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S. T. ECHOLS, SR., ET AL
ICE SHAVER AND CHIPPER MACHINE

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Fig. 1.

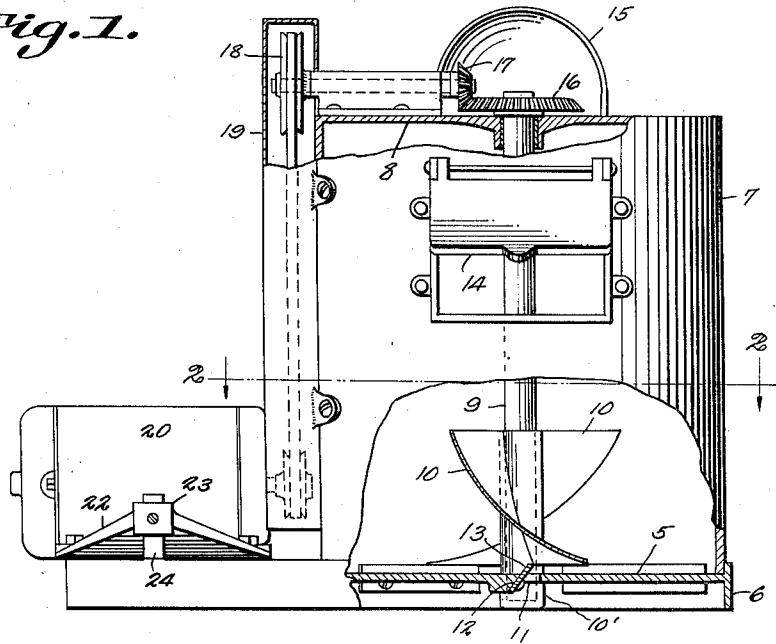
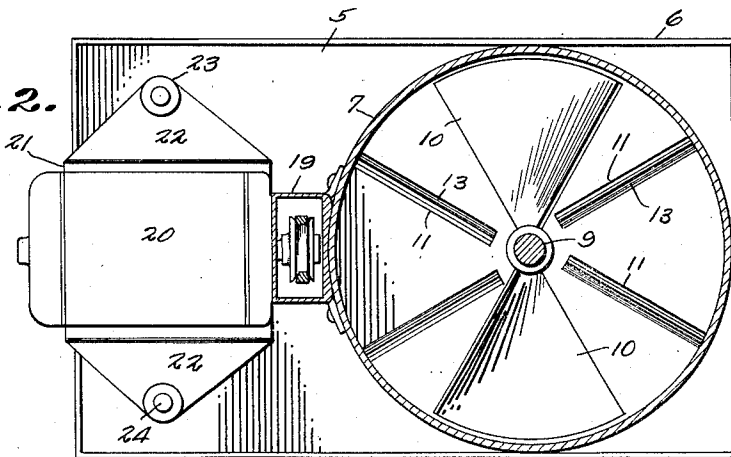


Fig. 2.



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ICE SHAVER AND CHIPPER MACHINE

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1 Claim. (Cl. 241—90)

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This invention relates to improvements in an ice-shaving and chipping machine.

An important object is to provide a machine of the type described which will be light and simple in construction, durable, easily operated, and adapted to efficiently shave or chip ice into fine particles.

Another important object is to provide a motor-powered machine of the type stated which will hold ice to be shaved in an amount of sufficient quantity to free the operator for other duties, by not requiring his constant loading of ice into the machine.

Another important object is to provide a machine as described wherein the ice-receiving hopper is so situated as to cause a gravity feed of ice to the working parts of the machine, this also contributing to freedom of the operator for other duties, by not requiring continued forcing of ice against the working parts of the machine.

Another important object is to allow a free and unobstructed delivery of shaved or chipped ice from the machine, thus to prevent choking and stopping of the machine by the packing of fine ice.

Another important object is to provide a construction in a machine of the character described wherein the several objects stated above will be met, and wherein additionally, bearings for the moving parts are so situated as to keep them dry despite their being surrounded by ice to be shaved, or ice already shaved.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, herein-after more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawing

Figure 1 is a side elevational view of a machine constructed in accordance with the invention, parts being sectioned away to show details of inner construction.

Figure 2 is a section on line 2—2 of Figure 1.

Referring to the drawing in detail, 5 is a base, of flat formation, and formed integrally with a surrounding depending flange 6 constituting means for elevating the base above a supporting surface, not shown.

Mounted on the base at one end thereof is a cylindrical ice-receiving hopper 7, formed open at its lower end, but having a closed upper end 8. The closed upper end 8 is provided centrally

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with a radial thrust bearing in which is journaled one end of shaft 9 disposed axially of hopper 7.

Adjacent the lower end of the shaft 9, opposed helical blades 10 of concavo-convex section are secured to the shaft in any suitable manner, for rotation therewith. The lower edges of the blades 10 are extended radially of the center of the shaft and are spaced slightly above the base 5, and the angle of pitch of the blades relative to the shaft increases towards the outer ends of the blades. By "outer ends" of the blades is meant those ends disposed at the periphery of the housing 7, as distinguished from those ends disposed adjacent the shaft 9. By "angle of pitch" is meant the angle of inclination from the vertical.

The lower end of shaft 9 is journaled in radial thrust bearing 10' mounted to the base 5.

A plurality of radially offset slots 11 are formed in the base 5, and one side wall of each slot is pitched oppositely to the pitch of the respective blades 10, and enlarged, as shown at 12. Secured to the side walls 12 of the respective slots are fixed blades 13, the upper edges of which are extended slightly above the plane of the base 5 so that there is minimum clearance between the upper edges of the fixed blades 13 and the lower edges of the rotating blades 10. Slots 11, as seen from the drawing, are of a width sufficient to permit shaved or chipped ice to drop therethrough, and it will be observed that the convex surfaces of the blades are presented to the lumps of ice to be shaved and as said lumps become smaller, aid the gravity action by directing the ice against the blades.

In the side wall of hopper 7 an opening is formed, closed by a hinged door 14, and through this door ice to be shaved or chipped is dropped into the hopper.

Mounted on the upper end 8 of the hopper is a dome 15 comprising a gear housing, and this encloses beveled meshing gears 16 and 17, gear 16 being secured to shaft 9 for rotation of the shaft.

Gear 17 is driven by a pulley 18, enclosed in a housing 19 secured to the hopper 7, pulley 18 being powered through a belt driven by motor 20 mounted on the other end of the base 5. The motor 20 is secured to a plate 21, from which extends upwardly inclined ears 22, formed integral with sleeves 23, that are adapted to be adjustably secured to posts 24 upstanding from the base, by means of set screws. Thus, adjustment of the motor 20 is possible, so as to maintain proper tension on the belt.

In use, pieces of ice to be shaved or chipped

are entered through the hopper opening, and in this connection, it may be noted that the upper bearing of shaft 9 is positioned above the opening, and thus will be unaffected by ice within the hopper. Additionally, the lower bearing of the shaft is so disposed relative to the rotating blades 10 and fixed blades 13, as to be kept wholly clear of the ice, this also being a desirable and important characteristic of the invention.

The ice feeds to the lower end of the hopper by gravity, and on rotation of the shaft 9, the ice is dragged over the fixed blades 13, and thus is efficiently shaved or chipped, the chipped or shaved ice dropping through slots 11 into a suitable receiver, not shown.

It may additionally be noted that the hopper is so formed and arranged as to receive a rather large quantity of ice, despite the compact and simple construction embodied in the invention, and thus the operator is freed for other duties, without the necessity of giving continued attention to the machine. Freedom of the operator for other duties is also provided for by reason of the fact that the construction is so arranged as to allow a free and unobstructed delivery of shaved or chipped ice from the machine, without danger of said ice packing and thereby obstructing such delivery. With further reference to the operation of the device, it may be noted that the lower edges of the blades 10 are disposed truly radially of the center of the shaft 9, while the fixed blades 13 are offset radially of said shaft center. As a result, there is a shear cutting action of the ice, and additionally, all portions of the cutting edges of the fixed blades are not presented to the edges of the rotary blades at one time. Rather, instead of subjecting the ice to action by the fixed blades from end to end of the fixed blades at one time, the cutting action of the fixed blades begins at that end of each fixed blade disposed adjacent the shaft 9 and travels to the opposite end of each fixed blade.

What is claimed is:

An ice-shaving and chipping machine including a vertical cylindrical hopper having a closed lower end; a shaft rotatable in and disposed axially of the hopper; blades of concavo-convex cross section secured to and rotatable with the shaft, said blades increasing in angle of pitch

from the vertical toward their outer ends and having their lower edges disposed radially of the center of the shaft and closely spaced from said lower end of the hopper, the hopper having an opening at its upper end for receiving ice to be shaved, the ice feeding to the lower end of the hopper by gravity, there being a plurality of slots formed in the lower end of the hopper for gravitation of shaved ice from the hopper; a fixed blade secured to one side wall of each slot, the fixed blades being pitched at an angle opposite to the pitch of the first-named blades and having upper cutting edges offset radially from the shaft center and barely cleared by the lower edges of said first-named blades, the inner end of each fixed blade being offset radially from the shaft center in a direction opposite to the direction of rotation of the first-named blades, the inner end of each fixed blade being the first part of a fixed blade to be traversed by a rotating blade passing thereover with increasingly more steeply pitched portions of the rotating blades successively traversing portions of the fixed blades disposed increasingly more closely to the outer ends of the fixed blades.

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