

June 14, 1960

V. G. SHARPE ET AL
ICE CRACKING DEVICE

2,940,678

Filed June 16, 1958

3 Sheets-Sheet 1

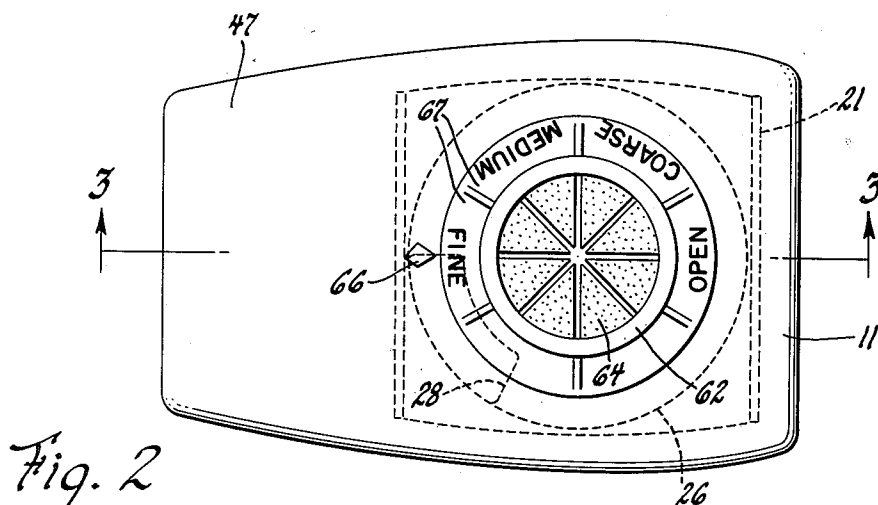
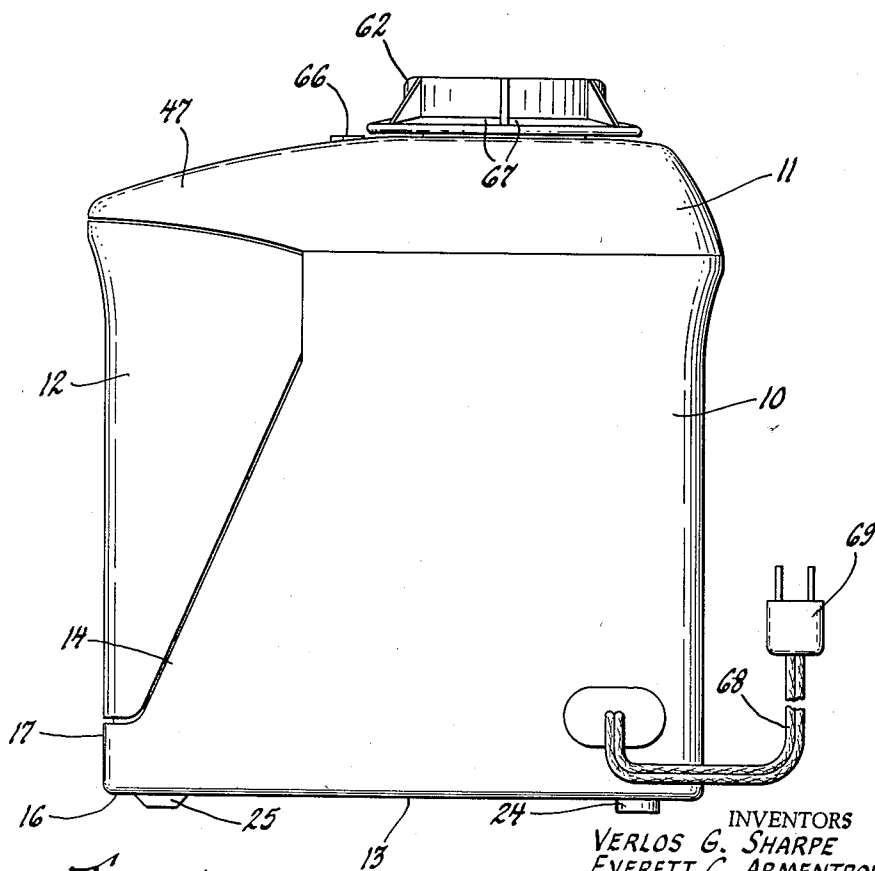


Fig. 1

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3 Sheets-Sheet 2

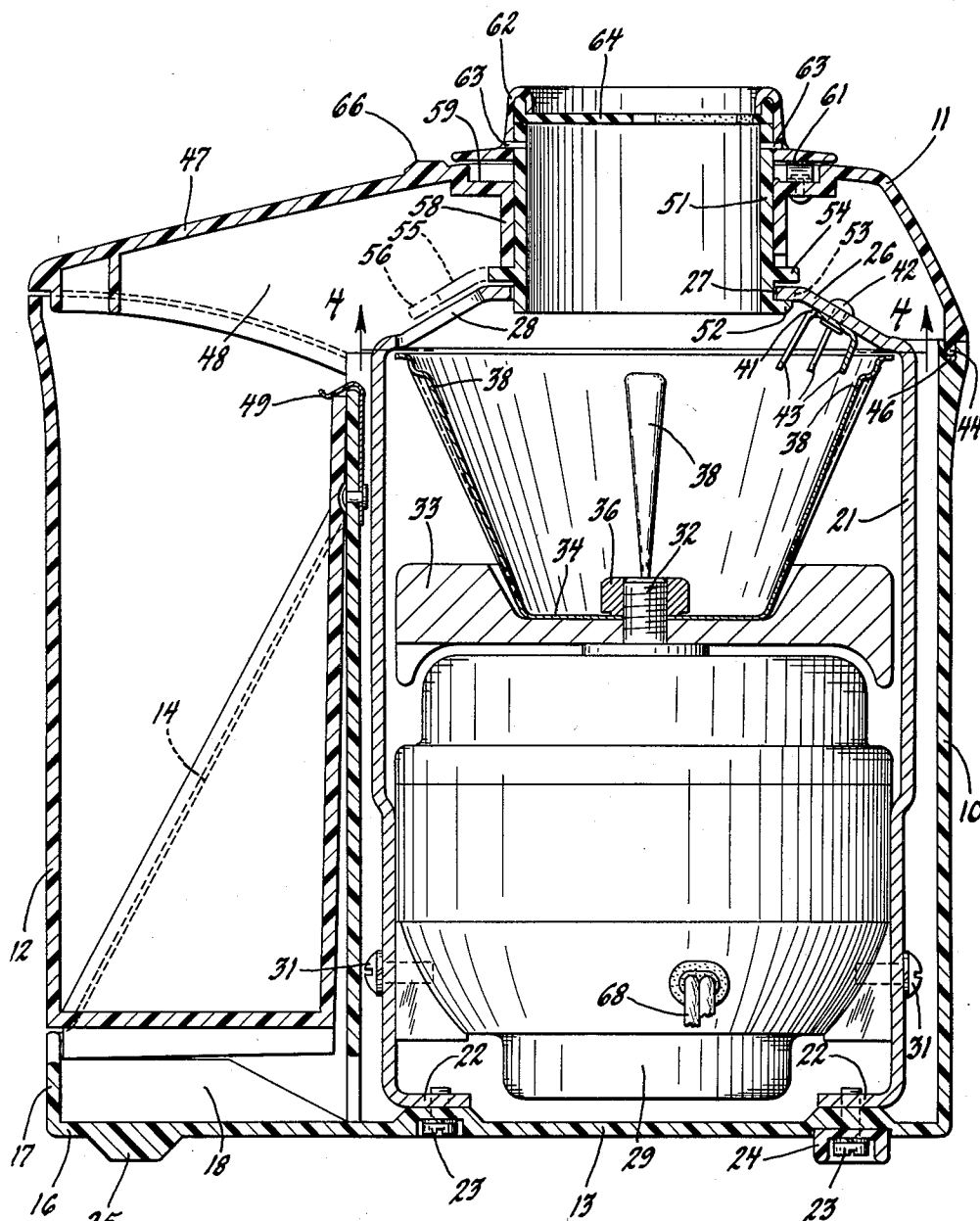


Fig. 3

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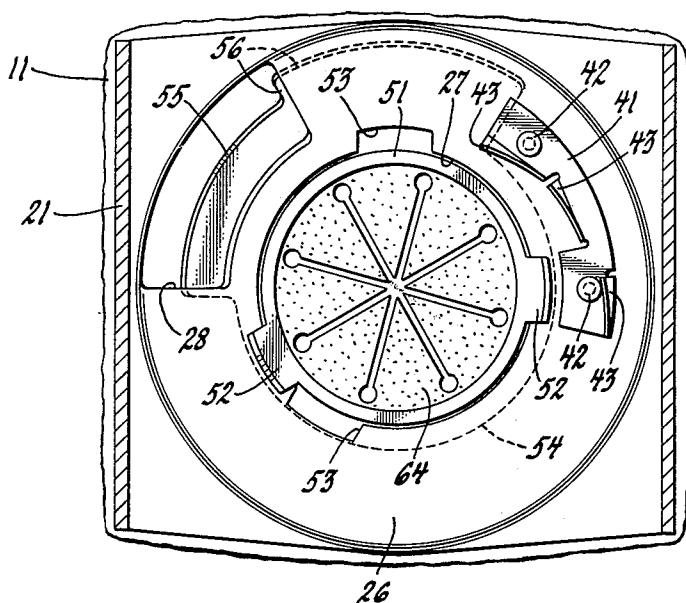


Fig. 4

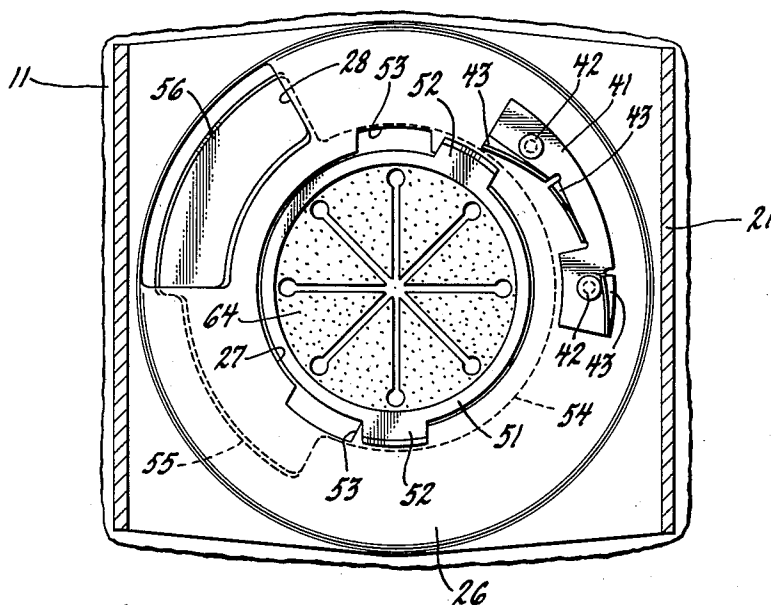


Fig. 5

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ICE CRACKING DEVICE

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Filed June 16, 1958, Ser. No. 742,359

13 Claims. (Cl. 241—275)

The present invention relates to a domestic appliance and particularly to an ice block or chunk altering or cracking device.

We are familiar with prior ice block crushing devices and realize the danger involved in their operation particularly those of the electrically driven variety. Electrically operated ice crushers employing a rotatable cutter, fracturing means or tine-like members present a hazard not only to adult operators thereof but also to children. For example, a person unaware or not alert to the danger of operating these prior ice crushers may have his or her fingers severely cut by sharp operating elements within a crusher during the act of inserting or feeding ice blocks or chunks of ice thereinto to be shattered or crushed thereby. This has created objections to such devices and retarded sales thereof to certain households because of the fear of a housewife having children who may, accidentally or out of curiosity, have their fingers badly cut, mangled or severed. We therefore contemplate the provision of an ice cracking device wherein even if a person's fingers accidentally come into contact with inner operating parts or elements of the device their finger or fingers will not be cut or mangled therein so as to alleviate the fear of and to overcome objections to such former devices whereby sales of such a device is stimulated and increased.

An object of our invention is to provide an improved method of and device for shattering ice blocks or chunks of ice in a chamber thereof into a plurality of ice pieces.

Another object of our invention is to provide an ice block altering or cracking device wherein ice blocks or chunks of ice received in a chamber thereof are centrifugally impelled or flung against a stationary means in the chamber by a rotatable or spinnable flinger element to crack the blocks or chunks into ice pieces which are then discharged from the chamber of the device by the centrifugal action of the impeller or flinger element.

A further object of our invention is to provide an outlet in the upper portion of a chamber of a centrifugally operated type ice block altering or cracking device the area of which outlet is adjustably reduced and/or enlarged to selectively vary the size of pieces of ice to be centrifuged or discharged from the chamber through its outlet whereby either coarse ice pieces, medium sized ice pieces and/or substantially chipped ice can be produced by the device.

A still further object of our invention is to provide a removable cap or cover for the housing of a centrifugally acting ice block altering or cracking device which forms an ice block admission opening to the cracking chamber thereof, which is shaped to form a spout

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cooperating with the chamber outlet for directing ice pieces centrifuged out of the chamber through its outlet into a dispensing receptacle removably associated with the device and which cap or cover includes a movable or adjustable portion controlling the chamber outlet to selectively vary the size of ice pieces to be discharged therethrough.

In carrying out the foregoing objects it is a more specific object of our invention to provide an electrically driven centrifuging type ice block altering or shattering device with a reservoir above the base thereof which receives and collects therein water dripping from moisture accumulated on walls thereof during ice cracking operations whereby to eliminate water messiness in the vicinity of the device on a table or supporting ledge therefor and to permit the water trapped in the reservoir of the device to be emptied therefrom into a kitchen sink and drained away.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a side elevational view of an ice block cracking device embodying the principle of our invention;

Figure 2 is a top view of the device shown in Figure 1;

Figure 3 is an enlarged vertical sectional view of the ice block cracking device taken on the line 3—3 of Figure 2 showing an ice receptacle removably associated therewith;

Figure 4 is a horizontal sectional view taken on the line 4—4 of Figure 3 showing adjustable means associated with the outlet of the device; and

Figure 5 is a view similar to Figure 4 showing another position of the adjustable means of the device.

Referring to the drawings we show in Figure 1 thereof a molded plastic housing 10 having a molded plastic cap 11 removably secured thereon and a molded plastic receptacle removably associated therewith and forming a box-like appliance structure or ice block altering or cracking device of the present invention. Housing 10 has, in addition to its base 13 and its main upright walls another upright wall or web-like side portions 14 which taper downwardly and outwardly from the main walls and join with an outwardly extending ledge part 16 of the housing base. Ledge part 16 and web-like wall portions 14 form a pocket at one side of the device for the removable molded plastic receptacle 12 (see Figure 3). Ledge 16 is provided with an upstanding bounding lip 17, for a purpose to be hereinafter described, and integral spaced apart raised ribs 18 on ledge 16 support the removable receptacle 12 within its pocket. Receptacle or container 12 may be of any desired shape and has its walls formed to match or substantially conform to the outer wall surfaces of housing 10 adjacent its pocket and cap or cover 11. An inverted generally U-shaped metal member or means 21 is located within the compartment of housing 10 and has feet 22 on its upright depending legs secured, by screws or bolts 23, to the base 13 thereof. One or more of the bolts 23 have a molded plastic button or the like 24 clamped to base 13 of housing 10 and these buttons cooperate with a boss or bosses 25 formed integral on ledge 16 to support the device (see Figures

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1 and 3). The top or bight portion of U-shaped metal means or member 21 is provided with a circular raised part 26 having a central ice block admission opening 27 therein and a laterally disposed elongated or arcuate shaped outlet 28. An electric motor 29 is provided with mounting bosses which are rigidly secured to member or means 21, by screws or bolts 31, to support the motor in an upright position with its vertical shaft 32 projecting upwardly therefrom. A weighted metal fan type flywheel 33 and a sheet metal cone-shaped impeller or flinger element 34 are rigidly mounted, keyed or suitably interlocked, upon motor shaft 32 by a nut 36 for simultaneous rotation or spinning therewith. Impeller or flinger element 34 is provided with integral upstanding ribs 38 projecting inwardly of the wall thereof to provide reaction means thereon for a purpose to be hereinafter described. The top peripheral edge of element 34 is slightly flared out to cooperate with circular raised part 26 of member or means 21 to provide or form an ice cracking chamber within housing 10 of the device. A fracturing means in the form of a metal piece 41 rigidly secured, by rivets or the like 42, to the top wall 26 of means 21 is provided with a plurality of sharp tine-like members or sharp forked edges 43 directed toward the open end of impeller or flinger element 34 at a side of means 21 opposite the chamber outlet 28. While we have shown the piece 41 as being separate from and secured to means 21 it is to be understood that raised ribs or tine-like projections could be formed integral on the chamber top wall 26 to provide a fracturing means thereon for the device. The cap or cover 11 has a depending bead 44 formed thereon about its lower edge which registers with and fits into a groove 46 provided in the top edge of outer upright walls of housing 10 to center or properly position the cover thereon. A portion of cap or cover 11 extends over the ice cracking chamber discharge outlet 28 and receptacle 12, as at 47, and is shaped to provide a guard thereover and a spout-like passageway 48 for directing ice pieces from outlet 28 downwardly into the removable receptacle 12. A leaf biasing spring 49, secured to an upright wall of housing 10, adjacent the receptacle pocket therein, in any suitable fashion, removably holds the receptacle 12 in place within its pocket of the device.

A molded plastic sleeve or collar-like movable or rotatable element 51 is carried by cover 11 within an opening therein and provides an ice block or chunk admission or inlet opening for the ice cracking chamber in the device. This sleeve 51 has spaced apart outwardly projecting lugs 52 formed integral thereon at the bottom thereof which are passed through suitably spaced notches 53 in a wall of opening 27 at the top of the inverted U-shaped member or means 21 to removably lock the cover of cap 11 to housing 10 (see Figures 4 and 5). Sleeve 51 is journaled in opening 27 for rotation relative thereto and to cover 11 and has an outwardly projecting flange 54 integrally formed thereon. This flange extends entirely around sleeve 51 and has two downwardly directed flange extensions or portions 55 and 56 formed thereon of different widths with respect to one another and both of which cooperate with the outlet 28 of the chamber of the ice cracking or altering device to form a valve or a means to adjustably enlarge and/or reduce the area of outlet 28 communicating with spout 48 for a purpose as will be hereinafter described. A downwardly flanged bearing portion 58 at the opening in cover 11 is recessed as at 59 and a pair of elongated arcuate shaped springs 61 are located thereon, by rivets or the like, to bias a molded plastic ring-like knob 62 secured to the upper end of sleeve 51, by press fitted pegs or pins 63, upwardly. The curved over top portion of knob 62 clamps a reticulated resilient rubber-like guard or diaphragm 64 between this knob and sleeve 51. This guard or diaphragm 64 covers the ice block or chunk admission or inlet opening of the ice making chamber

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of the device and serves to warn a user of the device against inserting his or her fingers thereinto beyond this guard while feeding ice chunks or blocks into the ice cracking chamber of the device. Cover 11 is provided on the top thereof with a raised indicator or pointer 66 and the top of rotatable knob 62 is divided into six dial sections as at 67 (see Figure 2), four of which bear suitable indicia adapted to be set centrally in registration with the pointer 66 to indicate to the user of the device whether it will discharge coarse, medium or fine ice pieces from the chamber thereof and also to indicate an open position of knob 62 which permits detachment or removal of cover 11 from housing 10 for cleaning the interior of the device. It is to be understood that this is accomplished by rotating the knob 62 into a preselected position which moves portions 55 and 56 of the flange at the lower end of sleeve 51 into and out of covering relationship with the chamber outlet 28 and also moves the lugs 52 into registration with the notches 53 in opening 27 at the top of the ice cracking chamber. Motor 29 of the device is provided with an extension cord 68 containing lead wires attached to a terminal plug 69 which is adapted to be inserted into an outlet receptacle of a source of electric power for operating the motor to cause it to rotate or spin flywheel 53 and impeller or flinger element 34.

When it is desired to crack or fracture chunks, blocks or cubes of ice in the ice altering device and to discharge the cracked ice pieces into the removable receptacle or container 12 thereof say, for example, in a coarse or large ice piece fashion knob 62 is rotated to move "Fine" away from pointer 66 and to rotate same so that "Coarse" on its dial registers with the pointer 66 on cover 11. It is to be understood that in this setting of knob 62 (not shown) the flanges 55 and 56 on sleeve 51 are both rotated beyond or entirely out of association with the ice cracking chamber outlet 28 and that the outlet is fully open. Plug 69 is now inserted into a suitable electric outlet to energize motor 29 and the motor rotates impeller or flinger element 34 to spin same. Chunks, blocks or cubes of ice are inserted or admitted to the cracking chamber of the device by way of its inlet opening, sleeve 51, upon passing them through the reticulated resilient rubber-like diaphragm 64, whereupon the ice blocks fall into or are received by the impeller or flinger element 34. The centrifugal or spinning action of impeller 34 flings or forces the ice blocks upwardly in a direction outwardly thereof against the fracturing means or tines 43 to crack the blocks of ice into ice pieces. The ice blocks react against the ribs 38 of the impeller 34 upon engaging the tines 43 to cause and to aid in the fracturing thereof into coarse or smaller pieces of ice which gravitationally fall back into the impeller. Chamber outlet passage 28 is, with this "Coarse" setting of knob 62, uncovered by the flanges 55 and 56 on sleeve 51 so that the entire area of outlet 28 is open or unrestricted and the device is capable of centrifuging or expelling the cracked pieces of ice falling back into impeller 34 from the cracking chamber. The centrifugal action of the impeller thus flings or discharges the ice pieces upwardly and outwardly away from the impeller 34 and from the filler or admission opening, sleeve 51, whereby they are centrifuged through outlet 28 into the spout portion 48 of cover 11 which portion thereof directs the ice pieces therefrom into removable container or receptacle 12. After the desired amount of coarse ice pieces has been collected in receptacle 12 it is tilted outwardly relative to and detached from housing 10 of the ice cracking or altering device and the ice pieces are dispensed or emptied therefrom say, for example, into a plurality of glasses or tumblers adapted to contain drinks to be chilled. During the ice cracking operation metal member 21 is chilled below room temperature and moisture in air ambient to the device accumulates on walls thereof and drips therefrom into the bottom or reservoir

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of the device above its base 13 provided by the base extension 16 and its upstanding lip 17. This reservoir traps water of the moisture dripping thereinto and prevents its flow from the device onto a support ledge or the like therefor to avoid messiness in the vicinity thereof. After sufficient ice has been cracked by the device it is moved toward the kitchen sink and bodily tilted upward to cause the trapped water in the reservoir to flow over lip 17 for draining water from the bottom of housing 10 into the sink. If, after this or subsequent ice cracking operations, it is desired to cleanse the interior of the ice cracking or altering device knob 62 is rotated so that "Open" on its dial 67 registers with the pointer 66 on cover 11 whereupon lugs 52 on sleeve 51 are brought into alignment with notches 53 in the wall of opening 27 at the top part 26 of member 21 and the cover 11 together with knob 62 and sleeve 51 may be removed as a unit upwardly of housing 10 to open the ice cracking chamber.

Suppose that still smaller or medium sized ice pieces, as compared to the coarse ice pieces, are desired to be received in receptacle 12 and harvested from the ice cracking or altering device herein disclosed at the next operation thereof or during the cracking of coarse ice pieces to produce a mixture of coarse and medium sized pieces of ice. The operator or housewife rotates knob 62, clockwise as viewed in Figure 2 of the drawings, to move "Coarse" on the dial 67 away from pointer 66 and to bring "Medium" on dial 67 into registration with the pointer 66 on cover 11. This adjusts or positions the narrower flange 55 of the two flange portions 55 and 56 of flange 54 on sleeve 51 over outlet 28 to thereby reduce or restrict the open area thereof (see Figure 4). In such case the cracking chamber and flange 55 cooperate to now form means for confining larger pieces of ice therein and as ice blocks, chunks or cubes of ice are fed into the chamber and cracked therein the larger ice pieces are restrained, by flange portion 55, from being centrifuged from the chamber and they are consequently reflung by impeller or flinger 54 against the fracturing means, tines 43, whereby they are re-cracked or refractured into still smaller or medium sized ice pieces. These medium sized re-cracked pieces of ice are then centrifugally expelled by the impeller through the open or that portion of discharge outlet 28 uncovered by the flange 55 of the adjustable means into spout 48 and directed thereby downwardly into removable receptacle 12. The medium sized ice pieces will obviously or as is well-known more rapidly chill drinks in glasses or tumblers or salads or other like food products.

Assume now that substantially chipped ice is desired to be harvested from receptacle 12 of the ice block cracking or altering device herein disclosed. The housewife or operator of the device rotates knob 62 to move "Medium" away from pointer 66 and to bring "Fine" on dial 67 thereof into registration with the pointer or indicator 66 on cover 11. This shifts the narrower portion or flange 55, on sleeve 51, beyond outlet 28 and adjusts or moves the wider portion or flange 56 thereover to thereby reduce or further restrict the open area of the outlet 28 (see Figure 5). The cracking chamber and flange 56 thus provide or form means for confining coarse or medium sized pieces of ice cracked in the chamber and prevents discharge thereof therefrom until they have been reduced, by the fracturing means, tines 43, to a chipped ice size. In other words when chunks, blocks or cubes of ice are fed through the admission opening, sleeve 51, of the cracking chamber and cracked into ice pieces these ice pieces gravitationally fall back into impeller or flinger element 34 and are flung and reflung against the tines 43 until they are refractured or resplit by centrifugal force into ice chips. Upon the ice pieces being reduced to chipped ice size the chipped ice is then centrifugally expelled or discharged by impeller 34 laterally from the cracking chamber of the device through the narrow open portion of outlet 28 or

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that portion thereof uncovered by flange 56 of the adjustable means. Chipped ice centrifuged upwardly and laterally out of the ice cracking chamber of the device into spout 48 is directed downwardly thereby into receptacle 12 for harvesting from the device and for use in more rapidly chilling drinks in glasses or the like.

From the foregoing it should be apparent that we have provided an improved method of and device for altering or cracking chunks, blocks or cubes of ice into ice pieces of various sizes and harvesting thereof from the device for different uses at the dinner table or cocktail lounge. The flexible diaphragm at the feeding or ice block admission opening of the device in addition to warning an operator thereof against inserting his or her fingers too far into the cracking chamber thereof also serves to substantially prevent entrance of dust and foreign substances into the chamber of the device. However, and by virtue of the fracturing tines being stationary, should a child insert his or her fingers too far into the device they may engage the ribs of the rotating or spinning impeller and be vacillated or vibrated, without injury thereto, to thereby further warn or frighten the child whereby to cause him or her to withdraw his fingers from the chamber and the impeller cannot therefore direct or force the child's fingers against or into contact with the sharp fracturing tines. This provides a safety feature for an ice block altering device which reduces the fear of use thereof particularly by children to enhance and increase its salability. The adjustable means in our device, which permits ice blocks to be selectively and centrifugally cracked into various size ice pieces and centrifuged therefrom, maintains the cover locked upon the outer housing thereof during adjustment of this means and it is simple and clearly comprehensible by an operator. The construction of the device is such that it is of light weight, readily portable from one location to another by a housewife and the structure thereof prevents the occurrence of a water messiness at the point of its use.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. An ice block altering device comprising, a housing and means associated therewith providing an ice block cracking chamber therein, said chamber having a central opening in the top thereof for admission of ice blocks thereto, a substantially cone-shaped impeller element within said chamber below the top opening thereof for receiving ice blocks inserted thereinto, stationary tine-like members on said means intermediate said chamber top opening and the peripheral edge of said impeller element for cooperation therewith in the cracking of ice blocks, a motor on said device below said impeller element and connected thereto for rotating same to centrifugally force ice blocks upwardly therefrom into contact with said members to crack the ice blocks into ice pieces, said chamber being provided with an outlet intermediate its top opening and said edge of said impeller element and spaced from said members, the pieces of ice in said device being discharged therefrom through said outlet by the centrifugal action of said element, and means for adjustably enlarging or reducing said chamber outlet to selectively vary the size of ice pieces to be passed there-through.

2. An ice block receiving and cracking device comprising, an upright housing and means associated therewith forming an ice block cracking chamber therein having a top wall provided with an opening for admission of ice blocks to said chamber, a cap on said device having an opening therein registering with the opening in said housing, said chamber being provided with an outlet in its top wall spaced laterally from the ice block admission opening therein, a flinging element in said cham-

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ber receiving ice blocks inserted therein, fracturing members on said means facing said flinging element, a motor below said element for rotating same to fling ice blocks therefrom into contact with said members to crack the ice blocks into ice pieces and to centrifugally discharge the pieces of ice from said chamber through said outlet, and said cap being shaped to provide a spout at said discharge outlet for directing the pieces of ice discharged therethrough downwardly into a receptacle removably associated with said device.

3. A device as defined by claim 2 wherein the cap includes a portion movable relative thereto and to the housing for adjustably enlarging and/or reducing the chamber outlet to selectively vary the size of ice pieces to be passed therethrough.

4. A device as defined by claim 2 wherein the cap includes a portion movable relative thereto and secured to the means associated with the housing for detachably locking the cap thereon.

5. A device as defined by claim 2 wherein the cap includes a movable portion secured to the means associated with the housing for detachably locking the cap thereon and has a part thereof adapted to adjustably enlarge and/or reduce the chamber outlet for selectively varying the size of ice pieces to be passed therethrough.

6. An ice block receiving and cracking device comprising, an upright housing and means associated therewith forming an ice block cracking chamber therein having an opening for admission of ice block to said chamber, a cover over said housing and said means provided with an opening registering with the opening in said chamber, said chamber being provided with an outlet spaced from the ice block admission opening therein, a flinger in said chamber receiving ice blocks inserted therein, fracturing members on said means intermediate said chamber opening and said flinger and facing the flinger, a motor on said device connected to said flinger for rotating same to fling ice blocks therefrom into contact with said members to crack the ice blocks into ice pieces and to centrifugally discharge the pieces of ice from said chamber through said outlet, said housing having a base portion extending laterally therefrom at a side thereof and forming a receptacle support on said device, a receptacle removably supported on said support, said cover being shaped to provide a spout at said discharge outlet for directing the pieces of ice discharged therefrom downwardly into said receptacle, said base portion of said housing having a raised peripheral edge forming a wall of a reservoir thereabove, and said reservoir receiving and collecting drippage water of moisture condensing on elements of said device during the cracking of ice blocks therein.

7. An ice block altering device comprising, a hollow substantially cone-shaped impeller and a stationary member associated therewith disposed over the open end thereof, said impeller forming the sides and bottom of an ice block cracking chamber in said device and said member forming a rigid top wall for said chamber, said stationary member having a central opening therein providing the top wall of said chamber with an inlet for admission of ice blocks into the chamber, means on said member projecting downwardly from the top wall of said chamber intermediate the upper peripheral edge of said impeller and said admission inlet opening for cooperation with the impeller in the cracking of ice blocks within said device, said stationary member having another opening therein spaced from said projecting means thereon and located between said admission inlet and said upper peripheral edge of said impeller providing said chamber with a single discharge outlet in the top wall thereof, a motor drivingly connected to said impeller for rotating same to centrifugally force ice blocks received in said chamber upwardly along sides thereof into contact with said projecting means to crack the ice blocks

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into ice pieces, the spacing of said single discharge outlet from said projecting means causing the cracked ice pieces to fall back into the impeller prior to their expulsion from said chamber, and the pieces of ice in said impeller being centrifuged from said device by continued rotation of said impeller over its said edge upwardly out of said chamber through said single discharge outlet in the top wall thereof.

8. A device as defined by claim 7 wherein upright ribs along the impeller provide projections on the inner surface thereof against which the ice blocks react while they engage and are being cracked into ice pieces by the means on the chamber top wall.

9. A device as defined by claim 7 wherein a movable element associated with the chamber top wall is adjustable relative thereto for reducing the single chamber outlet to selectively vary the size of ice pieces to be centrifuged upwardly therethrough.

10. The method of altering chunks of ice in and harvesting pieces of ice from a chamber having a top wall provided with an outlet therein and closed bottom and sides formed by a hollow substantially cone-shaped impeller element which consists in, centrifuging chunks of ice received in the chamber upwardly along the element against fracturing means on the chamber top wall inwardly of the upper peripheral edge of the element to crack the chunks into smaller pieces of ice, retaining the cracked smaller pieces of ice within the chamber prior to discharging them therefrom, and flinging the retained smaller pieces of ice over the impeller element upwardly out of the chamber through its outlet in the top wall thereof.

11. The method of altering chunks of ice in and harvesting pieces of ice from a chamber having a top wall provided with an outlet therein and closed bottom and sides formed by a hollow substantially cone-shaped impeller element which consists in, centrifuging chunks of ice received in the chamber upwardly along the element against fracturing means on the chamber top wall inwardly of the upper peripheral edge of the element to crack the chunks into smaller pieces of ice, retaining the cracked smaller pieces of ice within the chamber, recentrifuging the retained smaller pieces of ice upwardly along the element against the fracturing means to split them into ice chips, and flinging the ice chips over the impeller element upwardly out of the chamber through its outlet in the top wall thereof.

12. An ice block altering device comprising, a hollow substantially cone-shaped impeller and a stationary member associated therewith disposed over the open end thereof, said impeller forming the sides and bottom of an ice block cracking chamber in said device and said member forming a rigid top wall for said chamber, said stationary member having a central opening therein providing the top wall of said chamber with an inlet for admission of ice blocks into the chamber, tine-like means on said member projecting downwardly from the top wall of said chamber intermediate the upper peripheral edge of said impeller and said admission inlet opening for cooperation with the impeller in the cracking of ice blocks within said device, said stationary member also having a horizontally elongated arcuate shaped opening therein spaced from said tine-like means thereon and located between said admission inlet and said upper peripheral edge of said impeller providing said chamber with a single discharge outlet in the top wall thereof, a motor drivingly connected to said impeller for rotating same to centrifugally force ice block received in said chamber upwardly along sides thereof into contact with said tine-like means to crack the ice blocks into ice pieces, the spacing of said single discharge outlet from said tine-like means causing the cracked ice pieces to fall back into the impeller prior to their expulsion from said chamber, the pieces of ice in said impeller being centrifuged from said device by continued rotation of said impeller over its said edge up-

wardly out of said chamber through said single discharge outlet in the top wall thereof, and adjustable means associated with said elongated arcuate shaped single discharge outlet opening for varying the width thereof to selectively control the size of cracked ice pieces to be centrifuged therethrough.

13. A device as defined by claim 12 wherein upright ribs along the impeller provide abutments on the inner surface thereof against which the ice blocks and/or ice pieces react while they engage and are being cracked by the tine-like means.

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