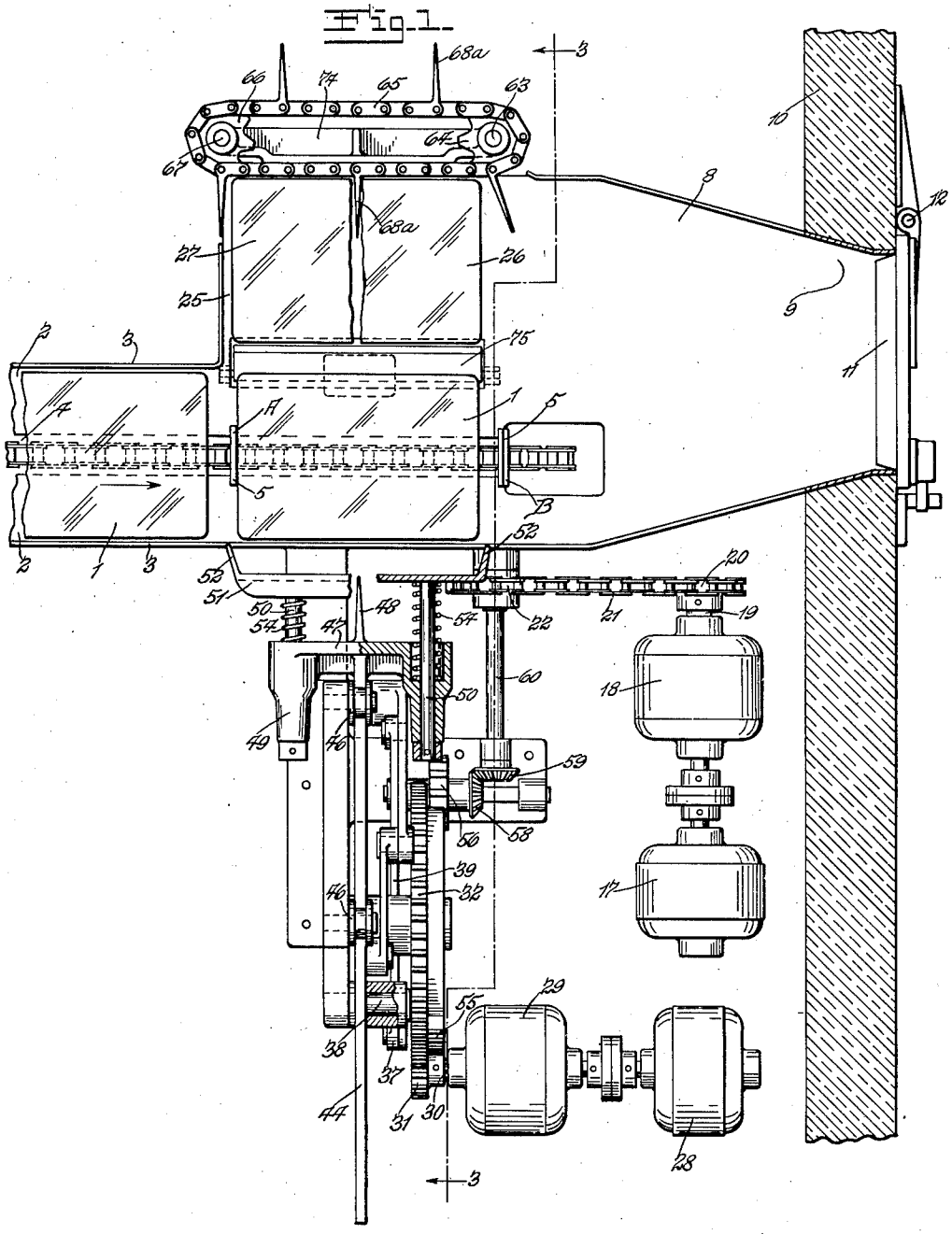
Oct. 27, 1936. J. H. SCHREIBER 2,058,727

VENDING MACHINE

Filed Feb. 24, 1933 3 Sheets-Sheet 1

Fig. 1.



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Filed Feb. 24, 1933 3 Sheets-Sheet 2

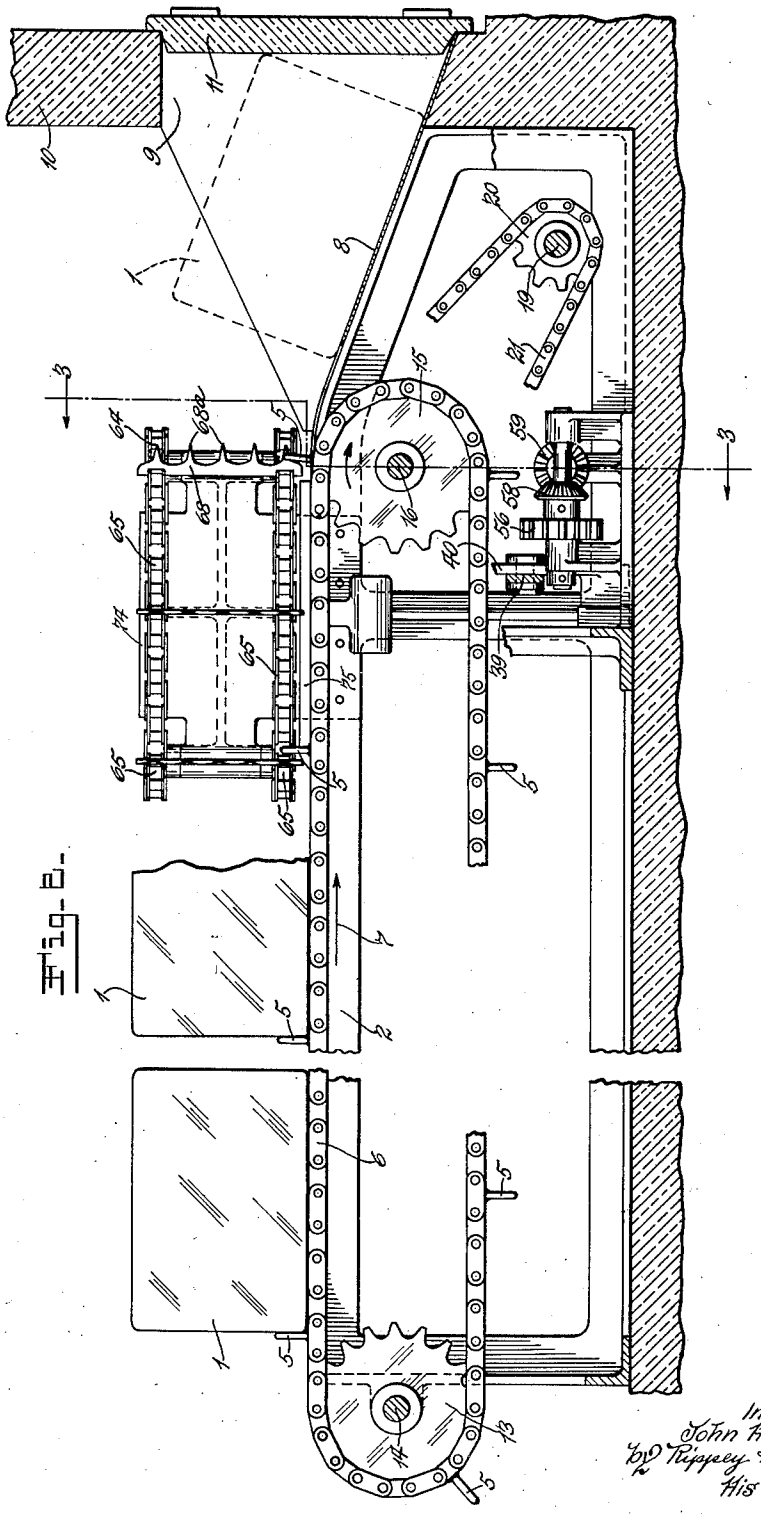


Fig. 2.

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Filed Feb. 24, 1933 3 Sheets-Sheet 3

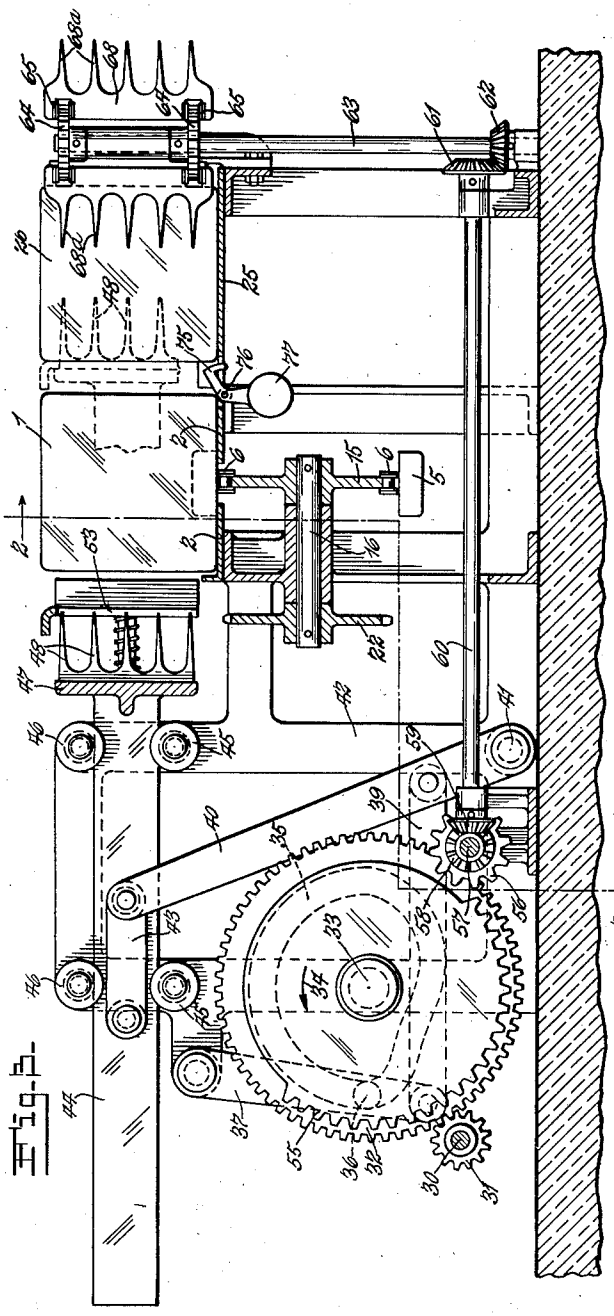


Fig. 5.

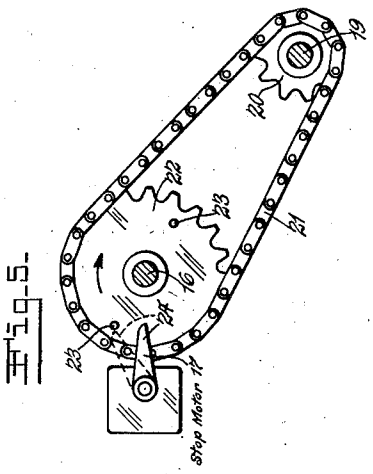
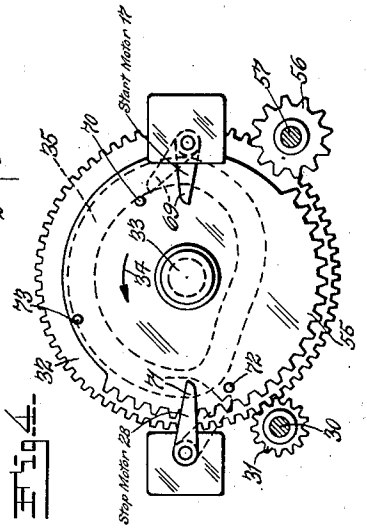


Fig. 4.



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UNITED STATES PATENT OFFICE

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VENDING MACHINE

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Application February 24, 1933, Serial No. 658,299

5 Claims. (Cl. 125—23)

This invention relates to vending machines.

An object of the invention is to provide an improved vending machine including a support for the merchandise contained in the machine, a novel form of intermittently operative mechanism for moving the merchandise along the support and discharging the articles of merchandise individually therefrom.

Another object of the invention is to provide an improved vending machine comprising supporting and delivering mechanism for the articles to be delivered from the machine, and improved means for dividing or severing different articles in the machine and delivering divided or severed portions thereof only, while retaining in the machine the remaining portions of said articles until a subsequent operation of the machine is performed for the purpose of delivering therefrom said divided or severed portions of said articles.

In the specific embodiment shown, my invention is designed and adapted for use in dispensing articles of merchandise, such as ice cakes of a certain size and value, and is equipped with mechanism for dividing or severing ice cakes contained in the machine so as to provide ice cakes of smaller size and value and discharge the divided and severed portions of the ice cakes instead of complete undivided ice cakes of the original size, and another object of the invention is to equip the machine with mechanism to perform the above operations optionally and satisfactorily.

Various other objects and advantages of my improved vending machine should be readily apparent from the following description, reference being made to the annexed drawings, in which—

Fig. 1 is a plan view of the principal mechanism comprising the present invention, parts being in section.

Fig. 2 is a vertical cross sectional view on the line 2—2 of Fig. 3.

Fig. 3 is a vertical sectional view approximately on the line 3—3 of Fig. 1, also indicated on the line 3—3 of Fig. 2.

Fig. 4 is a view showing the relationship of the start device for a motor controlling one of the discharge mechanisms and the stop device for a motor controlling another discharge mechanism.

Fig. 5 is a view showing the stop device for that motor having its starting device shown in Fig. 4.

In the construction shown, the ice cakes 1 are mounted on spaced supports 2, each having an upwardly extended flange 3 along its outer edge to retain the ice cakes on the supports. These supports 2 are separated by an intervening space 4. Arms 5, attached to an endless sprocket chain 6, extend upwardly through the space 4 and engage against the rear ends of the respective ice cakes 1. When the chain 6 is operated in the direction of the arrows 7, the ice cakes 1 are moved along the supports 2. This operation of the chain 6 is intermittent and each intermittent movement of said chain is sufficient only to discharge the ice cake 1 at the front from the supports 2 onto an inclined chute 8 leading to a door opening 9 through the wall 10 forming an enclosure or casing confining the mechanism and the merchandise. The chain 6 and cooperating mechanism constitute dispensing means for cakes of large size. A door 11, supported on hinges 12, may be opened to permit the removal of the ice cake from the machine and then closed to prevent access to the machine until another operation of the mechanism, or until the door is opened for other purposes.

The inner portion of the chain 6 is supported on a sprocket wheel 13 mounted on a shaft 14, and the outer portion of said chain 6 is supported on a sprocket wheel 15 attached to a rotary shaft 16.

A motor 17 (Fig. 1), through a conventional speed reducing device 18, rotates a shaft 19 having a sprocket wheel 20 attached thereto and engaged by a sprocket chain 21, which also engages a sprocket wheel 22 attached to the shaft 16.

Any suitable mechanism for controlling the starting and stopping of the motor 17 may be provided. Various types of coin controlled devices for starting and stopping motors of this type are known, and I contemplate the use of some such device in connection with the present invention. The stop mechanism may be operated by the sprocket wheel 22 by means of pins 23 projecting from said wheel and, during rotation of said wheel, engaging and operating a known type of stop switch 24 in the circuit controlling operation of the motor 17. The specific manner of assembling and operating the start and stop devices for the motor 17 is unimportant insofar as the present invention is concerned, because the motor 17 may be started and stopped by any one of numerous forms of devices.

As clearly shown in Fig. 1 of the drawings, in each unoperated position of the mechanism controlled by the motor 17, an ice cake 1 is at the front end of the supports 2 in position to be discharged into the chute 8. Each intermittent operation of the motor 17 moves the arm 5 from the position of the arm 5 at A to the position

of the arm 5 at B. This discharges the ice cake 1 that is in front of the arm 5 at the position A onto the chute 8 and advances another ice cake to the same position. Thus, in each unoperated position of the motor 17, there is an arm 5 at the position A and an ice cake 1 immediately in front of such arm in position to be discharged onto the chute 8 or to be laterally moved onto a laterally extended support 25 and automatically and as an incident to said lateral movement divided or severed to form two smaller ice cakes 26 and 27.

In the embodiment shown, my invention comprises an additional motor 28 operating through a conventional speed reducing device 29 to rotate a shaft 30 and a pinion 31 attached to said shaft. The pinion 31 is in constant mesh with a large gear wheel 32 mounted on a trunnion 33 and rotated by the pinion 31 in the direction of the arrow 34 (Figs. 3 and 4). This gear wheel 32 is formed with a cam 35 on one side engaged by a roller 36 supported at the side of a lever 37 pivoted for swinging movements on a stationary support 38.

A link 39 has one end pivoted to the lower end of the lever 37 and the opposite end pivoted to a lever 40. The lower end of the lever 40 is mounted on a pivot 41 projecting from the machine frame 42, and the upper end of said lever 40 is pivoted to one end of a link 43, which has its opposite end pivotally connected with a reciprocable carriage member 44. The carriage member 44 may be supported and guided in its reciprocating movements by grooved rollers 45 and retained in position on said rollers 45 by rollers 46 engaging the upper side of said carriage member 44.

A cross head 47 is connected with the front end of the reciprocating carriage member 44 and has a vertical series of forwardly extended prongs 48 in connection therewith opposite the center of the ice cake 1 that is in front of the arm at the position A. The cross head 47 supports bearings 49 in which rods 50 are supported for sliding movements. The forward ends of the rods 50 support a cross head 51 adapted to engage against the adjacent side of the adjacent ice cake 1 and move said ice cake 1 from the supports 2 to the laterally extended support 25 during each complete revolution of the cam wheel 32. Forwardly extended arms 52, in connection with the cross head 51, engage the adjacent marginal end portions of the ice cake 1 when said cross head 51 is moved forwardly and thereby center and retain the ice cake 1 in centralized position with respect to the cross head and prevent forward or rearward sliding movements of said ice cake. In the retracted or unoperated position of the cross head 51, the arms 52 are beyond and out of engagement with the ice cake 1. The cross head 51 has in its central portion a vertical slot 53 (Fig. 3) through which the prongs 48 may be projected when the cross head 51 is held from further movement, and said prongs continue to move. Springs 54, mounted on the rods 50 between the bearings 49 and the cross head 51, hold said cross head in its forward position but permit said cross head 51 to remain stationary during continuous forward movement of the cross head 47 and the prongs 48.

A segmental rack 55 is attached to the opposite side of the gear wheel 32 from the cam 35 and intermittently engages and disengages a pinion 56 attached to a rotary stud shaft 57. A pinion 58, attached to the rotary stud shaft 57, is in constant mesh with a pinion 59 attached to a rotary shaft 60 and having attached thereto a pinion 61 in constant mesh with a pinion 62 attached to a vertical shaft 63 beyond the outer end of the laterally extended support 25. The upper end of the shaft 63 has two vertically spaced sprocket wheels 64 attached thereto at and above the outer end portion of the laterally extended support 25 (Fig. 3). A pair of sprocket chains 65 engage the sprocket wheels 64 and complementary sprocket wheels 66 attached to a vertical shaft 67 at the opposite side of the laterally extended support 25. A series of plates or bars 68, having laterally extended prongs 68a rigid therewith, are attached to and operated by the chains 65. The chains 65 and associated parts constitute mechanism for splitting large cakes into cakes of small size and for dispensing said cakes of small size.

Thus, the chains 65 are operated during one-half of each complete revolution of the gear wheel 32.

The motors 17 and 28 cannot be operated simultaneously. Each of said motors may be operated only intermittently and each motor may be operated only during the time that the other motor remains unoperated.

A starting device 69 for the electric circuit controlling the motor 17 is operated once during each complete revolution of the wheel 32 by a pin 70 attached to and projecting laterally from said wheel. Additionally the electric circuit controlling the motor 17 may be operated by any coin control mechanism of any known type associated with the electric circuit while the starting device 69 remains in its unoperated position and while the wheel 32 remains unoperated.

A stopping device 71 controlling the electric circuit for operating the motor 28 is operated twice during each revolution of the gear wheel 32. The stopping device 71 is operated once during each revolution of the wheel 32 by a pin 72 attached to and projecting laterally from the gear wheel 32 and is also operated once during each complete revolution of the gear wheel 32 by another pin 73 attached to and projecting from the gear wheel 32.

A rigid member 74 is mounted between the shafts 63 and 67 and may support bearings for said shafts and may also function as an abutment for that one of the plates or bars 68 having its prongs 68a in position to divide or sever the block of ice 1 driven from the supports 2 to the laterally extended support 25 in order to form the smaller ice cakes 26 and 27.

A guide member 75 is mounted on a pivot 76 and is yieldingly supported in raised position by an actuator 77. This guide member in its unoperated position extends above the supports 2 and 25 (Fig. 3) inclining upwardly from the support 2 toward the support 25, so that the ice cake 1 may be moved laterally from the supports 2 onto the support 25. When the ice cake 1 moves onto the guide 75, said guide is thereby moved downwardly and is held in its downward position until the ice cake passes said guide and is placed on the support 25. Thereupon the actuator 77 raises the guide 75 opposite the two smaller ice cakes 26 and 27, which had been obtained by splitting the ice cake 1 that had been moved as aforesaid.

When the ice cake 1 is moved from the supports 2 by operation of the cross head 51 and engages the centered prongs 68a, the springs 54 yield and permit the prongs 48 to engage and

pierce the adjacent side of the ice cake 1 while the prongs 68a engage and pierce the directly opposite side of the ice cake 1. The cross head 47 continues to move forwardly until the prongs 48 for the greater portion of their length pierce the ice cake 1, the cross head 51 continuing also to move forwardly, which action results in the prongs 48 and 68a dividing or severing the ice cake, as shown in Fig. 1, to provide the two smaller ice cakes 26 and 27. Continued forward movement of the cross head 51 moves the ice cake 1, or the smaller ice cakes 26 and 27 obtained by the splitting thereof, beyond the guide 75 and onto the laterally extended support 25, whereby the actuator 77 raises the guide 75.

The mechanism illustrated in Figs. 1, 2, and 3 may be used in combination with or without the motor stop devices 71 and 24, shown in Figs. 4 and 5, and in combination with or without the motor start device 69, shown in Fig. 4. These parts are omitted from Figs. 1, 2, and 3 but are sufficiently illustrated in their relationship to their cooperating and operating relations in Figs. 4 and 5.

As shown in Fig. 4, the pin 72 is about 90° in advance of the pin 73 and said pin 73 is about 90° in advance of the pin 70. The gear wheel 32, rotating in the direction of the arrow 34, has caused the pin 72 to engage and move the motor stop device 71 for the motor 28 from the solid line position to the dotted line position. When the device 71 is moved from solid line position to dotted line position, the motor 28 is thereby immediately stopped and said device 71 is automatically, by its known construction, returned to the solid line position but does not again start the motor 28. The roller 36 has just left the low part of the cam 35 and entered the high part of said cam and has, therefore, completely retracted or moved to its unoperated position the carriage member 44 and the parts carried thereby, including the cross head 51 and the prongs 48.

The pin 70 has also just operated the start device 69 for the motor 17 from the solid line position to the dotted line position and released said start device 69, which immediately returned from the dotted line position to the solid line position. This starts the motor 17, which continues to operate and, through the connections described, to rotate the sprocket wheel 22 one-half of a revolution, causing one of the two diametrically opposite pins 23 to engage and move the motor stop device 24 for the motor 17 from the solid line position (Fig. 5) to the dotted line position and thereby stop said motor 17. This operation of the sprocket wheel 22 by the motor 17 operates the chain 6. But the motor 17 does not start to operate until about the time that the motor 28 is stopped, which is after the carriage member 44 and the parts carried thereby have been completely retracted or returned to their starting position by the parts operated by the cam 35.

In the position of the parts shown in Figs. 4 and 5, either of the motors 17 or 28 may be operated, but not both simultaneously, it being intended to employ a suitable interdependent means (not shown) to prevent simultaneous operation of these motors when the parts are in said positions. The motor 17 may be set in operation without operating the starting device 69, as is well known. When the motor 17 is started without use of the starting device 69, the sprocket wheel 22 is rotated in a clockwise direction (Fig. 5), thereby operating the chain 6 to discharge the ice cake 1 at the front and to move another cake of ice forwardly to position for subsequent discharge. The pin 23, that is farthest from the stop device 24, operates said stop device from the solid line position to the dotted line position and releases said stop device, thereby stopping the motor 17 when a cake of ice 1 is in position either for discharge by a subsequent operation of the chain 6 or for movement laterally onto the laterally extended support 25.

When the motor 28 is started to deliver the smaller ice cake 26, the motor stop device 71 for said motor 28 is operated after the gear wheel 32 turns about 90° in the direction of the arrow 34. During this movement, the arm 37 and the connections operated thereby remain unoperated. This advances the pin 73 to the position occupied by the pin 72. This 90° rotation of the gear wheel 32 engages the segmental rack 55 with the pinion 56 and thereby, through the gearing shown, operates the chains 65 to cause the prongs 68a to move forwardly and discharge the ice cake 26 from the support 25 to the chute 8. Since the gear wheel 32 has been rotated only about 90°, the pinion 56 remains in mesh with the segmental rack 55 for another operation of the chains 65. Then during the next operation of the motor 28, the chains 65 are operated to discharge the ice cake 27 from the support 25 onto the chute 8, because during the preceding operation the ice cake 27 had been moved forwardly to the position previously occupied by the ice cake 26. The motor 28 continues to operate until the pin 72 again engages and operates the stop device 71, because the pin 70 does not engage nor operate the stop device 71. The start device 69 for the motor 17 is not operated by either of the pins 72 or 73, because said pins 72 and 73 do not extend far enough from the rack member 55 to engage the start device 69. The continued rotation of the gear 32 causes the roller 36 to enter the low part of the cam 35 after the ice cake 27 has been discharged and after the segmental rack 55 has passed out of engagement with the pinion 56. When the segmental rack 55 passes out of engagement with the pinion 56, said pinion 56 stops and the chains 65 also stop in a position in which the prongs 68a are so located as to split a cake of ice 1 into the two approximately equal parts 26 and 27. During the time that the roller 36 is operating from the high part to the low part of the cam 35, the lever 37 is operated, thereby operating the carriage member 44 and the cross head 51 to move an ice cake 1 from the supports 2 to the support 25 and to cause the prongs 48 to pierce the ice cake and, in cooperation with the prongs 68a, to split the ice cake into two approximately equal parts 26 and 27. Then the lever 37 is operated during the time that the roller 36 is moving from the low part to the high part of the cam 35, which is to the position shown in Fig. 3. At the time the roller 36 enters the high part of the cam 35, as shown in Fig. 3, the pin 72 operates the stop device 71 to stop the motor 28. After the cross head 51 has been retracted, the pin 70 operates the start device 69 and thereby starts the motor 17 to advance another ice cake 1 to position for discharge by a subsequent operation of said motor 17, or for movement laterally onto the laterally extended support 25, as described.

It is now clear that this invention comprises optionally operable means for discharging selected cakes of ice and for dividing or severing larger cakes of ice to provide smaller cakes. It is also

clear that my invention comprises mechanism under control of the dispensing mechanism for the smaller cakes of ice to remove a larger cake of ice from the dispensing mechanism therefor and to place the larger cake of ice on the dispensing mechanism for the smaller cakes and simultaneously divide or sever the larger cake to obtain the smaller cakes.

By my improved mechanism, the purchaser may be served with the size of ice cake that is desired and the mechanism of the machine is controlled automatically by the dispensing mechanism to reload either dispensing mechanism when a vacancy occurs. In a broad aspect, my improved vending machine embodies ice storage means, mechanism under control of the motor 17 for dispensing ice cakes of a predetermined size, mechanism comprising the chains 65 and cross head 51 for dispensing ice cakes of a smaller size, and means comprising the chain 6 for supplying both mechanisms from the same storage means.

The construction and arrangement of the parts may be widely varied within the scope of equivalent limits and without departure from the nature and principle of the invention. No unessential limitations are intended or assumed, but what I claim and desire to secure by Letters Patent is:

1. A vending machine comprising storage means for ice cakes, mechanism for moving said ice cakes to a position to be discharged from said storage means, mechanism for moving said ice cakes from said position and during such movement dividing said ice cakes to form a plurality of smaller ice cakes, and connections operative by a part of said mechanism during a subsequent operation of said mechanism for dispensing said smaller ice cakes and for causing said mechanism to divide another ice cake to form a plurality of smaller ice cakes after a number of operations of said dispensing mechanism.

2. A vending machine comprising approximately horizontally alined supports, means for moving large ice cakes along one of said supports to a position alongside the other support, mechanism for moving said large ice cakes from said first support laterally onto said other support and for dividing said large ice cakes respectively into smaller ice cakes during such lateral movement, and means for operating a part of said last named mechanism to discharge said smaller ice cakes successively from said second support.

3. A vending machine comprising an inclined discharge chute, approximately horizontally alined supports at the upper end of said chute, means for moving large ice cakes along one of said supports and discharging said cakes onto said chute as desired, mechanism for moving selected large ice cakes from said one support laterally onto the other support, devices for dividing said large ice cakes respectively into smaller ice cakes during such lateral movement, and means for operating a part of said last named mechanism to discharge said smaller ice cakes successively onto said chute.

4. A vending machine comprising approximately horizontally alined supports, an inclined chute having its upper end adjacent to one end of said supports, dispensing means for moving large ice cakes along one of said supports to a position opposite the other support, means for operating said dispensing means optionally to discharge large ice cakes onto said chute, mechanism for moving large ice cakes from said first support laterally onto the other support, and devices operated in part by said mechanism for dividing said large ice cakes into smaller ice cakes during such lateral movement.

5. A vending machine comprising approximately horizontally alined supports, an inclined chute having its upper end adjacent to one end of said supports, dispensing means for moving large ice cakes along one of said supports to a position opposite the other support, means for operating said dispensing means optionally to discharge large ice cakes onto said chute, mechanism for moving large ice cakes from said first support laterally onto the other support, devices operated in part by said mechanism for dividing said large ice cakes into smaller ice cakes during such lateral movement, and mechanism for operating a part of said devices for discharging said smaller ice cakes successively from said other support onto said chute.

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