

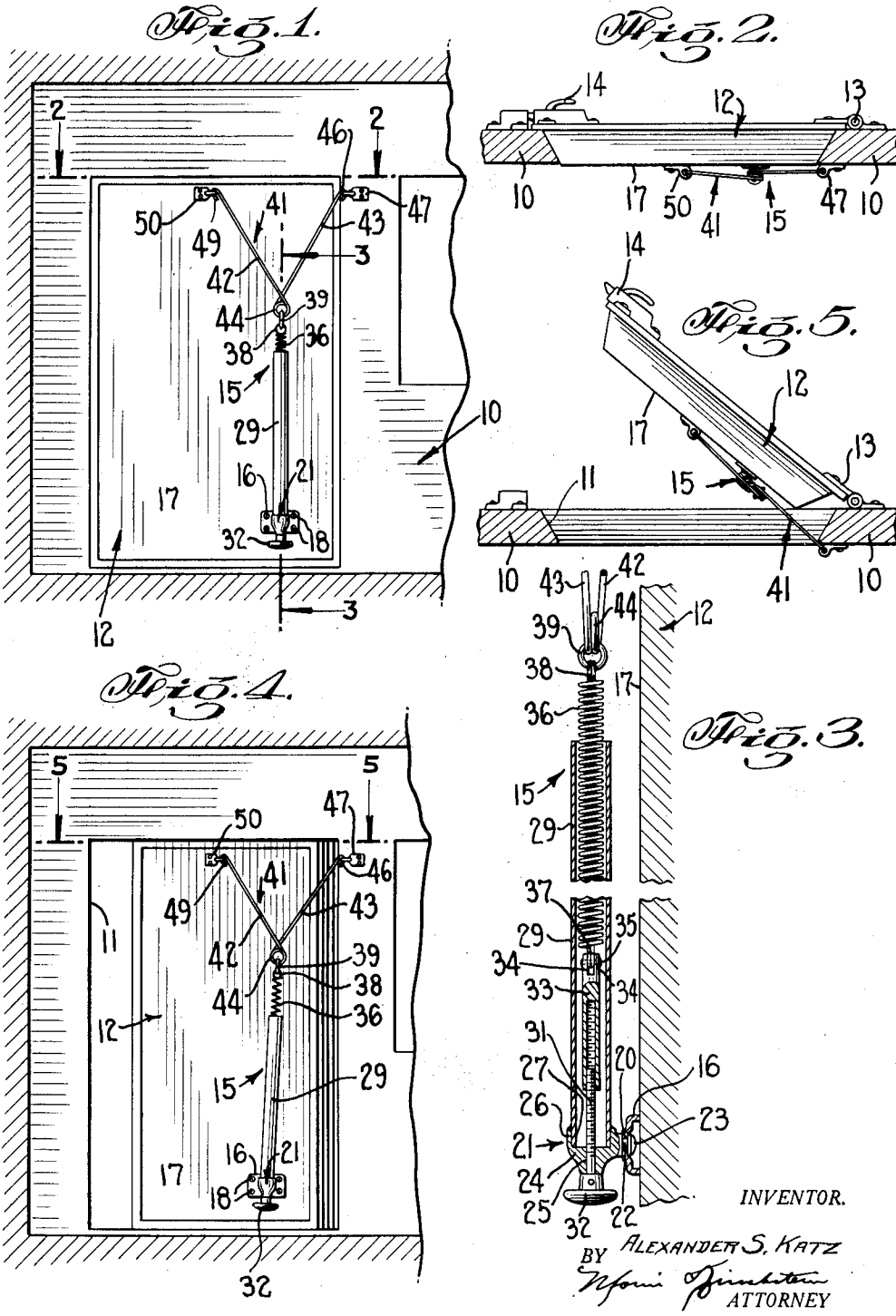
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CLOSURE OPERATING DEVICE

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CLOSURE OPERATING DEVICE

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This invention relates to closure operating devices, and is particularly directed to a device for automatically closing a door and retaining the same in closed position, and the like articles.

An object of this invention is to provide a strong and durable device of the character described which shall comprise comparatively few and simple parts, which shall be comparatively inexpensive to manufacture, easy to assemble and install, positive and smooth in action, attractive in appearance, and yet practical and efficient to a high degree.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention,

Fig. 1 is an inside elevational view of a refrigerator wall and a refrigerator door provided with a door closing device embodying the invention;

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1;

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

Fig. 4 is a view similar to Fig. 1 but showing the door in open position; and

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 4.

Referring now in detail to the drawing, 10 designates a refrigerator wall having a door opening 11 for the door 12 which is hinged to said wall on hinges 13, and is adapted to be opened outwardly by the latch mechanism 14. The door 12 is provided with a door closing device 15 embodying the invention.

Said closing device 15 comprises a bracket 16 attached to the inner side 17 of the door, in any suitable manner, as for example, by screws 18, said bracket 16 being provided with a bearing opening 20. Pivoted to said bracket 16 is a socket member 21 having a pin

22 journaled in said bearing 20, and a head 23 contacting the rear of the bracket 16. The member 21 is further formed with a wall 24 provided with an axial through opening 25 and with a cylindrical socket portion 26. Received within said socket portion 26 is one end 27 of an elongated tubular housing member 29, said end being soldered or welded to said cylindrical wall 26 for firmly attaching said tubular member to said socket.

The wall 24 thus forms an end wall for the tubular member 29. Slidably extending through said axial opening 25 is a screw threaded member 31 to the outer end of which is attached a knob 32 for turning of said screw threaded member. Screwed to the opposite end of the member 31 is a member 33 of any suitable construction having bifurcated ends 34 interconnected by a transverse pin 35.

Partially housed in the tubular member 29 is an elongated tension spring 36 anchored at its inner end to the member 33 by means of an integral eyelet portion 37 received between the bifurcated members 34 and around pin 35. The engagement of said eyelet portion 37 in the slot between the bifurcated members 34 prevents member 33 from turning within the tubular member 29. At the upper end thereof spring 36 is provided with another preferably integral eyelet portion 38 extending through a ring 39. Attached to said ring 39 is a hanger member 41 preferably made of a single elongated piece of spring wire, having upwardly and outwardly diverging arm portions 42 and 43 interconnected by a coiled portion 44 received within said ring 39. The upper end 46 of the arm 43 may be in the form of a hook and is attached to an eyelet or the like fastening member 47 fixed to the inner wall 10 adjacent the door. The upper end of the arm 42 is likewise preferably in the form of a hook 49 which engages an eyelet or the like attaching member 50 fixed to the inner face 17 of the door 12. The attaching members 47 and 50 are substantially on an equal level adjacent the top of the door.

The bracket 16 may be attached to any suitable portion of the door. When the door is closed, the spring 36 is preferably under

tension for normally retaining the door in closed position. Upon opening the door, by reason of the increase in linear distance between the attaching members 47 and 50, the spring 36 will be further tensioned so that upon releasing the door from any open position thereof, the door will be swung back to closed position. By means of the handle 32 the tension spring 36 may be adjusted. Obviously upon turning the handle in such direction as to pull the member 33 downwardly, the tension on the spring will be increased.

In securing the device 15 to the door 12 and wall 10, the brackets 16 is preferably first attached to a suitable portion of the door. The attaching members 47 and 50 are then fixed to the wall and door, respectively, in such position that the arms 42 and 43 must be forced apart and the spring 36 must be pulled or stretched several inches beyond the outer end of the tube 29 to cause engagement between the hooks 46 and 49 and the eyelets 47 and 50, respectively. The door will then be retained in closed position by the spring. The tube 29 serves to house and protect the spring and the adjusting members, and obviates danger of injury from contact with said members, while at the same time making for neatness in appearance.

By reason of the pivotal connection between the member 21 and the bracket 16, the tube 29 together with said member 21 may pivot about the bracket as the door is opened or closed. The tension produced by forcing the arms 42 and 43 apart before engaging the upper ends thereof with the eyelets 47 and 50 aids in normally urging the door to closed position. As will be readily understood, the tension of the spring 36 causes a downward pull on the ring 39 and coil portion 44 of the member 41, which pull is in turn transmissible along the arms 42 and 43, so that components of these pulls act at the connection between the upper ends of said arms and the members 49 and 50, to retain the door in closed position or return the door to closed position after the door is opened.

Although the device 15 is shown herein as applied to a refrigerator door, it will be clearly understood that my improved device may be attached to any suitable door or closure member, the upper end of the arm 43 being attached to the door jamb. As shown in the drawing, the inner surface of the wall 10 is substantially flush with the inner surface 17 of the door 12. It is obvious, however, that where a device is applied to a door and door jamb which is offset from the inner surface of the door, the eyelet 47 may be attached to the inner surface of the door jamb.

Upon opening or closing the door, the tubular member 24 may swing about the pin portion 22 which is journaled in the bracket 16. The device 15 may be attached to the out-

side of the door for normally opening the door. In such case, the bracket 16 would be attached to the outer side of the door and the members 47 and 50 would be attached to the outer surface of the door 12, respectively. Upon releasing the latch 14, the spring 36 would, in such case, cause a downward pull on the arms 42 and 43 which would cause the door to open automatically.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made in the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A device for causing closing of a door comprising a member attached to the door, an elongated tubular member having an end wall pivoted to said first member, said end wall having an opening, a screw threaded member slidably extending through said opening, a member having a screw threaded connection with said screw threaded member and disposed within said tubular member, said last member having a bifurcated end portion forming a slot, an elongated spring having a portion at one end thereof received in said slot and attached to said bifurcated portion, a pair of diverging arms attached to the other end of said spring, means for connecting the end of one arm to a wall adjacent said door and the end of the other arm to the door.

2. A device for controlling a closure member, comprising a member adapted to be attached to said closure member, a member pivoted to said first member and having an opening therethrough, a screw threaded member slidably extending through said opening and having a handle at one end thereof, to permit said screw member to be turned, a member having a screw threaded connection with said screw member, an elongated coil tension spring having one end connected to said last mentioned member, and a pair of diverging arms connected to the other end of said spring.

3. A device for controlling a closure member, comprising a member adapted to be attached to said closure member, a member pivoted to said first member and having an opening therethrough, a screw threaded member slidably extending through said opening and having a handle at one end thereof, to permit said screw member to be turned, a member having a screw threaded connection

with said screw member, an elongated coil tension spring having one end connected to said last mentioned member, and a member made of a single elongated piece of spring metal having a pair of diverging arms, and a portion interconnecting said diverging arms and connected to the other end of said spring.

4. A device for controlling a closure member, comprising a bracket adapted to be attached to the closure member, a member attached to said bracket and having a through opening, a screw extending through said opening, an elongated coil tension spring connected at one end thereof to said screw, and a member made of a single elongated piece of spring metal having a pair of diverging arms, and a portion interconnecting said arms attached to the other end of said spring.

5. A device for controlling a closure member, comprising a bracket adapted to be attached to said closure member, a member attached to said bracket and having an opening therethrough, a screw slidably extending through said opening and having a handle attached to one end thereof to permit turning of said screw, a member having a screw threaded connection with said walls and provided with a pair of bifurcated ends, a transverse pin interconnecting said bifurcated ends, an elongated coil tension spring having an end portion received between said bifurcated ends and engaging said pin, and a pair of diverging arms connected to the opposite end of said spring.

6. A door controlling device comprising a bracket adapted to be attached to the door, an elongated tube having an end wall attached to said bracket, said end wall having an opening therethrough coaxial with said tubular member, a screw slidably extending through said opening into said tube, and having a handle attached to the outer end thereof, a member having a screw threaded connection with said screw and having a bifurcated end portion forming a slot, an elongated coil tension spring housed within said tubular member and having an end thereof within said slot and attached to said bifurcated portion, and a member made of a single elongated piece of spring metal having a pair of diverging arms interconnected by a coiled portion, means for connecting the opposite end of the spring to said coiled portion, said diverging arms having bent portions at the outer ends thereof for attaching the same to the door and door jamb, respectively.

7. In combination, a bracket attached to a door and having a bearing opening, a member having a pin journaled within said bearing opening, an elongated tubular member attached to said last member, said last member forming an end wall for said tubular member and being provided with a through opening coaxial with said tubular member, a

screw slidably extending through said opening, a handle attached to the outer end of said screw, a member having a screw threaded connection with said screw and being provided with a bifurcated end portion forming a slot, a transverse pin attached to said bifurcated end portion, an elongated coil tension spring housed within said tubular member and having an eye at one end thereof received within said slot and engaging said pin, the opposite end of said spring being formed with a second eye, a ring receiving said second eye, and a member made of a single piece of elongated spring metal comprising a pair of diverging arms and an interconnecting coil portion received within said ring, and means for attaching the upper ends of said diverging arms to the door and door jamb, respectively.

8. A door controlled device comprising a bracket adapted to be attached to the door, a member pivoted to said bracket and having an elongated tubular portion, a screw slidably extending into said tubular portion, an elongated coil tension spring connected at one end thereof to said screw, and a member made of a single piece of spring metal having a pair of diverging arms, and a portion interconnecting said arms and attached to the other end of said spring.

In testimony whereof I affix my signature.
ALEXANDER S. KATZ.

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