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H. L. McCLUNG
RELEASABLE HINGE

2,859,470

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2 Sheets-Sheet 1

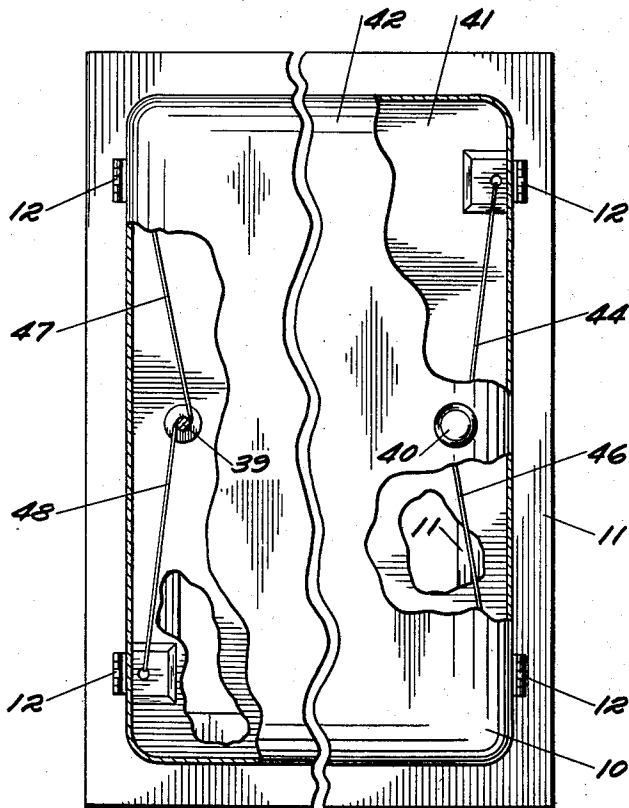


FIG. 1

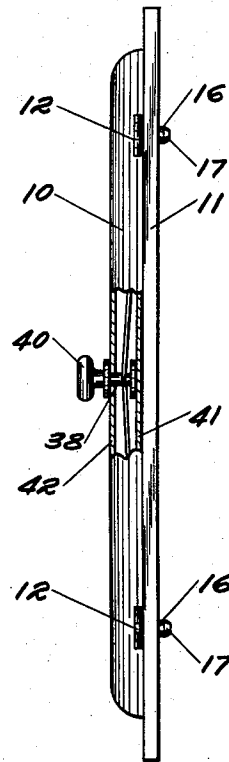


FIG. 2

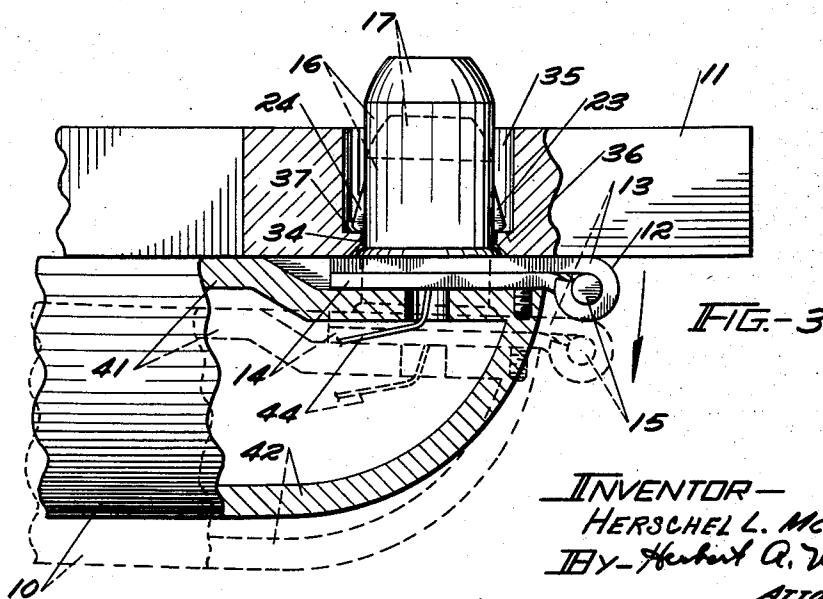


FIG. 3

INVENTOR—
HERSCHEL L. McCLUNG
BY—Herbert Q. Venturi
ATTORNEY

Nov. 11, 1958

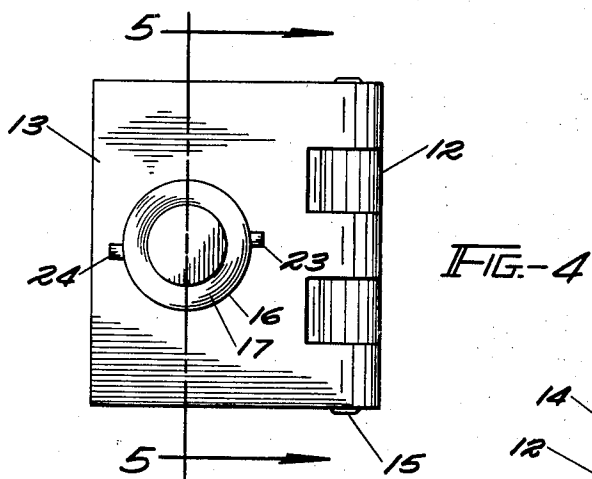
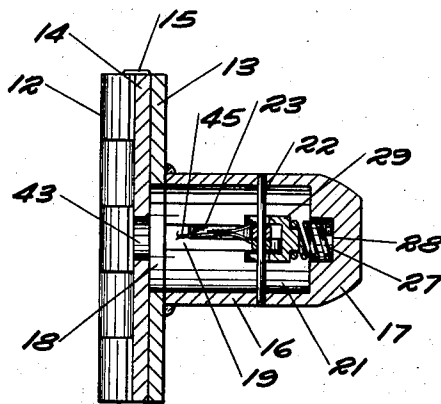
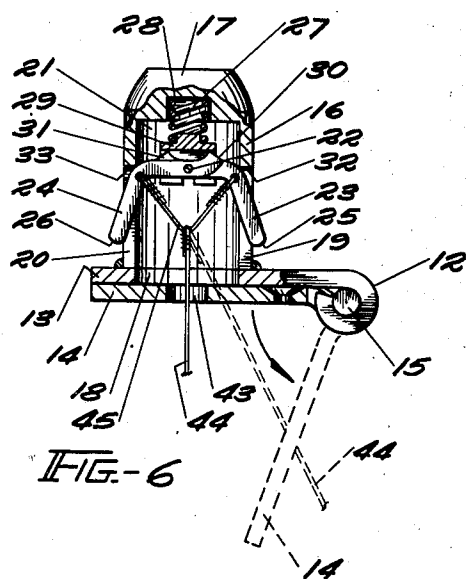
H. L. McCLUNG

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2 Sheets-Sheet 2



INVENTOR—
HERSCHEL L. McCLUNG
BY—Herbert A. McIntire
ATTORNEY

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2,859,470

RELEASABLE HINGE

Herschel L. McClung, Bloomington, Ind.

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4 Claims. (Cl. 16—147)

This invention relates to a hinge construction which may be applied to both right and left hand sides of a door, so that the door may be selectively opened either by swinging on the left hand side or on the right hand side. One particular application of the invention is in the field of refrigerators where locations of the refrigerator may in some instances require the door be opened from the left side, and in other installations be opened from the right hand side.

By employing the invention, but one model of the invention is required, rather than having to have two refrigerators each with a fixed right hand door opening or a fixed left hand door opening.

Many other advantages of the invention exist, including an extremely simple structure which may be not only manufactured but also installed at a relatively low cost, and furthermore which may be extremely durable and operable over long periods of usage.

These and many other objects and advantages of the invention will become apparent in the following description of one particular form of the invention as illustrated in the accompanying drawings, in which

Fig. 1 is a view in front elevation and partial section of a door structure to which the invention is applied;

Fig. 2 is a view in vertical end elevation and partial section;

Fig. 3 is a detail in top plan and section of the end structure;

Fig. 4 is a view in side elevation of the hinge alone;

Fig. 5 is a view in section on the line 5—5 in Fig. 4 and

Fig. 6 is a view in top elevation and section of the hinge shown in Fig. 4.

In a simple application of the invention, there is a door 10 carried by a wall or panel 11 of a stationary nature.

The door 10 is mounted on the panel 11 by use of the present invention, herein shown as employing two of the hinge structures designated generally by the numeral 12, on one side of the door 10, and two of the hinge structures on the other side. All of the hinge structures 12 are identical in all details. They do not have to be made in right or left hand forms.

In the hinge structure 12, there is a pair of leaves 13 and 14 hingedly interconnected by means of the pin 15. These leaves 13 and 14 are preferably formed in relation to the reception of the pin 15 that they will lie face to face in the "closed" condition as illustrated throughout the several views in the drawings.

On the leaf 13, there is fixed a hollow cylindrical post 16 having a tapered nose 17 at an outer end, and opening through a window 18 in the leaf 13. The post 16 is centrally, transversely slotted so as to provide the openings 19 and 20 through the post communicating with the interior bore 21.

A pin 22 extends diametrically across the bore 21 to have its ends fixed in the wall of the post 16. On this pin 22 there is mounted a pair of dogs 23 and 24, which may be made in a number of different forms or

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shapes, herein shown as L-shape. The proportions of the dogs 23 and 24 are such that they may swing on the pin 22 outwardly by lower ends 25 and 26 through the openings 19 and 20 as best indicated in Fig. 6. These dogs 23 and 24 are urged to swing outwardly through those openings 19 and 20 by spring means, herein shown as by a coil spring 27 mounted by one end in a recess 28 in the nose 17 of the post 16, and bearing by the other end against a keeper 29 which straddles the pin 22 and also bears on the inner free ends 30 and 31 of the dogs 23 and 24. Outward swing of these dogs 23 and 24 is limited by reason of their contacting the shoulders 32 and 33 of the openings 19 and 20.

The wall or panel 11 is provided with a post receiving bore 34, opening inwardly of the panel 11 by a counter-bore 35 of large diameter. The hinge structure 12 is located on and fixed to the door 10 in each instance so that the post 16 will be centered axially of the bore 34 when the door is swung from an opposite side and the post 16 approaches the wall 11. It is to be noted that on the "free" side of the door, that is, the side of the door which will be opened, the hinge leaves 13 and 14 will lie in contact one with the other as indicated in Fig. 3, and the post 16 will enter the bore 34, and continue traveling there-through causing the dogs 23 and 24 to be retracted within the post 16 until the ends 25 and 26 of the dogs may spring outwardly over the shoulders 36 and 37 and thus prevent withdrawal of the post 16 from the bore 34 and thereby form a support of the door 10 by the post 16 bearing on the wall of the bore 34; and also, in addition, serve as a latch preventing the opening of the door until the dogs 23 and 24 may be retracted within the post 16. The bearing length of the post 16 in the panel 11 is of course determined by the axial length of the bore 34, and this length may be varied depending upon the location of the extending dog ends 25 and 26 along the post 16. Obviously the post may be made longer, to space the dog ends 25 and 26 a greater distance inwardly of the panel 11, or the dogs 23 and 24 themselves may be shortened.

The hinge structure and the panel structure is identically the same for each end structure employed as above indicated.

In order to release the post from the panel 11, a dog retracting mechanism is employed, and operable by a pair of rotatable shafts 38 and 39, shaft 38 being on the right side of the door 10 and shaft 39 being on the left hand side. These shafts may be rotated by any external device such as a lever, or a knob 40 as herein shown. The door 10 is herein shown as having inner and outer walls 41 and 42 respectively as would be the case in a refrigerator door, although a single wall door may be employed if desired. Each of the hinge leaves 14 is provided with a hole 43 therethrough axially centered on the hole 18 in the leaf 13. A flexible member such as a cable 44 extends from engagement with one of the shafts, such as the shaft 38 through the hole 43 and then divides to extend and be fixed to each of the dogs 23 and 24, the cable 44 either being divided for those connections, or, as is herein shown, engages a separate cable length 45 which interconnects the two dogs 23 and 24. A like cable 46, Fig. 1, extends to the hinge structure 12 on the same side as to which the cable 44 leads to the other hinge structure 12.

Therefore by rotating the knob 40, the cables 44 and 46 are wound about the shaft 38, Fig. 2, and in this manner, the dogs 23 and 24 in both of the hinge structures 12 on the right hand side are retracted so that the door 10 may then be swung outwardly from the panel 11 by hinging on the left hand hinge structures 12. As is indicated in Fig. 6, there is provided sufficient longitudinal travel of the cables 44 and 46 to permit the door 10 to travel in

an opening direction with the leaf 13 remaining stationary and the leaf 14 rocking with the door on the pin 15 without stretching the cables. Sufficient slack is provided in the cross cable 45 as indicated without releasing the dogs 23, 24 under longitudinal travel of the cables 44 and 46 in this opening action. The knob shaft 38 are free to rotate under the pull of the cables 44 and 46 in the opening door travel. Obviously, a sufficient length of the cables 44 and 46 in each instance may have been wound about the respective shaft 38 to provide, by unwinding, the required extra lengths which may be required by the door travel in the absence of sufficient slack in the cross cable 45 without releasing the dogs 23 and 24, at least until the knobs have been turned sufficiently to rewind the cable to effect the release.

As may be readily understood, the reverse hinging of the door 10 may be had by turning the shaft 39 on the left hand side of the door after the hinge structures 12 on the right hand side have been engaged by their respective posts with the panel 11 through their dogs, simply by rotating the shaft 39 and thus, through the cables 47 and 48 interconnecting with the dogs 23 and 24 of the hinge structures 12 retract those dogs so that the posts 16 on that left hand side may be pulled outwardly from the panel 11 to hinge the door then on the right hand hinge structures 12. As has been indicated, the weight of the door 10 is supported on the panel 11 through the bearings of the post 16 on the wall of the bores 34, for such support when the door is closed, and to such support when the door is opened.

In addition to the objects set out above, the invention provides for selective removal of the door 10 from the panel 11 without the necessity of removing hinge pins and the like. By rotating both knobs 40 simultaneously, the cables 44, 46, 47 and 48 are wound about the respective shafts 38 and 39 causing the dogs 23 and 24 in all of the hinge structures to retract within the posts 16. The door 10 may then be completely removed from the panel 11 since the hinge structures 12 are in a disengaged condition.

Thus it is to be seen that I have provided a selective hinging and supporting of a door which may be opened from either the right or left hand sides thereof, or completely removed therefrom, and while I have described the structure of my invention in the one particular form, it is obvious that structural changes may be employed, particularly in the dog releasing means, all without departing from the spirit of the invention, and I therefore do not desire to be limited to the precise form beyond the limitations which may be imposed by the following claims.

I claim:

1. The combination with a frame bounding an opening and a door carried by the frame to close said opening and hinged to swing selectively from opposite sides of the frame, of a plurality of releasable hinge structures, one

at least carried at each side of the door, each comprising a pair of pivotally interconnected leaves, one leaf being fixedly attached to said door; a post fixed to the other of said leaves and extending outwardly, substantially normally therefrom away from said door when the two leaves are swung one toward the other; said frame having a plurality of sockets, each socket receiving therein one of said posts; an annular shoulder within each of said sockets adjacent the entrance therein; each of said posts having an opening in a side thereof; a dog rockably carried by said post and biased to swing laterally from said post, over said shoulder upon entry of the post within the socket occasioned by closing of the door over said frame opening; a shiftable dog release member carried by said door; and a flexible member freely passing through both of said hinge leaves in each instance inter-connecting said dog with said release member; said release member upon being shifted retracting said dog by pull on said flexible member to within said post and from over said shoulder to allow withdrawal of the post from its socket at one side of the door and swinging of the door upon through said hinge leaves at the opposite side of the door.

2. The structure of claim 1 in which said socket has an entry bore of a diameter providing a sliding fit between the bore and the post entering it for vertical support of the door, and said socket is counterbored at the inner end of said bore providing said shoulder at said bore inner end.

3. The combination of a releasable hinge structure intervening between a relatively stationary member and a member swingable therefrom, comprising a pair of hinged together leaves, one of which leaves is fixed to said swingable member; said stationary member having a socket entering therein with an open outer end with a bore entering the socket from said end; a shoulder presented at a position along said bore removed from said end; a post fixed to the other of said leaves and of a diameter entering said socket bore for support by the wall thereof of said swingable member through said leaves and said post; and means engageable with said shoulder and releasably retaining said post within said socket.

4. The structure of claim 3 in which said shoulder engageable means comprises a dog shiftable laterally of the post over said shoulder; and means carried by said swingable member retracting said dog from said shoulder.

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