Sept. 1, 1970 H. A. BRIEL 3,526,100

CONTINUOUS ICE-MAKING MACHINES

Filed April 5, 1968

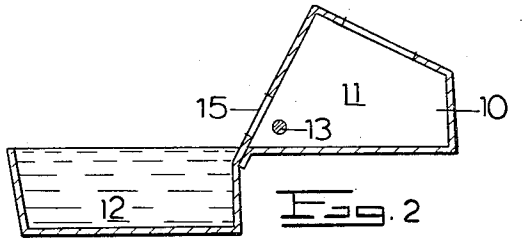


Fig. 2

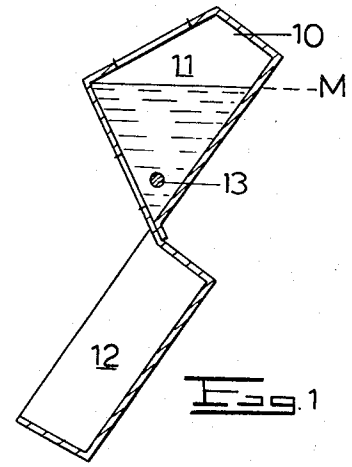
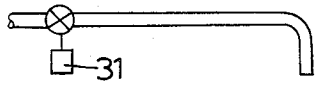


Fig. 1



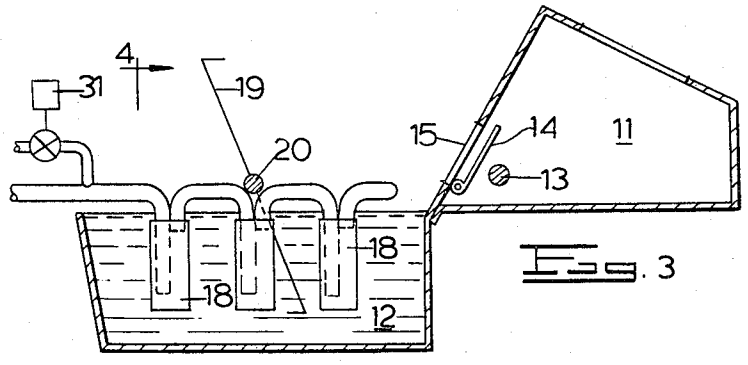


Fig. 3

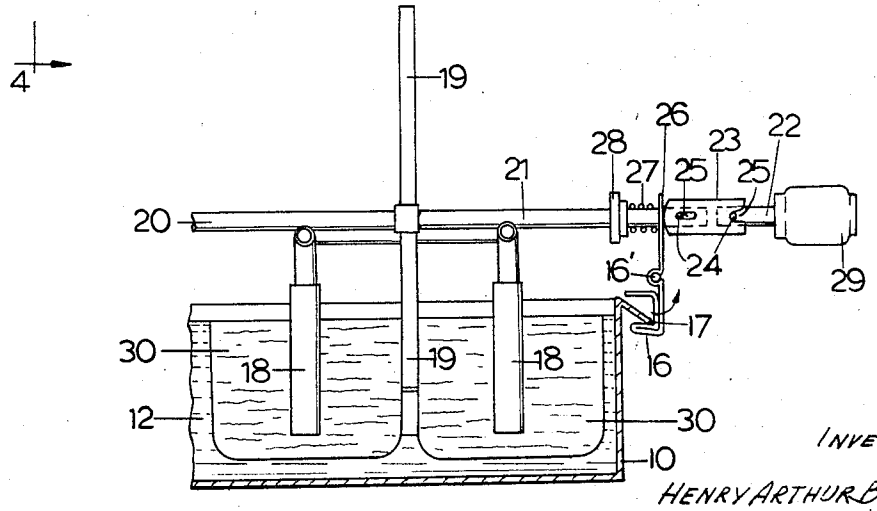


Fig. 4

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United States Patent Office 3,526,100 Patented Sept. 1, 1970

3,526,100

CONTINUOUS ICE-MAKING MACHINES

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Filed Apr. 5, 1968, Ser. No. 719,002
Int. Cl. F25c *1/08*
U.S. Cl. 62—136 1 Claim

ABSTRACT OF THE DISCLOSURE

A continuous ice-making machine comprises a hopper having a first and a second chamber; the hopper being rotatable between a first position in which water is fed into the first chamber and a second position in which the water passes to the second chamber where icing is effected by an evaporator in the form of a series of fingers, the hopper being biased to the first position and rotation taking place once the water in the first chamber reaches a predetermined level; a releasable catch to hold the hopper in the second position, a stirrer carried on a rotatable shaft and adapted to release the catch when its movement is obstructed by the formation of ice, the stirrer acting between the fingers of the evaporator, and means to blow hot gas on the fingers of the evaporator to discharge the ice.

This invention relates to continuous ice-making machines.

Continuous ice-making machines are known in which water is introduced into a receptacle provided with an evaporator, the arrangement being such that the receptacle is moved away from the evaporator when the ice has formed, so that the ice can be removed. Several machines incorporating automatic means for carrying out this process have been designed, and it is an object of the present invention to provide a machine which is simpler than the prior art machines and which is efficient.

A continuous ice-making machine according to the invention comprises a hopper having a first and a second chamber; a water inlet in the first chamber, the hopper being rotatable between a first and a second position in response to the level of the water in the first chamber, means biasing the hopper to the first position, a passage for water to the second chamber when the hopper is in the second position, means to ice the water in the second chamber, a releasable catch to hold the hopper in the second position and to release the hopper for return to the first position when the water has iced to a predetermined extent in the second chamber, and means to discharge the formed ice.

Further according to the invention a continuous ice-making machine comprises a hopper having a first and a second chamber; a water inlet in the first chamber, the hopper being rotatable between a first and a second position in response to the level of the water in the first chamber, means biasing the hopper to the first position, a passage for water to the second chamber, an evaporator in the form of a series of fingers in the second chamber, a releasable catch to hold the hopper in the second position, a stirrer between the fingers in the second chamber, a rotatable shaft carrying the stirrer and adapted to release the catch to allow the hopper to return to the first position when the movement of the stirrer is obstructed by the formation of ice, and means to discharge the ice.

An embodiment of the invention is described below with reference to the accompanying drawings, in which:

FIG. 1 is a schematic view of the hopper of a continuous ice-making machine, according to the invention, in its first position,

FIG. 2 is a schematic view of the hopper of the ice-making machine in its second position,

FIG. 3 is a sectional diagrammatic side view of the ice-making machine, and

FIG. 4 is a diagrammatic sectional view of the ice-making machine along the line 4—4 in FIG. 3.

With reference to FIGS. 1 and 2, a water hopper **10** having a first chamber **11** and a second chamber **12** is rotatable about a fulcrum **13**. In the first position, illustrated in FIG. 1, water is fed into the first chamber **11** until just above the level M. At this point the centre of gravity of the hopper **10** is displaced to the right of the fulcrum **13** thereby causing the hopper to rotate in a clockwise direction to a second position, illustrated in FIG. 2. During rotation, a water valve **14** (FIG. 3) opens to allow the water to flow from the first chamber **11** to the second chamber **12**. The valve **14** closes an opening **15** between the two chambers in the first position.

As illustrated in FIG. 4, the hopper **10**, which is biased to the first position, is held in the second position by a catch **16** which engages a lip **17** of the second chamber **12**.

Once in the second position the water comes into contact with an evaporator comprising a series of rows of fingers **18** through which a suitable cooling medium flows. The water is agitated by a number of paddle stirrers **19** mounted on a horizontal rotating shaft **20**, each paddle working between two adjacent rows of fingers **18**.

As the water is cooled ice **30** forms and builds up around the fingers **18**. When the buildup of ice reaches a predetermined level, the rotation of the stirrers **19** is impeded, which impedance causes the catch **16** to be released. The release of the catch **16** is caused in the following manner:

With reference to FIG. 4, the shaft **20** carrying the stirrers **19** consists of two sections **21** and **22** joined by a slotted sleeve **23**. Lugs **24** on each section are in engagement with slots **25** in the sleeve **23**. The catch **16** is so pivoted as at **16**, on a fixed structure that the section **21** of the shaft **20** passes through its upper portion **26**. A spring **27**, abutting a collar **28** on the shaft **20**, biases the upper portion **26** against the sleeve **23**.

A motor **29** rotates the section **22** which, by virtue of the coupling arrangement, rotates the section **21**. However, resistance to rotation of the section **21** results in resistance to the rotation of the sleeve **23** while the section **22** remains rotating freely so that the lug-slot engagement of the section **22** with the sleeve **23** forces the sleeve, and hence the upper portion **26** of the catch **16**, to the left. The catch **16** is thus disengaged from the lip **17**.

After the release of the catch, the hopper returns to the first position under the influence of gravity where the un-iced water flows out of the second chamber **12**. A current of hot gas is blown through the fingers **18** to free the ice which falls off the fingers **18** and thence to storage in a substantially dry form. While this is happening water is again fed into the first chamber **11** in preparation for the next cycle.

The flow of both the water into the chamber **11** and the current of hot gas to free the ice are controlled by solenoid valves **31** which are actuated by a microswitch. The microswtich is "on" for the first position of the hopper and "off" for all other positions of the hopper.

I claim:

1. A continuous ice-making machine comprising a hopper having a first and a second chamber; a water inlet in the first chamber, the hopper being rotatable between a first and a second position, a passage for water to the second chamber when the hopper is in the second position, means to ice the water in the second chamber, the second chamber including an evaporator in the form of a series of fingers, a paddle stirrer between adjacent fingers, the stirrer being mounted on a shaft comprising two portions

connected by a slotted sleeve having an eccentric portion acting on a catch when there is resistance to rotation of the stirrer, the catch holding the hopper in the second position and releasing it when the water has iced to a predetermined extent.

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