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PATENTED JUNE 16, 1903.

W. J. RUFF.
PASTEURIZER.

APPLICATION FILED APR. 16, 1901.

NO MODEL.

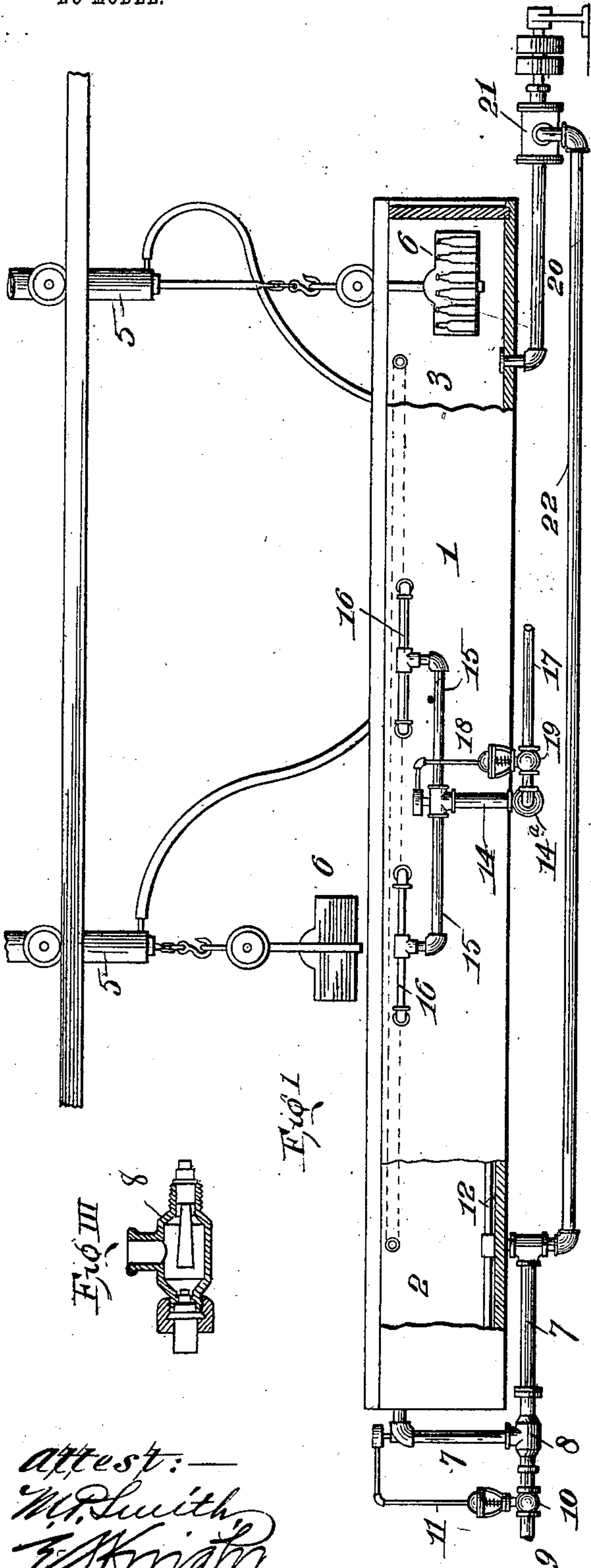
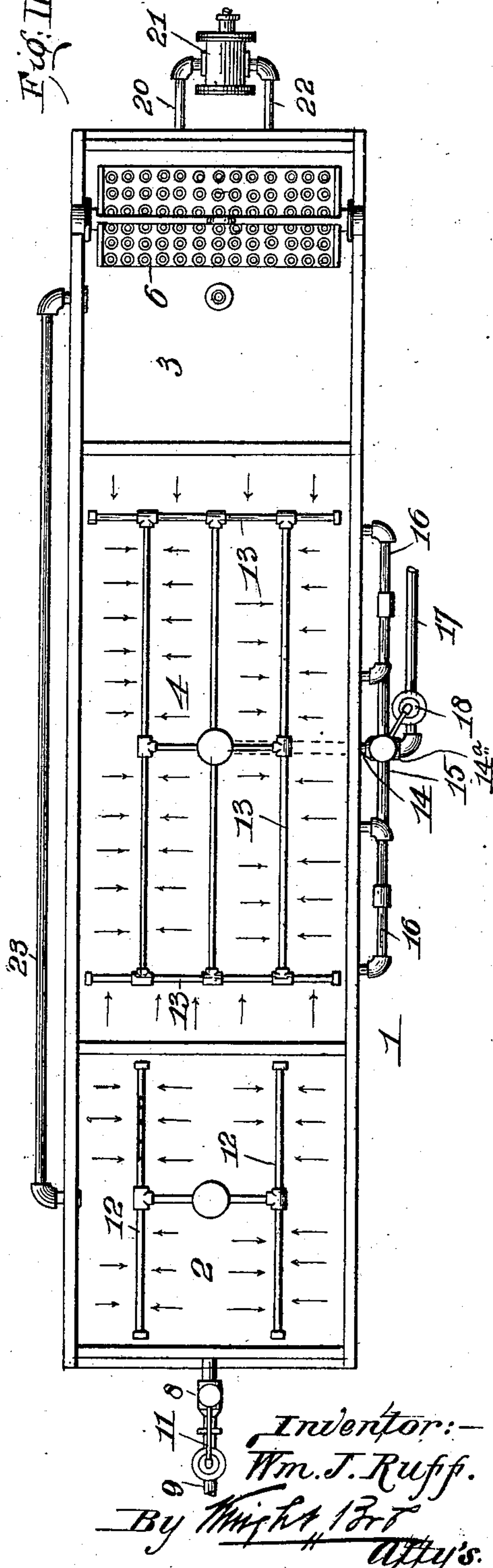


Fig. I

Fig. II



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PASTEURIZER.

SPECIFICATION forming part of Letters Patent No. 731,131, dated June 16, 1903.

Application filed April 15, 1901. Serial No. 55,899. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. RUFF, a citizen of the United States, residing at Quincy, in the county of Adams and State of Illinois, have invented certain new and useful Improvements in Pasteurizers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The object of my present invention is to provide an apparatus for pasteurizing beer (and which may be used for sterilizing milk and other substances) which is inexpensive in construction as well as effective in operation, and which can be used without danger of breaking the bottles, and which will do the work in a minimum space of time without deleterious effect on the beer due to too rapid heating and cooling of the beer.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a side view illustrative of my invention, part in section. Fig. II is a top or plan view showing one of the branch pipes broken away to show perforations therein, and Fig. III is a sectional view of one of the jet-pumps.

Referring to the drawings, 1 represents a tank having end compartments 2 and 3 and a middle compartment 4.

5 represents one or more traveling cranes or hoists by which the bottle-carrying receptacles 6 are handled.

7 represents a water-pipe forming a communication between the upper and the lower part of compartment 2. In this pipe is a jet-pump 8, which may be of any well-known form or type, and with the jet-pump there connects a pipe 9. In the pipe 9 is a valve 10, between which and the upper part of the pipe 7 is a regulator 11, which may be of any well-known form or type and which acts to open and close the valve 10 in conformity with the temperature in the pipe 7. The pipe 7 has perforated branches 12 located within the compartment 2, so that as the water is introduced into the bottom of the compartment from the pipe 7 it is distributed over the bottom of the compartment.

In the bottom of the compartment 4 are a number of branch pipes 13, perforated in the

same manner as the pipes 12 and communicating with a water-pipe 14, that extends beneath the tank and up on one side of the tank, its upper end being provided with branches 15, that communicate with the upper portion of the tank through subbranches 16. In the pipe 14 is a jet-pump 14^a, which corresponds in construction and operation to the pump 8, and to this pump there connects a steam-pipe 17.

18 represents a regulator forming a communication between the pipe 14 and a valve 19 in the pipe 17, this regulator corresponding to the regulator 11 of the pipe 7.

20 represents a water-pipe forming a connection between the bottom of compartment 3 and a pump 21, and 22 represents a pipe forming a communication between the pump and the pipe 7 where the latter enters the compartment 2.

23 represents a pipe forming a communication between the upper portions of the compartments 2 and 3.

In operating the apparatus the compartments 2, 3, and 4 are filled with water up to about the line of the pipe 23. Steam is then turned on through the pipes 9 and 17 to heat the water in the compartments 2 and 4, the water in the former being heated to approximately 100° to 105° Fahrenheit and the water in the latter being heated to approximately 144° to 148° Fahrenheit. The pump 21 being set in operation water will circulate from the compartment 2 to the compartment 3 and back again through the pipes 23 and 22, and thus the water in these two compartments will be raised to and maintained at approximately the same temperature. When the water is thus properly heated, the receptacle 6, loaded with bottles, is lowered into the compartment 2 for the initial heating of the beer, the temperature in this compartment not being sufficient to heat the bottles rapidly enough to break them or not being hot enough to have any deleterious effect on the beer on account of too rapid heating. After the bottles have remained in the compartment 2 for approximately thirty minutes the receptacle is shifted into the compartment 4, where it is allowed to remain for approximately one hour and in which the beer is heated sufficiently to be thoroughly pas-

teurized. The receptacle is then shifted into the compartment 3, where the beer and bottles are cooled down sufficiently to avoid deleterious effects on the beer from being too rapidly cooled by contact with the atmosphere and the bottles sufficiently cooled down to avoid breakage by contact with the atmosphere.

The apparatus is one in which beer or other substances can be quickly and effectively sterilized with a small amount of labor and within a minimum period of time.

There may be any desired number of receptacles 6 and hoists 5 used at one time, the number being controlled by the size of the tank and its compartments.

It is well known that if beer in pasteurizing it is heated beyond a certain temperature or even if it remains at a minimum pasteurizing temperature beyond a stated length of time changes in the composition of the beer will take place, such as coagulation of the albumenoids and in some cases elimination of the same, and the brilliancy of the beer will thereby be affected and the taste of the beer changed to a disagreeable and an unnatural one, and the beer will also take on an objectionable odor. With my system of handling the bottles and transferring them bodily from one compartment to another of different temperature the length of time that they are allowed to remain in either compartment can be regulated as circumstances may require, and in neither compartment need the bottles be allowed to remain longer than is necessary to produce the best results, and this system of pasteurizing, wherein the bottles are bodily changed from one compartment to another, is very advantageous when quarts and pints are being treated at the same time. It requires a longer time to pasteurize beer in quart bottles than it does in pint bottles, because it takes longer for the maximum temperature to reach the center of the bottles. With my system one receptacle may be loaded with quarts and the other with pints and each allowed to remain in the different baths the requisite time required for each, whereas with the old system of conveying the bottles by means of an endless carrier no beer can be removed until the tank is cooled, and consequently the beer contained in pint bottles would suffer deleterious effects before the beer contained in the quart bottles becomes thoroughly pasteurized.

In my apparatus the compartment 2 may be termed an "attemperating-tank," the compartment 4 the "sterilizing-tank," and the compartment 3 the "cooling-tank."

By forming a communication between the tanks 2 and 3 and causing the water to circulate from one to the other the condition of the beer itself is utilized for attemperating

purposes—that is to say, when the hot beer is moved from the sterilizing-tank into the cooling-tank it would raise the temperature of the water in the latter tank above the desired cooling-point were it not for the fact that the water is caused to circulate from the tank 3 to the tank 2, thus causing water to be brought from the tank 2 (which has been cooled by the cold beer) into tank 3, and the warmer water taken from tank 3 to tank 2 acts to assist in raising the temperature in the latter tank to a desired degree for attemperating purposes. In this way I economize in the use of an independent heating medium for the water in tank 2 and in the use of an independent cooling medium for the water in the tank 3.

I claim as my invention—

1. In a pasteurizer, the combination of an attemperating-tank, a cooling-tank, a sterilizing-tank without communication with said tanks, means for moving the substance to be sterilized from one tank to another, means for causing a circulation of water between the attemperating-tank and the cooling-tank, and means for maintaining the water in the sterilizing-tank at a higher temperature than the water in the other tanks, substantially as set forth.

2. In a pasteurizer, the combination of an attemperating-tank, a cooling-tank, a sterilizing-tank without communication with said tanks, means for moving the substance to be sterilized from one tank to another, means for heating the water in the attemperating and cooling tanks, means for causing a circulation of water between the two last-mentioned tanks, and means for maintaining the water in the sterilizing-tank at a higher temperature than the water in the other tanks, substantially as set forth.

3. In a pasteurizer, the combination of an attemperating-compartment, a sterilizing-compartment, a cooling-compartment, means exterior of said compartments creating a circulation between the attemperating-compartment and cooling-compartment, said means being without communication with the sterilizing-compartment, and means carrying the substance to be sterilized through said compartments, substantially as set forth.

4. In a pasteurizer, the combination of an attemperating-tank, a sterilizing-tank, a cooling-tank, means for heating the sterilizing-tank, and means for distributing heat from the sterilizing-tank to the attemperating and cooling tanks, the heating medium in the attemperating and cooling tanks being out of communication with the sterilizing-tank.

WILLIAM J. RUFF.

In presence of—

GERHARD G. ARENDS,
HENRY DAMHORST.