M. F. JURUICK.

DOOR FOR REFRIGERATORS.

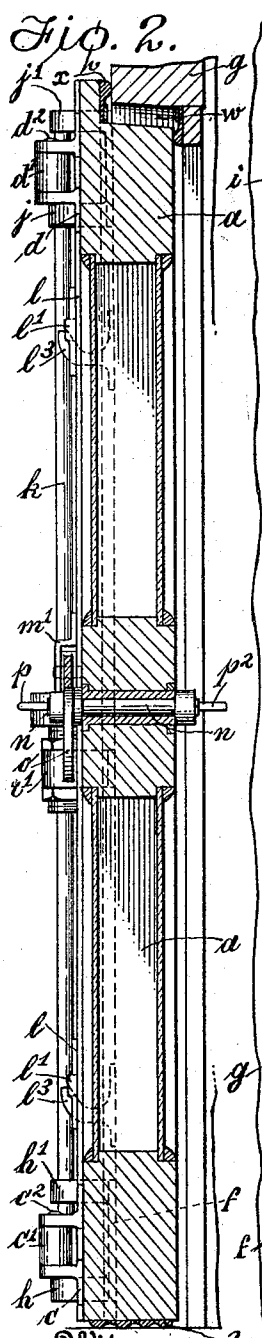
APPLICATION FILED SEPT. 30, 1915.

1,202,068.

Patented Oct. 24, 1916.

2 SHEETS—SHEET 1.

Fig. 2.



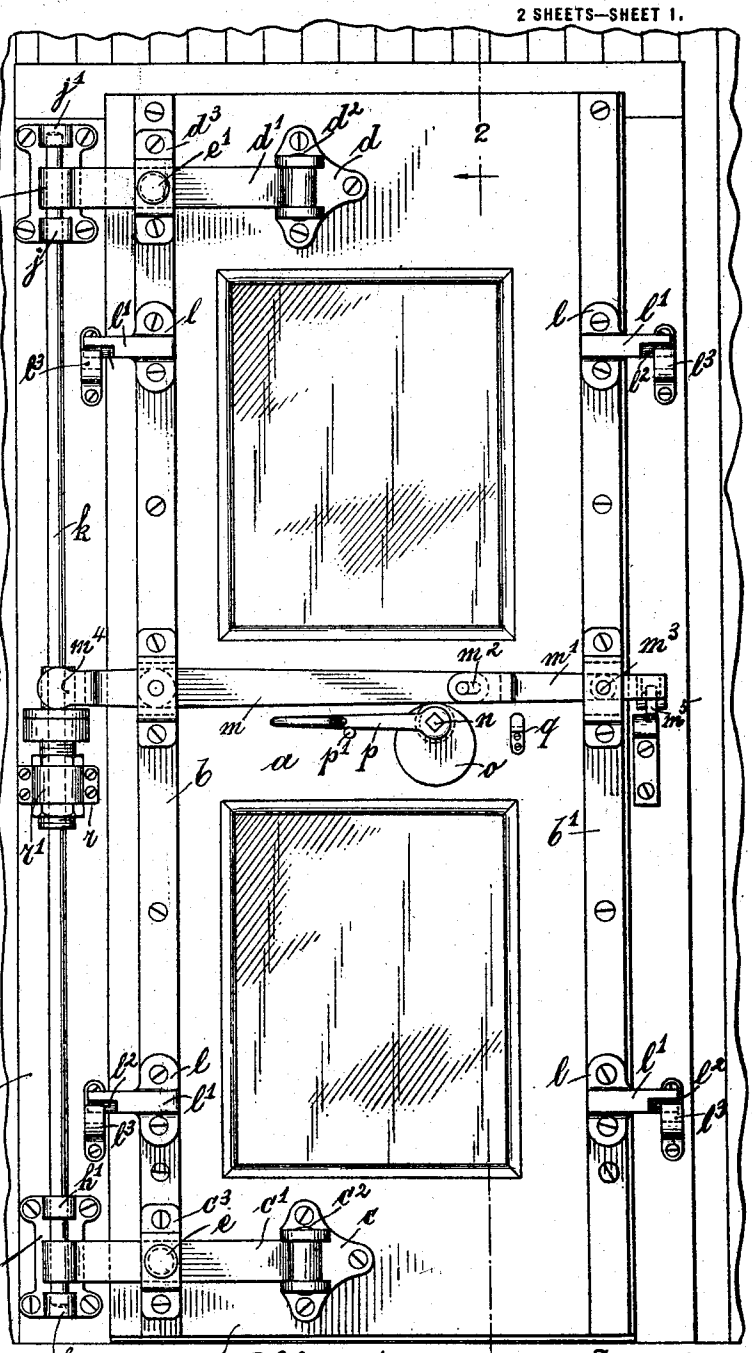


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

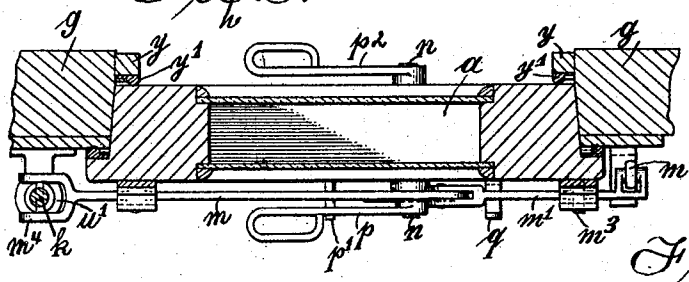


Fig. 5.

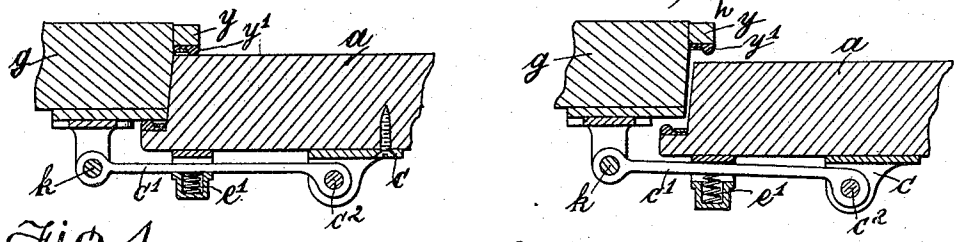


Fig. 4.

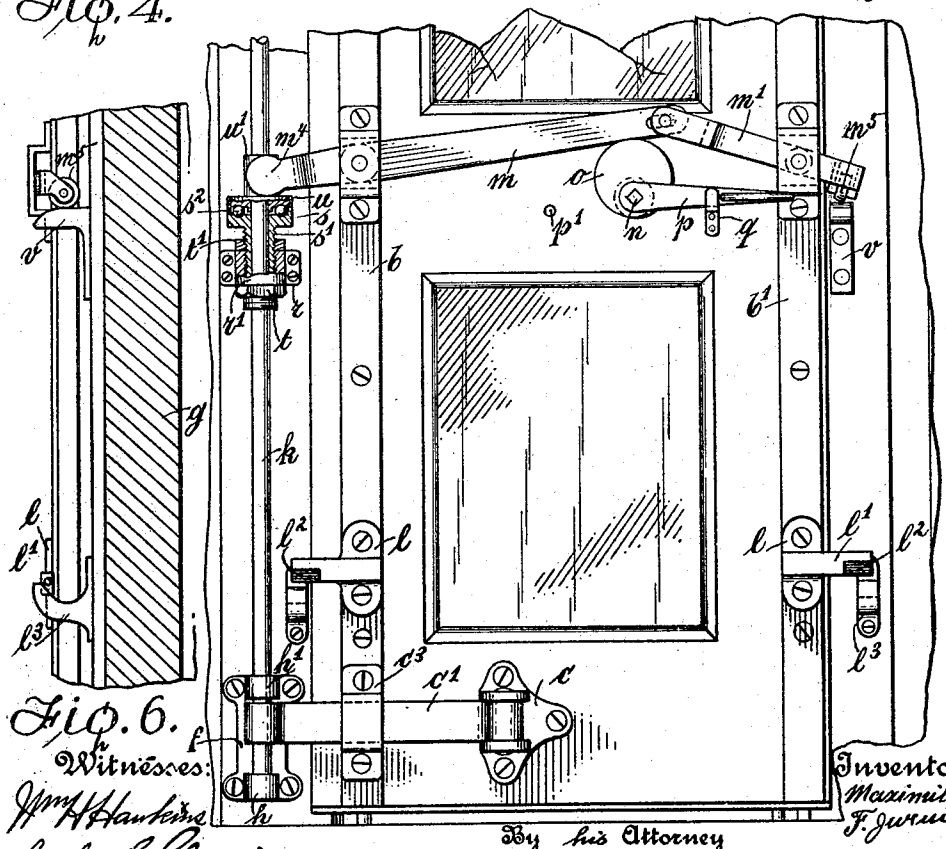


Fig. 6.

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Fig. 7.

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UNITED STATES PATENT OFFICE.

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DOOR FOR REFRIGERATORS.

1,202,068. Specification of Letters Patent. Patented Oct. 24, 1916.

Application filed September 30, 1915. Serial No. 53,388.

To all whom it may concern:

Be it known that I, MAXIMILIAN F. JURUICK, a citizen of the United States of America, and a resident of Allentown, county of Lehigh, State of Pennsylvania, have invented certain new and useful Improvements in Doors for Refrigerators, of which the following is a specification.

This invention has reference to doors for refrigerators which are applied to cold storage rooms of all descriptions.

In cold storage rooms there is a sill underneath the door whereon cushions of felt or other heat non-conducting material perform a sliding or wiping motion during the operation of the door. These cushions thereby are easily distorted and torn which results in leaks. The sill on the floor is an obstacle during carting goods in and out of the cold storage rooms and the sill, on account of its raised position above the floor is subject to greater wear and tear than a level floor, therefore leaks will occur here in the course of time. Furthermore the doors usually employed are liable to sagging and then become untight and leaky while a reliable closure by a refrigerator door is absolutely necessary for economic and practical reasons.

The present invention has for its special purpose to overcome the described defects and in addition thereto it presents novel features embodying new functions. The novel door has been constructed with a view of rendering it very reliable and secure. By the present construction of a door for refrigerators liability to derangement and repairs has also been reduced, the felt cushions will not be distorted and torn, sagging, under normal conditions, is practically prevented and durability imparted so that the door may be used for years without requiring attention.

In order to render the invention entirely clear reference is had to the accompanying drawing in which:

Figure 1 represents in front elevation a refrigerator door embodying in desirable forms the present improvements. Fig. 2 is a cross section on line 2—2 of Fig. 1. Fig. 3 shows the door in sectional plan view taken just above the lifting mechanism. Fig. 4 illustrates in sectional plan view one of the hinge members when the door is closed. Fig. 5 is a similar view of one of the hinge members when the door is partly opened. Fig. 6 shows in side elevation one of the door locking means. Fig. 7 is a front elevation, of the door in a raised position ready to be opened.

Similar characters of reference denote like parts in all the figures.

In the drawing in Fig. 1 a represents the door, b, b^1 are two vertical metal strips or bands one each secured on one side portion of the door which strengthen first the structure of the door and second support the locking members and hinges. The hinges comprise each a pivot plate c, d. Upon each pivot plate there is one of the hinge straps c^1, d^1 through which an auxiliary hinge pintle c^2, d^2 passes. The hinge straps extend horizontally and a strap support c^3, d^3 is provided one for each hinge strap. These hinge strap supports are fastened upon the metal strip b. The raised upper portion of the strap support c^3, d^3 forms a spring housing and a spring e, e^1 is mounted in each housing as shown in section in Figs. 4 and 5. Said springs e, e^1 tend to press upon the hinge straps and against the strap supports fastened on the metal strip b. The hinge straps extend beyond the door and a hinge butt f is screwed upon the door casing g. The hinge butt supports two pintle bearings h, h^1 one at the bottom and one at the top portion. The hinge butts f are rather long so that there is considerable space between the bearings. This device is exactly constructed as described with reference to other hinges that may be employed. In the drawing two hinges are shown. In the upper hinge i represents the hinge butt and j, j^1 the bearings. For the purpose of imparting perfect alinement and stability to the hinges both hinges have a common hinge pintle k which represents a long steel rod, as shown in Figs. 1 and 7. The hinge straps are permitted to travel up and down on the hinge pintle between the bearings during the operation of the door.

On the metal strips or bands b, b^1 a plurality of locking means are provided of which 4 are shown in Fig. 1 as an example. The locking means comprise each a supporting plate l having a branch or arm l^1 which extends horizontally toward the door casing. The outer portion of each extending arm forms a pin which has a beveled or inclined surface l^2. Upon the door casing there are mounted in corresponding places locking members l^3 which are provided each

with an inclined surface corresponding to the inclined surface of the arm l^1.

In Fig. 1 of the drawing the door is shown in the closed position and therefore the locking means are closed. In Fig. 7 of the drawing the door is shown to be in a raised position and therefore the locking members are out of engagement.

Upon the metal strip or band b, about in its center, there is pivotally mounted a lever m which extends horizontally in both directions. The lever extends toward the right for a relatively large distance and connects there with a short lever m^1 which is hinged thereto in a slot m^2. The short lever m^1 is pivotally mounted upon the metal strip or band b^1 as shown at m^3. Underneath the end portion of the lever m adjoining to the connection of the two levers m, m^1 there is mounted a cam mechanism. A bolt n with square ends passes through the door and the cam o with the cam lever p are mounted upon the said bolt on the outer side of the door, as shown in Figs. 1 and 7. A stop pin p^1 is provided underneath the lever p to arrest and support the lever p. A similar lever p^2 is mounted upon the bolt n on the inner side of the door, as shown in Fig. 3, to operate the cam from the inside.

Assuming that the cam o is turned by means of the lever p then the long lever m with the short lever m^1 is raised in an upward direction and the ends of the lever beyond the pivots of the strips b, b^1 are lowered, as shown in Fig. 7. At the end of the movement of the lever p it is arrested by means of a locking device q.

In order to utilize the downward movement of the lever ends for raising the door, mechanism is provided which resists these downward movements. This mechanism is mounted upon the door casing and comprises a supporting plate r. From the plate r extends a lug r^1.

A ball-bearing box s having a shank s^1 which extends downwardly through the lug r^1 is held in any desired position by the two nuts t, t^1. This renders the ball-bearing box adjustable. Within the box s there is a ball-bearing s^2. Upon the ball-bearing there is a flange u with a sleeve u^1. The hinge pintle k passes through the threaded shank of the ball-bearing and the sleeve u^1 which brings the ball-bearing in true alinement with the hinges. The end of the lever m is fork-shaped and the fork m^4 passes around the sleeve u^1 which surrounds the hinge pintle k. This fork rests upon the flange u and when the cam arrangement has been operated to raise the lever m then the downward moving end of the said lever with the fork m^4 is checked by the stationary position of the ball-bearing device and therefore the door is raised from the floor by the pivoted lever connection fastened upon the metal strip or band b as shown in Fig. 7. By the upward movement of the door the various locking means become disengaged and the door now is swung open. During the upward movement of the lever m the adjoining portion of the lever m^1 also moves upward while the free end portion of the lever m^1 beyond its pivot on the metal strip or band b^1 moves downward. In order to utilize this downward movement for raising the door on the right hand side a bracket v is mounted upon the door casing. The adjoining end portion of the lever m^1 is provided with a little roller m^5 for the easy movement upon the top of the bracket v, see Figs. 1, 6 and 7. However this lever m^1 and pertaining elements may be dispensed with on small doors.

In order to render it possible to raise the door a space w is left between the door and the top of the casing as indicated in Fig. 2. The door has overlapping portions on both sides and the top. Inside of these overlapping portions cushions x are provided for the purpose of rendering these sections airtight. On the inside of the door casing strips y are fastened on both sides and the top of the casing and cushions y^1 are also fastened on the strips y to insure a tight closure, as shown in Fig. 3.

When raising the door the springs e, e^1 pressing upon the hinge straps tend to move the door away from the casing at the very beginning of the upward movement which is facilitated by the inclined surfaces l^1, l^3 of the locking devices, thus eliminating all friction of the cushions on the outer and inner part of the casing simultaneously the bottom portion of the door is raised from the floor avoiding any friction there, as shown in Figs. 5 and 7.

When it is desired to lock the door same is swung close to the casing, then the lever p of the cam mechanism is returned into its initial position until it rests on the pin p^1. Now the door has descended in a straight vertical plane and the cushions z secured underneath the door, as shown in Fig. 2, also have descended in a straight vertical plane and make perfect contact with the floor without performing a destructive sliding or wiping motion. Thus the interior of the refrigerator is closed airtight against the outside and no interchange of air can take place between the floor and the lower surface of the door. During the closing of the door the locking means also have descended on the inclined surfaces herein described and lock the door at both sides because some of the locking means are provided on the right side of the door and some on the left of the same. It is evident that during the descent of the door the hinge straps also move in a downward direction

on the hinge pintle and in perfect alinement because all the hinges move on one pintle common to all the hinges employed.

The entire weight of the door when lifted rests, by means of the levers m, m^1, on the flange u, but on account of the ball-bearing arranged in peculiar manner underneath the said flange an easy swinging of the door is obtained.

I claim as my invention:

1. The combination with a door and its frame having contacting engagement at the sill in a horizontal plane and at its other boundary edges in a vertical plane, with means for mounting the door so that it may both swing and have a vertical movement, and means causing the door in both opening and closing to have a movement in a diagonal to the two planes of contact to simultaneously free it from both.

2. A door for refrigerators comprising a cushion on its bottom surface, means permitting of raising and lowering the door to free it from the floor without friction while being raised, and springs pressing against the said means during raising the door to move it away from the casing thus avoiding friction therewith.

3. A door for refrigerators comprising contacting cushions on its bottom and side surfaces, means permitting of raising and lowering the door to free it from the floor without friction while being raised, springs pressing against the said means during the raising of the door to move it away from the casing thus avoiding friction therewith, and sliding means with slanting surfaces to produce a movement in a diagonal to the two planes both during opening and closing the door.

4. A door for refrigerators comprising contacting cushions on its bottom and side surfaces, means permitting of raising the door to free it from the floor without friction while being raised, springs pressing against the said means during the raising of the door to move it away from the casing thus avoiding friction therewith and producing a diagonal movement of the door during raising it, and sliding means with slanting surfaces adapted to produce a diagonal movement while opening the door and closing it by its own weight.

5. A door for refrigerators comprising locking devices having inclined guiding surface portions and pins adapted to move thereon, a cam and lever with handle adapted to act as a door pull on both sides of the door for raising and lowering the same so that the door may be operated from both sides to actuate the locking devices and raising and lowering the door.

6. A door for refrigerators comprising hinge straps on the door, hinge butts on the door casing at a relatively large distance apart, a hinge pintle common to all the hinges permitting the hinge straps to move up and down on the pintle, a cam with lever on the door, and a support for the inner lever end on the hinge pintle, so arranged that by turning the cam lever the door is raised for initiating the opening of the same.

7. A door for refrigerators comprising hinges, a common hinge pintle for the said hinges, hinge straps adapted to move up and down on the common pintle, a cam and lever arrangement on the door, and ball bearing mechanism on the hinge pintle on which the adjoining lever end rests whereby the door may be raised and lowered.

8. A door for refrigerators comprising a cam with lever pivotally secured to the outer surface of the door, an adjustable ball bearing device with cover on which the adjoining end of the lever rests so that by the operation of the cam the door is raised with the weight of the door on the said ball bearing device.

9. A door for refrigerators comprising lifting mechanism for the door, a cam mounted upon a bolt passing through the door and having securing means thereon, a lever at each end of the said cam bolt and a handle at the free end of each lever so that by turning said cam bolt by means of either the outer or inner lever the lifting mechanism of the door may be operated from the outside and from within the refrigerator.

Signed at Allentown, Pa., this 29th day of September, 1915.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."