Dec. 6, 1955 J. PISANI 2,726,113

LOCK BLOCKING DEVICE FOR REFRIGERATORS

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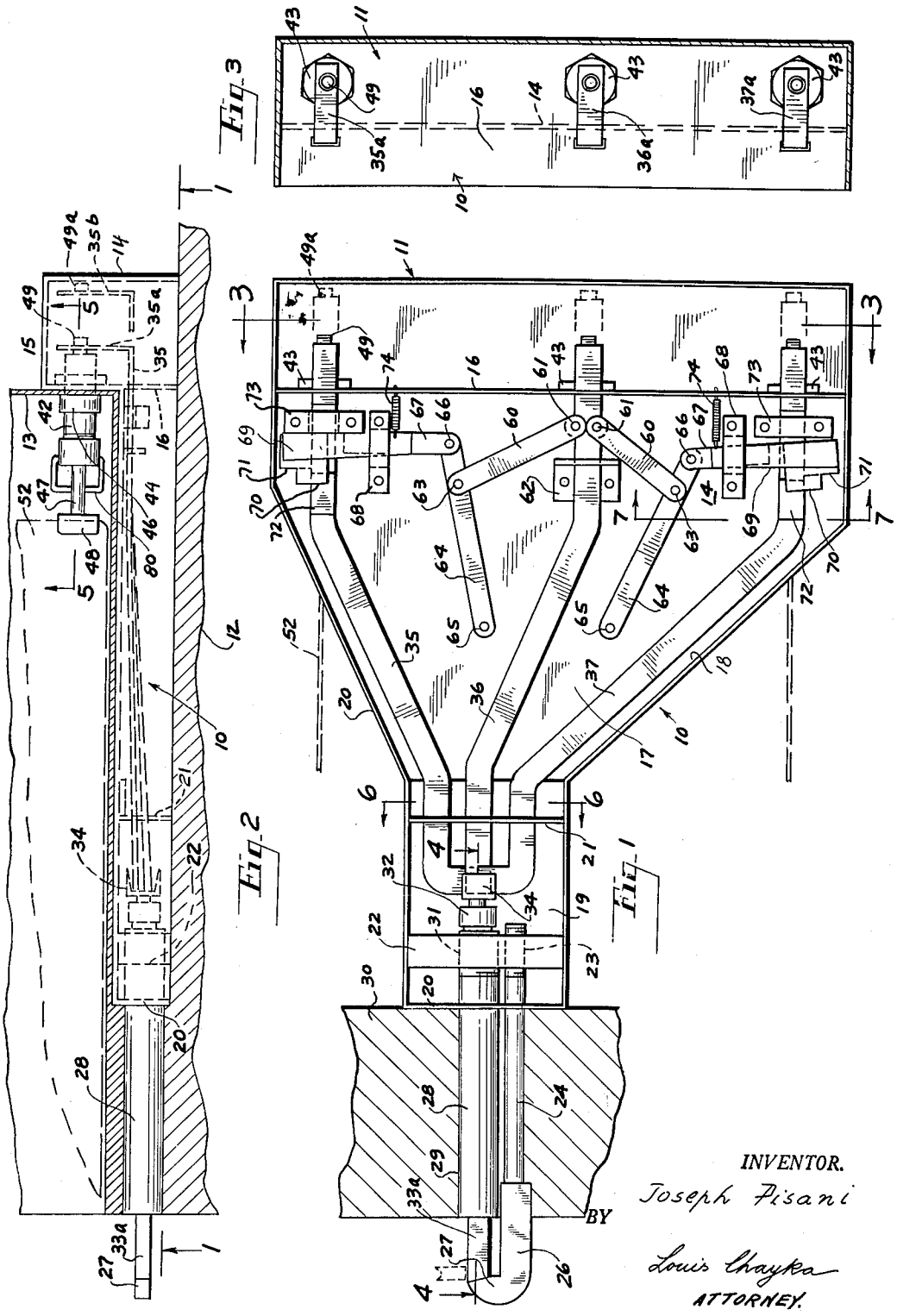


Fig. 3

Fig. 2

Fig. 1

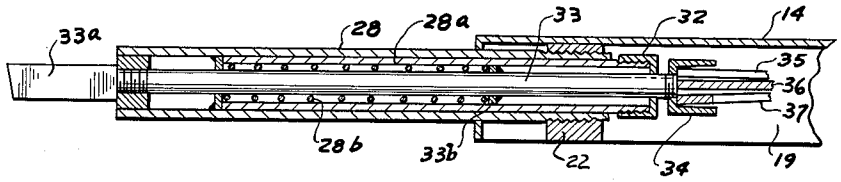
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LOCK BLOCKING DEVICE FOR REFRIGERATORS

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Fig. 4



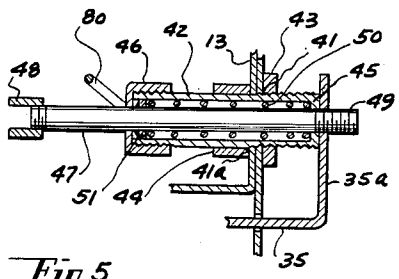


Fig. 5

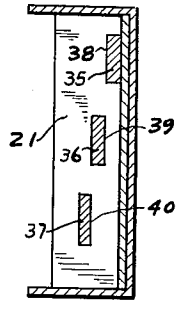


Fig. 6

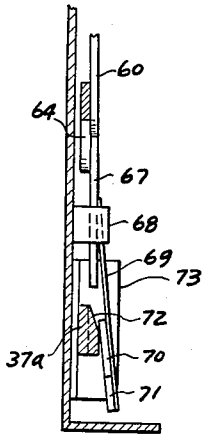


Fig. 7

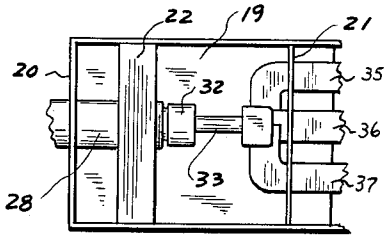


Fig. 8

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LOCK BLOCKING DEVICE FOR REFRIGERATORS

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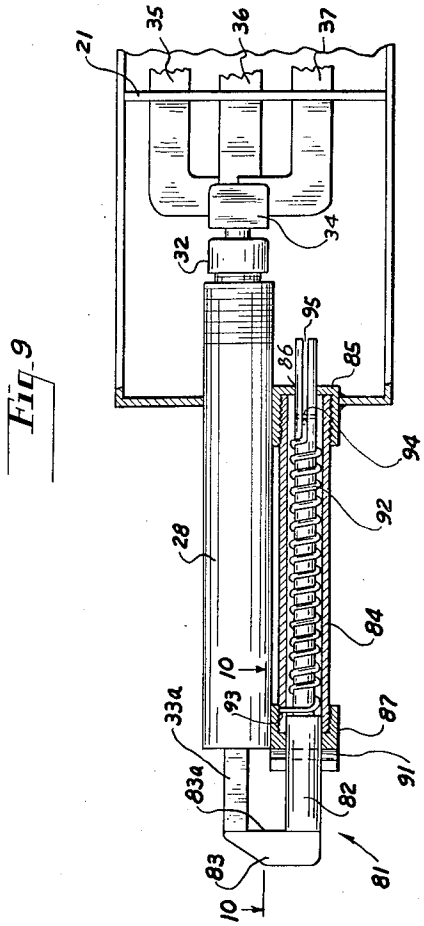


Fig. 9

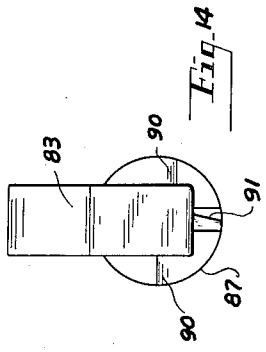


Fig. 14

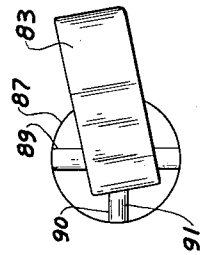


Fig. 15

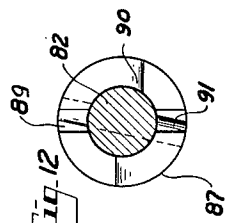


Fig. 12

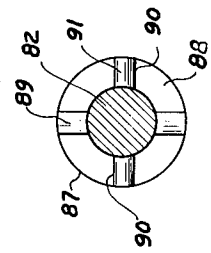


Fig. 13

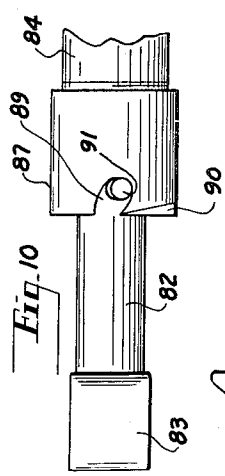


Fig. 10

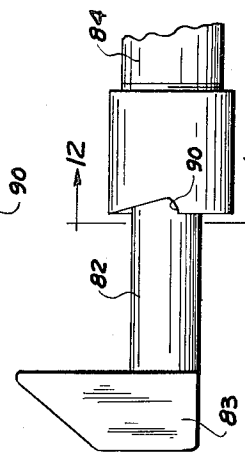


Fig. 11

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2,726,113

LOCK BLOCKING DEVICE FOR REFRIGERATORS

Joseph Pisani, Detroit, Mich.

Application March 3, 1954, Serial No. 413,802

4 Claims. (Cl. 292—341.15)

The device pertains to household refrigerators and ice boxes of the type which include a cabinet provided with a plurality of horizontally-disposed shelves therein. The locking means in this type of refrigerator and ice box, which both types from here on will be generally referred to as ice boxes, are mounted on the outside only and cannot be controlled or unlocked from within the respective ice box. It is because of this last-named feature that each year a number of children have perished by suffocation when trapped in abandoned and unguarded ice boxes of this type. Once locked within the ice box, a child has no way of opening the locked door from inside.

It is in view of the above situation that I have approached the problem from a different angle and have devised means to save the children from being trapped in ice boxes in the manner described above.

Since the ice boxes of the type mentioned are small, a child cannot enter a particular ice box as long as there are any shelves therein. To permit entry into the box, the shelves, or at least some of them, have to be removed therefrom. Taking advantage of this situation, I have provided means which will prevent the locking of the door of the ice box automatically upon removal of one or more shelves therefrom. Thus, an accident will be prevented even before circumstances favoring it, such as an open door ice box, are created.

I shall now describe my improvement with reference to the accompanying drawings in which:

Fig. 1 is a side elevational view of my device as it is installed in a side wall of an ice box;

Fig. 2 is a top elevational view of said device;

Fig. 3 is a sectional view on line 3—3 of Fig. 1;

Fig. 4 is a sectional view on line 4—4 of Fig. 1;

Fig. 5 is a sectional view on line 5—5 of Fig. 2;

Fig. 6 is a sectional view on line 6—6 of Fig. 2;

Fig. 7 is a sectional view on line 7—7 of Fig. 1;

Fig. 8 is a side elevational view of a detail of a mechanism included in my device, the view disclosing said detail in one of its two alternate operative positions;

Fig. 9 is a side elevational view, partly in section, of a modified keeper element of the lock;

Figs. 10 and 11 show each an enlarged side elevational view of structural details of said modified keeper;

Figs. 12 and 13 show each the front elevational view of a cap forming a part of the keeper assembly shown in Fig. 9;

Figs. 14 and 15 are front elevational views of two alternate positions of the modified keeper element with respect to the parts co-operating therewith.

Similar numerals refer to similar parts throughout the several views.

To start my description, I wish to refer to the fact that a conventional ice box is provided with a two-element lock, including a keeper which is provided with an upright shoulder or spur and which is mounted upon the body of the ice box, specifically, on a portion which will be here identified as a door frame. The complementary

part of the lock is a latch which is mounted on the door in such a manner that upon closing the door the latch will come into engagement with the keeper, ordinarily falling into place between the shoulder and the door frame of the box.

As the working of my device is directed to said keeper, the mechanism of said device is located in the wall of the box on the side on which the keeper is installed. Most elements of the mechanism are installed in a flat casing which is composed of a shallow pan, generally indicated by numeral **10**, and a chamber, generally marked by numeral **11**. The pan, which is provided with a flange **20** all about its sides, is disposed vertically in the wall of the box, the open side of the pan being turned away from the interior of the ice box, as shown in Fig. 2 where the side wall of the ice box is marked **12**.

The pan **10** and the chamber **11** are in a right-angle relation to each other, the chamber **11** being disposed behind the inside lining **13** within the rear portion of the ice box. At the rear, the chamber is defined by a vertical wall **14**. The front wall **15** of said chamber extends into the pan, forming therein a partition **16**. The mid-portion **17** of the pan is substantially triangular in shape, being defined at the top and at the bottom by two converging lines **18** leading to a rectangular area **19**.

A flange **20** which fringes the sides of the pan defines here one side of the rectangular area and bears against the rear surface of the door frame **30** of the ice box. Disposed transversely within the rectangular area **19** of the pan is another vertical partition **21**, and forwardly therefrom, that is, in the direction to the front of the ice box, is a vertical bar **22** which is in a spaced relation to the door frame of the box. Threaded into a transverse aperture **23** in said bar **22** is a bolt **24** which passes through the door frame **30** and terminates outside of said door frame with the keeper constituting one element of the door-locking assembly. The keeper includes a horizontally-disposed shank **26** and an upwardly-extending spur or shoulder **27**.

Located directly above said bolt **24**, and extending parallel thereto, is a tubular member **28** which is disposed within a bore **29** in said door frame **30**. The inner end of the member is threaded into an aperture **31** in said bar **24**, while the outer end of said member **28** terminates at the outer face of said door frame, as shown in Fig. 1. Axially disposed within said member **28** is a tube **28*a*** containing therein an axially-disposed shaft **33** which at its front end **33*a*** is adapted to project forwardly into engagement with the inner face of the spur **27**, as shown in Fig. 1.

At the inner end, the tubular member **28** is provided with a cap **32** having an axial opening therein for passage of said shaft **33**. A spring **28*b***, contained in said tube **28*a***, bears against an annular flange **33*b*** on said shaft **33**, urging said shaft inwardly, that is, towards the rear portion of the ice box. The inner end of the shaft **33** carries a U-shaped, horizontally-disposed fork **34** opening towards the rear portion of the ice box.

Located within the pan are three oblong levers marked **35**, **36**, and **37**, respectively, the levers having the shape of flat bars, each being adapted to be moved horizontally, and each lever passing at its front end through a separate slot in the partition **21** and at its rear end in a corresponding separate slot in said partition **16**. The levers are all disposed in substantially the same vertical plane while passing through the rear partition **16**, but are in slightly divergent positions when passing through partition **21**, as shown in Fig. 6 where said slots are marked, from top to bottom, **38**, **39**, and **40**, respectively. The front ends of all the levers fit into the U-shaped fork **34** from the open end thereof, the end portion of

the lever 35 being turned downwardly into said fork, the front end of the lever 37 being turned upwardly into said fork, and the end portion of the lever 36 reaching said fork in its straight line extension.

At the rear, each lever turns laterally into chamber 11. This is shown in Fig. 2 with respect to lever 35, the laterally-turned portion thereof being marked 35*a*, while similar lateral extensions of the other levers are marked 36*a* and 37*a*, respectively.

It will be understood that the mechanism is not limited to three shelves, but that a separate lever has to be provided to co-act with each shelf.

Secured with an aperture 41 in the front wall 15 of the chamber 11, and in the alined aperture 41*a* in the lining 13 of the ice box, is a cylindrical member 42 threaded, at one end, for reception of a nut 43. The latter is disposed in an opposed relation to a collar 44 axially mounted upon the body of said cylindrical member 42. The nut and the collar clamp the lining 13 and the wall 15 of the chamber 11 from opposite directions to hold the cylindrical member in place. This is best shown in Fig. 5.

At one end, that is, the rear end, said cylindrical member is provided with an inwardly-turned annular flange 45. At the opposite end a cap 46 is threaded upon said member, but contains an axial opening for passage of a rod 47. At what is its front end, the rod 47 carries a fork 48, while the rear end of the rod is threaded into one of the laterally-extending end portions of the levers 35*a*, 36*a*, or 37*a*, as the case may be.

Coiled about the rod in the cylindrical member 42 is a spring 50 which, bearing against an annular flange 51, drives the rod outwardly towards the front of the ice box. The fork 48 is in a position to the rear of a shelf 52 in the ice box, the rear edge of the shelf fitting into the opening or slot between the plates or tines of the fork. When the shelf is put down in its place, it will push the rod 47 rearwardly towards the rear wall 14 of the chamber 11, and as the rod is connected to the lever 35, said lever will be also moved rearwardly till the lateral extension of said lever will occupy position 35*b*.

An identical arrangement of elements, including a cylindrical member 42, a rod 47, and a coiled spring 50, is in a co-operative engagement with each of the two other levers of the ice box.

Returning to the levers as shown in Fig. 1, it will be noted that lever 36 is in a co-operative relation with the lever 35 disposed thereabove, and with the lever 37 which is disposed below said lever 36. As the means to effect the relation are the same for lever 35 as they are for said lever 37, I will restrict my description to the means pertaining to said lever 35 alone.

As shown in Fig. 1, a link 60 is at one end pivotally connected by means of a bolt 61 to said lever 36 at a point between the partition 16 and a bracket 62 supporting said link. The outer end of the link 60 is connected by a pin 63 to a link 64, one end of which is pivotally secured to the bottom of pan 10 by a bolt 65. The opposite end of said link 64 is, in turn, joined by a bolt 66 to a vertically-disposed bar 67 adapted to slide vertically within a retaining bracket 68. Secured to the upright bar 67, and extending downwardly therefrom, is a flat spring 69 which carries on its inner surface a plate 70. The plate, which is recessed at one corner to form a vertical shoulder 71, is in abutment, face to face, with an inverted, vertically-disposed wedge 72 welded to the outer surface of said lever 37, as shown in Figs. 1 and 7. Located between the sliding vertical bar 67 and the partition 16 of the pan is a bracket 73 to guide the horizontal portion of the lever in its sliding movement at that point.

A coiled spring 74 anchored to the partition 16 pulls the upper portion of said vertical member 67 towards said partition.

To conclude the description of my device, I wish to add

that the cap 46 of the cylindrical member 42 which is in a co-operative relation to the top shelf, and the cap of a similar cylinder in co-operation with the lowest shelf, are each provided with a pivoted U-shaped clamp which fits into the slot of the fork 48. The reason for this arrangement is as follows: At times it may be desirable to remove the upper shelf without affecting the locking means of the ice box. This can be done by pushing the fork 48 manually towards the rear wall 14 of the chamber 11, causing the clamp to enter into the slot of the fork 48. This done, the lever 35 would be permanently held back in its inoperative position. However, there is no such arrangement for the intermediate lever 36. Here, once the shelf controlling said lever has been removed, the lever will always block the locking means. The clamp is marked 80.

I shall now describe the operation of my device:

When the ice box is in its normal use, all the shelves are in place, and, because of that, all the levers are in their withdrawn positions, their lateral extensions 35*a*, 36*a*, and 37*a*, respectively, being disposed close to the rear wall 14 of the chamber 11, as shown in dotted lines 35*b* with respect to the position of lever 35. With all these levers withdrawn, as above stated, the device is inoperative. This means that the ice box may be locked or unlocked in the customary manner.

It will be now assumed that one of the shelves, say the top one, has been removed. As there is no shelf to push back the fork 48 towards the rear of chamber 11, the coiled spring 50 acting upon rod 47 within the cylinder 42 will move said rod forwardly towards the front of the ice box, and as the rod is connected by intermediate means to said lever 35, it will cause the lever to move forwardly, bearing against the fork 34 which is located rearwardly of the door frame 30 of the ice box. As the fork is mounted on shaft 33, it will push said shaft outwardly against the tension of spring 28*b* so that the outer portion or bar 33*a* of shaft 33 will come in contact with the face 27 of the keeper 26. With the bar 33*a* in said position, the latch of the lock cannot be applied to the keeper 26 and the door cannot be locked.

Exactly the same thing would happen if any other, all, or any two shelves had been removed, as the mechanism applicable to the other shelves is identical with that already described with reference to the top shelf and to the lever 35.

It will be obvious that a child cannot enter the ice box as long as the shelves therein are in place. Assuming that the shelves have been removed and that a child has entered the ice box, it might be possible for said child to push back the fork 48 which controls the intermediate lever 36. Now, restricting my description to the elements shown in Fig. 1, below said lever 36, this is what would take place. Lever 36 would be shifted rearwardly towards the rear wall of chamber 11. Link 60, pulled by the lever, would act upon link 64 and cause it to pull up the vertical bar 67. The wedge 72 would then engage the shoulder 71 in plate 70 to prevent the withdrawal of lever 37 rearwardly. In other words, even if the child were to push in the middle lever 36 out of engagement with fork 34 which controls the bar 33*a*, the other levers would still remain in place so that said keeper 26 would be blocked by said bar 33*a*, as shown in Fig. 1.

The mechanism shown in Figs. 10 to 13 is a modification of the locking mechanism employed by me. The modification is restricted to the keeper, generally indicated by numeral 81, and to the means to operate the same. The keeper itself includes a shank 82 terminating at its front end with an upright spur 83. The shank fits axially into a tubular member 84 which is to be located below the tubular member 28 shown in Fig. 1, in parallel relation thereto. At the rear end, the member 84 is closed by a cap 85 provided with an axial aperture 86 to permit a slideable movement of the shank therethrough. At the front, the member 84 is provided with a cylindrical

collar 87. The front face 88 of the collar contains two bayonet slots 89, these being in a diametrically-opposed relation to each other, and with two notches also in diametrically-opposed relation to each other but on a line disposed at right angle to the diameter joining the slots. The notches are marked 90.

The shank is equipped with a pin 91 passing diametrically through said shank at the front end thereof, the ends of the pin being adapted to come into engagement alternately with said slots and said notches. A spring 92, coiled about the shank, is at one end 93 anchored in an aperture in the tubular member at the front end thereof, while the other end 94 of said spring is anchored in a slot 95 at the end of the shank remote from the keeper 81. The object to be attained by the use of the spring is two-fold. First, the spring is to urge the shank in the rearward direction to keep the pin 91 in engagement with the slots or the notches; the other object is to impart to the shank a partial turn about its axis.

The device operates as follows: Normally, the keeper 81 is in such a position that the spur 83 is turned upwardly, as shown in Fig. 9. Assuming now that the rod 33 in the tubular member 28*a*, shown in Figs. 1 and 9, is pushed out by one of the levers 35, 36, or 37, the bar 33*a*, at the end of the shaft 33, would bear against the face 83*a* of the spur and push it outwardly to disengage pin 91 from the bayonet slots 89. As a result thereof, the keeper 81, actuated by the spring, would turn 90 degrees, the pin would come into engagement with the notches 90 so that the spur 83 would be in a horizontal position, rendering the keeper inoperative. This is shown in Figs. 10 to 15.

It will be understood that instead of using the above-named rotary keeper in conjunction with the sliding shaft 33, the mechanism, including said keeper 81, may be used alone. In such a case, the mechanism, including its tubular member 84, would be substituted for the tubular member 28, and the sliding shaft 33, but, otherwise, it would be actuated by the levers 35 to 37, inclusive, through said fork 34. This means that instead of acting upon said shaft 33, the levers would act upon the shank 82 in the tubular member 84, with the result described above.

I claim:

1. In combination with the keeper element of a lock for an ice box having a plurality of shelves therein, the keeper comprising a shank secured within the front portion of the ice box and a spur extending at right angle therefrom in a spaced relation to the outer surface of the front wall of the ice box, a separate cylindrical member supported horizontally within the ice box rearwardly of each shelf in a parallel position to the side wall of the ice box, a rod axially disposed in each cylinder and including at the front end a member in contact with the rear portion of the respective shelf, a coiled spring within each cylinder urging the rod forwardly against said shelf, the rod projecting rearwardly out of the cylinder, a horizontal shaft slidingly disposed within an aperture in the front wall of the ice box above the shank of the keeper in a parallel relation thereto, the front end of the shaft being normally flush with the outer surface of the front wall of the ice box, spring means acting upon said shaft to keep it in said normal position, a separate, elongated lever cooperating with each rod, each lever being at its rear end connected to the rear end of the respective rod and being in engagement, at its front end, with the rear end of said shaft, the lever being adapted to be moved forwardly by the respective rod against the tension of the last-named spring to push the shaft outwardly beyond the surface of the front wall of the ice box for contact with the spur of the keeper.

2. In combination with the keeper element of a lock for an ice box having a plurality of shelves therein, the keeper being mounted on the ice box along its door, and including a spur disposed parallel to the front surface of the ice box in a spaced relation thereto, means to block said keeper, said means including, for each shelf, a horizontal rod disposed rearwardly of the respective shelf parallel to the side wall of the ice box, the rod bearing at its front end against the rear portion of the shelf, spring means urging the rod against said shelf, an oblong lever within the body of the ice box, the rear end of the lever being secured to the rear end of the rod, a horizontal shaft located, for a longitudinal sliding movement, within an aperture in the door frame of the ice box parallel to the side wall thereof, the rear end of the shaft being provided with a fork for reception of the front end of the lever, spring means acting upon said shaft to urge it in a rearwardly direction, the above-said rod being adapted, on removal of the shelf from the ice box, to push the lever forwardly into the fork and to cause the shaft to project outwardly of the front surface of the ice box into contact with the spur of the keeper.

3. In combination with the keeper element of a lock for the door of an ice box which contains a plurality of shelves therein, the keeper having a shank secured to the wall of the ice box and a spur extending from the shank at right angle in a spaced relation to the outer surface of said wall, separate spring-biased means bearing against the rear portion of each shelf, and being kept from moving forwardly by the shelf itself, a shaft slidingly disposed in the front wall of the ice box parallel to a side wall in a position alined with the spur, spring means to keep the shaft in a normally inwardly withdrawn position, a lever disposed within the ice box for a substantially horizontal movement therein in the direction of the spur, the lever being at its rear end connected to said spring-biased means and being at its front end connected by intermediate means with said shaft, the spring-biased means being adapted, on removal of the respective shelf, to move forwardly and, by means of the lever, to push the shaft in the same direction to bring the front end thereof into engagement with the spur.

4. In an ice box having a hinged door, a removable shelf at a level midway between the top and the bottom thereof, a removable shelf above said first-named shelf, and another removable shelf therebelow, a separate spring-biased member bearing against the rear edge of each shelf, the member being prevented from moving forwardly under the action of the spring by the shelf itself, a keeper forming one element of lock means for the ice box, the keeper projecting from the front surface of the ice box along the door opening therein, the keeper including a horizontal shank and a spur extending at right angle therefrom in a spaced relation to the outer surface of the front wall, a shaft slidingly disposed within a horizontal aperture in the front wall in alinement with the spur, spring means to keep the shaft in its normally withdrawn position out of touch with the spur, a fork mounted upon the rear end of the shaft, the fork opening rearwardly, a separate lever affixed at its rear end to a respective spring-biased bearing member for movement therewith, the front end of each lever fitting into said fork, each lever being adapted, when actuated by the respective bearing member, to push the shaft, by means of said fork, outwardly for engagement with the spur of the keeper, a vertical sliding bar associated with the top lever, and a similar vertical sliding bar associated with the bottom lever, link means connecting each bar to the intermediate lever, said links being responsive to the movement of the intermediate lever rearwardly in the ice box to shift the bars towards said intermediate lever, and means on the bars and the two other levers to interlock, on movement of said bars towards the intermediate levers, to prevent the outer levers from being pushed rearwardly and to withdraw the shaft from engagement with the spur of said keeper.

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