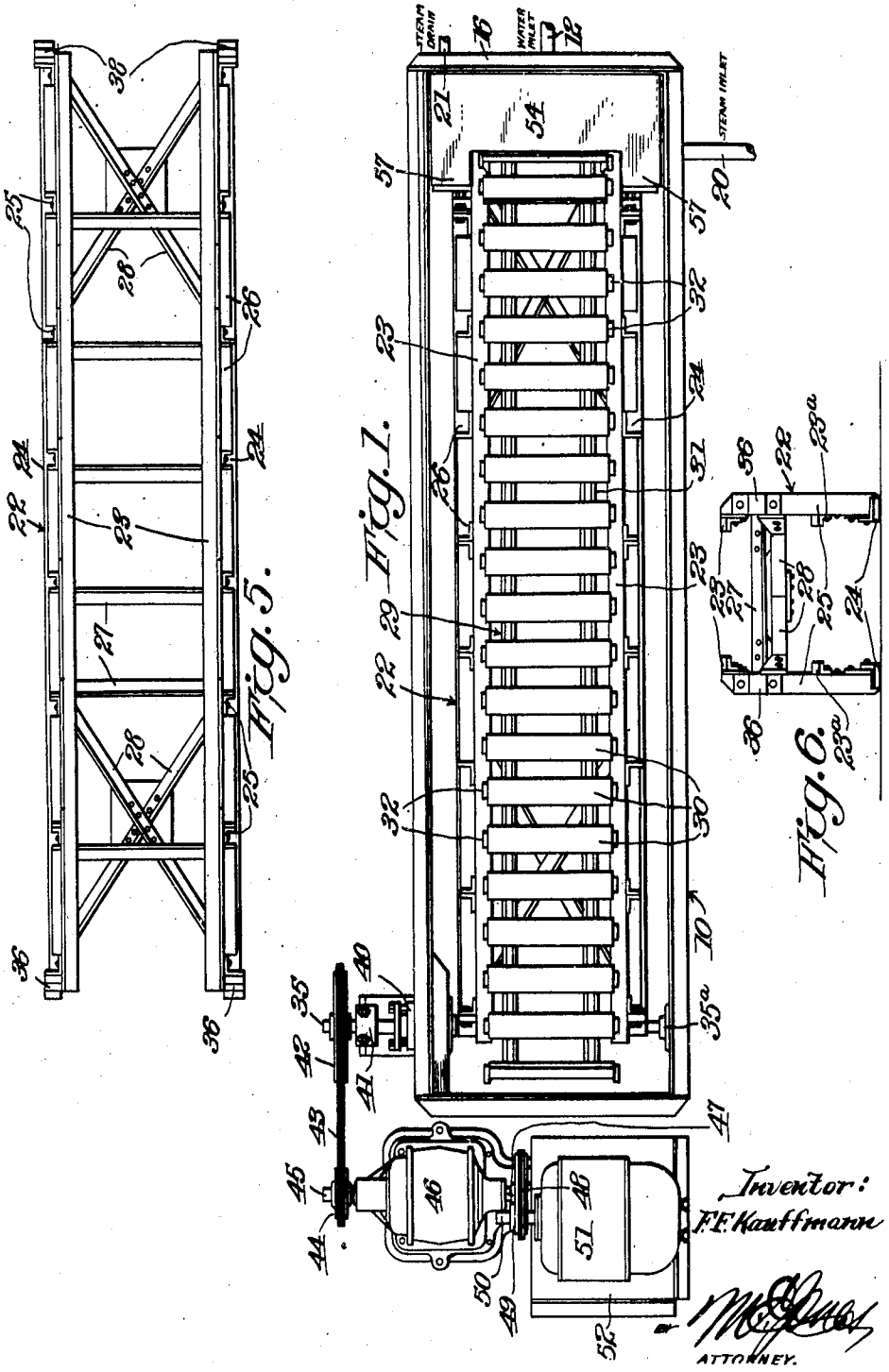
March 11, 1930. F. F. KAUFFMANN 1,749,947

DISH STERILIZING APPARATUS

Filed May 21, 1926 3 Sheets-Sheet 1



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DISH STERILIZING APPARATUS

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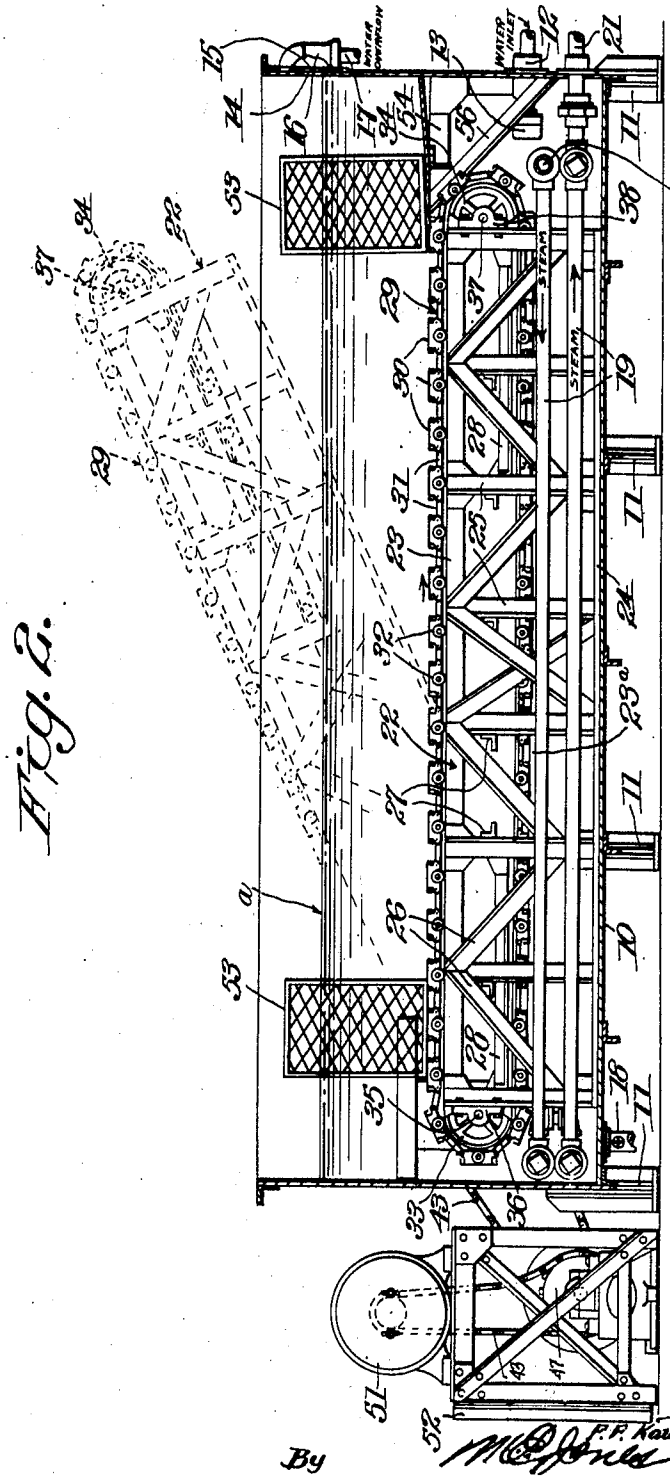



Fig. 2.

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Fig. 3.

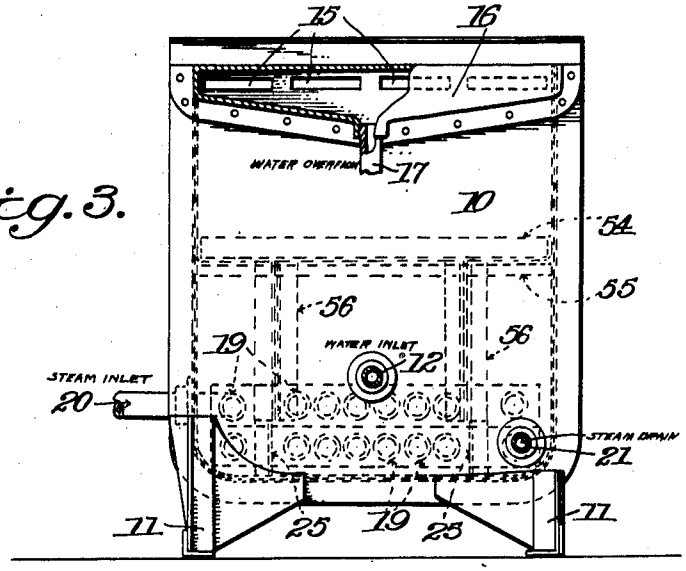
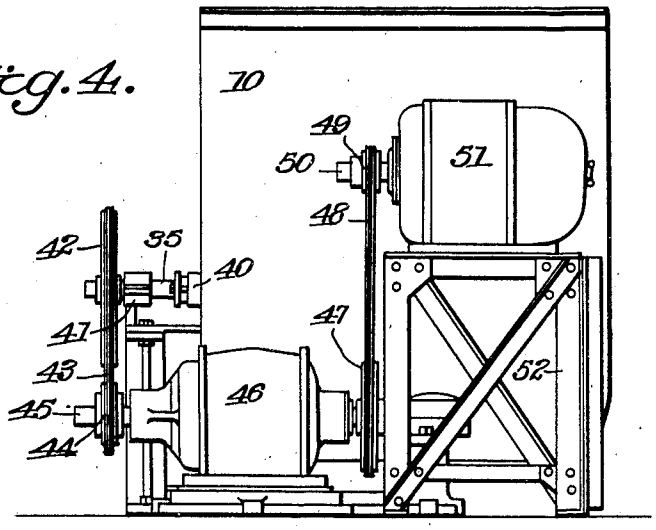



Fig. 4.




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Patented Mar. 11, 1930 1,749,947

# UNITED STATES PATENT OFFICE

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## DISH-STERILIZING APPARATUS

Application filed May 21, 1926. Serial No. 110,713.

This invention relates to sterilizing apparatus and generally aims to produce a comparatively simple, compact, efficient, noncorrosive, inexpensive and durable construction primarily for use in large kitchens, and wherein dishes in particular may be sterilized, usually subsequent to washing thereof.

An important object is to provide a novel construction having a slowly travelling conveyor to move the dishes or articles and maintain them a sufficient length of time in a sterilizing bath such as hot water, and serviently to drive the conveyor from an adjustable speed motor through interposed speed-reducing gearing.

A second desideratum is to invent a sterilizer having a novel means to mount and guide the conveyor and coacting parts, which is capable of being swung from the axis of the conveyor drive shaft to render the parts within the device accessible for cleansing, inspection and repair.

Another aim is to provide novel means whereby scum in the sterilizing bath may overflow and discharge.

Various additional objects and advantages will become apparent from a consideration of the following description taken in connection with accompanying drawings illustrating a representative embodiment.

In said drawings:

Figure 1 is a top plan view of the apparatus;

Figure 2 is a side elevation of the apparatus with one side wall of the tank removed and the adjacent walls shown in section and with the raised position of the structural frame suggested in dotted lines;

Figure 3 is an end elevation of the apparatus with the water-overflow header broken away;

Figure 4 is an end elevation opposite to Figure 3;

Figure 5 is a plan view of the structural frame alone and

Figure 6 is an end elevation of said structural frame.

In the drawings wherein like reference characters designate like or similar parts, 10 designates a tank or reservoir of suitable size, shape and material. Said tank may be supported by pedestals or legs 11 as from a floor and is adapted to contain a sterilizing bath, for instance, water at an appropriately high temperature. Any other sterilizing agent, of course, may be substituted.

Water or other sterilizing agent from any suitable source and under appropriate control may be admitted to the reservoir or tank 10 through a supply pipe 12, having a nozzle sprayer 13 at its discharge end within the tank. The water may substantially fill the tank since its level or elevation as indicated by line *a* in Figure 2 is governed by laterally elongated overflow ports or openings 14 cut in either end wall thereof. Said openings 14 register with openings or ports 15 provided in the back or attaching wall of a hollow header 16 fastened to said end wall and from which the water may drain through a depending pipe 17. A valved drain pipe 18 may extend from the bottom wall of the tank 10.

Any suitable means may be employed to heat the water within the tank 10 and to this end, an appropriate number and arrangement of coils or pipes 19 are submerged in the bath within the tank and adapted to be supplied with steam or other means of heat from any suitable source through an inlet pipe section 20 extending laterally through one side wall of the tank. The steam may drain from the coils 19 through a pipe 21 extending through an end wall of the tank and leading to a suitable point of discharge. In order to be effective for sterilizing purposes, the water within tank or reservoir 10 is adapted to be at a high degree of temperature and even boil if preferred. If desired, an automatic temperature regulator (not neces-

sary to show) of which there are various forms on the market may be used in connection with the sterilizing bath.

Located within the reservoir and submerged in the sterilizing bath, is a frame or supporting body 22. Said body may be of any appropriate construction, but is preferably made up of sections of angle material riveted or otherwise secured together, particularly having top runners 23, lower runners 23ª, uprights 25 connecting said runners and bars, diagonal braces 26 for said runners, uprights and strips, transverse connecting members 27 and crossed connectors or braces 28 adjacent each end of the structural frame connected to adjacent parts thereof and located between the planes of runners 23 and 23ª. The bars 24 rest directly on the floor or bottom of tank 10 and together with the uprights 25 and adjacent parts extend between certain of the coils 19 in order to secure maximum compactness as best seen in Figure 3.

Said structural frame or supporting body 22 mounts an endless conveyor 29 (Figures 1 and 2) which may be formed of flights or slats 30, connected by links 31 pivoted at their ends thereto so that the conveyor will be flexible. The flights 30 at each end have a roller 32 pivoted thereto and disposed for their main travel on the upper runners 23 and to return on the lower runners 23ª. The endless conveyor is trained around sprocket wheels 33 and 34 (Figure 1) whose teeth coact with the links 31. Sprocket wheel 33 is a driver while sprocket wheel 34 is an idler. A shaft 35 is journaled in suitable bearings 36 fastened to the adjacent uprights 25 and has the sprocket wheel 33 keyed thereto. In turn, sprocket wheel 34 is keyed to a shaft 37 which is journaled in bearings 38 fastened to adjacent uprights 25. The said conveyor 29 is adapted to support and move the material to be sterilized through the sterilizing bath.

Said shaft 35 is sectional and has its sections connected by a suitable separable coupling located adjacent one side wall of the tank and the shaft projects through the last mentioned side wall to the interior of the tank, as through a stuffing box or equivalent means 40 in said wall forming a watertight joint about said shaft. The opposite side wall of the tank mounts a bearing 35ª in which said shaft 35 is journaled. Exteriorly of the tank, shaft 35 is journaled in a bearing 41 of suitable form which may rise from the same base as the tank 10 as best seen in Figure 4. A sprocket wheel 42 is keyed to shaft 35 and has a sprocket chain 43 trained over it and which also is trained over a sprocket wheel 44 keyed to a shaft 45 of planetary reducing gear unit 46, of a suitable construction and unnecessary to specifically illustrate. The gear ratio of said wheel 46 is preferably 64–46 to 1. Shaft 45 has a sprocket wheel 47 thereon over which a sprocket wheel 49 keyed to the main or armature shaft 50 of an electric motor 51, adapted to receive its current from any appropriate source. The various sprocket wheels and chains may be enclosed or encased, if desired. Said motor is adjustable as to speed so that the speed of travel of the conveyor may be varied or regulated and further may be of the size and type adapted to operate at 1750 revolutions per minute, and it is mounted upon a suitable stand 52, for instance, of the skeleton or angle iron construction shown as resting on the same base as the tank 10.

Since table 22 has shaft 35 journaled in the bearings 36, and said shaft 35 is supported in bearings 35ª and 41, the frame may be swung on the axis of said shaft 35 to the dotted line position of Figure 2 to facilitate cleaning, inspection and repair of the parts.

The tank 10 and pipes and all parts within said tank are preferably made of a non-corrosive metal as for instance, Monel metal.

Since the top of tank 10 is open, reticulate baskets or other containers 53 adapted to hold dishes (usually after washing thereof) or other articles to be sterilized may be readily placed on or removed from the conveyor. Said conveyor moves from left to right in Figures 1 and 2, and the baskets 53 are initially placed thereon preferably adjacent the left-hand end. Due to the speed-reduction gearing unit at 46, the conveyor moves relatively slow and accordingly the dishes or articles being sterilized remain for a considerable period of time in the sterilizing bath. In practice, the construction shown is such that the conveyor usually travels but eight feet per minute but which rate may be varied through adjustment of the motor 51.

As the containers 53 approach the right hand end of the tank, they are automatically moved by the conveyor onto a supporting shelf 54, which prevents upsetting of the containers 53 and supports the same in the event the operator neglects the container or should be otherwise engaged. If a row of the containers should be neglected, they would not upset since the foremost ones would rest on shelf 54 and abut the adjacent end wall of the tank with the conveyor simply slipping under the baskets. Said shelf 54 is supported in any suitable manner within the tank, and for instance on an angle iron 55 bridging the side walls of the tank, and further by braces 56 fastened to said shelf and to an end wall of the tank. To facilitate the transfer of the baskets 53 from the conveyor to the shelf 54, the latter is preferably bifurcated as best shown in Figure 1 so that extremities 57 of said shelf will be disposed partly below the basket-supporting plane of the conveyor and engaged by the adjacent basket before the portion of the conveyor originally engaged

with the basket, starts to move away from the same in following the periphery of sprocket wheel 34.

Obviously the connections of the various pipes such as 12, 18, 20 and 21 with the tank are watertight.

In operation, water flows to the tank 10 through pipe 12 to the level *a* and is heated by the steam coils 19. The supply of water may be continuous and move slowly so that the same will constantly overflow through the ports 14, header 16 and pipes 17, to continuously remove scum which may form on the water. On the other hand, if desired, the water may remain standing in the tank 10 and additional quantities admitted from time to time in order to overflow the same and thereby remove the scum. The dishes, usually after being washed, or other articles, are placed in the baskets 53 and the attendant deposits said baskets onto the conveyor 59 at the left hand of Figures 1 and 2. The baskets extend above the level of the water and hence may be readily engaged while placing them on the conveyor or removing the same therefrom. The dishes or articles to be sterilized, however, are submerged and travel with the conveyor at a very slow rate of speed toward the shelf 54 so that the dishes or articles remain a sufficient length of time in the water for complete sterilization. The baskets gradually approach and automatically move onto the shelf 54, after which the attendant lifts same from the tank. It is to be realized that the baskets one after another are placed on the conveyor relatively close together to utilize the maximum capacity of the machine and that such baskets are successively removed by the attendant from the shelf 54.

Since the shaft 35 is journaled in the bearings 36, and supported in bearings $35^a$ and 41 the frame 23 with conveyor 29 thereon as a unit may be readily swung upwardly from the axis of the shaft 35 to the dotted line position of Figure 2. This is advisable when draining and cleaning the tank or inspecting, repairing or replacing parts within the tank rendered normally inaccessible by the presence of said frame.

Various changes in the location, arrangement and details of the parts may be resorted to within the spirit and scope of the invention as defined by appended claims.

I claim as my invention:

1. A machine of the class described comprising a tank to contain a sterilizing bath, an endless conveyor to support and move articles being sterilized in the bath, a frame carrying said conveyor, a drive wheel for said conveyor, a shaft on which said wheel is rigid, said shaft being journalled on said frame and permitting the latter to be swung about the axis of said shaft.

2. A machine of the class described comprising a tank to contain a sterilizing bath, an endless conveyor to support and move articles being sterilized in the bath, a frame carrying said conveyor, a shaft journalled on said frame and permitting the latter to be swung about the axis of said shaft, a drive wheel for said conveyor rigid on said shaft, said shaft extending through an upstanding wall of the tank, a water-tight joint for said shaft at said wall, and means exterior of the tank to drive said shaft.

3. A machine of the class described comprising a tank to contain a sterilizing bath, an overflow means for the tank, means for the inlet of the bath to the tank, means to heat the bath, a drive shaft, a frame within the tank on which said shaft is journalled, an article-supporting conveyor on said frame, a wheel rigid on said shaft to drive said conveyor, and said frame being movable from the axis of said shaft, said conveyor and frame being below said overflow means.

4. A machine of the class described comprising a tank to contain a sterilizing bath, means for the supply of the bath to the tank, means to heat the bath, a drive shaft, a motor to drive said shaft, a speed-reducing means between said motor and said shaft, a frame within the tank on which said shaft is journalled and from the axis of which said frame may be swung, an article-supporting conveyor on said frame, and a wheel rigid on said shaft to drive said conveyor.

5. A machine of the class described comprising a tank to contain a sterilizing bath, means for the supply of bath to the tank, the tank having an overflow outlet, coils within the tank to heat the bath, a drive shaft journalled in the tank and extending through and exteriorly beyond a wall thereof, a water-tight joint for said shaft at said wall, a speed-reducing unit in driving relation to said shaft, means to drive the unit, a frame within the tank on which said shaft is journalled, an article-supporting conveyor on said frame, a wheel rigid on said shaft to drive said conveyor, said frame being movable from the axis of said shaft, certain of the said coils being spaced apart to accommodate the supporting means of the frame, said conveyor and frame being below said overflow outlet.

6. A machine of the class described comprising a tank adapted to contain a sterilizing bath, a conveyor frame supported within the tank, a drive shaft journalled in a wall of the tank providing a pivotal axis on which the frame may be swung to elevated position to expose the bottom of the tank and parts of the machine adjacent thereto, and a conveyor mounted on the frame to support and move articles in the bath for sterilizing.

7. A machine of the class described comprising a tank adapted to contain a sterilizing bath, a conveyor frame supported within the tank, a drive shaft journalled in a wall of the tank providing a pivotal axis on which

the frame may be swung to elevated position to expose the bottom of the tank and parts of the machine adjacent thereto, a conveyor mounted on the frame to support and move articles in the bath for sterilizing, and a shelf within the tank below the level of the bath and relatively close to an upstanding wall of the tank, said shelf being in substantially the article-supporting plane of the conveyor so that articles may be automatically transferred thereto by the conveyor and their transfer limited by the last mentioned wall.

In testimony whereof I have affixed my signature.

FREDERICK F. KAUFFMANN.