July 2, 1957 S. A. MOREHOUSE 2,797,655

SAFETY REFRIGERATOR LOCK

Filed April 13, 1954 4 Sheets-Sheet 1

Fig. 1.

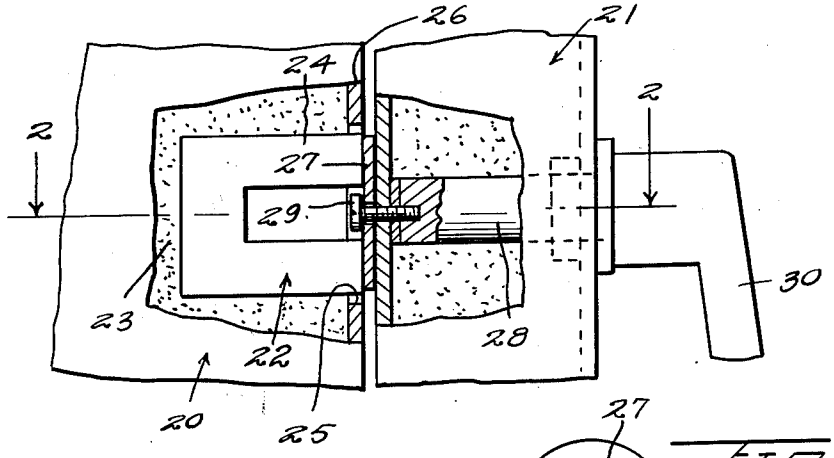


Fig. 3.

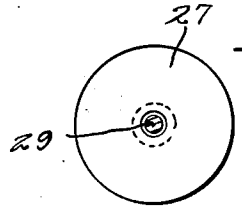
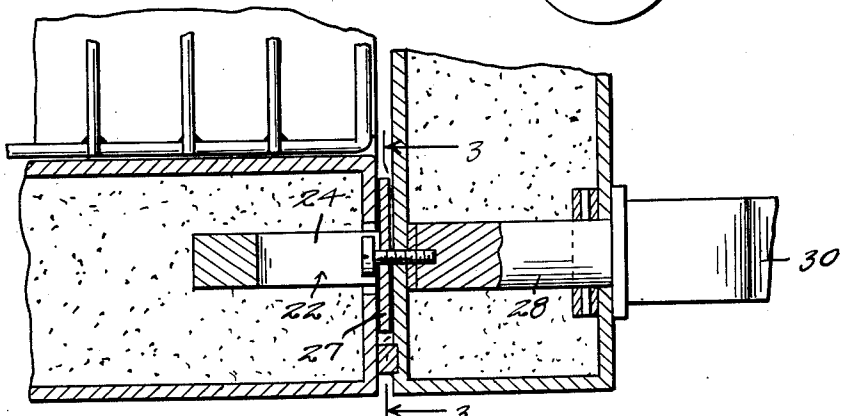


Fig. 2.



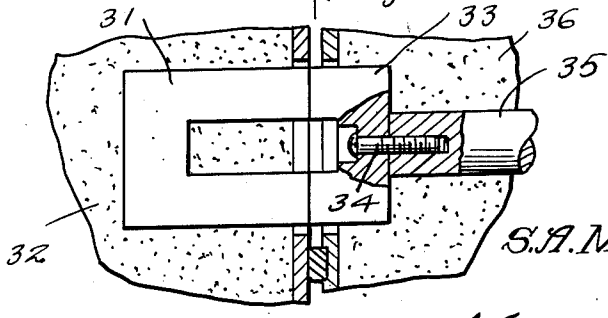


Fig. 4.

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SAFETY REFRIGERATOR LOCK

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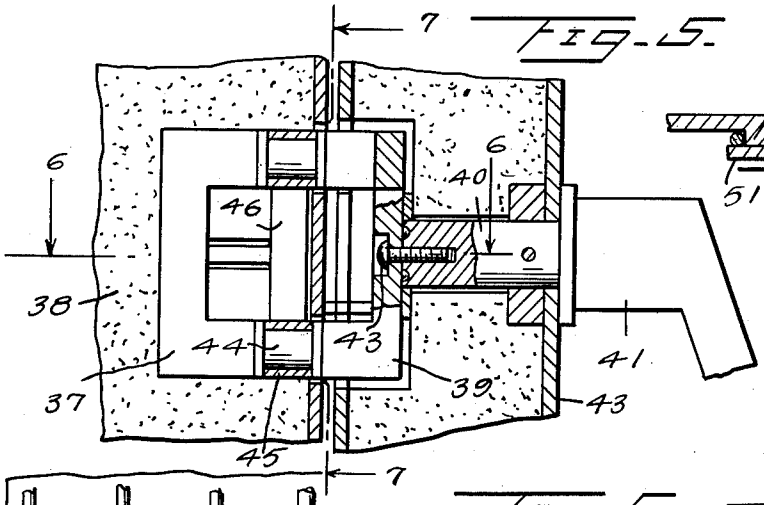

Fig. 5.

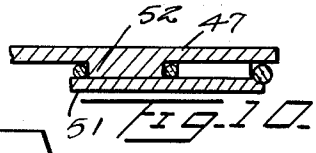

Fig. 10.

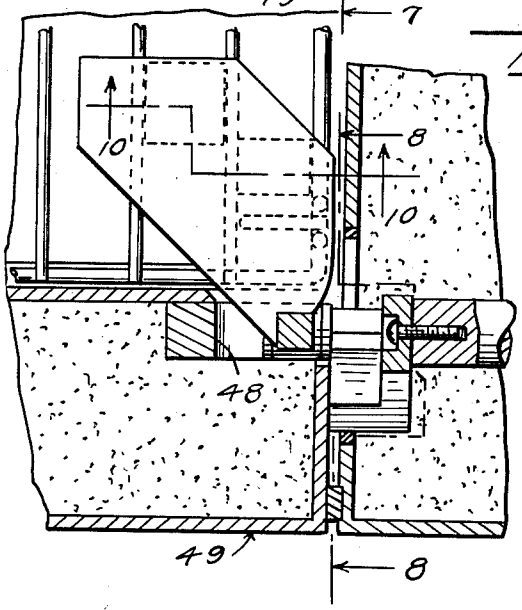

Fig. 6

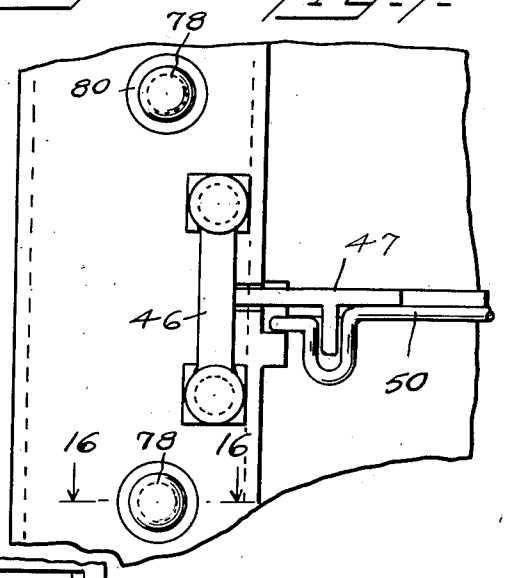

Fig. 7.

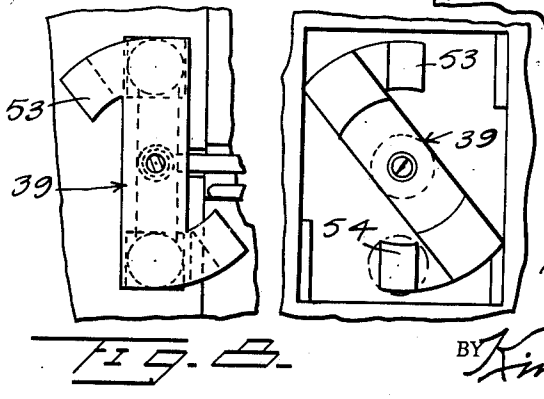

Fig. 8.

Fig. 9.

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Fig. 12.

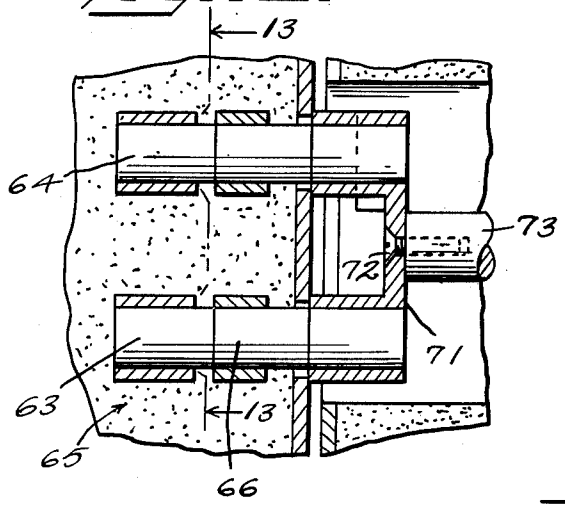


Fig. 13.

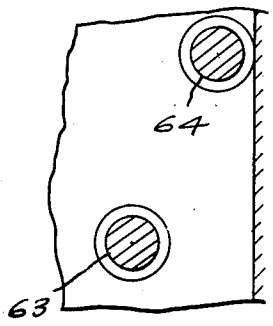


Fig. 14.

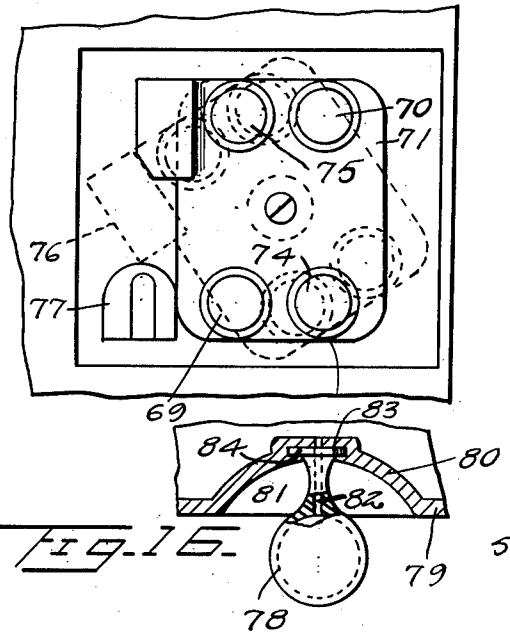


Fig. 15.

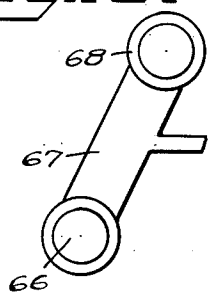
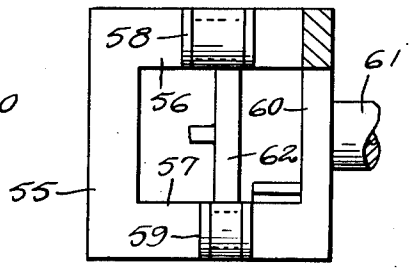


Fig. 16.

Fig. 11.



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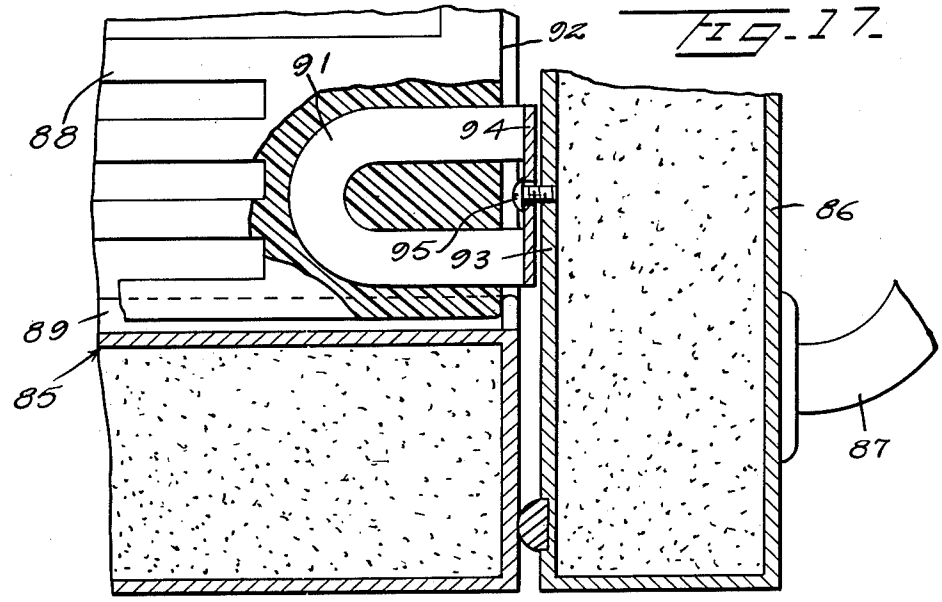

Fig. 17

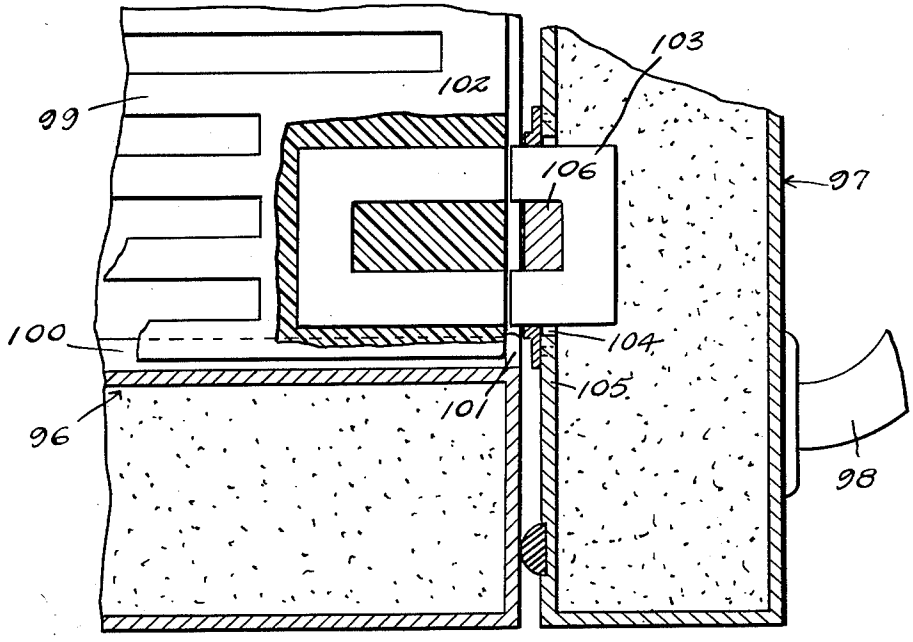

Fig. 18

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2,797,655

Patented July 2, 1957

2,797,655

SAFETY REFRIGERATOR LOCK

Silas A. Morehouse, Annandale, Va.

Application April 13, 1954, Serial No. 422,777

9 Claims. (Cl. 109—63.5)

This invention relates to a safety lock for refrigerator doors.

An object of this invention is to provide an improved lock for holding refrigerators closed, which is so constructed and arranged that the door may be readily opened from the inside in order that in the event a child should crawl into the refrigerator the child could open the door from the inside.

Another object of this invention is to provide an improved safety lock for refrigerator doors which is so constructed and arranged that the door will not be held in closed position when a shelf is removed, so that a child could not be locked in the refrigerator.

A further object of this invention is to provide an improved safety lock for refrigerators which includes opposed permanent magnets carried one by the wall of the refrigerator and the other by the door. The lock also includes an interposed metal element which is fixed relative to a shelf so that when the refrigerator is abandoned and the shelf is removed, the opposed magnets will have insufficient power to keep the door closed.

A further object of this invention is to provide an improved safety lock for refrigerators which is simple in construction and will, therefore, not readily get out of order.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a fragmentary side elevation, partly broken away and in section, of a safety lock for refrigerator doors constructed according to an embodiment of this invention.

Figure 2 is a fragmentary sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a fragmentary vertical section showing a modified form of this invention.

Figure 5 is a fragmentary vertical section showing another modification of this invention.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a fragmentary sectional view taken on the line 7—7 of Figure 5.

Figure 8 is a fragmentary sectional view taken on the line 8—8 of Figure 6.

Figure 9 is an inner detail elevation showing the rotatable permanent magnets mounted on the door.

Figure 10 is a fragmentary sectional view taken on the line 10—10 of Figure 6.

Figure 11 is a detail side elevation, partly broken away and in section, showing another modification of this invention.

Figure 12 is a vertical section showing a further modification of this invention.

Figure 13 is a sectional view taken on the line 13—13 of Figure 12.

Figure 14 is an inner elevation showing the lock embodied in Figure 12 mounted in the door.

Figure 15 is a fragmentary front elevation showing the removable metal cores for interposing between the permanent magnets.

Figure 16 is a fragmentary sectional view showing a shock absorbing member adapted for mounting in the edge of the refrigerator body.

Figure 17 is a fragmentary horizontal section of another modification of this invention.

Figure 18 is a fragmentary horizontal section of a further modification of this invention.

Referring to the drawings, and first to Figures 1, 2, and 3, the numeral 20 designates generally the body of a refrigerator having a door 21 hingedly secured thereto. In order to provide a means whereby the door 21 will be normally held in closed position, I have provided a permanent magnet 22 of C-shape which is mounted in heat insulating means 23 disposed in the side wall of the refrigerator body 20.

The parallel arms 24 of magnet 22 extend loosely through openings 25 formed in the front wall 26 of the body. The magnet 22 may be secured within the wall 20 in any suitable manner, and in order to provide a means whereby the door 21 will be held in normally closed position, I have provided an iron bridging member 27 which is secured to a handle shank 28 by fastening means 29.

The shank 28 includes a bail or handle member 30 disposed on the outer side of the door 21. The bridging member 27 is loosely mounted on the bolt or screw 29 so that the bridging member 27 will be able to seat itself against the outer ends of the magnet 22.

Referring now to Figure 4, there is disclosed another form of this invention embodying a permanent magnet 31 which is disposed substantially entirely within the side wall of the body 32. A second C-shaped magnet 33 is secured by fastening means 34 to the shank 35 of a handle.

In the present instance the outer magnet 33 is nonrotatable with respect to the door and the inner magnet 31, and is adapted to hold the door 36 in normally closed position. However, the pull of the two magnets 31 and 33 relative to each other is such that if a small child should get into the inside of the refrigerator a slight pressure by the child on the inside would be sufficient to swing the door 36 to an open position.

Referring now to Figures 5 to 10, inclusive, there is disclosed another modification of this invention. A C-shaped magnet 37 is disposed in the body 38 of the refrigerator, and a second C-shaped magnet 39 is secured to the shank 40 of a rotatable handle 41. The magnet 39 is secured to the shank 40 by fastening means 42.

In order to provide a means whereby the door 43 will be held in normally closed position by attraction of the two magnets 37 and 39, I have provided a pair of iron plugs or cores 44 which extend through cylindrical sleeves 45 carried by a vertical bracket arm 46.

The bracket arm 46 is carried by a horizontally disposed plate 47 which projects through an opening 48 formed in the side wall 49 of the body 38. The plate 47 is secured to a removable wire shelf 50 by means of a plate 51 which engages the lower side of shelf 50 and is cemented or otherwise fixed to a depending off set carried by plate 47.

When handle 41 is in the position shown in Figure 5,

the two magnets 37 and 39 will be attracted toward each other with core members 44 being interposed between the two magnets 37 and 39.

When the refrigerator becomes abandoned or when shelf 50 is withdrawn, core members 44 carried by bracket 46 will be removed with the shelf 50 so that there will be a sufficient space between the two magnets 37 and 39 in order that these magnets will not be able to pull and maintain the door 43 in closed position.

When handle 41 is rotated through an arc of substantially 180° the poles of the magnets 37 and 39 will be reversed so that these magnets will repel each other and therefore prevent the door 43 from being closed. When the handle 41 is in a normal downwardly projecting position the poles of magnets 37 and 39 will be opposite so that these magnets will be attracted toward each other.

Magnet 39, as shown in Figure 8 and 9, may be limited in its turning movement, and in order to provide for reversing the poles of magnet 39, I have provided off-set poles 53 and 54 which upon turning of magnet 39 will be disposed in confronting position to cores 44 and the pole magnet 37.

Referring now to Figure 11, there is disclosed another modification of this invention embodying an inner magnet 55 having arms 56 and 57 of unequal length.

As shown in Figure 11, arm 56 is a short arm and arm 57 is a long arm. A pair of plugs or cores 58 and 59 are adapted to be disposed in confronting position to arms 56 and 57 with core member 58 longer than core member 59 so that the outer ends of the core members 58 and 59 will be in the same vertical plane.

A rotatable magnet 60, similar to magnet 39, is fixed to the shank 61 of a rotatable handle and is adapted in one position thereof to be attracted to magnet 55, and in a second position to be repelled from magnet 55.

The two cores 58 and 59 are carried by a bracket 62, similar to bracket 46, which is secured to a shelf so that upon removal of the shelf the two magnets 55 and 60 will have the confronting ends thereof disposed a sufficient distance apart so that the pulling attraction of the magnets will not be sufficient to hold the door in closed position.

The arms of magnet 55 are made of unequal length so that a shelf must have the correct length of cores secured thereto before the door can be properly maintained in closed position.

Referring now to Figures 12 to 15, inclusive, there is disclosed another modification of this invention embodying a pair of permanent magnets 63 and 64 which are fixedly secured within the body 65 of the refrigerator.

A pair of cylindrical core members 66 are secured to a bracket 67 being mounted in a cylindrical holder 68 carried by bracket 67. Bracket 67 is adapted to be secured to a removable shelf so that when the shelf has been removed the core member 66 will be taken out therewith.

A pair of permanent magnet members 69 and 70 are secured to a holder 71 which is fixed by fastening means 72 to a rotatable handle 73. The magnets 69 and 70 are inclined relative to the vertical as to their position, one relative to the other, and in the normal position of the holder 71, as shown in Figure 14, the two magnets 63 and 64 will be disposed in confronting position to the core members 66. The holder 71 also has mounted therein a pair of magnets 74 and 75 which are reversed as to the poles thereof with respect to magnets 69 and 70.

In other words when the holder 71 is swung to the position shown in dot-and-dash lines in Figure 14, the repelling magnets 74 and 75 will be disposed in confronting position to core member 66 and magnets 63 and 64.

The holder 71 has secured thereto a weight 76 so that holder 71 will be normally swung to the left, as viewed in Figure 14, with weight 76 engaging a bumper or cushion stop member 77.

In order to provide a means whereby the door in each of the forms of this invention herein described will be held against slamming or jarring with the opposed magnets striking each other, I have provided hollow spherical retarding members 78 which are adapted to be secured to the front edge 79 of the side wall of the refrigerator body.

The front edge 79 is formed with an inwardly concaved depression 80 so that retarding member 78 may be forced into the concaved outer side of the depression 80.

The spherical member 78 has extending inwardly therefrom a shank 81 formed with a central bore 82, and the shank 81 terminates in an enlarged inner end 83 which is seated in a recess 84 formed at the bottom of the depression 80. The retarding member 78 upon closing of the door will be collapsed into the depression 80 and the air inside of the retarding member 78 will be gradually released or discharged through the bore 82 in stem or shank 81. It will be understood that each door or front edge of the refrigerator body will be provided with the conventional rubber sealing gasket and the retarding member 78 will be in addition to the conventional rubber seal.

With a refrigerator door lock as hereinbefore described, the door will be held in normally closed position by the permanent magnets, with the magnets 22 and 31 having sufficient pull to maintain the door closed, but with this pull such as relatively light pressure from the inside of the refrigerator will be sufficient to open the door.

Where the interposed cores are secured to the shelf of the refrigerator when the refrigerator is abandoned the shelf must be removed and even if left in the refrigerator the space between the shelf to which the core members are secured will be insufficient to permit the entrance of a small child. Therefore, when a shelf is removed carrying the iron cores the refrigerator door will be held against tight closing so that if a child should enter the refrigerator box the child would not suffocate.

Referring now to Figure 17, there is disclosed another modification of this invention embody a refrigerator body 85 having a door 86 hinged thereto with a handle 87 fixed on the outer side of the door 86. A removable shelf 88, preferably formed of plastic or other non-magnetic material, is disposed in the body 85 and is supported from a horizontal shelf support 89 secured to the inside of the body 85.

The support 89 includes a stop member 90 at the outer end thereof whereby the shelf 88 will be held against outward movement but may be lifted slightly above stop 90 so as to remove the shelf from the interior of the body 85.

The shelf 88 has fixed in the forward end thereof a permanent magnet 91 which projects slightly forwardly of the forward edge 92 thereof, and the inner wall 93 of the door 86 has secured thereto a bridging member 94. The bridging member 94 is loosely mounted on a bolt or fastening member 95 secured in the inner wall 93.

The pull of magnet 91 is such as to normally hold the door 86 in closed position but a pull on the handle 87 will effect release of the bridging member 94 from the outer end of magnet 91.

Referring now to Figure 18, there is disclosed another modification of this invention embodying a refrigerator body or housing 96 having a door 97 hinged to the forward side thereof with a handle 98 secured to the outer side of the door 97.

A non-magnetic shelf 99, which may be formed of plastic or other non-magnetic material, is supported from a shelf support 100 carried by the body 96, and a stop 101 is disposed at the outer end of the support 100. A U-shaped permanent magnet 102 is embedded in the forward end of the shelf 99 and a confronting U-shaped

permanent magnet **103** is supported through an opening **104** formed in the inner wall **105** of the door. **97**.

The magnet **103** may be secured in the opening **104** by means of a plate **106** which is formed of non-magnetic material. The magnet **103** will be normally disposed in slightly spaced relation to the forward end of magnet **102**, as shown in Figure 18.

In the use and operation of the refrigerator door locking means shown in Figures 17 and 18, the shelf supporting magnets **91** and **102** will hold the doors in closed position, but the doors may be opened by a relatively light pull on the handles **87** and **98**.

When the refrigerator is abandoned the shelves **88** and **99** will be removed so that the doors **86** and **97** will not be locked and can be readily swung open by a small child on the inside of the body.

In the event a small child should get into the refrigerator body with the shelf remaining therein a relative light push from the inside would open the door so that the child would not suffocate.

What is claimed is:

1. In a refrigerator having a body and a door hinged thereto, a permanent magnet fixed in said body, a second permanent magnet in said door confronting said first magnet, means rotatably mounting said second magnet in said door, a pair of iron core members in said body between said magnets, and means removably supporting said core members.

2. In a refrigerator having a body, a door hinged thereto, and at least one shelf removably disposed in said body, a permanent magnet fixed in said body confronting said door, a second permanent magnet in said door, means rotatably supporting said second magnet in said door, a pair of iron core members interposed between said magnets, and means securing said core members to said shelf in laterally offset relation thereto whereby removal of said self will render said magnets ineffective to maintain said door closed.

3. In a refrigerator having a body, a shelf slidable and removable in said body, a door hinged to said body, a permanent magnet fixed in said body confronting said door, a second permanent magnet carried by said door confronting said first magnet, a pair of iron ore members interposed between said magnets, and means supporting said core members from said shelf whereby removal of said shelf will render said magnets ineffective to hold said door closed.

4. In combination, a refrigerator having a body and a door hinged thereto, cooperating permanent magnets carried by said body and door normally holding said door closed, a shelf removably disposed in said body,

an a pair of iron core members fixed relative to said shelf and offset therefrom to a position interposed between said magnets.

5. In combination, a refrigerator having a body and a door hinged thereto, cooperating permanent magnets carried by said body and door normally holding said door closed, a shelf removably disposed in said body, one of said magnets having one leg shorter than the other leg, a long core member confronting said short leg, a short core member confronting said long leg, a bracket fixed to said shelf and projecting laterally therefrom, and means carried by said bracket supporting said core members.

6. In a refrigerator having a body, a removable member in said body, a door hinged to said body, a permanent magnet fixed in said body confronting said door, a second permanent magnet carried by said door confronting said first magnet, a pair of iron core members interposed between said magnets, and means supporting said core members from said removable member whereby removal of said removable member will render said magnets ineffective to hold said door closed.

7. In combination, a refrigerator having a body and a door hinged thereto, cooperating permanent magnets carried by said body and door normally holding said door closed, a member removably disposed in said body, one of said magnets having one leg shorter than the other leg, a long core member confronting said short leg, a short core member confronting said long leg, a bracket fixed to said removable member and projecting laterally therefrom, and means carried by said bracket supporting said core members.

8. A device as claimed in claim 2, wherein the means securing said core members to said shelf includes an offset bracket member having a base secured to said shelf.

9. A device as claimed in claim 4 in which an offset bracket is secured to said shelf and said core members are secured to the offset portion of said bracket.

References Cited in the file of this patent

UNITED STATES PATENTS

2,288,688	Dubilier	July 7, 1942
2,446,336	Mark et al.	Aug. 3, 1948
2,471,634	Mark et al.	May 31, 1949
2,565,891	Sherman	Aug. 28, 1951
2,584,480	Manting	Feb. 5, 1952
2,673,377	Gaugler	Mar. 30, 1954

FOREIGN PATENTS

145,325	Germany	Nov. 25, 1903