April 19, 1938. C. W. BAKER 2,114,365

HOUSEHOLD REFRIGERATOR

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FIG.1.

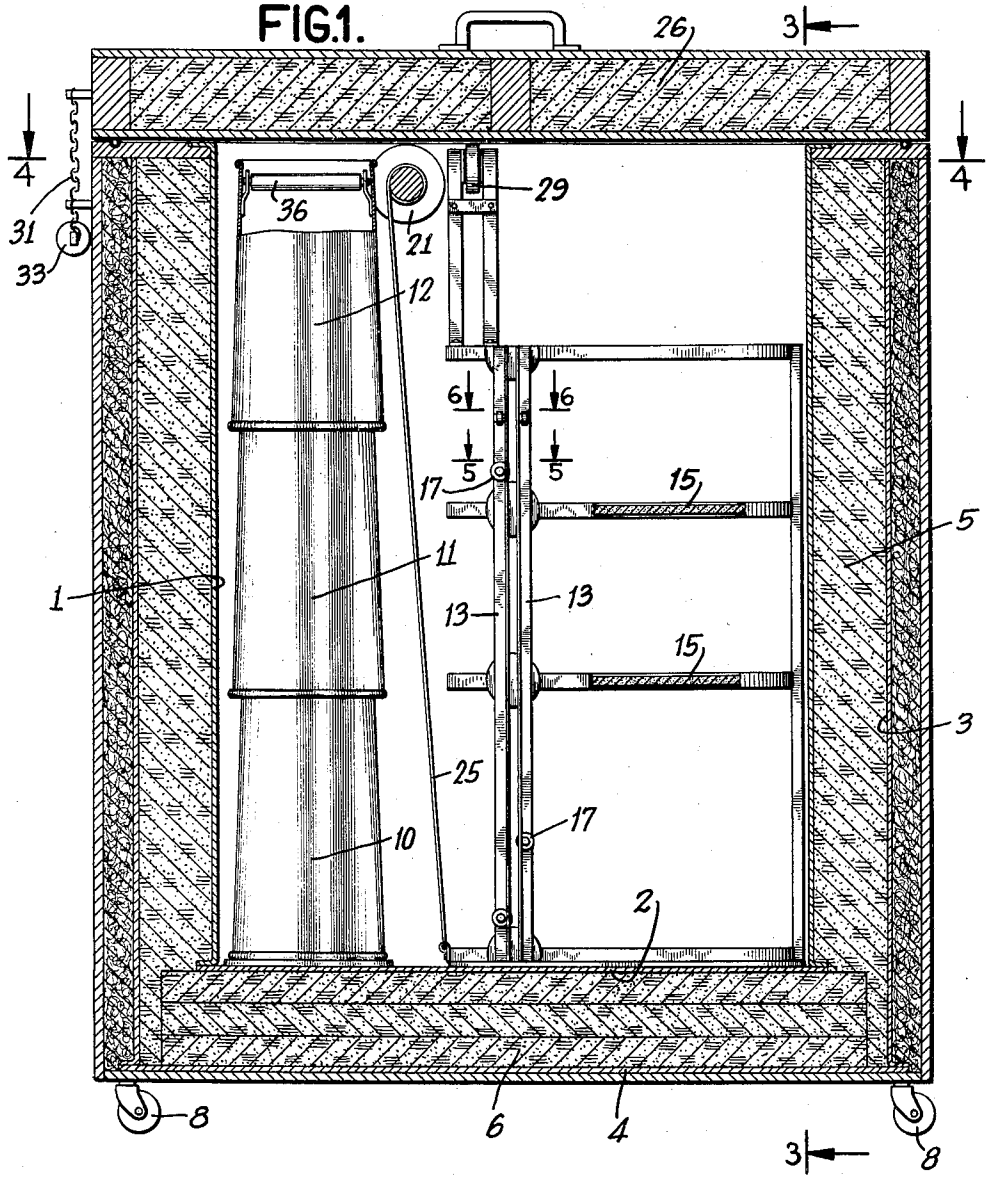
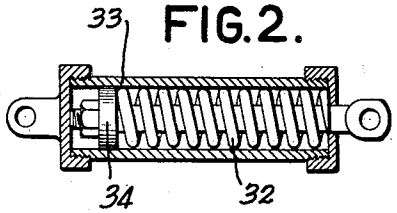


FIG.2.



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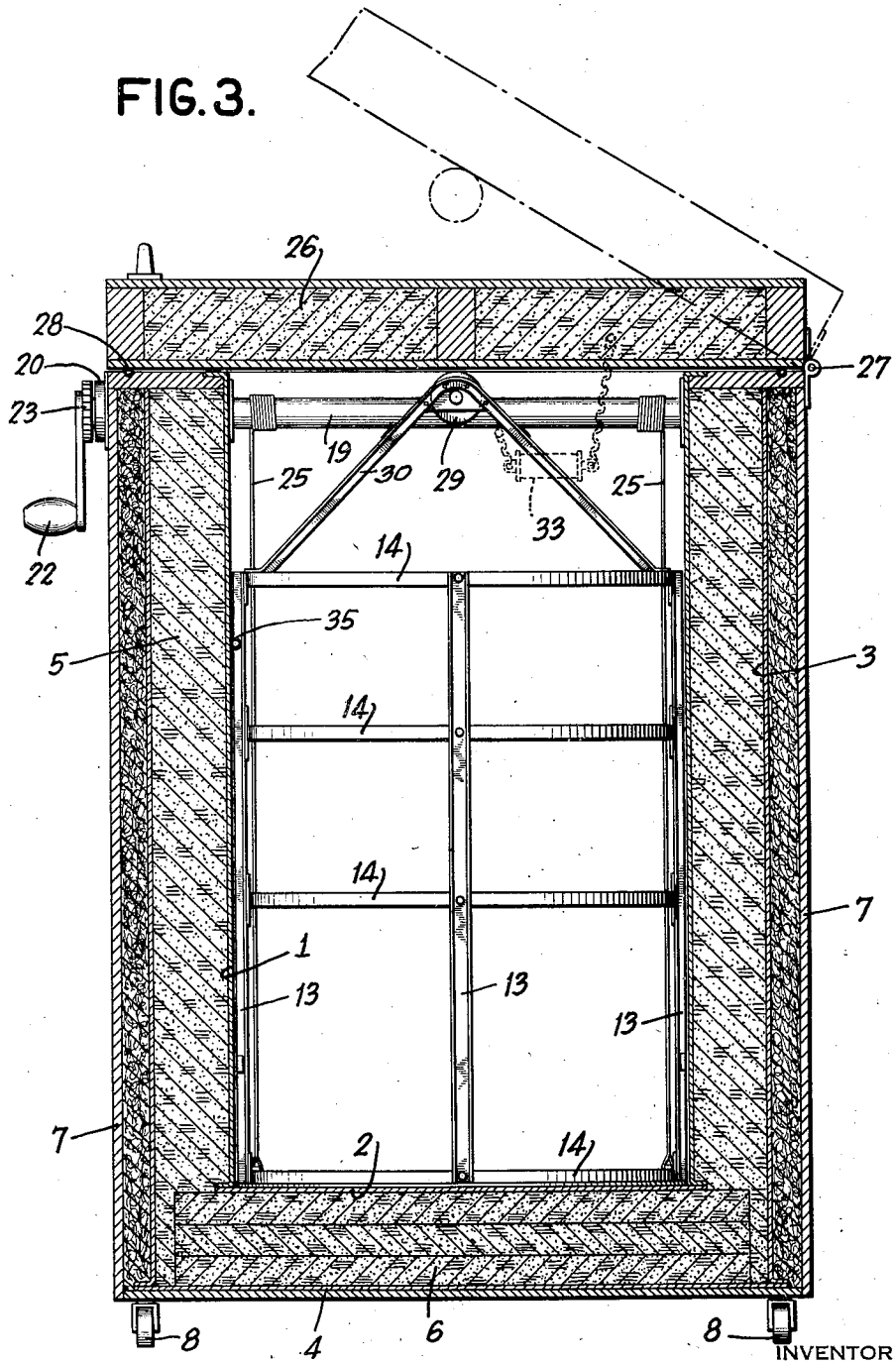
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FIG. 3.



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FIG.4.

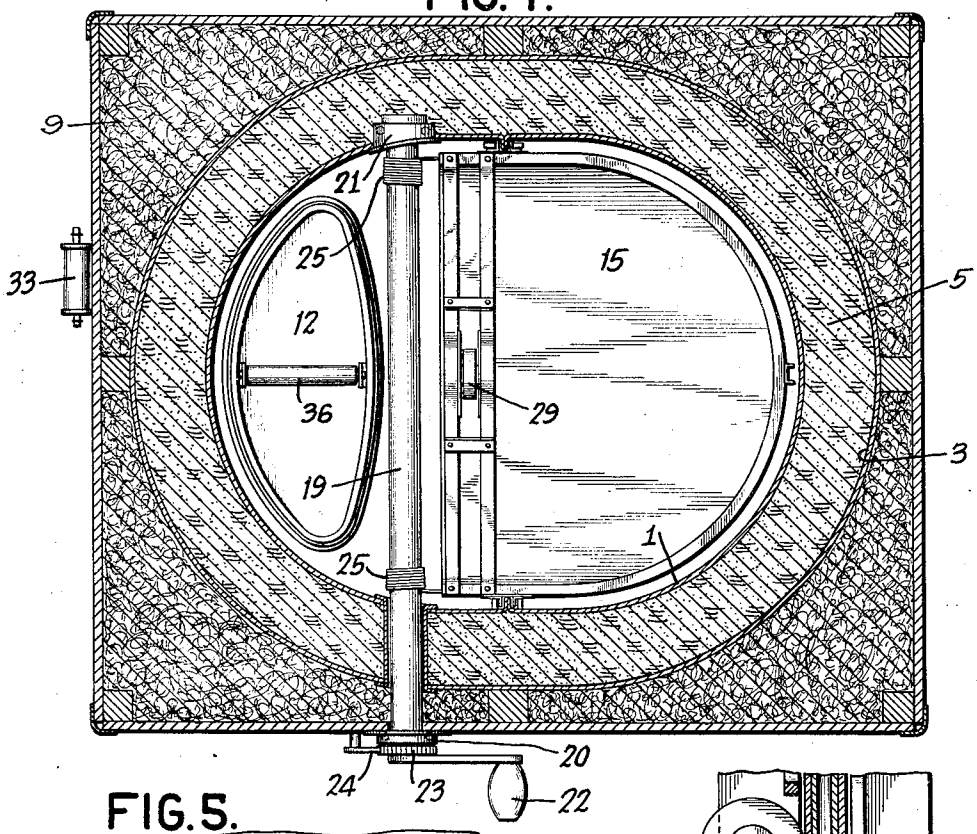


FIG.5.

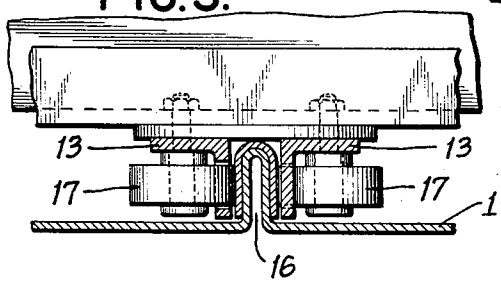


FIG.6.

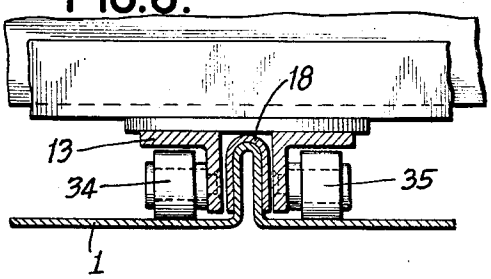
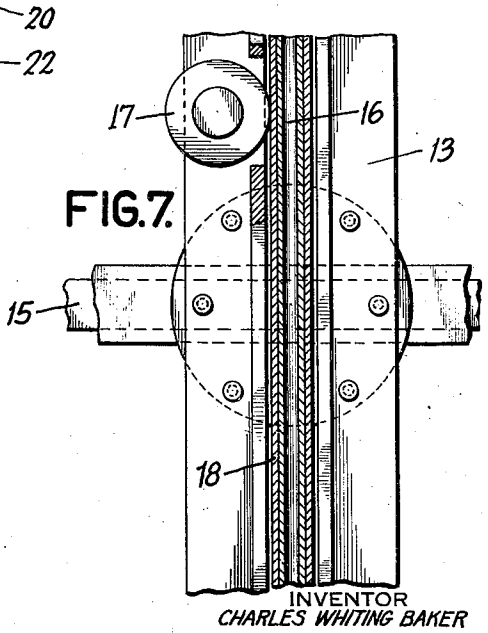


FIG.7.



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Patented Apr. 19, 1938

2,114,365

UNITED STATES PATENT OFFICE

2,114,365

HOUSEHOLD REFRIGERATOR

Charles Whiting Baker, Montclair, N. J.

Application June 20, 1936, Serial No. 86,373

2 Claims. (Cl. 62—69)

My present improvements relate to household refrigerators of low manufacturing cost and high efficiency of the general type shown and described in my pending application filed April 23, 1936, Serial No. 75,962. The refrigerator disclosed in said application has a single cold chamber in which are placed both the refrigerant and the food or other articles to be kept cool. This cold chamber is made of sheet metal, generally cylindrical in form and this is set inside a larger sheet metal cylindrical casing, leaving an annular space between the two in which the insulation is placed, insulation being also placed between the flat bottoms of the two cylinders. An insulated cover closes the top of the cold chamber and is the only means of access to it.

Such a cold chamber cannot be made of greater depth than the user can conveniently reach from the top in order to place food and other articles on the bottom of the chamber. Further, the placing of an intermediate shelf between the top and bottom as disclosed in said application interferes somewhat with access to articles placed on the bottom of the cold chamber.

With my improved refrigerator as will be hereinafter described this limitation to the depth of the cold chamber is removed. Several shelves may be placed in the cold chamber at such heights as may be desired and these shelves are made accessible on all sides for the placing or removal of food and without any stooping or bending or any difficulty in reaching articles at the back of a shelf on account of other articles in front being in the way.

In order that my improvements may be better understood attention is directed to the accompanying drawings forming a part of this specification and in which

Figure 1 is a vertical cross-section of a refrigerator embodying my present improvements.

Figure 2 is a longitudinal sectional view of the spring dashpot which I prefer to use in connection with the insulated cover.

Figure 3 a vertical sectional view on the line 3—3 of Figure 1 showing in dotted lines the cover in a partly raised position.

Figure 4 a horizontal sectional view on the lines 4—4 of Figure 1.

Figure 5 an enlarged cross-sectional view partly in elevation on the line 5—5 of Figure 1.

Figure 6 a similar view on the line 6—6 of Figure 1 and

Figure 7 a vertical sectional view through the guide track showing some of the elements in elevation.

Referring to Figures 1, 2 and 3 the cold chamber is made up of the inner sheet substantially cylindrical member 1 with bottom 2 which is set inside the outer substantially cylindrical member 3 with bottom 4.

Insulation 5 is placed between the shells 1 and 3 and several layers of insulation board 6 or other insulating material are placed between the bottoms 2 and 4 as shown in Figures 1 and 3.

The cold chamber is placed in a generally rectangular cabinet 7 mounted on castors 8 and a cheap insulating material like mineral wool 9 fills the space between the cold chamber and the cabinet as shown. At the bottom of the cold chamber and at one end thereof are set pails containing crushed ice which are superimposed one on the other.

With the arrangement shown these pails are of reduced dimensions at the top so as to conveniently support the pail above. With the present construction I prefer to employ pails 10, 11 and 12 which in the aggregate extend nearly to the top of the cold chamber as shown in Figure 1. When three pails are used, each may have a capacity of twenty-five pounds this being the unit generally used in the retail sale of ice, so that the total capacity will be seventy-five pounds.

The user of the refrigerator may however if he desired to economize in the use of ice fill only the two lower pails. This will allow the temperature in the upper part of the cold chamber to rise somewhat, thereby reducing the flow of heat to this upper part. By using the upper shelves of the refrigerator as I will hereafter explain for fruit, vegetables, and the like, which do not require a very low temperature for preservation, the usefulness of the refrigerator is not impaired.

The ice containing pails are not round in cross section but as shown in Figure 4 are curved on one side to fit closely the curved end of the cold chamber and these pails have a form which leaves as much space as possible in the cold chamber for the placing of food consistent with the required ice holding capacity of the pails. An additional advantage of pails of this section is that they expose a much larger surface for refrigeration than pails of circular cross section as shown in my said application.

Instead of making the height of the cold chamber substantially equal to its diameter as shown in said application I make the height considerably greater. While this gives a larger interior surface to the cold chamber it lessens the relative space therein occupied by the ice pails of a

given total capacity and thus leaves more room for the storage of food. With this greater height of the cold chamber it will no longer be possible to conveniently place food and the like on the bottom of the cold chamber from the top.

I have therefore provided means whereby shelves may be placed in the cold chamber at most convenient heights for the storage of a variety of articles and means whereby these shelves may be raised from the cold chamber and held at the most convenient height for the placing of food thereon and its removal therefrom. I therefore provide a skeleton framework comprising the vertical members **13** and the horizontal channels **14** in which shelves **15** are removably carried. In this way they may be removed for cleaning. The whole structure comprising the skeleton framework and shelves is movable vertically within the cold chamber.

Preferably each side of the inner shell **1** is crimped as shown in Figures 5 and 6 to form a rib **16** with which rollers **17** cooperate, said rollers being carried by two of the upright members **13** at each side. If desired a piece of sheet metal may be inserted within each of the ribs or guides **16** to add to the strength and stiffness. In order that the porcelain or galvanized surface of the ribs **16** may not be worn off by the rollers **17** to thereby rust, I prefer to encase each rib or guide with a cover **18** of non-corrosive metal such as stainless steel.

In order to raise the shelves vertically in the cold chamber I prefer to make use of a shaft **19** made preferably of wood mounted in ball bearings **20**, **21** and turned by means of a crank **22**. This shaft carries a ratchet wheel **23** with which a pawl **24** cooperates. Cords or chains **25** lead from the shaft **19** and connect with the bottom of the skeleton frame as shown. By turning the shaft the frame and shelves will be raised as will be obvious, the pawl and ratchet **23—24** holding the shelves at any desired position. Upward movement of the shelves is limited as the lower ends of the cords or chains **25** near the shaft **19** in such movement.

While the insulated cover **26** of the cold chamber may be lifted by hand, some means of making its lifting easy is desirable as well as to support it safely when raised to the desired height with no possibility of shutting accidentally or of going over backward.

I therefore preferably provide for opening the cover automatically by the rotation of the crank **22** which raises the skeleton framework and shelves from the cold chamber. Therefore the cover is secured to the cold chamber by two or more spring hinges **27** one being shown in Figure 3, said hinges being adjusted so as to exert a constant tendency to lift the cover while at the same time permitting sufficient weight to be exerted on the gasket **28** as to make a tight joint.

In practice I have made use of spring hinges which are sufficient to counterbalance not more than two-thirds of the weight of the cover when closed.

Cooperating with the cover is a roller **29** carried by an angular frame **30** secured to the before mentioned skeleton frame. Therefore the cover will be raised by the crank **22** as the shelves move upwardly owing to the employment of spring hinges. The lifting at first will be very easy and when the cover has been raised about 40 degrees it will continue to rise of itself until checked by a chain **31**, as shown particularly in Figure 3.

Preferably this chain includes a spring **32** mounted in a casing **33** in which is a plunger **34** acting as a dashpot. Therefore the opening movement of the cover under the effect of the spring hinges will be checked easily and without shock.

As the cover rises its increasing inclination produces an increasing lateral thrust on the skeleton framework tending to push it against the side of the cold chamber. To avoid the friction and wear which this would cause I make use of a pair of anti-friction rollers **35** carried by the vertical angles **13** and adapted to engage the wall **1** on the side where the thrust occurs as shown in Figure 6.

In my improved refrigerator it will be seen that the turning of the crank **22** will not only result in the cover **26** being automatically raised but also all the shelves **15** (except the lower one) may be lifted out to permit easy access thereof. In the case of the lowermost shelf this will be raised to a position somewhat below the shaft **19** and can be reached with equal facility.

Preferably each of the ice pails **10**, **11** and **12** is provided with a handle **36** located within the pail below the upper edge thereof as shown particularly in Figure 1. In this way the pails may be readily carried and the handles will not interfere with their proper assembly.

Having now described my invention, what I claim as new therein and desire to secure by Letters Patent is as follows:

1. In a household refrigerator, the combination with a cold chamber opening only at the top, of ice-containing pails within and at one side of the cold chamber to effect refrigeration, a skeleton framework within the cold chamber and vertically movable therein, a series of shelves carried by said framework, a manually operated shaft extending across the cold chamber near its upper end and cables or chains connecting said shaft with the lower end of the skeleton frame.

2. In a household refrigerator, the combination with a cold chamber opening at the top, of ice containing pails at one side of the cold chamber to effect refrigeration, a skeleton framework within the cold chamber and vertically movable therein, a series of shelves carried by said framework, a manually operated shaft extending across the cold chamber near its upper end and cooperative means between the framework and said shaft whereby the framework may be moved vertically by said shaft.

CHARLES WHITING BAKER.