

Aug. 5, 1952

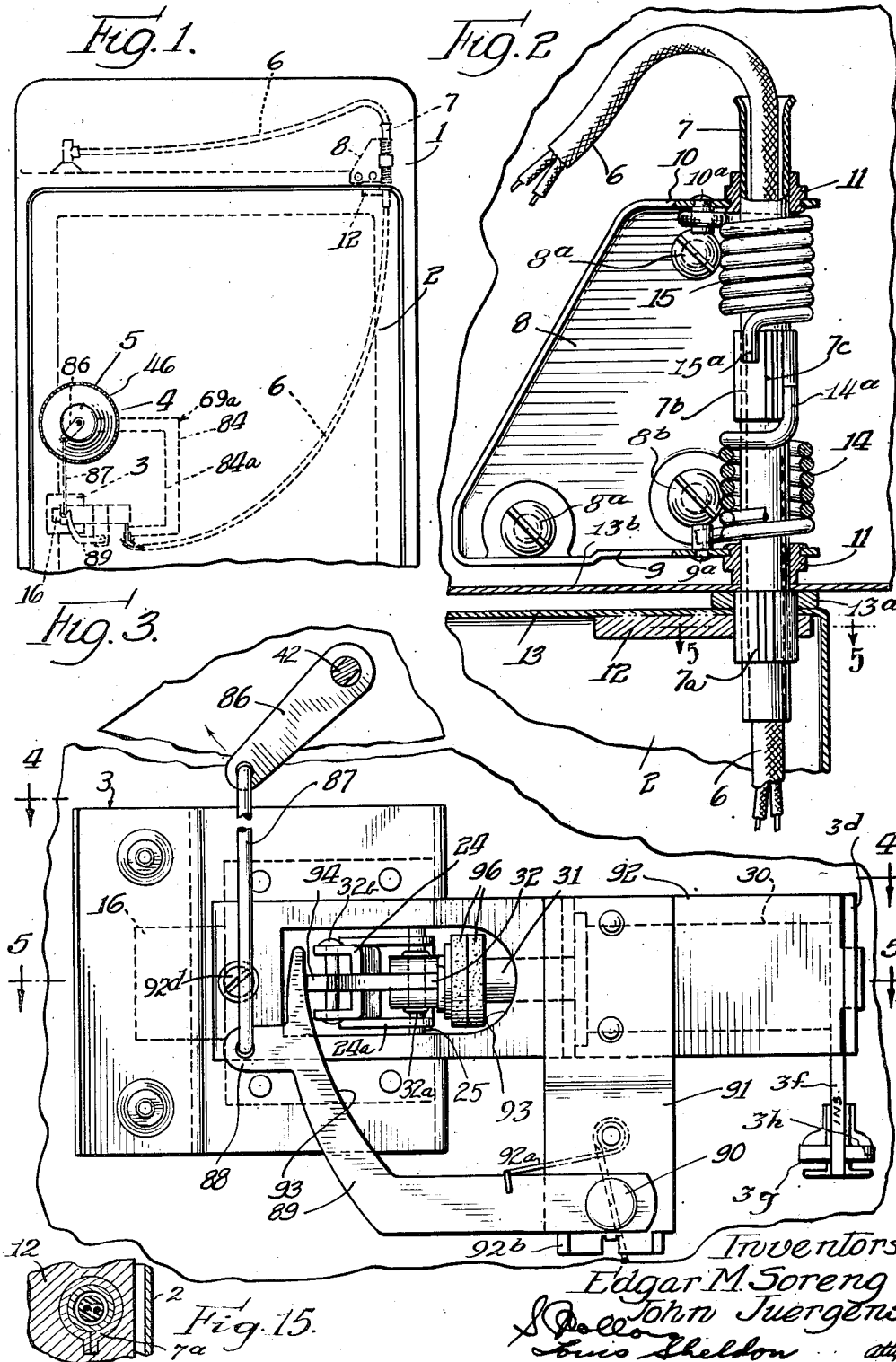
E. M. SORENG ET AL

2,606,052

SOLENOID-OPERATED LATCH

Filed May 23, 1945

4 Sheets-Sheet 1



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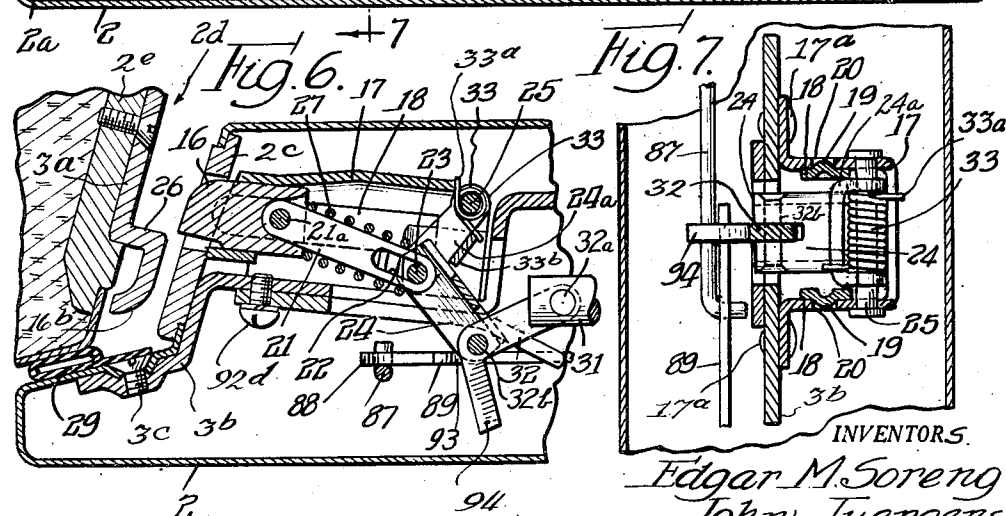
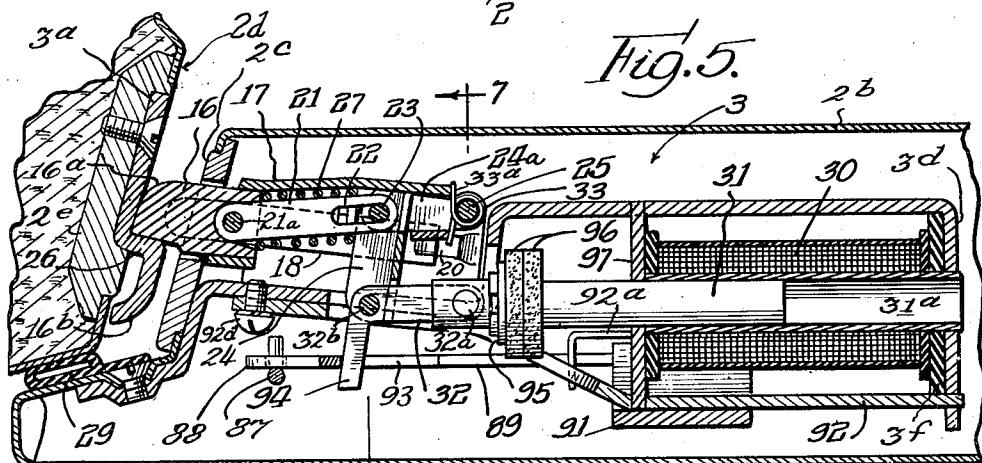
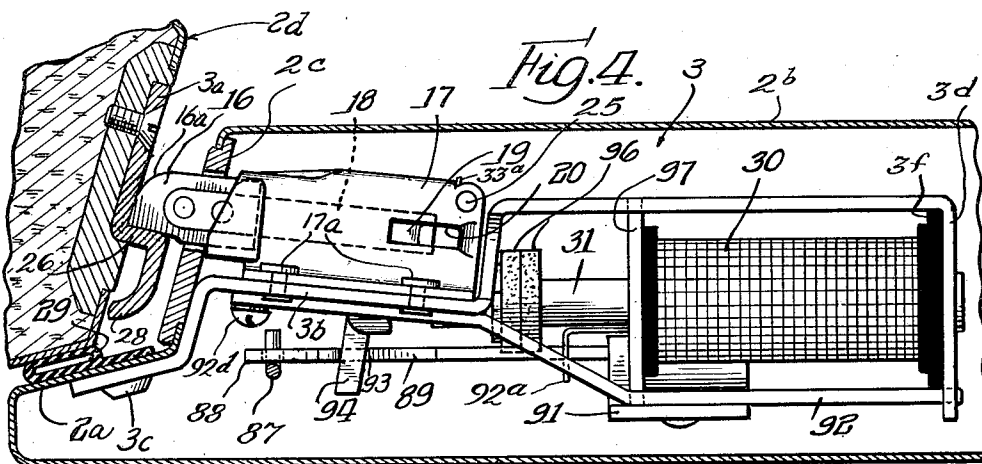
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SOLENOID-OPERATED LATCH

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4 Sheets-Sheet 2



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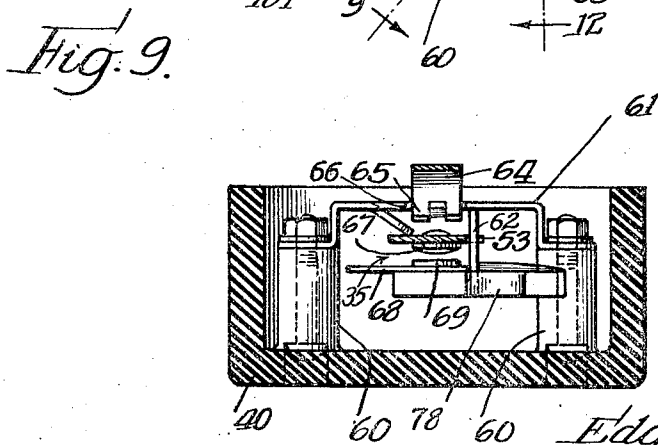
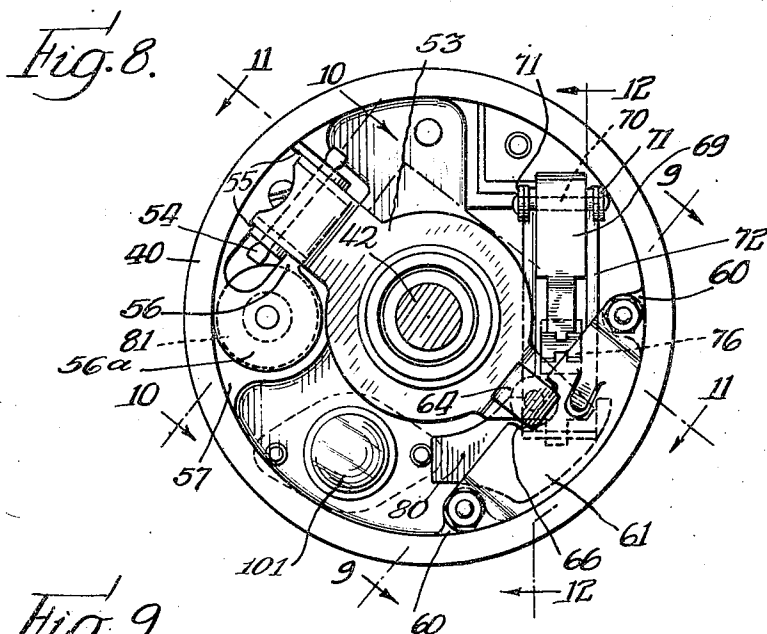
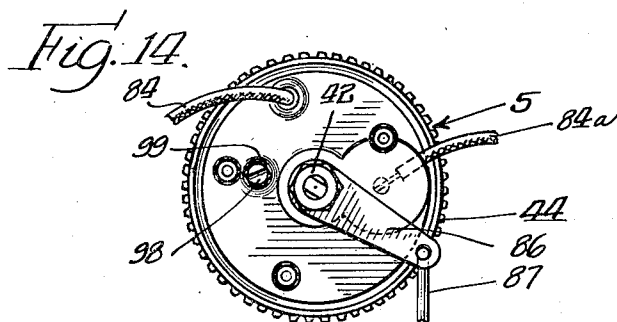
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SOLENOID-OPERATED LATCH

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4 Sheets-Sheet 3



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SOLENOID-OPERATED LATCH

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4 Sheets-Sheet 4

Fig. 11.

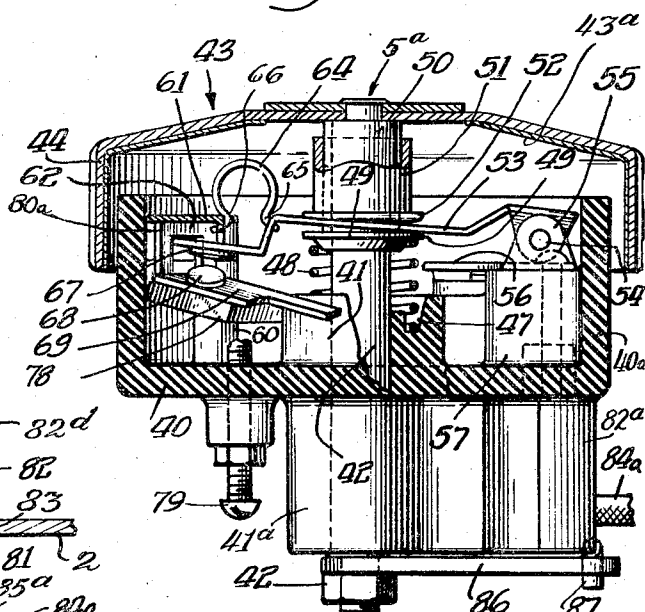


Fig. 10.

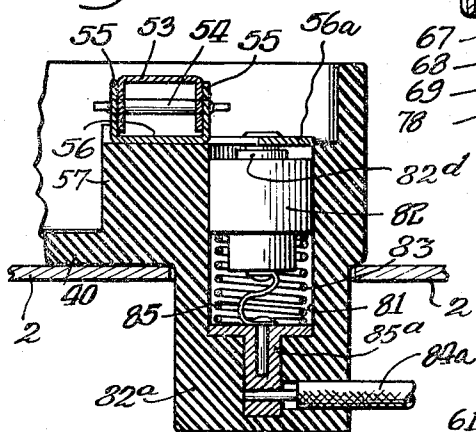


Fig. 12.

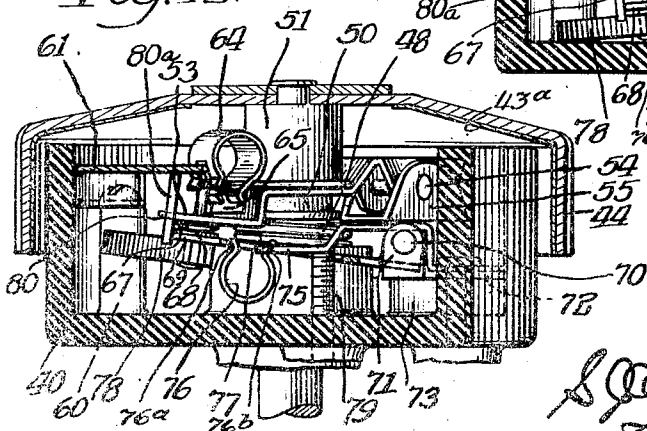


Fig. 13.

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UNITED STATES PATENT OFFICE

2,606,052

SOLENOID-OPERATED LATCH

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Application May 23, 1945, Serial No. 595,406

5 Claims. (Cl. 292-144)

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The present invention relates to refrigerating apparatus and is concerned more particularly with improvements in automatically controlled door latching and releasing devices for refrigerators.

A principal object of the present invention is to provide a door latching mechanism for refrigerators which may be released by the simple expedient of surface contact or abutment without requiring excessive actuating power while yet providing a secure and powerful latch mechanism for holding the door closed against inadvertent release influences.

It is also an object of the present invention to provide a latch operating apparatus electrically controlled and equipped with an inertia circuit breaker in order to prevent the actuation of the release control switch from resulting as an incident to the movement of the door during its closure.

Other objects of the present invention are such as will appear during the course of the following description and include such features as will be pointed out more specifically hereinafter.

Briefly stated the invention comprises a latch mechanism in which the latch bolt is maintained under the pressure of a relatively firm spring element in which there is incorporated a break down linkage for permitting the latch to recede upon overcoming a relatively milder spring action which may be actuated by means of an interior control force such as for example an electrically operated solenoid. The breakdown linkage is preferably maintained rigid so that the major holding force of the firmer tension spring obtains during all of the time except when the release mechanism is actuated either through the function of the electrical control solenoid or as a result of manual actuation as will be noted more specifically hereinafter.

The solenoid is designed in connection with the breakdown linkage to operate in a manner which circumvents the influence of the strong spring and its electrical control is effected through the medium of a contact switch mechanism preferably located on the fore portion of the refrigerator door, where it is exposed to be engaged by an operator upon slight surface pressure which may be effected by simply leaning against a crown button. The switch mechanism includes, among other things, a pair of over-centering lever systems, the first one of which is actuated by the initial contact with the crown button, whereupon as a result of its over-centering action the second lever system is brought

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into effective operating condition momentarily closing the solenoid actuating circuit, but in so doing introducing the operating current into the coil of the solenoid for a precise interval of time which is adequate to withdraw the latch bolt without unduly extending the solenoid energizing time beyond the minimum requirement of latch release operation.

In the solenoid actuating circuit there is preferably located an inertia apparatus controlling a subservient circuit breaker. This apparatus is designed to operate during the closing or slamming action of the door so that the effect upon the crown button by reason of the door closure which might otherwise result in the inadvertent initiation of the control switch will be prevented from so doing due to the opening of the subservient circuit breaker, thereby preventing the inertia effect resulting from the closure of the door from releasing the latch bolt and consequently from repeated false opening operations which might otherwise ensue.

For a better understanding of the present invention reference will now be had to the accompanying drawings and to the following detailed specification in which like reference characters designate corresponding parts throughout and in which:

Fig. 1 is a front elevation of a typical refrigerator and door construction having the lower portion broken away and illustrating one adaptation of the present invention applied thereto.

Fig. 2 is an enlarged sectional detail view showing a refrigerator door hinge particularly designed for use in conjunction with one adaptation of the present invention.

Fig. 3 is an enlarged elevational detail view of the latch operating mechanism with a portion of the door shell removed so as to reveal posterior details of construction.

Fig. 4 is a plan sectional view taken approximately on the line indicated 4-4 of Fig. 3 and showing the refrigerator door latch and solenoid apparatus in plane elevation.

Fig. 5 is a plan sectional view of the same apparatus featured in Fig. 4 but taken on a line designated 5-5 in Fig. 3.

Fig. 6 is a fragmentary horizontal section taken on a line similar to that of Fig. 5 but illustrating a portion only of the latch releasing mechanism in its actuated condition.

Fig. 7 is a sectional detail view taken approximately on line 7-7 of Fig. 5.

Fig. 8 is a front elevational view of the switch control apparatus with the crown button re-

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moved to reveal the interior of the button mechanism housing,

Fig. 9 is a fragmentary sectional view taken approximately on a line indicated 9—9 on Fig. 8.

Fig. 10 is an enlarged fragmentary sectional view taken approximately on line 10—10 of Fig. 9 and features the inertia controlled subservient circuit breaker mechanism,

Fig. 11 is a detail sectional view taken approximately on a line designated 11—11 on Fig. 8,

Fig. 12 is a transverse sectional view similar to Fig. 11 but illustrating the crown button and over-centering lever mechanisms in their actuated condition during which the solenoid operating circuit has been momentarily closed,

Fig. 13 is a further sectional view resembling Figs. 11 and 12, but indicating the ultimate condition following the crown button operation,

Fig. 14 is a rear elevational view of the switch casing illustrating a mechanical operating linkage for controlling the latch mechanism independently of the electric system, and

Fig. 15 is a fragmentary sectional view taken approximately on line 15—15 of Fig. 2.

Referring now more particularly to the accompanying drawings, attention is directed to Figs. 1 and 2 wherein the reference character 1 designates a refrigerator box or casing having a hinged front sealing door 2 which is provided with a perimetrically defining lip 2a formed in spaced relation from the door plate 2, and at an angle with respect thereto. A rear door plate designated 2b parallels the front plate 2 and connecting the perimetric lip 2a to the rear plate 2b, there may be noted a spacing and heat insulating strip 2c after the manner of conventional refrigerator door practice. The angle at which the strip 2c is disposed parallels that of a door casing generally designated 2d which comprises a somewhat heavier strip of heat insulating material specifically denoted 2e.

Within the strip 2e and in horizontal alignment with the latch mechanism generally designated 3 is a metallic striker plate 3a formed with a latch engaging shoulder 26 against which there is adapted to repose the latch nose 16 rounded at 16a so as to be cammed into compression position, Fig. 6, upon engagement with the striker surface 16b, during the closure of the door. The latch bolt 16 is preferably confined for limited longitudinal movement within a metallic shell 17 and integral with said bolt there is provided a guide tail 18 consisting of two flat parallel strips between which is a pivoted link 21. In order to maintain parallelism in the movement of the bolt 16 the guide strips or tail members 18 are preferably provided with outwardly protruding embossments 19, Fig. 7, that are each confined within associated slots 20 formed in the top and bottom sides of the shell 17.

Link 21 is pivoted within the bolt head 16 at 21a for limited movement with respect thereto while the rearmost extremity of link 21 is provided with an elongated slot 22 through which there passes a rod 23, Figs. 5 and 6. A compression spring 27 of the coil type encircles link 21 urging against the rear surface of bolt head 16 and against the rod 23. This spring 27 will be spoken of as comparatively stouter in its force and is the element which undergoes compression when the bolt 16 is cammed upon encountering the camming surface 16b of the striker plate 3a.

Rod 23 is part of an integral lever 24 pivoted at 32b to a bell crank lever 32. The movement

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of link 24 is influenced by another link 24a through which the rod 23 also passes and which in turn is pivoted on a stationary pivot bar 25 around which there is wound a helical spring 33, one end 33a of which abuts against a surface of the shell 17 and the other end of which abuts against a rib 33b integral with lever 24a. Spring 33 will be spoken of as the milder tensioning influence and its effect is to maintain lever 24a in the position designated in Fig. 5.

As may be noted from Fig. 7 shell 17 is secured as by riveting 17a to a latch frame member 3b, one end of which is secured as at 3c to the lip 2a and which extends horizontally to provide rearmost support as at 3d for the solenoid slide tube 31a. The bell crank 32 in addition to being pivoted at 32b to the link 24 is also pivoted at 32a to the fore portion of the solenoid 31 which is appropriately slotted for receiving this member thereat. A free arm 94 of the bell crank 32 normally is disposed in the manner illustrated in Figures 3, 4, and 5, so as to be engageable by the extremity of an operating lever 89 pivoted at 90, when the latter is actuated, clockwise, as viewed in Fig. 3 in opposition to its individual restoration spring 92a. In order to obtain a mechanical advantage in cam lever 89, it is provided with a curved cammed surface 93 which has a wiping engagement with arm 94 during the condition of actuation when said lever 89 is rotated as already stated through the lift action of a link 87, arm 86, and rotatable spindle 42.

The principal latch supporting frame 3b—3d, is reinforced by means of a connecting support plate 92, one end of which extends through a slot of member 3d and the other end of which is held by a securement screw 92d to an intermediate surface of the principal frame member 3. As may be noted from Figs. 3, 4, and 5 supporting plate 92 is provided with an opening 93 through which there protrude portions of the bell crank 32, solenoid plunger 31 and impact cushion washers 96 carried upon the plunger 31. Lever 89 which is pivotally supported at 90 on a bracket 91 is provided with an ear 88 to which the link rod 87 is articulated, Figs. 3 and 4.

Solenoid plunger 31 slides within a journal tubing 31a around which is wound the actuating coil 30 electrically energized to attract plunger 31 to thereby move the latter rightwardly as viewed in Figs. 4 and 5 until the impact washers 96 impinge against the stop wall 97. As a result of such energization bell crank 32 is bodily moved rightwardly and in so doing is rocked about pivot 32a to assume the position designated in Fig. 6. As a further result of this movement link 24 becomes disposed as indicated in Fig. 6 and link 24a is rotated counter-clockwise about pivot rod 25 against the influence of its restoration spring 33. It is to be noted that in so doing the pivot bar 23 is moved downwardly carrying with it link 24 and withdrawing latch bolt 16 without in any appreciable manner affecting the major force spring 27. During such condition of operation the total restorative influence is maintained by the minor spring 33 and normal condition may be resumed as soon as the magnetic effect of coil 30 is released or as soon as the mechanical control over lever 89 is released.

The opposite terminals of the winding of solenoid 30 are conveniently mounted upon an insulated mounting strip 3f, Figs. 3 and 4, onto the lower extremity of which there may be provided appropriate terminal fittings 3g and 3h, to one

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of which is connected an electrical conductor 84 and to the other of which is connected a companion conductor 84a, see Figs. 1, 10 and 11, conductors 84 and 84a being part of a cable 69a coming from the switch control housing 5, Fig. 14, or being independent lead wires as may be preferred.

Referring now more particularly to Figs. 8 to 14, the reference character 40 designates generally a cup shaped housing formed of electrically insulated material and designed to be carried by the outer surface of the door 2, as best indicated in Figs. 1 and 10. The housing 40 is provided with a cylindrical wall section 40a open at its upper extremity and thereat over-covered by a crown button 44 having a fluted flange portion 4a and preferably made of a translucent or transparent material. The crown cap or button 44 is riveted as at 5a to the spindle 42, see also Fig. 3, so that upon the depression of the crown cap 44, the spindle 42 is shifted downwardly, Figs. 11, 12, and 13, and upon being rotated clockwise Figs. 1 and 3, the integral spindle 42 is correspondingly rotated causing arm 86 to be raised for effecting the mechanical actuation of the latch control mechanism. The cap 44 thus constitutes a protective covering for the casing 40 as well as serving as a mechanical and electrical actuating medium. By constructing this member of translucent material and coating its inner surface as at 43a, with a luminous substance, the crown cap may be made visible in darkness. Alternatively towards the same objective there may be provided within the case 40 a small glow tube 101, preferably of the neon type, whose luminosity may be observed through the translucent or transparent crown button 44 where a more effective index is desired.

The case 40 is provided with integral dependent formations that extend into appropriate openings of the door thickness 2 as at 82a and at 41a, within which are housed mechanical devices to be described later. The spindle 42 is journaled for longitudinal as well as rotational movement in the well journal 41a and at its upper extremity carries a flanged sleeve 50 whose flange 49 rests upon the upper convolution of a compression spring 48. A flanged sleeve 51 encircling sleeve 50 has a flange 52 resting upon the upper surface of a contact lever 53 pivoted at 54. It is to be noted that sleeve 51 is of somewhat shorter length than is sleeve 50 so that upon the depression of crown button 44 sleeve 50 is carried downwardly to effect the depression of spring 48 before sleeve 51 begins its downward movement. Accordingly it will be understood that the space intervening flanges 52 and 49 will become slightly greater as portrayed in Figs. 12 and 13 during the initial portion of the button actuation or otherwise stated contact lever 53 will be afforded a clearance for its counter-clockwise rotation about pivot 54 shortly before such rotation becomes induced by the action of flange 52. An over-centering spring loop 64 is connected by lug penetration into the lever 53 at one of its ends and to a stationary bracket 61 at the other, exerting a mild pressure towards influencing lever 53 in one direction or the other about its pivot 54. This is clockwise in Fig. 11, due to the fact that the impingement point of spring 64 against lever 53 is somewhat higher than the impingement point of spring 64 against the bracket 61. As soon as the movement of lever 53 is compelled by the action of flange 52, however, this relative condition is at once reversed with the impinge-

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ment points displaced in an opposite relationship whereupon the expansible tension of spring 64 becomes directed towards the service of rotating lever 53 in a counterclockwise direction about its pivot 54 and thereupon the electrical contact projection 67 is driven into engagement with its cooperating contact projection 68 carried by a contact lever 69.

The two impingement points of over-centering spring 64 are designated 65 and 66 in Figs. 11 and 13 and the manner of action is best portrayed in Fig. 12 which illustrates the momentary condition when contact projection 67 is brought into engagement with its cooperating projection 68 and before lever 69 has become influenced in its pivotal action about its own pivot center 70.

The motion of lever 53 continues counterclockwise dwelling in the condition illustrated in Fig. 12 for a precise predetermined interval during which the contactual engagement between projections 67 and 68 energized the solenoid 30 after which lever 69 moves downwardly effecting the over-centering spring 76 in the same manner as was the case above described in connection with over-centering spring 64, that is to say, the impingement surface 76a is made lower than the impingement surface 76b whereupon lever 69 is driven downwardly or counter-clockwise about its pivot 70 to an extent illustrated in Fig. 13.

Meanwhile lever 53 reaches its lowermost limit of travel while lever 69 rides on separating the contact projections 67 and 68 to establish the condition illustrated in Fig. 13. For the sake of clarifying the surrounding structure it will now be mentioned that the impingement surface 76b of spring 76 engages with an inert bracket 75 which is anchored in an embossment 73 and the lowermost extremity of travel of lever 69 is attained when its insulated block 78 strikes the floor of the housing 40. A bracket 72 having a pair of ears 71 provides a trunnion support for pivot screw 70 just as does the bracket 56 with its ears 55 similarly serve the pivot 54.

Thereafter the actuating pressure is relieved from the crown cap 44 and this member, together with its shaft 42 and under the influence of compression spring 48 pressing against flange 49 seek to resume their normal condition as featured in Fig. 11. The upper surface of flange 49 first encounters the under surface of lever 53 during this upward travel, raising the latter member until the extremity 80 thereof comes into contact with the under surface of the yoke 62, formed of insulation material, whose sides 80a extend downwardly and are imbedded in the insulated block 78. Due to the greater force of spring 48 the power thereby exerted raises lever 69 as lever 53 approaches its uppermost limit of travel. As both of the levers pass the critical or median point of their respective over-centering springs 64 and 76, the latter elements become effective in the service of maintaining said levers 53 and 69 in their normal setting as portrayed in Fig. 11.

From this it will be seen that the actuating motion of the crown cap 44 no matter how manipulated by an operator will result in an invariable response so far as the actuation of contacts 67 and 68 is concerned, the sole provision being that said cap be moved downwardly or inwardly throughout its full course of travel which operation may be conveniently effected by the simple expedient of leaning or pressing against its generous breadth or area. The anchor plates 72 and 56 which support the pivots 70 and 54 respectively, serve also as contact terminals

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through which current is conducted to the projections 67 and 68 and while bracket 72 may be directly connected into the circuit which controls the energization of solenoid 30, bracket 56 in its region designated 56a is provided with a further contact lug for a purpose which will now be more particularly described.

Having reference to Fig. 10 attention is directed to the downwardly extending embossment 82a within which there may be noted a cylindrical well or recess 81 that affords slidable accommodation for a cylinder 82 connected by an electrically conducting cable 85 to the imbedded terminal 85a. Cylinder 82 is preferably of predetermined mass and is shouldered so as to rest upon a compression spring 85 of sufficient tension to maintain the cylinder 82 at its upward extremity whereat the contact lug 82d engages a contact projection on the bracket extension 56a. Terminal 85a is electrically connected with the afore-mentioned lead conductor 84a that extends to one of the terminals of solenoid winding 30. In the same manner electrical conductor 84 mentioned above is connected to the bracket 72. It will be understood accordingly that by means of the two contact levers 53 and 69 there may be obtained a momentary enclosure of the circuit illustrated in Fig. 1 which results in the energization of solenoid 30 and that periodicity of this closure is mechanically regulated by the provisions of the mechanism contained in the switch generally indicated 43, to a precise predetermined interval.

It will be noted also that this circuit may be interrupted by the action of cylinder 82 separating from contact plate 56a coincident with the slamming of the door 2, if such movement is of sufficient violence to set up an inertia factor that influences the crown cap 44. In other words, the mass of cylinder 82 is preferably comparable to that of cap 44 so that the two masses are moved in unison, thereby preventing the energization of solenoid 30 except when the actuator crown cap 44 is moved intentionally by an operator as distinguished from its movement inadvertently due to the inertia effect of closing the door.

The illuminated index 101 may be appropriately connected to the line circuit which is designated by the cable 6 in any manner and the particular circuit arrangement involving the introduction of the power line 6 to the solenoid actuating circuit is believed also to be a matter of preference to accord with convenience of arrangement.

From Fig. 1 it will be noted that the cable 6 extends through a hollow pivotal shaft 7 which forms part of a special pintle structure for the upper pivot of the door 2. This structure may include a tubular pivot shaft 7 to which is integrally secured a keyed collar 7a that passes through a corresponding opening in the top section 13 of the door 2 as well as through a reinforcement plate 12 welded thereat. An appropriate spacing gasket 13a intervenes between the top 13 of the door 2 and the casing flange 13b of the refrigerator box. An anchor bracket 8 that may be made of sheet material is secured by anchor screws 8a to a rigid portion of the box 1 and, integral with the bracket 8, there may be provided horizontal flange sections 9 and 10 in which are carried the journal bearings 11. From Fig. 2 it will be noted that a pair of oppositely wound torsion coil springs 14 and 15 are disposed around sleeve 7 each having its remote end engaging an anchor pin 9a and 10a, and its mean

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ends terminating in vertically extending abutment portions 14a and 15a. In the space which intervenes between the coil springs 14 and 15 a collar member 7b is secured to the sleeve 7 and is provided with a projecting lug 7c disposed between the spring terminals 14a and 15a. The arrangement of the aforescribed elements is such that during the closed position of door 2 lug 7c engages the projection 15a of spring 15, setting up a force in the latter coil which will effect the opening of the door as soon as the latch bolt 16 is withdrawn from engaging the strike shoulder 26. When the door is opened and moved throughout a limited arc of motion, approximately 20 to 30 degrees preferably, the force in the spring 15 becomes spent and upon the further movement of the door in its opening direction, lug 7c engages the spring terminal 14a, winding its coils 14 and setting up a force which tends to close the door as soon as the opening force exerted by the operator is released. Accordingly, there will be an intermediate position at which the door 2 may remain open that is free from the influence of either spring 14 or 15 or which may be the result of a neutralizing effect of both of said springs if such an arrangement is preferred but otherwise each spring serves a purpose in directing the door from either of its extremities of movement towards the aforementioned intermediate position.

It will be noted that regardless of the movement of the door, no twisting is imparted to the cable 16 whereby line current is brought in to effect the operation of the door unlatching solenoid 30 and the lighting of index bulb 101.

While the foregoing invention has been explained and described with reference to a specific embodiment it is to be understood nevertheless that numerous modifications and variations may be instituted without departing from the essential spirit or scope thereof. Accordingly, it is not intended to be limited, in construing the realm of this invention to the particulars described in the foregoing detailed specification nor to the specific illustrations of the accompanying drawings except as indicated in the hereunto appended claims.

We claim:

1. A common stimulus control mechanism for refrigerator door latches having both mechanical and electromagnetic actuating devices comprising, a base member, a pair of electrical contacts contained in said base member, one of said contacts of said pair being pivotally mounted to move into and out of engagement with other of the contacts of said pair, overcentering spring means for yieldably maintaining said pivoted contact in either its closed or open companion contact engaging position, a depressible knob carried by said base member having articulation with said pivoted contact to move said contact between its alternative positions, a spring for maintaining said knob normally in its contact opening position, an additional pair of electrical contacts in electrical series connection with said first mentioned pair of electrical contacts, one of the contacts of said additional pair being a weighted inertia member adapted to separate from its associated contact of said additional pair during violent closure movement of refrigerator door, spring means for returning said inertia contact member to its closed position with respect to its associated contact, and an energizing circuit including both said first mentioned and addi-

tional contact pairs for electrically energizing said electromagnetic device.

2. In a latch operating mechanism for refrigerator doors having a latch bolt spring tensioned into door latching position and adapted to be retracted by an electromagnetic device or by a train of linkage which withdraws the latch bolt mechanically, said operating mechanism including a protuberant knob slidably mounted on a sleeve in response to pressure on the knob, and rotatable relative to the sleeve in response to the application of a torque force, said linkage including a centrally disposed spindle secured to the knob and rotatable therewith, a connecting arm carried by the spindle and in operative connection with a link member attached to a cam lever, a bell crank pivotally carried on a slidable support and pivoted to a second link connected to a toggle which retracts the bolt when the toggle is broken, said cam lever engaging one arm of the bell crank to pivot the bell crank to retract the bolt through said second link and toggle.

3. In a latch operating mechanism for refrigerator doors having a latch bolt spring tensioned into door latching position and adapted to be retracted by an electromagnetic device or by a train of linkage which withdraws the latch bolt mechanically, said operating mechanism including a protuberant knob slidably mounted on a sleeve in response to pressure on the knob, and rotatable relative to the sleeve in response to the application of a torque force, said linkage including a centrally disposed spindle secured to the knob and rotatable therewith, a connecting arm carried by the spindle and in operative connection with a link member attached to a cam lever, a bell crank pivotally carried on a slidable support, a toggle comprising two links, one end of one link being connected to the bolt, one end of the other link being connected to the bolt support, the remaining ends of the links being connected together and a third link connected to the connection between the toggle links, said third link being adapted to break the toggle, said cam lever engaging one arm of the bell crank to pivot the bell crank to retract the bolt through said third link and toggle.

4. In a latch operating mechanism for a refrigerator door in which a common latch bolt is spring tensioned into door latching position, the combination with an electromagnetic device for withdrawing the latch bolt upon the completion of its energizing circuit and a train of linkage for withdrawing the latch bolt mechanically, of a common operator which comprises the initiating stimulus for both said electromagnetic device and train of linkage alternatively including a protuberant knob supported on a cylindrical mounting sleeve so as to be susceptible to axial depression by longitudinal movement within said sleeve as well as to limited rotation in response to the administration thereto of a torque force

by rotation within said sleeve, electrical contact means for completing said energizing circuit closed in response to said axial depression of said common operator, and a lever arm pivotable by said limited rotation of said common operator in response to the administration thereto of said torque force, said lever arm being operatively connected to the train of linkage used for withdrawing the latch bolt.

5. In a latch operating mechanism for a refrigerator door in which a common latch bolt is spring tensioned into door latching position, the combination with an electromagnetic device for withdrawing the latch bolt upon the completion of its energizing circuit and a train of linkage for withdrawing the latch bolt mechanically, of a common operator which comprises the initiating stimulus for both said electromagnetic device and train of linkage alternatively including a protuberant knob supported on a cylindrical mounting sleeve so as to be susceptible to axial depression by longitudinal movement within said sleeve as well as to limited rotation in response to the administration thereto of a torque force by rotation within said sleeve, electrical contact means for completing said energizing circuit closed in response to said axial depression of said common operator, a lever arm pivotable by said limited rotation of said common operator in response to the administration thereto of said torque force, said lever arm being operatively connected to the train of linkage used for withdrawing the latch bolt, a spring loaded contact element in said energizing circuit movable away from a companion contact element in a direction parallel to that of said common operator during the latter's axial depression movement, said spring loaded contact element having mass and inertia characteristics approximating those of said common operator whereby violent closure of the refrigerator door sufficient to effect momentary axial depression movement of said common operator by reason of inertia resulting in the completion of said energizing circuit will also cause a corresponding momentary opening of said energizing circuit at said spring loaded contact element.

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