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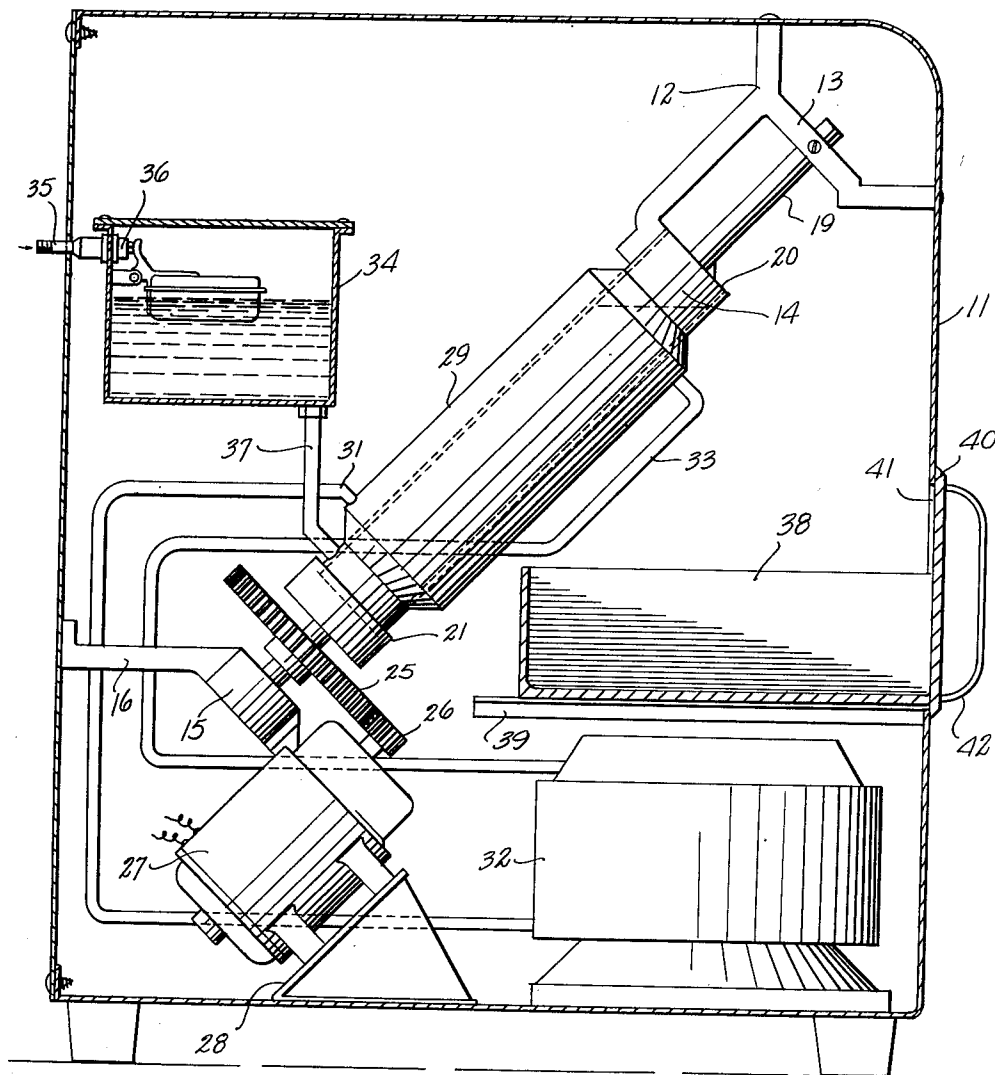
2,597,515

AUTOMATIC MACHINE FOR FREEZING SPIRAL ICE CHIPS

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2 SHEETS—SHEET 1

FIG. 1.



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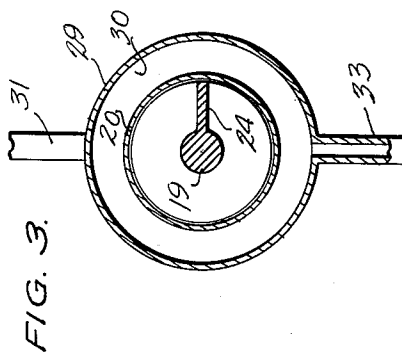
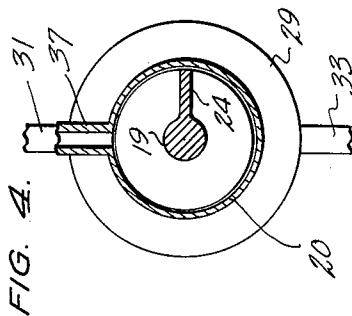
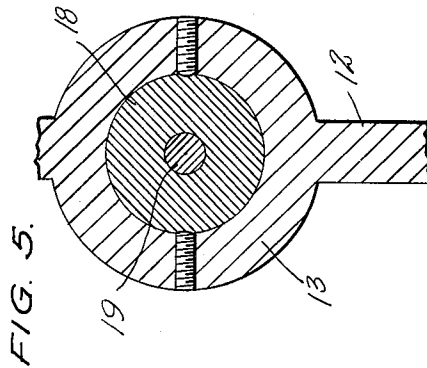
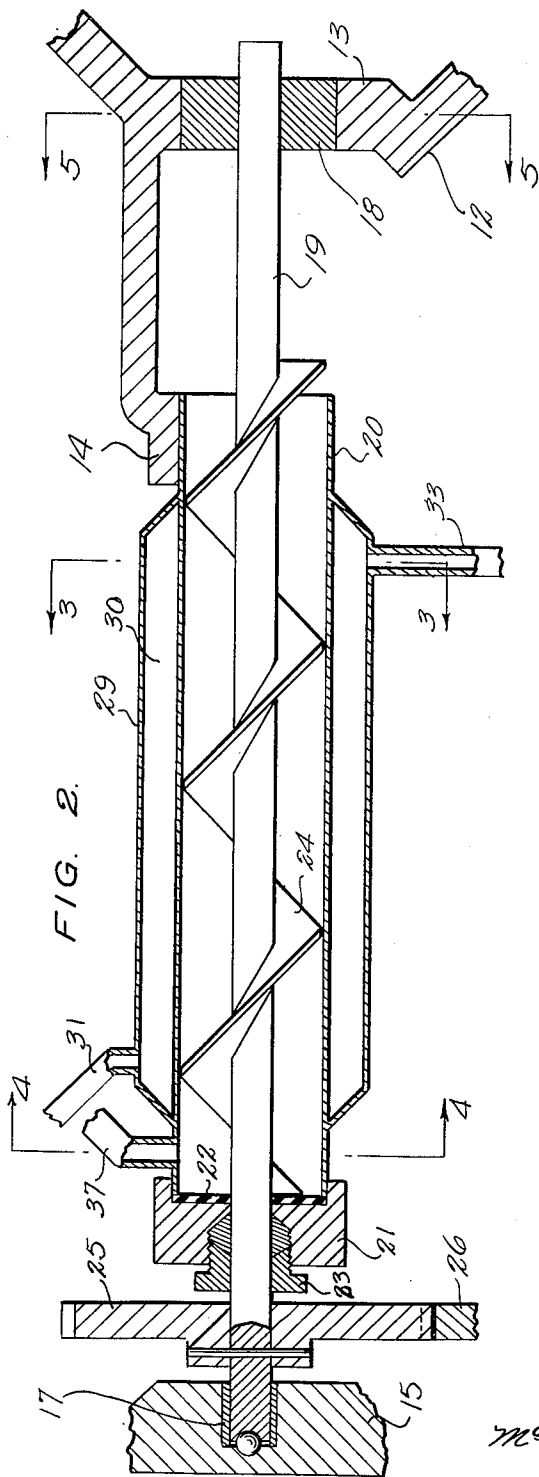
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AUTOMATIC MACHINE FOR FREEZING SPIRAL ICE CHIPS

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2 SHEETS—SHEET 2



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AUTOMATIC MACHINE FOR FREEZING
SPIRAL ICE CHIPS

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1 Claim. (Cl. 62—106)

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This invention relates to ice-making machines, and more particularly to a machine for making ice in the form of small fragments.

A main object of the invention is to provide a novel and improved ice-making machine which operates automatically and continuously for producing spiral chips of ice, said machine being very simple in construction, involving only a few parts, and requiring a minimum amount of human supervision.

A further object of the invention is to provide an improved ice-making machine for making crushed ice in the form of spiral chips, said machine being very inexpensive to manufacture, operating in a continuous and automatic manner without human supervision, being rugged in construction and requiring a minimum amount of attention for the maintenance thereof.

Further objects and advantages of the invention will become apparent from the following description and claim, and from the accompanying drawings, wherein:

Figure 1 is a vertical cross sectional view taken through an improved ice-making machine constructed in accordance with the present invention.

Figure 2 is an enlarged longitudinal cross sectional detail view taken through the refrigerated conveyor auger of the machine of Figure 1.

Figure 3 is a transverse cross sectional detail view taken on line 3—3 of Figure 2.

Figure 4 is a transverse cross sectional detail view taken on line 4—4 of Figure 2.

Figure 5 is a transverse cross sectional detail view taken on line 5—5 of Figure 2.

Referring to the drawings, 11 designates a generally rectangular housing which may be formed of any suitable material, such as sheet metal or the like and which may be suitably insulated if desired. Secured to the upper forward portion of the housing 11 is a bracket 12 which includes an end bearing portion 13 and a sleeve portion 14 spaced from the end bearing portion 13 by a connecting member rigid at its ends with the respective portions. As shown in Figure 1 the axis defined by the sleeve portion 14 and the end bearing portion 13 extends diagonally and is aligned with the sleeve portion 15 of a bracket 16 secured in the lower rear portion of the housing 11. The sleeve portion 15 contains a bearing 17, as shown in Figure 2, and the bracket portion 13 contains a bearing 18. Journaled in the bearings 17 and 18 is a shaft 19. Rigidly secured to the sleeve portion 14 is a cylindrical casing 20 through which shaft 19 axially extends, and the

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lower end of the casing 20 is provided with a cap 21 having a sealing gasket 22 engaging the lower rim of the casing 20 and provided with a sealing gland 23 through which the shaft 19 rotatably and sealingly extends. Shaft 19 carries a helical auger blade 24 which extends closely adjacent to the inner surface of the casing 20. The blade 24 terminates a short distance beyond the top end of the casing 20, as shown at the right side of Figure 2.

Secured to the lower end portion of the shaft 19 is a relatively large gear 25 which meshes with a relatively small gear 26 carried on the shaft of a motor 27, said motor being of the slow speed type or being provided with a gear reduction means, whereby the gear 26 rotates at a relatively slow speed. Motor 27 is mounted on an inclined support 28 secured on the bottom wall of the housing 11, whereby the motor axis is parallel to the shaft 19.

Secured on the cylindrical casing 20 is a jacket member 29 defining a space 30 extending for a considerable distance along the length of the casing 20, as shown in Figure 2, the lower end of the jacket 29 being connected by a conduit 31 to the high pressure outlet of a refrigerant compressor 32 mounted on the bottom wall of the housing 11, and the upper end of the jacket 29 being connected by a conduit 33 to the low pressure inlet portion of a compressor 32.

Secured in any suitable manner in the upper rear portion of the housing 11 is a tank 34 connected at 35 to the water supply mains, the tank being provided with a float controlled inlet valve 36 arranged to maintain the level in tank 34 at a level slightly below that of the upper end of the casing 20, as shown in Figure 1. A conduit 37 connects the bottom of the tank 34 to the lower end of the casing 20, as shown in Figure 1, and a tray member 38 is provided with a front cover plate 40 adapted to overlie the margins of an opening 41 formed in the front wall of the housing 11 through which the tray member may be withdrawn. The cover plate 40 carries a suitable handle 42 for withdrawing the tray member 38 from the housing whenever required.

In operation, the refrigerant is delivered from the compressor 32 through the conduit 31 to the lower end of the jacket 29 and expands in the space 30, extracting heat from the casing 20. Water is supplied to the lower end of the casing 20 by the conduit 37, and the water is frozen and ice collects on the inner wall surfaces of the casing. The auger blade 24 is rotated continuously and scrapes the ice off the inner wall sur-

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faces of the casing and feeds the ice upwardly toward the top end of the casing. The ice is therefore continuously collected from the inner wall surfaces of the casing and is fed toward the top of the casing in the form of spiral chips, said chips being pushed out of the casing at its top end and falling into the tray 38. After a supply of chips has collected in the tray 38, said chips may be removed by withdrawing the tray from the housing and emptying the contents thereof into any suitable receptacle. When the device is not in operation, the water level in the casing 20 rises to the same level as the water in the tank 34, and since said level is below the top end of the casing, overflow of water from the casing 20 is prevented. The expanded refrigerant in the jacket 29 returns to the low pressure inlet portion of the compressor 32 by means of the conduit 33. The refrigeration cycle is conventional and functions to provide substantially continuous refrigeration of the casing 20 whereby frozen spiral ice chips may be continuously fed upwardly through the casing and dispensed from the top end thereof to the tray 38 positioned subadjacent said top end.

As will be noted from Figure 1, the bracket 12 is so formed that no portion thereof extends into the space between the open upper end of the cylindrical casing 20, and the ice receiving surface of the tray 38. In this connection, the connecting member extending between the bearing of the bracket and the open upper end of the casing is disposed wholly out of and above the path of a spiral piece of ice fed upwardly from the casing. As a result, said spiral piece of ice is permitted to break under its own weight after being fed from the casing and formed to a substantial length. When the spiral piece of ice breaks under its own weight, it has a free fall to the ice receiving surface of the tray 38, and the unobstructed gravitation of the relatively large piece causes said piece to dash itself forcibly against the surface of the tray, thus to be broken into a large number of small spiral chips.

Although a specific embodiment of an automatic machine for making spiral ice chips has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claim.

What is claimed is:

In an apparatus for making ice chips, an inclined cylindrical casing forming a water receiv-

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ing freezing chamber, said casing having a closed lower end and being formed fully open at its upper end; a refrigerating jacket surrounding said casing and arranged to chill the wall thereof to an extent effective for the continuous formation of a film of ice upon said wall; means for supplying water to the casing to a controlled level spaced from the open upper end thereof; a feed screw rotating within the casing, said screw including an elongated shaft and a spiral blade on the shaft having a cutting edge spaced closely from the casing wall, to effect a continuous scraping of said film from the casing wall and an advancement of the scrapings toward the open upper end of the casing; a supporting bracket for the upper end of the casing formed with a bearing spaced a substantial distance beyond and above the open end of the casing and receiving one end of the feed screw shaft, said bracket including a connecting member paralleling and arranged above said shaft, said connecting member extending from the bearing to the casing and supporting said open end of the casing, the connecting member being arranged wholly clear of and above the space between the bearing and casing out of the path of a spiral piece of ice fed upwardly through the open upper end of the casing; and a receiving tray spaced a substantial distance below the open upper end of the casing, said bracket being so formed and arranged relative to the casing and tray as to be wholly clear of the space therebetween, for free fall of a broken spiral piece of ice fed through the open upper end of the casing to the tray, whereby to forcibly dash said broken piece against the tray surface.

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