

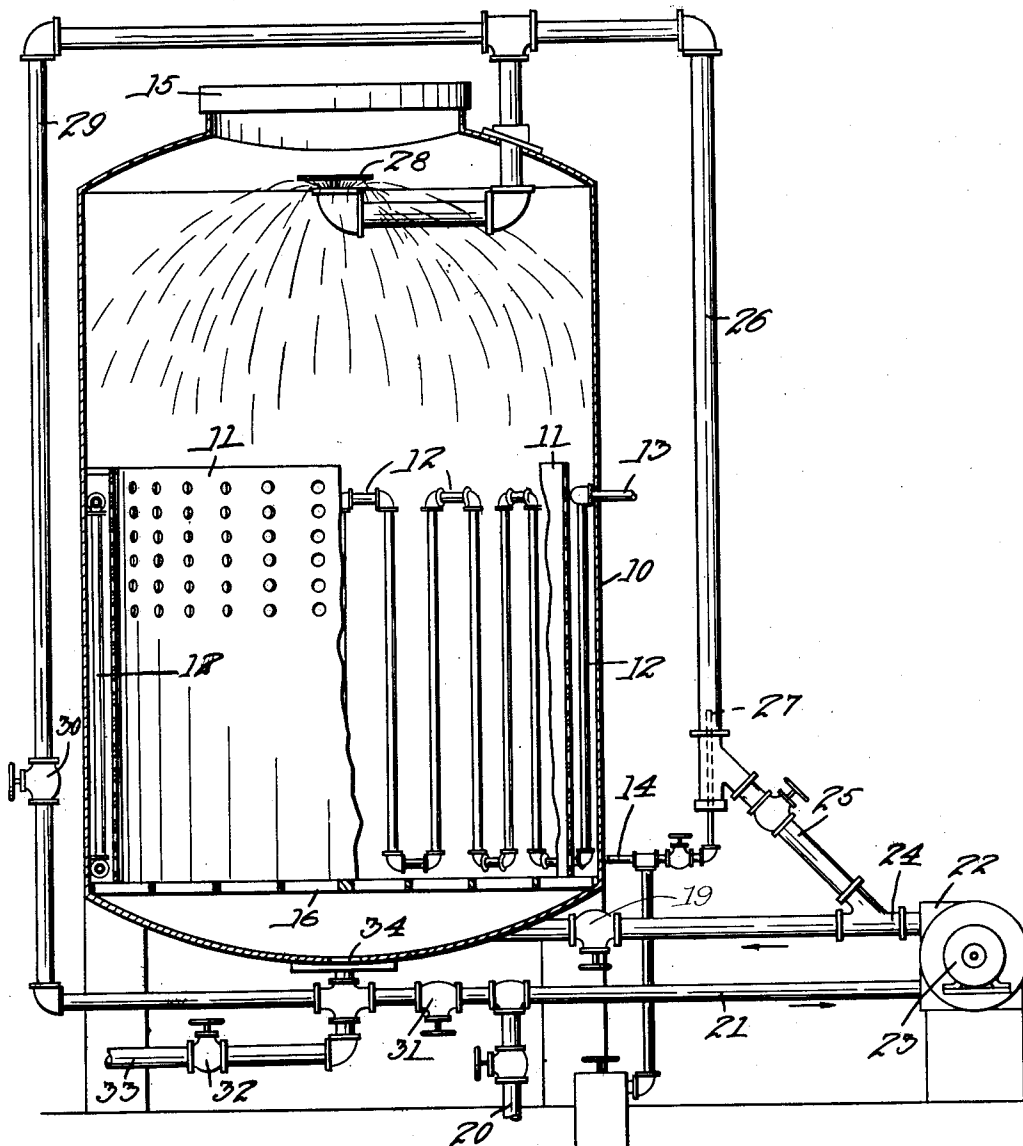
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KIER.

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The principal objects of this invention are to provide means whereby the goods in a kier will be more thoroughly and uniformly subjected to the action of the liquid therein and the heat; and to provide a construction in which the goods cannot come into contact with the steam pipes or get entangled therewith; also to provide for economies in the use of the steam and to assist the circulation by exhaust steam.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing which is a side view of the circulating system showing the kier in central section in accordance with this invention.

The kier is, as usual, in the form of a tank 10. In accordance with this invention, the tank is provided with a perforated partition 11 inside, spaced from the wall of the tank. This partition allows free circulation through its perforations but leaves a smooth surface for the goods in the tank to engage. It is surrounded by a series of steam coils 12 between the partition and the wall 10 of the tank, the steam entering through a pipe 13. These pipes therefore are protected by the partition and the goods do not come in contact with the pipes at all and they are not subjected to the direct heat thereof. The pipes or coils are separated by the partition 11, which is circular in the present instance, and therefore cannot be injured by the heat and cannot get tangled up in the pipes.

The pipes 12 discharge the exhaust steam through a pipe 14 and perform further functions as will appear. The goods are introduced through an opening in the top by a cover 15. At the bottom of the partition 11 and constituting a grating on which the goods rest, is a perforated plate 16 located horizontally. This may be merely an iron plate provided with perforations or a grating of any kind. It supports the goods at the bottom of the enclosure made by the partition 11 and allows free circulation of the liquid through it.

The circulating system starts with the admission of liquid through a pipe 20 to a pipe 21 which is adapted to enter the pump 22 which is operated by a motor 23. This pump discharges through a pipe 24 which extends directly into the convex bottom of the kier controlled by a valve 19 so that the liquid will circulate up through the grating 16.

The pipe 24 also has a branch 25 which extends up into a pipe 26. This pipe 26 has a jet nozzle 27 extending up into it from the steam exhaust 14 to heat the liquid and assist in circulating it. The liquid is introduced into the kier in the top through a spray nozzle 28. There is also a by-pass pipe 29 having a valve 30 for controlling it and entering the pipe 21 to re-circulate the liquid if desired. The circulation is controlled by two valves 31 and 32, the latter being located in a discharge pipe 33 which also is connected at 34 directly with the bottom of the kier.

It will be seen that all possible contingencies are provided for in the circulation of the liquid and that the kier is heated by the steam pipes or coils 12 which are located out of the path of the goods, that these heating coils are protected from the entanglement or lodgment of the goods and that an unobstructed space for receiving the goods is formed by the grating 15 and the wall 11. The walls of this space are free from all internal projections and will allow the goods to be subjected to the full force of the circulating liquid as well as the heating medium in the coils 12. The circulation of the liquid through the pipe 26 is facilitated and the liquid heated by the exhaust steam as specified.

Although I have illustrated and described only a single form of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is:—

1. In a kier, the combination with a tank, of a grating across the bottom thereof to support the goods and permit circulation of liquid therethrough, a perforated partition spaced from the wall of the tank extending upwardly from said grating, steam coils in the space between the tank wall and the partition, means for spraying liquid in the top of the tank above the space within said partition, means for introducing liquid into the bottom of the tank below the partition, piping for introducing the liquid into said spraying means at the top, and means whereby the exhaust steam from said coils is introduced into the last-named piping to heat the liquid and assist its flow.

2. In a kier, the combination with a tank, of a partition spaced from the wall of the tank, steam coils in the space between the tank wall and the partition, means for spraying liquid in the top of the tank above the space within said partition, piping for introducing the liquid into said spraying means at the top, and means whereby the exhaust steam from said coils is introduced into the last-named piping to heat the liquid and assist its flow.
3. In a kier, the combination with a tank, of a grating across the bottom thereof to support the goods and permit circulation of liquid therethrough, a perforated partition spaced from the wall of the tank extending upwardly from said grating, steam pipes in the spaces between the tank wall and the partition, a liquid circulating system comprising a pipe extending up to and into the top of the tank and also connected with the bottom of the tank, a pump for forcing the liquid through said piping, a supply pipe for the pump connected with the piping which enters the bottom of the tank, and a series of valves for permitting the liquid to flow therefrom into the pump or into the discharge if desired.
- In testimony whereof I have hereunto affixed my signature.

JOSEPH CYRUS BONNEAU.