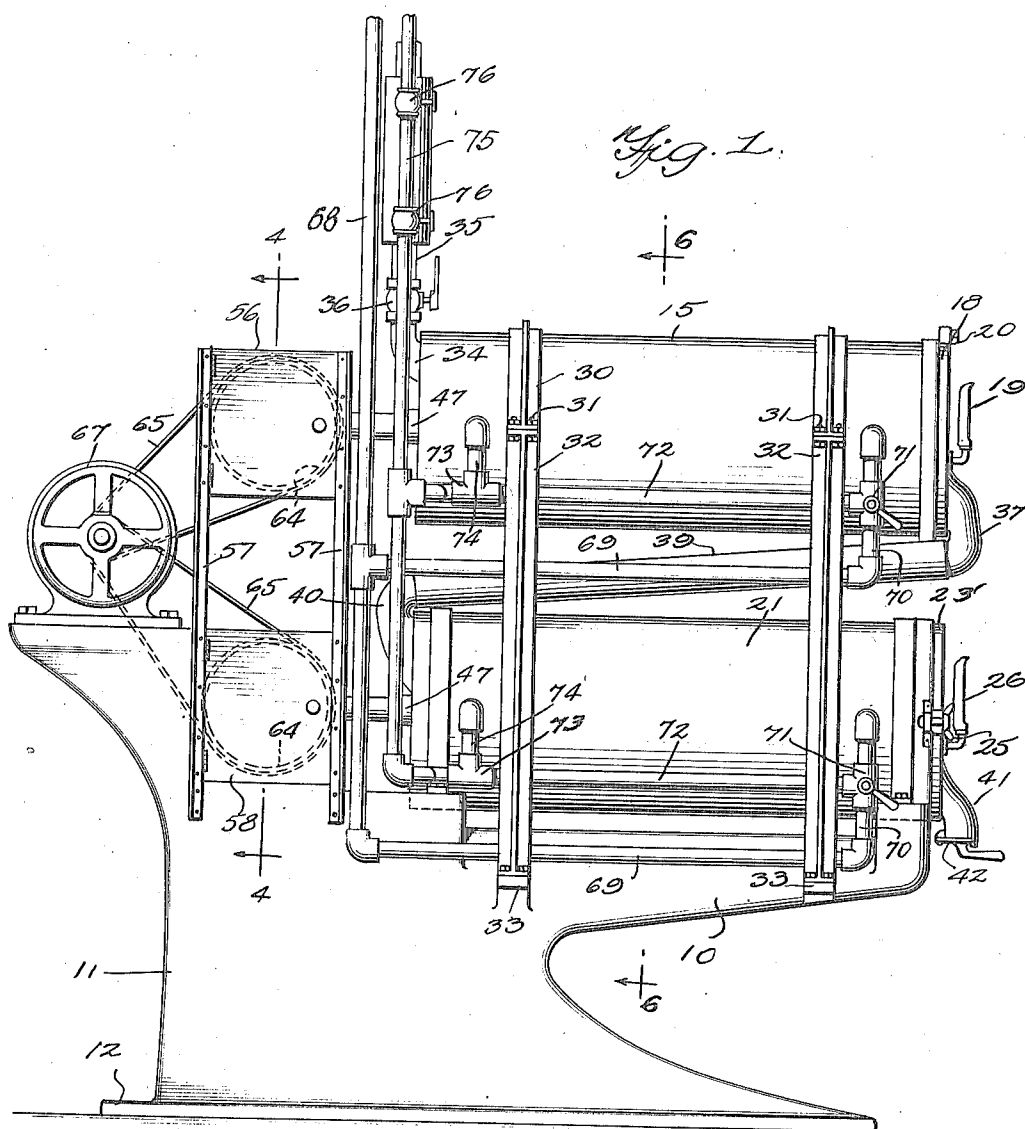
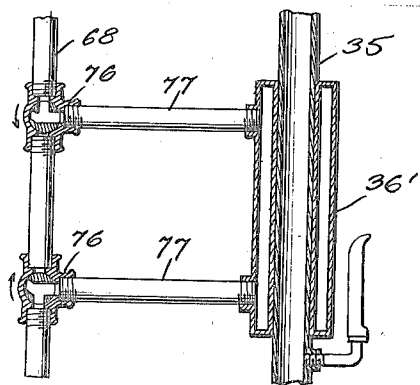


Jan. 23, 1923.

E. HAUK,
METHOD FOR PRODUCING ICE CREAM.
FILED DEC. 14, 1921.

1,442,945

3 SHEETS-SHEET 1



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3 SHEETS-SHEET 2

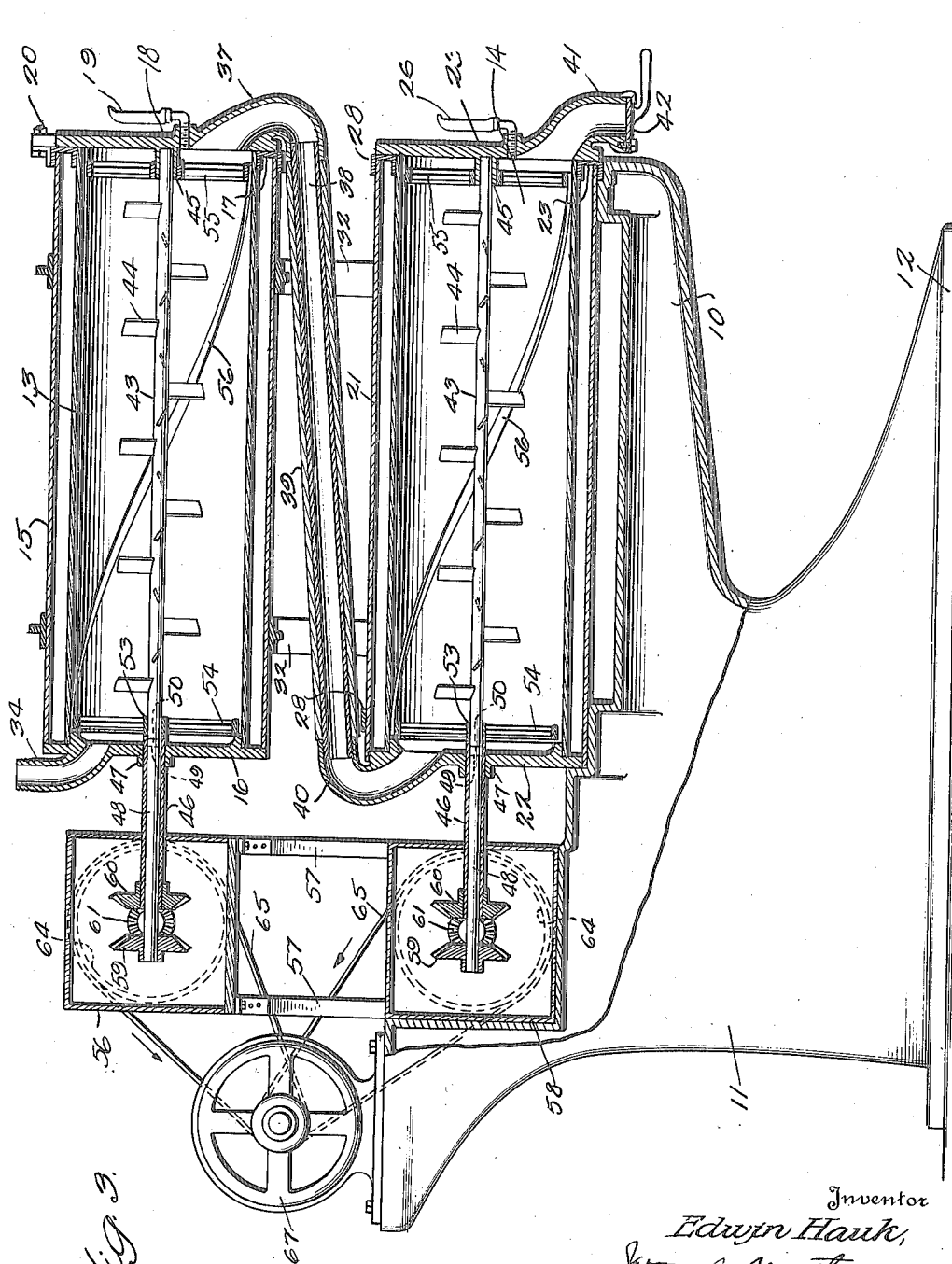


Fig. 3.

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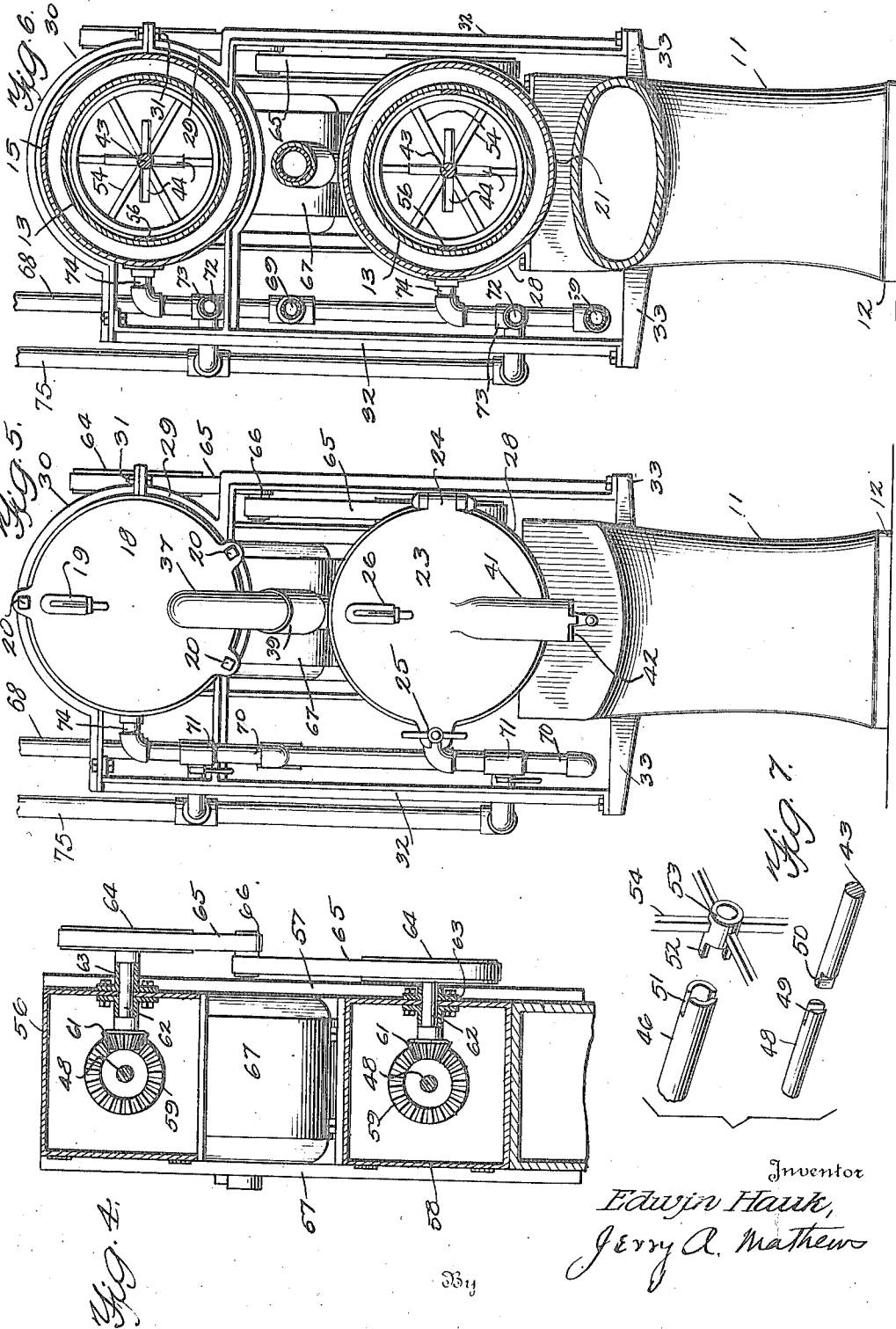
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3 SHEETS-SHEET 3



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UNITED STATES PATENT OFFICE.

EDWIN HAUKE, OF CHICAGO, ILLINOIS.

METHOD FOR PRODUCING ICE CREAM.

Application filed December 14, 1921. Serial No. 522,422.

To all whom it may concern:

Be it known that I, EDWIN HAUKE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Methods for Producing Ice Cream, of which the following is a specification.

My invention relates to a method of producing ice cream. An important object of the invention is to provide a method of the above mentioned character, adapted to swell the batch to the maximum, and subsequently freeze the swollen batch, the entire operation being continuous.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification and in which like numerals are employed to designate like parts throughout the same.

Fig. 1 is a side elevation of apparatus embodying my invention.

Fig. 2 is a detail section through the cooling jacket for the supply pipe,

Fig. 3 is a side elevation of the apparatus, parts being shown in central vertical longitudinal section,

Fig. 4 is a transverse vertical section taken on line 4—4 of Fig. 1,

Fig. 5 is a forward end elevation of the apparatus,

Fig. 6 is a transverse section taken on line 6—6 of Fig. 1, and,

Fig. 7 is a perspective view of couplings or joints employed in the apparatus.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a table, carried by a pedestal 11, formed upon a base 12.

The numerals 13 and 14 designate upper and lower cans or receptacles, which are preferably cylindrical and are horizontally arranged. The upper can 13 is surrounded by a cylindrical cooling or brine jacket 15, which is cylindrical and spaced therefrom. The jacket 15 is connected at its rear end with the can 13 by means of a rear head 16, and a spacing ring 17 connects the forward ends of this can and jacket. It is obvious that other means may be employed to rigidly connect the can 13 and its jacket 15 and maintain the same in the spaced concentric relation.

The numeral 18 designates a forward head, serving to close the forward end of the can 13, and this head is detachably held in place by bolts 20, or like means. The numeral 19 designates a thermometer carried by the head 18.

The can 14 is surrounded by a jacket 21, for receiving the brine, and this brine jacket is connected at its rear end to a head 22, also connected with the can 14. The numeral 23 designates a spacing ring, connecting the forward ends of the can and jacket 21. It is thus seen that the can 14 and its jacket are rigidly connected, in spaced concentric relation, and any other suitable means may be employed for this purpose. The forward end of the can 14 is closed by a head 23, which is removable or may be swung to an open position. The head 23, Fig. 5, is supported by a hinge 24, and held in a closed position by a clamping bolt 25, or like means. The head 23 carries a thermometer 26.

The lower jacket 21 is supported upon the table 10, and is held thereon by straps 28. The upper jacket 15 is supported in curved hangers 29, having upper portions 30, which are removable, and held in place by bolts 31. The hangers are supported by frames 32, which are mounted upon horizontal bars 33, carried by the table 10. It is thus seen that the construction of the hangers is such that the upper jacket 15 and its can may be removed, if desired.

The numeral 34 designates a curved tubular inlet, Figs. 1 and 2, which is connected with a feed pipe 35, by means of a valve 36. This feed pipe leads to the tank, ordinarily located upon the second floor of the building, and containing the batch. The pipe 35 has a portion thereof surrounded by a brine jacket 36', for a purpose to be described. The forward head 18 has a tubular connection 37, preferably formed integral therewith, and extending downwardly, as shown. The lower end of this tubular connection is generally horizontal and receives the forward end of a pipe 38, which is inclined and extends downwardly in a rearward direction. There is preferably a close smooth fit between the end of the pipe 38 and the end of the tubular connection 37, which telescope, as shown. This fit is sufficiently close to prevent leakage, but permits of the head 18 being removed,

when desired. This pipe 38 is preferably covered with heat insulating material 39. The rear end of the pipe 38 is screw threaded into the upper end of a tubular connection 40, which is inclined, and discharges into the rear end of the can 14, as shown. The head 23 is provided with a downwardly discharging tubular connection 41, preferably formed integral therewith, to deliver the frozen ice cream to the usual cans. The tubular connection is provided with a horizontally swinging gate 42, which may be opened and closed, for discharging the frozen ice cream, as desired.

Extending longitudinally within each can 13 and 14 is a beater shaft 43, carrying radial beaters 44, set at an angle to propel the batch forwardly. The forward end of the beater shaft 43 is journaled in a bearing 45, while its rear end projects into a tubular shaft 46, and is journaled therein. This tubular shaft is rotatable in a bearing 47. A drive shaft 48, Figs. 3 and 7, is rotatable in the tubular shaft 46, and is coupled to the shaft 43 to drive it, by being provided with a transverse notch 49, receiving a tongue 50, formed upon the shaft 43. The tubular shaft 46 projects into the can, for a short distance and is provided with longitudinal slots 51, for receiving tongues 52, formed upon the hub 53 of a wheel 54. This hub is rotatable upon the beater shaft 43. The numeral 55 designates a second wheel, rotatable upon the bearings 45, and the wheels 54 and 55 are connected by spiral scraper blades 56. The scrapers and the beaters are driven in opposite directions, the beaters rotating in a direction to propel the batch forwardly.

The numeral 56 designates an upper gear case, and 57 are legs supporting the same, and connected with a lower gear case 58. Arranged within each gear case is a bevelled gear 59, rigidly mounted upon the shaft 48, and a bevelled gear 60 is rigidly mounted upon the tubular shaft 46. A bevelled gear 61 is arranged between these bevelled gears and is driven by a shaft 62, journaled in the bearing 63. The shafts 62 carry pulleys 64, engaged by belts 65, engaging a pulley 66, driven by a motor 67.

The numeral 68 designates a brine supply pipe, having connection with a brine tank. Branch pipes 69 lead from the pipe 68 and are connected with pipes 70, discharging into the jackets 13 and 14. Two-way valves 71 are connected in the pipes 70 and with return branch pipes 72. The pipes 72 have T-couplings 73 connected therein, connected with pipes 74, leading into the jackets. The pipes 72 are connected with a return pipe 75, leading to the brine tank. Three-way valves 76 are connected in the pipe 68, and pipes 77 are connected with these valves and with the jackets 36.

In operation, the brine is supplied through the pipe 68, and if the valves 76 are in the position shown in Fig. 2, the brine will circulate through the jacket 36 and then pass to the pipes 69. If the valves 71 are open to the pipes 70 and closed to the pipes 72, this brine will pass into the jackets 13 and 21, and out through pipes 74, and through portions of pipes 72, to the pipe 75. By closing the valves 71, to the pipes 70 and opening them to the pipes 72, the brine will pass through the pipes 69, valve 71, pipes 72 and back to the pipe 75. By manipulating the three-way valves 76, all or part of the returning brine may be passed through the jacket 36'.

Under operating conditions, the mix in the mix tank is preferably maintained at about 40° F. for 24 hours, and the temperature of the mix passing through the jacket 36' is preferably 35° F., so that when the valve 36 is opened the mix is supplied to the upper can 13 at substantially 35° F., it now being assumed that the two cans are filled with the mix. The supply of brine in the upper jacket 15 is regulated so that mix in the upper can 13 has a temperature of from 29° to 33°, and the mix in this can is maintained at this temperature. While the mix is maintained at this temperature, it is subjected to the action of the beaters and the cutters, which causes the same to be whipped. This whipping causes the swell in the mix or cream, and I have found that this swell can be more advantageously obtained by whipping the mix while it is at temperatures of 29° to 33° F. This temperature of 29° to 33° F. is a swelling and whipping temperature, without freezing the mix to any considerable extent. The freezing is not completed in the upper can 13, to any considerable extent, but the swell is substantially completed therein. This swell together with the action of the beaters forces the swollen mix through the tubular connection 37 and pipe 38 into the rear end of the can 14, wherein the swollen mix is further agitated and reduced to a temperature of 26° to 28° F. The freezing is completed in the lower can 14, and the swollen and frozen mix, still in a plastic state, discharges out continuously through the pipe 41, into cans or the like. The valves 36 and 42 are partly or wholly open during the operation of the apparatus, and the frozen batch continuously discharges from the can 14. It is thus seen that the batch first travels slowly and continuously through the upper can, and then in a similar manner through the lower can. It is of the utmost importance that the mix in the upper can be maintained at a temperature from 29° to 33° F., for if this temperature drops below 29° F., the freezing of the mix may occur to such an extent that the swelling

of the same will be substantially prevented. In order that these temperatures in the upper and lower cans may be maintained, I have provided the thermometers 19 and

5 26. If the temperature in the upper and lower cans tends to drop, it may be raised by opening the mix valve 36 further, or adjusting the brine valves, or both. A point of adjustment may be found where the mix
10 will pass continuously through the upper and lower cans, and be subjected to the proper temperatures therein, the swelling occurring in the upper can, and the freezing in the lower can.

15 It is to be understood, that the form of my invention herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be re-
20 sorted to without departing from the spirit of my invention or the scope of the subjoined claim.

Having thus described my invention, I claim:

The hereindescribed method for producing 25 ice cream, which consists in first substantially completely effecting the swelling of the mix by subjecting the mix to a whipping action in the presence of a temperature of from 29° to 32° F. whereby the maximum 30 swelling is obtained without any considerable freezing of the mix which would prevent such maximum swelling, and subsequently subjecting the swollen mix to a temperature of 26° to 28° whereby the 35 previously swollen mix is frozen, said mix being continuously fed longitudinally in one direction during the swelling operation and longitudinally in an opposite direction during the freezing operation.

40 In testimony whereof I affix my signature.

EDWIN HAUKE.