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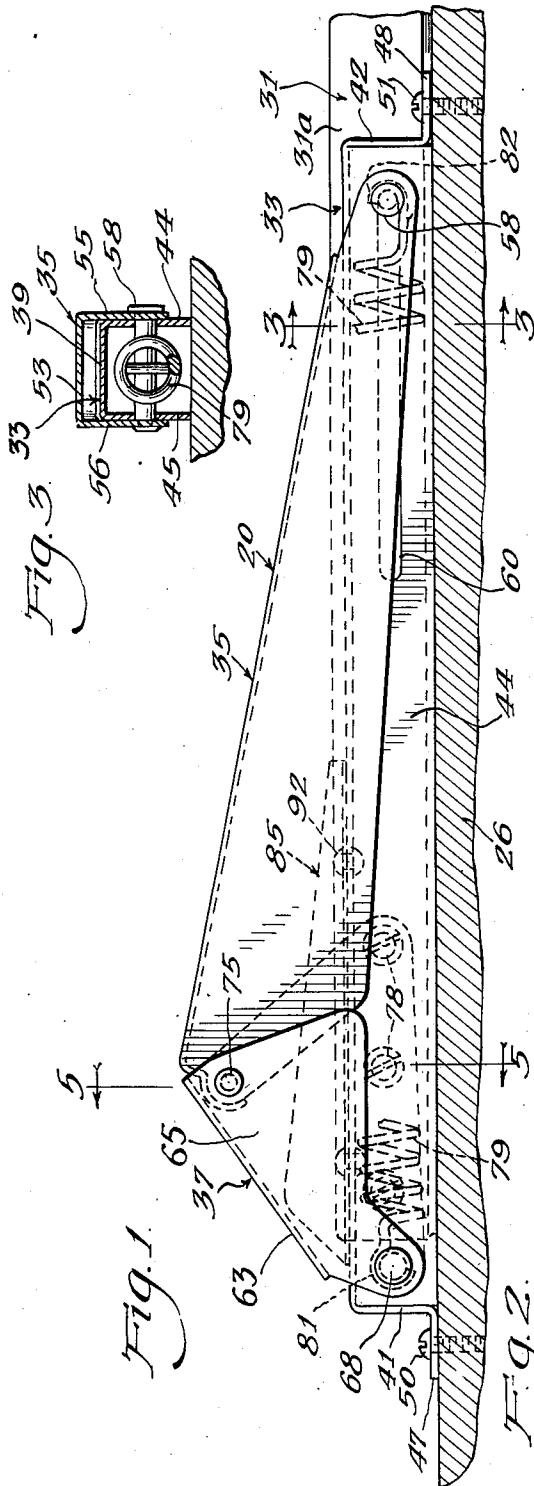
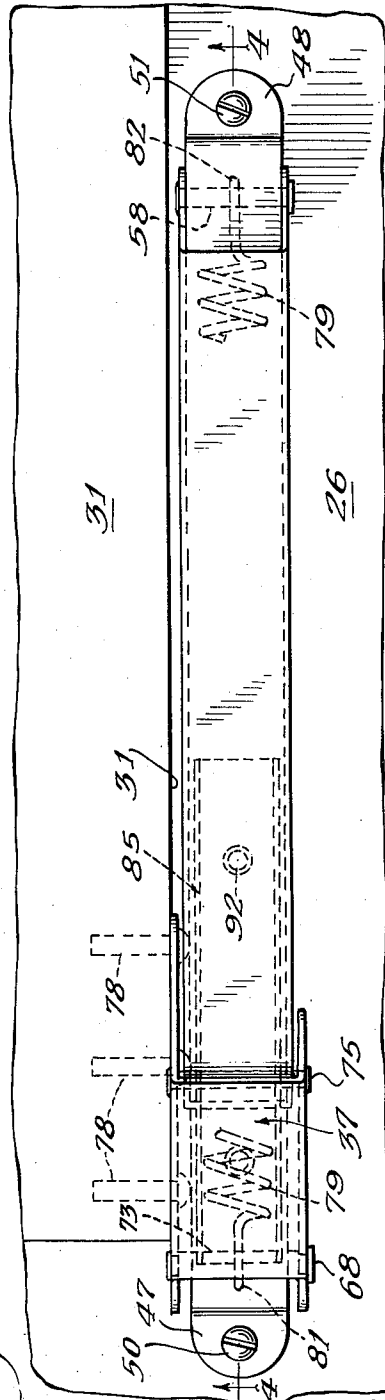
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HINGE

Filed Feb. 28, 1947

2 Sheets-Sheet 1



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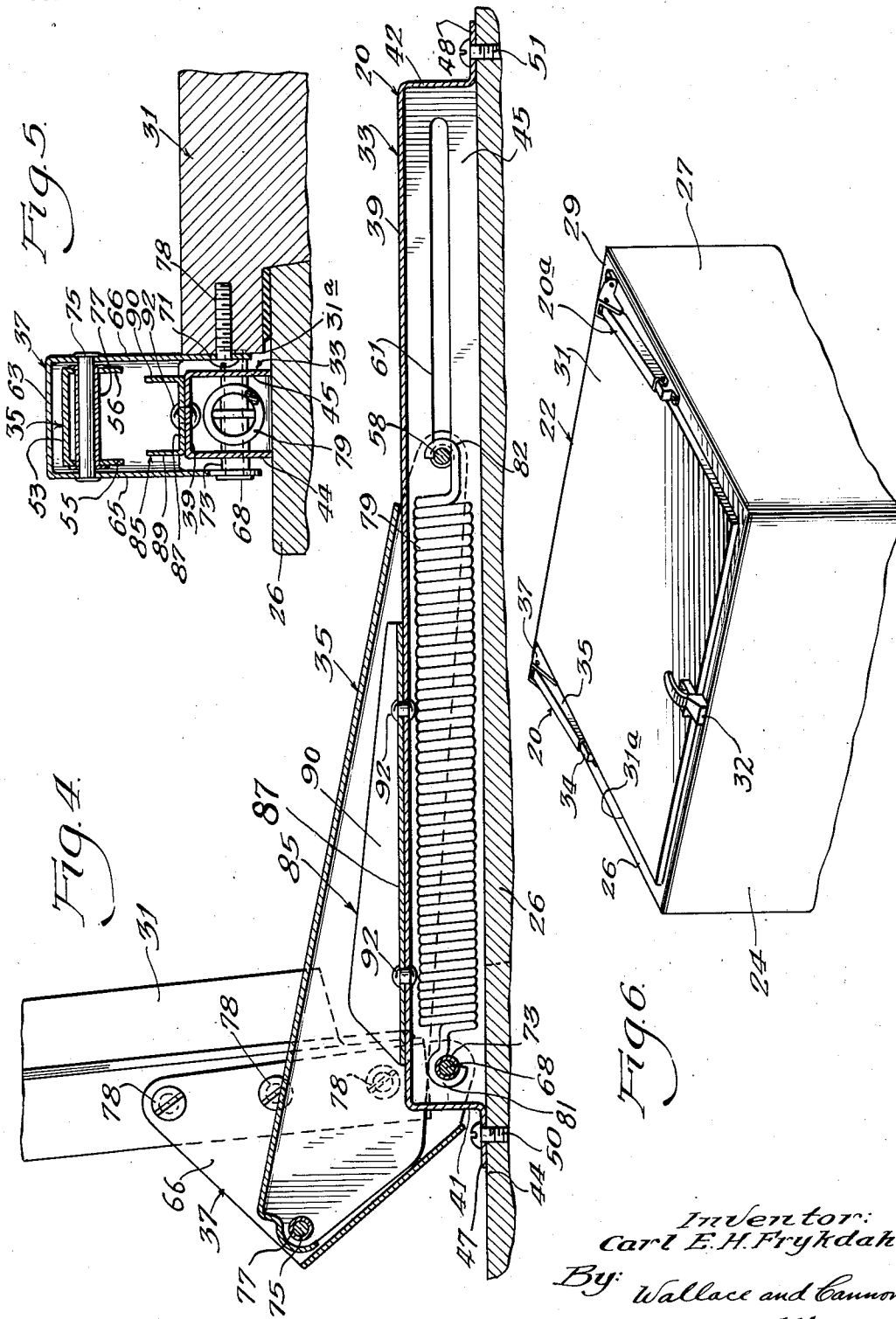
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UNITED STATES PATENT OFFICE

2,495,371

HINGE

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This invention relates to hinges and more specifically to hinges of the type particularly adapted for use on freezer-chests and the like.

In certain cabinet units such as, for example, freezer chests and the like, the doors used therein are often mounted in the top wall thereof which necessitates upwardly swinging, or otherwise raising, the doors when it is desired to gain access to the interiors of the units. Because such doors are normally relatively heavy it is often difficult for a person, operating without assistance, to raise these doors, and it is a primary object of my invention to afford a novel hinge for freezer-chests and the like which will assist a person in opening the door thereof.

Another object of my invention is to afford a novel hinge which will assure that when the door to which it has been attached has been moved to fully open position, the door will not fall by gravity toward closed position.

A further object of my invention is to construct a hinge of the above referred to character which operates in a novel and expeditious manner whereby protection against injury thereby is afforded to persons in the vicinity of a door being raised or lowered thereon.

Other objects of my invention are to construct a novel hinge of the character with which my invention is involved, which is: compact; attractive in appearance; economical and practical to manufacture commercially; efficient in operation; and easy to install on a unit such as, for example a freezer-chest.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a side elevational view of a hinge embodying the principles of my invention showing it attached to a door in closed position;

Fig. 2 is a top plan view of the hinge as shown in Fig. 1;

Fig. 3 is a sectional view taken substantially along the line 3—3 in Fig. 1;

Fig. 4 is a sectional view taken substantially

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along the line 4—4 in Fig. 2 but showing the hinge attached to a door in open position;

Fig. 5 is a sectional view taken substantially along the line 5—5 in Fig. 1; and

Fig. 6 is a perspective view of the top of a freezer-chest showing two of my novel hinges installed in operative position.

In the accompanying drawings two of my novel hinges 20 and 20a, respectively, Fig. 6, are shown as they would appear when installed on a freezer-chest 22 having a front wall 24, side walls 26 and 27, a rear wall 29 and a top door 31, normally held in closed position by a suitable latch 32. The two hinges 20 and 20a are identical in construction except that they are the reverse of each other, the hinge 20 being adapted to be used on the left side of the door 31, as viewed in Fig. 6, and the other hinge 20a being adapted to be used on the right side thereof as viewed in this figure.

As is best seen in Figs. 1, 4 and 6, the hinge 20 comprises a base member 33, a slide member or link 35 and a lever arm 37. The base member 33, Figs. 4 and 5, comprises a top wall 39, two end walls 41 and 42, two side walls 44 and 45 and two flanges 47 and 48 projecting outwardly from the bottom edge portions of the end walls 41 and 42, respectively in substantially parallel relation to the top wall 39. The base member 33 is secured to the top surface of the side wall 26 of the freezer-chest 22 by two screws 50 and 51 which project through the flanges 47 and 48, respectively.

The link 35 comprises a substantially channel-shaped member, Fig. 3, having a top wall 53 and two side walls 55 and 56, respectively, and one end thereof is pivotally and slidably connected to the base member 33 by a rivet 58 which extends through one end of the side walls 55 and 56 of the link 35 and through two substantially parallel slots 60 and 61 formed in one end portion of the side walls 44 and 45, respectively, of the base member 33.

The lever arm 37 comprises a substantially channel-shaped member, Figs. 1 and 5, having a top wall 63 and two side walls 65 and 66. The lever arm 37 is pivotally attached to the base member 33 by a rivet 68 which extends through the lower end portions of the side walls 65 and 66 thereof, respectively, and through a bushing 73 mounted in one end portion of the side walls 44 and 45 of the base member 33. A pivoted connection between the lever arm 37 and the other end portion of the link 35, opposite the end which is connected to the base member 33, is

established by a rivet 75 which extends through the side walls 65 and 66 of the lever arm 37 and through a bushing 77 mounted in the side walls 55 and 56 of the link 35. Also, it will be noted that the side wall 66 of the lever arm 37 is attached to a side 31a of the door 31 on the freezer unit 22 by screws 78, so that the lever 37 serves as a hinge-plate pivoted on the rivet 68, for the door 31.

A relatively stiff tension spring 79 is mounted in the base member 33 and has one end attached to the bushing 73 by a hook 81 and the other end attached to the rivet 58 by a hook 82.

As is best seen in Fig. 1, when the door 31 is in closed position and held therein by the latch 32, Fig. 6, the spring 79 is in extended or stretched position between the bushing 73 and the rivet 58, and tends to slide the link 35 longitudinally along the slots 60 and 61 from the position shown in Fig. 1 to the position shown in Fig. 4, and thereby swing the lever arm 37, and the door 31 attached thereto, from the closed position shown in Fig. 1 to the open position shown in Fig. 4. Therefore, it will be apparent that when it is desired to open the door 31 of the freezer-unit 22, and the latch 32 thereof is accordingly released, the spring 79 pulls on the rivet 58 and assists the person opening the freezer unit 22, to raise the door 30, the door swinging upwardly about the rivets 68 in the hinges 20 and 20a, respectively. The amount of assistance rendered by the spring 79 in raising the door 31 is, of course, directly proportional to the strength or stiffness of the spring 79 used, and, therefore, as will be apparent to those skilled in the art, my novel hinge 20 or 20a may be readily adapted to be used with different weight doors by merely changing the spring 79 so that a spring of the proper strength is used.

It will be noted that when the lever 37 and the door 31 attached thereto is swung to the fully open position, as shown in Fig. 4, both the lever 37 and the door 31 are swung beyond the vertical so that both the force of gravity operating on the door 31 and the force exerted by the spring 79 on the rivet 58 tend to hold the door 31 in open position. To close the door from this position, it is necessary to exert a positive pressure to the right, as viewed in Fig. 4, on the door to move it up past the vertical toward closed position. Thus, it will be noted that when the door is in fully open position on my novel hinges 20 and 20a, it is effectively held in open position in such a manner that there is no danger of the force of gravity causing it to slip from this position toward closed position, and yet, when it is desired to close the door, this may readily be accomplished by manually exerting a relatively light positive force thereon in a forward direction.

When the door 31 is in the fully open position shown in Fig. 4, the rivet 58 abuts the inner end of the slots 60 and 61 to thereby hold the door from moving further in an open position. This insures that the door 31, in opening, will stop in such position that the door 31, or the lever 37 secured thereto will not strike the top of the rear wall 29 of the freezer-unit 22, and holds the door in a convenient raised position where it is out of the way of a person desiring to have access to the interior of the freezer unit, but is readily accessible to a person desiring to close it.

A guard member 85, having a bottom wall 87 and upwardly extending side walls 89 and 90 is mounted on the top wall 39 of the base member 33 and is secured thereto by any suitable means

such as rivets 92. The side walls 89 and 90 of the guard member 85 project upwardly from the top wall 39 of the base member 33 and are so positioned thereon that they form an inner wall relatively closely underlying the side walls of the lever 37 and the link 35, substantially closing the space between the lower edges of the side walls of the lever arm 37 and the link 35 and the top wall 39 of the base member 33 in all positions of the lever 37 and the link 35 where the lower edges of the side walls thereof are above the top wall 39 of the base member 33, and, therefore, act as a guard against foreign articles, such as, for example, the fingers of a person being caught between the side walls of the lever 37 and the link 35, or between these side walls and the base member 33. As is best seen in Figs. 1 and 4, the upper edges and the end edges of the side walls 89 and 90 of the guard member 85, are so formed that they underlie and are spaced from the top walls 63 and 53 of the lever 37 and the link 35, respectively, when the lever 37 and the link 35 are in their lowermost position.

In the manufacture of my novel hinge, the base member 33, the link 35, the lever 37 and the guard member 85 may be constructed in any suitable manner and from any suitable material. In this connection, I have found that by using #22 US-gage steel for the guard member 85, #14 US-gage steel for the base member 33 and the link member 35, and #12 US-gage steel for the lever member 37, and by forming these members from these respective steels by bending and forming operations which are well known in the art, a hinge which is well adapted for substantially general use on the usual freezer-chests and the like may be afforded. However, other thicknesses of steel, and other materials may be used by those skilled in the art without departing from the purview of my invention, and it will be appreciated that I specify steel of these thicknesses by way of illustration and not by way of limitation.

From the foregoing it will be seen that I have afforded a novel hinge which may be readily adapted for use on freezer-units, and the like, of various sizes, and which is effective to assist in raising or opening a door, or the like, to which it may be attached, and is effective to hold the door in open position.

Also, it will be noted that my novel hinge is compact in form, efficient in operation, presents a pleasing appearance when installed on a freezer-unit, or the like, and may be readily manufactured commercially.

Thus, while I have illustrated and described the preferred embodiment of my invention, it is to be understood that this is capable of variation and modification and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. A hinge for mounting a door or the like on a supporting member and comprising an elongated base member adapted to be attached to said supporting member in position to extend substantially parallel to one end of said door, a lever pivotally connected to said base member and adapted to be connected to said one end of said door, a link, means pivotally and slidably connecting one end of said link to said base member, means pivotally connecting the other end of said link to said lever with the axis of pivotation in fixed

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relation to said link and lever, and resilient means connected to said base member and said link for moving said link longitudinally of said base member to thereby pivot said lever relative to said base member.

2. A hinge for movably mounting a door or the like on a supporting member and comprising an elongated base member adapted to be attached to said supporting member in spaced relation to said door, a lever pivotally mounted on said base member and having a normally closed position and an open position relative thereto, said lever having a portion adapted to be attached to said door to support the same, said portion of said lever extending substantially longitudinally along said base member in spaced relation thereto when said lever is in said normally closed position, a link, means pivotally and slidably connecting one end of said link to said base member, means pivotally connecting the other end of said link to said lever with the axis of pivotation in fixed relation to said link and lever, said link being operable upon movement thereof in one direction relative to said base member to move said lever, and resilient means connected between said link and said base member urging said link to move in said one direction relative to said base member.

3. In a hinge of the character described, a base member adapted to be attached to a supporting member, a lever member having one end pivotally attached to said base member and adapted to pivotally support a door, a link, means slidably and pivotally connecting one end of said link to said base member, means pivotally connecting the other end of said link to said lever member with the axis of pivotation in fixed relation to said link and lever, said lever member and said link normally occupying a position wherein they form obtuse angles relative to each other, said link being operable to slide along said base member to thereby pivot said lever member from said position to another position wherein said lever member and said link form an acute angle relative to each other, and resilient means connected to said base member and said link for urging said link from said first mentioned position to said other position.

4. In a hinge of the character described, a base member having a top wall and substantially parallel side walls projecting therefrom, a door-supporting member having a top wall and substantially parallel side walls projecting therefrom, means pivotally connecting said side walls of said door supporting member to said side walls of said base member in substantially parallel relation thereto, a link member having a top wall and substantially parallel side walls projecting therefrom, means pivotally and slidably connecting said side walls of said link member to said side walls of said base member in substantially parallel relation thereto, means pivotally connecting said side walls of said door-supporting member to said side walls of said link member in substantially parallel relation thereto, and means for urging said link member toward said last named means.

5. In a hinge of the character described, a base member having a top wall and substantially parallel side walls projecting therefrom, a door-supporting member having a top wall and substantially parallel side walls projecting therefrom, means pivotally connecting said side walls of said door-supporting member to said side walls of said base member exteriorly thereof, a link member having a top wall and substantially parallel side

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walls projecting therefrom, means pivotally and slidably connecting said side walls of said link member to said side walls of said base member exteriorly thereof, means pivotally connecting said side walls of said door-supporting member to said side walls of said link member exteriorly thereof, and means urging said link member toward said door-supporting member.

6. In a hinge of the character described, a base member having a top wall and substantially parallel side walls projecting therefrom, a door-supporting member having a top wall and substantially parallel side walls projecting therefrom, means pivotally connecting said side walls of said door-supporting member to said side walls of said base member exteriorly thereof, a link member having a top wall and substantially parallel side walls projecting therefrom, means pivotally and slidably connecting said side walls of said link member to said side walls of said base member exteriorly thereof, means pivotally connecting said side walls of said door-supporting member to said side walls of said link member exteriorly thereof, said door-supporting member and said link supporting member having one position relative to each other wherein the top walls thereof are at obtuse angles to each other and another position wherein the top walls thereof are at an acute angle relative to each other, and means connected to said link member for moving said door supporting member and said link member from said one position to said other position.

7. A hinge for mounting a door or the like on an elongated supporting member, said hinge comprising an elongated base member adapted to be attached to said supporting member in parallel relation thereto, a lever, means pivotally connecting one end portion of said lever to one end portion of said base member, a link, means pivotally connecting one end of said link to another portion of said lever with the axis of pivotation infixed relation to said link and lever, means pivotally and slidably connecting the other end of said link to the other end portion of said base member, said lever having an intermediate portion between said one end portion and said other portion adapted to be attached to a door, and resilient means connected to said link and said base member yieldingly urging said link in one direction relative to said base member.

8. A hinge adapted to be mounted on a surface framing an opening adapted to be opened and closed by a pivotal closure member and including an elongated base member of inverted U-shaped cross section and having end walls defining a housing therebetween, a lever, means pivotally connecting one end of the lever to one end of the base member, means connecting the lever to the closure member, a link pivotally connected at one end to the lever and pivotally and slidably connected at its other end to the base member, a resilient means disposed within and housed by the base member and connected at one end to the pivotal connection of the base to the lever and at its other end to the pivotal and slidable connection of the base to the link, said resilient means normally urging said lever and the closure member connected therewith to an open position, whereby the opening of the closure is effected by manually exerting a relatively slight lifting force on the closure member, the resilient means assisting the manual force in moving the closure member to its open position.

9. A hinge adapted to be mounted on a surface framing an opening adapted to be closed by a

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pivoted closure member comprising an elongated base member of inverted U-shaped cross section, a link member of similar cross section disposed in overlapping sliding relation with respect to said base member, means pivotally and slidably connecting one end of the link with one end of the base member, a lever of similar cross section pivotally connected to the other end of the base, overlapping the base and the link and pivotally connected to the other end of the link and adapted for connection to the closure member so that swinging movement of the lever effects swinging movement of the closure, and resilient means enclosed by said base member and connected at its opposite ends to the respective pivotal connection between the base and lever and the pivotal and slidable connection between the base and the link, said resilient means normally urging the link toward the lever and thereby normally urging the closure member toward open position, the cross sectional shape and diameters of the respective base, link and lever and the overlapping relationship thereof minimizing entangling of foreign objects such as clothing and human appendages between the respective component parts of the hinge.

10. A hinge as defined in and by claim 9 wherein the pivotal and slidable connection between the said one end of the link and one end of the base member comprises parallel slots provided in opposite side walls of the base member, and a pin connection passing through the slots and

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connected at its opposite ends with the respective overlapping side walls of the link adjacent the said one end thereof.

11. In combination with a vertically swinging closure member, a hinge adapted to be mounted on a horizontally disposed surface framing the opening to be closed by the closure member and including a base member of inverted U-shaped cross section, a lever pivoted at one end to one end of the base member and connected with a side edge of the closure member, a link pivotally and slidably connected with the other end of the base member and pivotally connected at its other end with the lever, resilient means housed within said base member, connected between the respective pivotal connection of the lever to the base member and the pivotal and slidable connection of the link to the base member, and which resilient means normally urges the link toward the lever to urge the lever to closure opening position.

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