May 3, 1932. B. LANDEN 1,856,919

ICELESS COOLER

Filed June 5, 1930 2 Sheets-Sheet 1

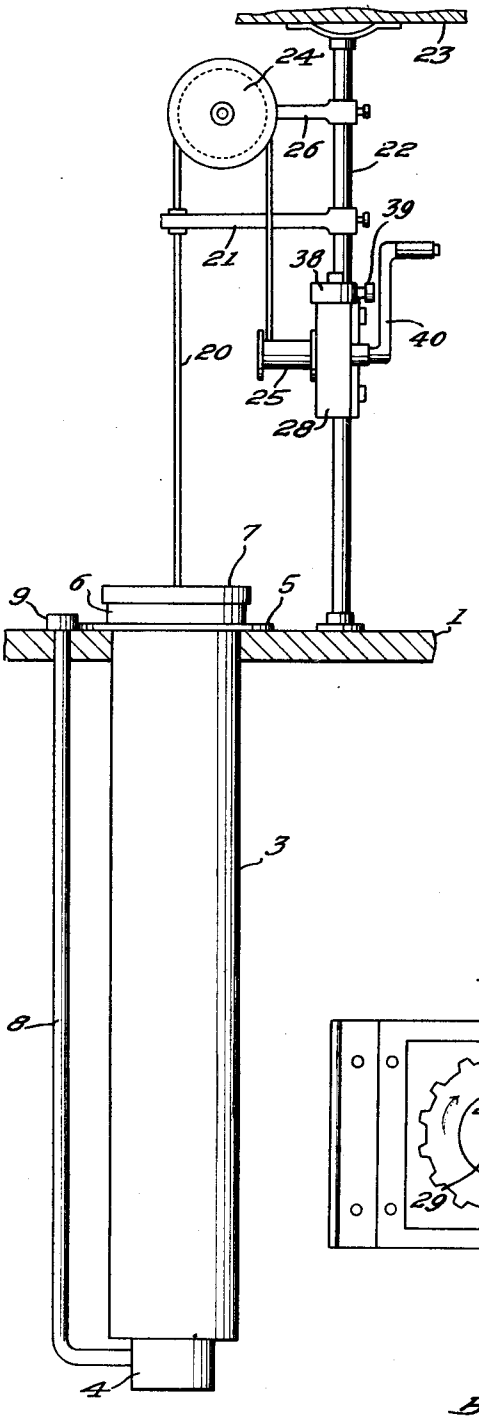

FIG. 1

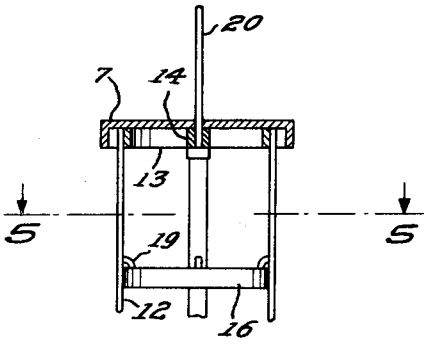

FIG. 2

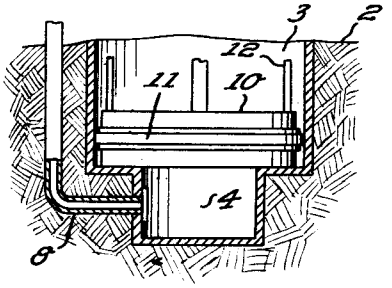

FIG. 3

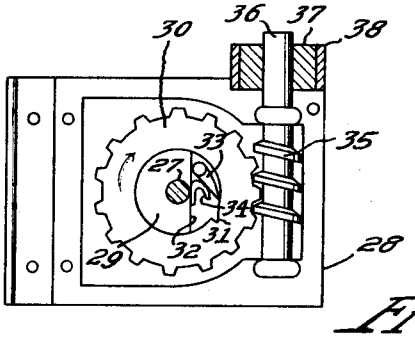

FIG. 4

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ICELESS COOLER

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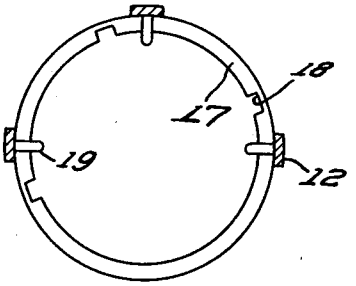

FIG. 5

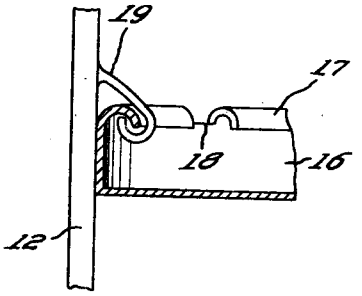

FIG. 6

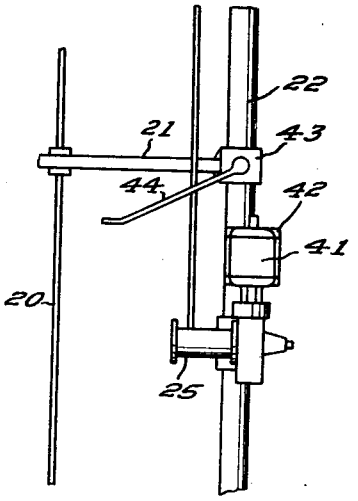

FIG. 8

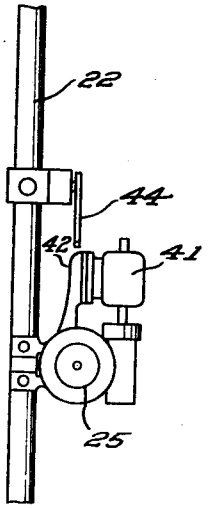

FIG. 7

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Patented May 3, 1932

1,856,919

UNITED STATES PATENT OFFICE

BERNARD LANDEN, OF OAKLAND, NEBRASKA

ICELESS COOLER

Application filed June 5, 1930. Serial No. 459,389.

This invention relates to improvements in refrigerating apparatus for domestic use and more particularly to an iceless cooler of that type adapted to be positioned below the surface of the earth and dependent upon the earth temperature for its cooling properties. Coolers of this class comprise carriers or dumb waiters that are raised and lowered to receive and deliver their contents and frequently parts are broken or damaged through carelessness or accident in operation. The present cooler provides an automatic governor that regulates or controls the speed of the carrier upon its return to its normal position after each delivery.

The cooler is adapted for either manual operation or to be driven by a motor. Means for supplying fresh air to the cooler each time it makes a delivery are provided. The cooler is compact in assembly and not complicated in structure so that installation in a very small space, such as in a corner of a pantry or kitchen, is possible.

More specifically the invention consists in the combination and arrangement of parts to be hereinafter fully described, pointed out in the claim and illustrated in the accompanying drawings which form a part of this application for patent and in which—

Fig. 1 is a view of the complete cooler in elevation illustrating its application.

Fig. 2 is an enlarged fragmentary sectional view of the carrier.

Fig. 3 is a similar view of the lower end of the cooler showing how it is imbedded in the earth and provided with air supply means.

Fig. 4 is an enlarged fragmentary sectional detail view of the cooler illustrating the governor for controlling the descent of the carrier.

Fig. 5 is a cross sectional view taken on the line 5—5 of Fig. 2.

Fig. 6 is an enlarged vertical sectional view of Fig. 5.

Fig. 7 is a fragmentary view of the cooler provided with a motor.

Fig. 8 is a side view of Fig. 7.

Like reference characters denote corresponding parts throughout the several views.

The cooler comprises the carrier that is disposed normally beneath the surface of the earth in a casing, the lower end of the casing being supplied with air furnished by a pipe leading from a point above the surface of the ground. Raising and lowering the carrier in its casing causes air to be drawn into and forced out of the casing. Raising and lowering mechanism for the carrier are provided above the ground.

The reference numeral 1 denotes the flooring of a basement or house resting upon the surface of the ground 2. Extending snugly through an opening in the floor and into the ground is the cylindrical casing 3 having the contracted lower termination 4 forming an air well. Surrounding the upper end of the casing and resting upon the floor is the dust collar 5 integral with the annular band 6 that snugly encompasses the casing and receives the cover 7. An air pipe 8 tapped into the air well 4 of the casing extends upwardly through the floor 1 and terminates in the intake head 9 provided with a screen for excluding dust and dirt from the pipe.

Received within that portion of the casing 3 above the air well is the carrier having the base 10 encompassed by the ring 11, similar to a piston ring, which meets the inner face of the casing and, as the carrier is raised and lowered, causes a suction to draw in air or expel the same through the air pipe 8.

Three rods 12 secured to the carrier base 10 extend perpendicularly to the yoke ring 13 at the upper end of the carrier to which said rods are secured, said yoke ring having a diametrical cross bar 14, the upper end of the carrier receiving, together with the said band 6, the cover 7.

The carrier includes a plurality of trays 16 for receiving the food, each tray comprising a bottom and an integral annular body wall formed with a top inwardly curved flange 17 formed with three notches 18 to provide clearance for the hooks 19 carried by the rods 12, the space between the notches corresponding to that between the hooks in a horizontal plane so that the three hooks may be passed simultaneously through the three notches and the tray then turned slightly to cause the hooks to engage with the flange 17, as shown in Fig.

6, and support the tray. A plurality of trays are provided spaced apart in the carrier. Each tray is adjustable horizontally to permit engagement with and release from its hooks, and removable.

One end of a cable 20 extends through a perforation in the cover 7 and is secured to the cross bar 14, said cable extending up through a cable guide 21, carried by the support post 22 that rests upon the floor and is secured to the ceiling 23, and over the sheave 24 to the spool 25. The sheave is supported at one end of the arm 26 adjustably secured to the post 22.

Referring now to Figs. 1 to 6 inclusive, the shaft 27 of the spool is journaled in and extends through the housing 28 secured to the post 22, said shaft 27 having fast thereupon, within said housing, a non-circular disc 29 which is received concentrically within the worm gear 30, said gear and disc fitting loosely to each other so that normally the disc may rotate freely with respect to the gear.

The bore in the worm gear is formed with a notch 31 and in the space between the flat edge 32 of the disc and the wall of the bore a dog 33 is arranged and kept yieldingly in frictional engagement with the wall of the bore by the spring 34 secured to the flat edge 32. When the shaft and disc rotate in one direction they will rotate independently of the worm gear as the dog will pass over the notch 31. When the direction of rotation is reversed, however, the dog will enter the notch 31 and cause rotation of the worm gear. This gear is in mesh with the worm 35 mounted for rotation inside the housing 28, one end 36 of the worm shaft extending beyond the housing and carrying a bushing 37 encompassed by a clamping ring 38 secured to the housing, said ring carrying the set screw 39 whereby said ring 38 may be clamped, in the manner of a brake, against the bushing to retard the rotation thereof together with the shaft 36. The clamping ring 38 may be of any type, such as a split ring with its ends engaged by the screw 39 so that tightening the screw will force one end of the ring frictionally against the bushing to act as a brake.

The shaft 27 at one end is provided with the handle 40 by means of which it may be rotated to wind the cable upon the spool 25 and raise the carrier, with the trays, out of the casing 3. In this movement the shaft 27 is rotated in a direction to turn the disc 29 independently of the worm 35. When the carrier, comprising the base 10, rods 12, ring 13 and trays 16, is raised out of the casing the trays may be manually filled or unloaded and the carrier then returned to the casing. This movement takes place when the handle 40 is released, with the brake off. The weight of the carrier will unwind the cable from the spool and rotate the shaft 27 in a direction to rotate the worm gear and the worm 35. The latter will serve as a governor to check an otherwise too rapid descent of the carrier into the casing. This governor feature prevents damage to the carrier or its contents. The cable passing through the center of the cover 7 will automatically apply the same to the casing as the carrier descends.

Referring now to Figs. 7 and 8, the shaft of the spool 25 is connected to the shaft of a motor 41 that is supported by bracket 42 fastened to the post 22. Mounted to the inner end of the cable guide 21 is a switch box 43 that carries a switch for turning on the motor. Connected to this switch is the long lever 44 that extends obliquely downward and when the arm is depressed manually it throws the switch to start the motor. The free end of the arm 44 is now in the path of movement of the carrier which, when raised by the motor, will strike said arm and raise same and so automatically open the switch and shut off the motor. The brake is applied before the motor is started so that return of the carrier to the casing 3 through gravity after the motor has stopped is prevented. When the carrier is to be returned the brake is released and the weight of the carrier will reverse the motor and permit the carrier to lower at moderate speed.

What is claimed is:—

In an iceless cooler, a casing adapted to be positioned beneath the surface of the earth, a carrier adapted for movement into and out of said casing, said carrier being adapted to move into said casing through gravity after each removal therefrom, a spool, a cable connecting said carrier to said spool and adapted to be wound upon the latter to raise said carrier, a motor for said spool, a worm gear loose upon the motor shaft, means connecting said worm gear and motor shaft for causing them to move together when said motor shaft moves in one direction, a worm in mesh with said worm gear, and a brake for said worm.

In testimony that I claim the foregoing as my own I have hereto affixed my signature.

BERNARD LANDEN.