A. HORWITZ.

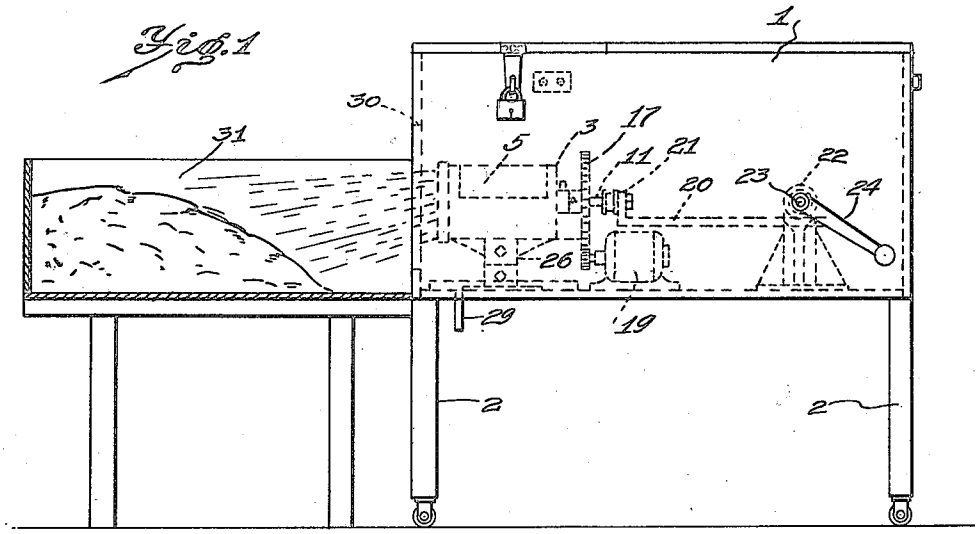
ICE SHAVING MACHINE.

APPLICATION FILED DEC. 15, 1920.

1,432,186. Patented Oct. 17, 1922.

3 SHEETS—SHEET 1.

Fig. 1



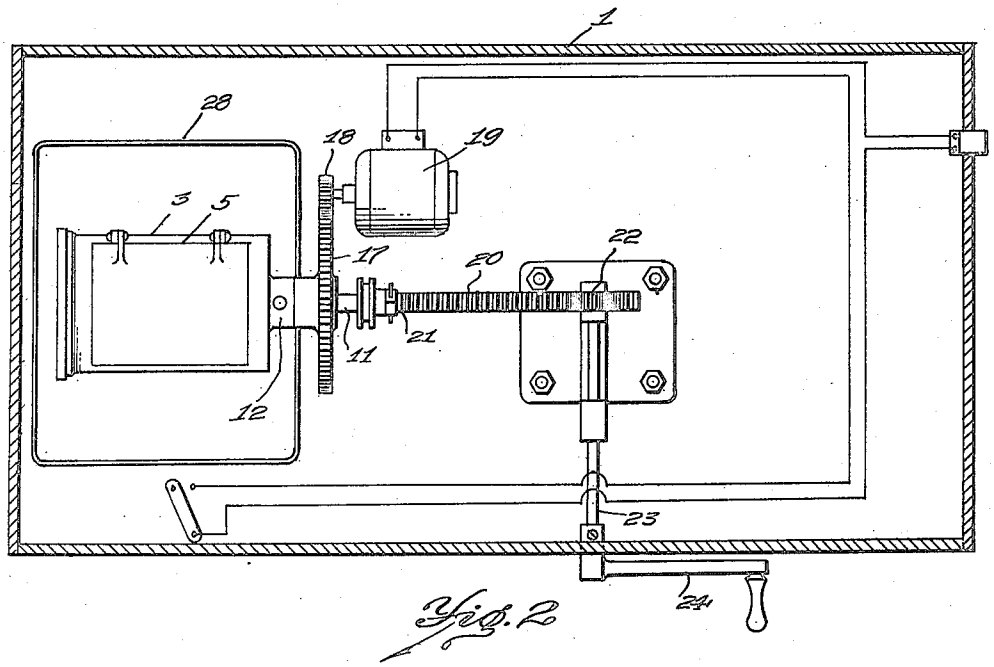


Fig. 2

INVENTOR.
ADOLPHE HORWITZ
BY
ATTORNEY

A. HORWITZ.

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3 SHEETS—SHEET 2.

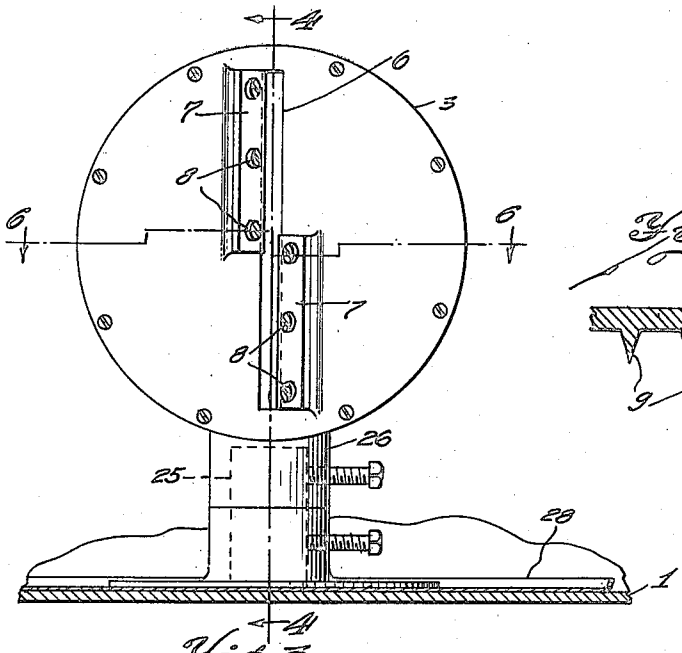


Fig. 3

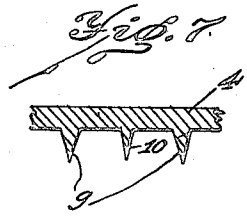


Fig. 7

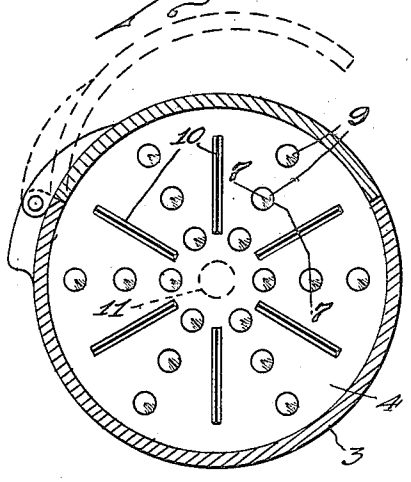


Fig. 5

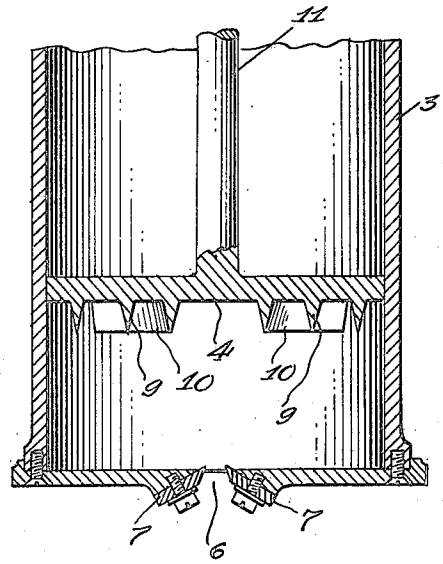


Fig. 6

INVENTOR.

BY ADOLPHE HORWITZ

ATTORNEY

A. HORWITZ.

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3 SHEETS—SHEET 3.

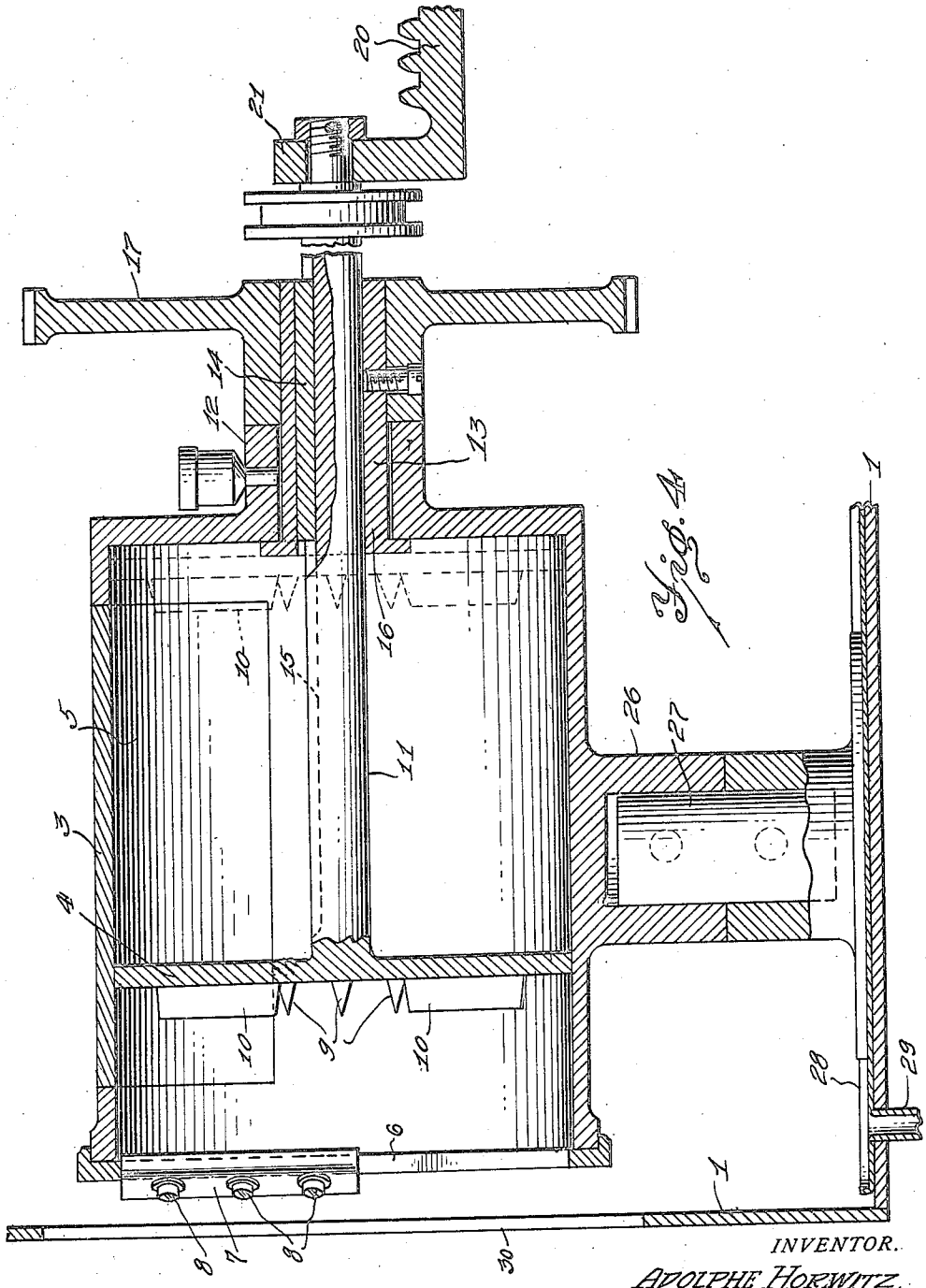


Fig. 4

INVENTOR.

ADOLPHE HORWITZ.

BY D. F. Wheeler

ATTORNEY

Patented Oct. 17, 1922. 1,432,186

UNITED STATES PATENT OFFICE.

ADOLPHE HORWITZ, OF DETROIT, MICHIGAN.

ICE-SHAVING MACHINE.

Application filed December 15, 1920. Serial No. 431,055.

To all whom it may concern:

Be it known that I, ADOLPHE HORWITZ, a citizen of the Dominion of Canada, residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Ice-Shaving Machine, of which the following is a specification.

This invention relates to ice shaving machines, such as are employed for reducing ice to a finely divided form, permitting its cooling properties to be used to greater advantage.

It is the object of the invention to provide a machine of the aforesaid character, which will accomplish the shaving of ice at a rapid rate and with a minimum application of energy.

In attaining this object the invention contemplates a cylindrical receiver for the ice and a piston actuable both rotatively and longitudinally in said cylinder, said piston having projections for communicating its rotation to the ice, and end of the cylinder being slotted for the discharge of the ice shavings, and the shaving knives being arranged upon opposite margins of the slot and in substantially a diametrically opposed relation.

A preferred embodiment of the invention is hereinafter described and illustrated in the accompanying drawings, wherein,

Fig. 1 is a view of the machine in side elevation and partial section.

Fig. 2 is a horizontal sectional view of the same, drawn to an enlarged scale, and omitting the receiver for the shaved ice.

Fig. 3 is a view of the discharge end of the cylinder of the machine.

Fig. 4 is an axial vertical sectional view of the same, the section being taken on line 4—4 of Fig. 3.

Fig. 5 is a cross-sectional view of said cylinder showing the ice engaging face of the piston, and indicating in dash line a raised position of a hinged top section of the cylinder providing for the introduction of the ice.

Fig. 6 shows in longitudinal section the piston and a portion of the cylinder, the section being taken on line 6—6 of Fig. 3.

Fig. 7 is a fragmentary cross-section of the piston taken on lines 7—7 of Fig. 5.

In these views the reference character 1 designates a casing for the machine mounted at a convenient elevation upon legs 2. In one end of said casing is disposed a cylinder 3, wherein a reciprocatory and rotative piston 4 is mounted. A section 5 of said cylinder in the top portion thereof is formed separate from the main body and is hinged so that it may be raised as indicated in dash lines in Fig. 5 to permit the introduction of ice into the cylinder. Said cylinder has at one end a diametrical slot 6 forming a discharge orifice for ice shavings which will be removed from the ice in the cylinder by a pair of knives 7. These are secured to the slotted end of the cylinder by screws 8, and are located upon opposite margins of the slot and in a substantially diametrically opposed relation, as is best seen in Fig. 3. Said blades are mounted at opposite acute inclinations to the slotted end of the cylinder, as is shown in Fig. 6, their cutting edges projecting slightly into the cylinder. The face of piston 4 opposing the discharge end of the cylinder is formed with a plurality of spaced projections 9 and 10 for imparting to the ice a rotation to which the piston is subjected. The projections 9 are conical and are arranged in radial rows. The projections 10 are wedge-shaped and radially elongated, alternating with the rows of projections 9.

The piston is actuable rotatively and longitudinally by a shaft 11 extending axially of the cylinder from the rear face of the piston and passing through the rear cylinder wall. Said wall is formed with an exterior bearing 12 in which is journaled a bushing 13 carrying a spline 14 engaging a spline-way 15 in the shaft 11. Said bushing is restrained from outward movement in the bearing 12 by a flange 16 upon its inner end, and inward shifting of said bushing is prevented by a gear 17 fast upon the outer end of said bushing. Said gear, together with a pinion 18 enmeshed therewith, establishes a drive to the shaft 11 from a motor 19. Owing to the splined connection between the bushing 13 and shaft 11 the latter may be shifted longitudinally without interfering with the rotative drive. The mechanism for actuating the shaft 11 lengthwise comprises a rack 20 having an upturned lug 21 on one end loosely engaging the outer end of said shaft, a pinion 22 engaging said rack and mounted upon a shaft 23 extending through a wall of the casing 1, and an actuating crank 24 upon said shaft 23 exteriorly adjacent said wall

of the casing. It is preferred to swivel the cylinder 3 upon a vertical axis so that it may adjust itself to relieve the shaft 11 of any bending stresses or tendency to bind in the bearing 12. Thus a socket member 26 is arranged to depend integrally upon the cylinder, midway of its ends, and a post 22 secured to the floor of the casing 1 is engaged with said socket. It is also preferred to provide a drain pan 28 upon the floor of the casing beneath the cylinder, said pan having the discharge pipe 29 passing through said floor.

Considering now the operation of the described construction, initially the position 4 is retracted a maximum distance from the discharge end of the cylinder, as is shown in dash lines in Fig. 4. One or more chunks of ice are then introduced into the cylinder, preferably being of a size to substantially fill the same. The motor 19 is now started, rotatively driving the shaft 11 and piston 4 through the gears 17 and 18. The operator now rotates the crank 24 at such a rate as to gradually advance the piston toward the discharge end of the cylinder. Thus the ice is pressed between the piston and the slotted wall of the cylinder and is gripped by the projections 9 and 10 of the piston so as to participate in the rotation thereof. Through such rotation the ice is continuously fed against the cutting edges of the blades 7 so as to be shaved thereby, and the longitudinal feed applied to the piston advances the ice continuously against the discharge end of the cylinder so that its rotation will engage it with the blades. The ice shavings are ejected through the slot 6, and passing through an opening 30 in the end of the casing 1 are deposited in the receiver 31. Any drippings from the cylinder 3, resulting either from condensation on its outer walls or from melting of the ice and escape of the resulting water by way of slot 6, is received by the pan 28 and discharged therefrom through the pipe 29. The splined engagement of the shaft 11 with the rotatively driven bushing 13 and the loose connection of the rack 20 with said shaft permit the rotative and longitudinal drives to be applied to the shaft quite independently of each other. The alternated pointed and wedge shaped projections on the piston provide a very dependable means for rotating the ice by means of the piston. Production of shaved ice may be accomplished with the described machine at a very rapid rate and with comparatively slight application of energy.

What I claim is:

In an ice shaving machine comprising a cylindrical ice receptacle having a discharge opening at one end thereof, a shaft passing axially of said receptacle through the other end thereof, a bushing in which said shaft is splined, rotatively journaled in the last mentioned end of the receptacle, a piston mounted fast upon said shaft in said receptacle, means for rotatively driving said bushing, a rack bar swiveled to the free end of said shaft, and means for longitudinally actuating said rack bar to impart axial movement to said shaft.

In testimony whereof I sign this specification.

ADOLPHE HORWITZ.