Aug. 11, 1953 R. J. WILSON 2,648,093

MULTIPLE LEAF CONCEALED HINGE

Filed Aug. 25, 1952 2 Sheets-Sheet 1

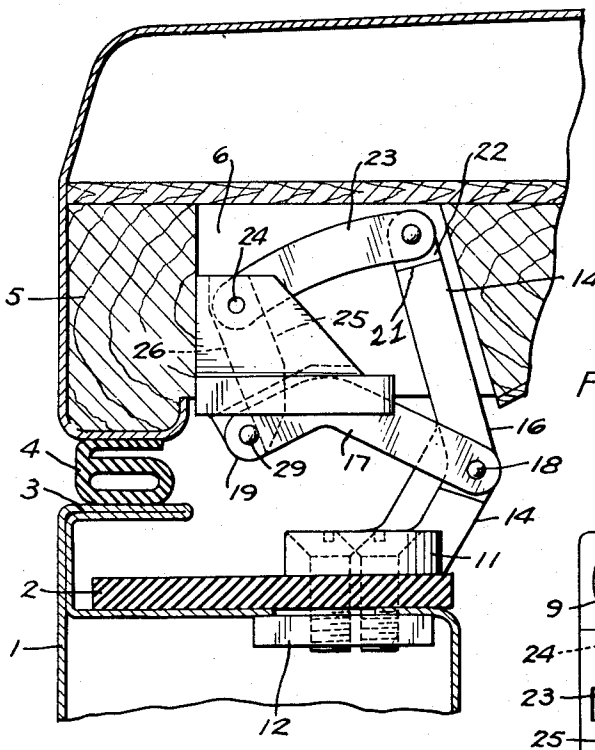

FIG. 1.

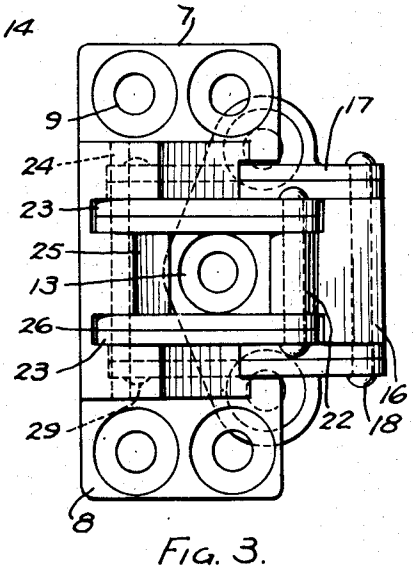

FIG. 3.

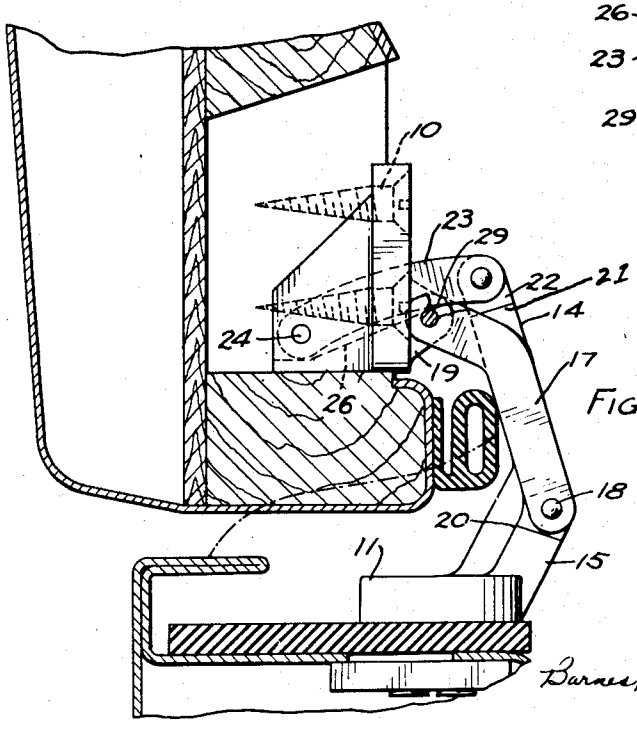

FIG. 2.

INVENTOR.
ROBERT J. WILSON
BY
Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS.

Aug. 11, 1953 R. J. WILSON 2,648,093

MULTIPLE LEAF CONCEALED HINGE

Filed Aug. 25, 1952 2 Sheets-Sheet 2

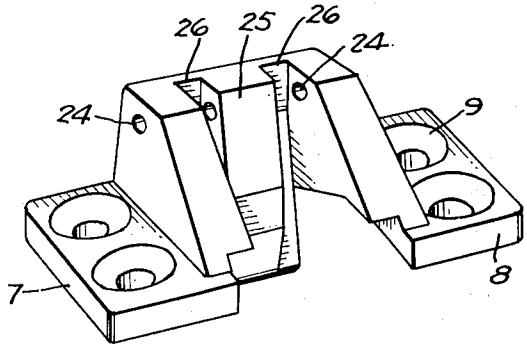

FIG. 4.

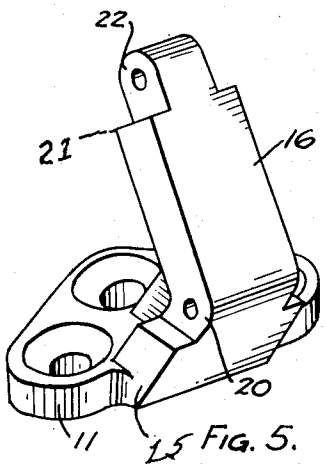

FIG. 5.

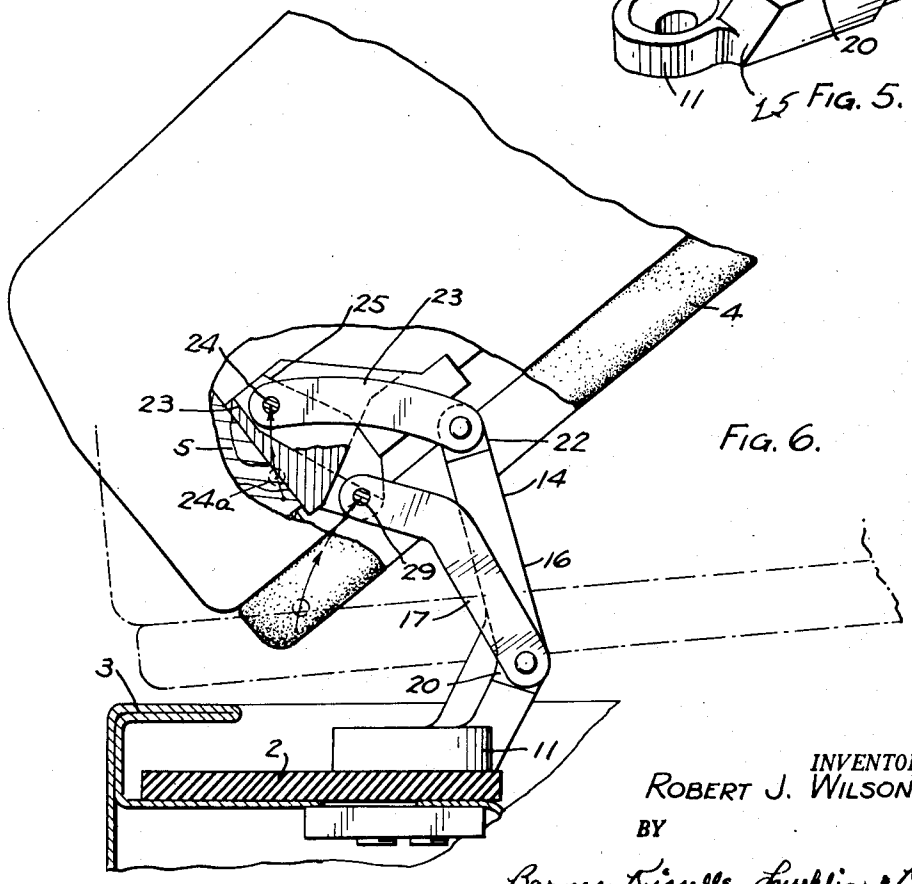

FIG. 6.

INVENTOR.
ROBERT J. WILSON
BY
Barnes, Kisselle, Raisch & Choate
ATTORNEYS.

Patented Aug. 11, 1953 2,648,093

UNITED STATES PATENT OFFICE

2,648,093

MULTIPLE LEAF CONCEALED HINGE

Robert J. Wilson, Detroit, Mich., assignor to Soss Manufacturing Company, Detroit, Mich., a corporation of Maine

Application August 25, 1952, Serial No. 306,094

4 Claims. (Cl. 16—164)

1

This invention relates to concealed hinges, particularly a multiple leaf concealed hinge for a cabinet such as a refrigerator. It is the object of the invention to provide a strong hinge which can be mounted flat on the stationary pillar of the cabinet without cutting into the pillar.

The hinge also acts as a door check to check the opening of the door in the half open or perpendicular position. This is very desirable in kitchens where other furniture may be in the way, or in a deep freeze where it is desirable to stop the lid in the half open or vertical position. Another object of the invention is that as the door is swung open the hinge arms, some of which are arranged to form a toggle, throw over the center line so as to tend to keep the door fully open.

Referring to the drawings:

Fig. 1 is a fragmentary section through a refrigerator taken at the cabinet pillar and the door pillar. The door is in closed position.

Fig. 2 is a similar view showing the door swung open.

Fig. 3 is an elevation of the hinge.

Fig. 4 is a perspective of the door hinge casing.

Fig. 5 is a perspective of the stationary pillar hinge arm and butt.

Fig. 6 is a fragmentary sectional view of the pillar and the hinge with parts broken away.

The stationary pillar of the cabinet is designated 1. This is formed of sheet metal to which is secured a heavy metal face strip 2. The sheet metal is doubled upon itself and projects beyond the face strip 2 of the pillar, then it is turned over and projects integrally to form at 3 a door jamb with which engages the rubber seal 4 which is secured on the door pillar 5. This door pillar 5 is cut away at 6 to form a hinge recess. The hinge butt 11 is fastened to the metal strip 2 of the stationary pillar by means of screws engaging in a nut member 12 on the back of the stationary pillar. There are three of these screws going through the three countersunk screw holes 9 in the butt. This butt 11 has a long outwardly projecting fixed arm 14 with two stepped or inset portions. This arm is widest at its inner portion 15 where it joins the hinge butt 11. It is stepped down to about half width in the portion 16. It is cut away at both top and bottom and in these cut away portions are a pair of links 17 pivoted at 18 to the narrow portion of the fixed arm 14. The links 17 are, at their outer ends, pivoted to the ears 19 that project from the hinge box that is fastened to the door.

These are two of these bowed links 17, each

2

preferably two ply. The outer end of the stationary arm 14 is stepped down or cut away at 21 to form the narrowed end 22 to which are pivoted two links 23 above and below the narrow portion of the end of the stationary arm 14. These links pass into the hinge box and are pivoted at 24 to the top and bottom wall of the hinge box.

Pivotally supported on the two stepped down portions of the stationary arm 14 are what amounts to a pair of parallel links, but these approximately parallel links have in each case a double ply arm above and below the stationary arm. The two offsets and the two thicknesses of the stationary arm are for the purpose of setting these parallel links in different planes so that they can pass each other in the movements that they make in the opening and closing of the door.

The upper plate 7 and the lower plate 8 are fastened by screws 10 passing through the countersunk openings 9 into the portions of the door pillar above and below the cut out recess 6. This large cut out recess accommodates the hinge links 23 and the hinge arm 14 when the door is in closed position, see the position of the parts in Fig. 1. Channels 26 are provided in the hinge box above and below the stop block 25 to accommodate the swinging links 17. When the door opens to a right angular position as shown in Fig. 2 the hinge box carried on the door pillar has turned through 90°, and changes from a position shown in Fig. 1 to a position shown in Fig. 2. It is turned so that now the links 23 are stopped by the bases of the channels 26 and the pivot pin 29 and consequently the door is checked in the perpendicular position. Block 25 spaces the channels 26. The links, when the door is closed as shown in Fig. 1 form roughly a parallelogram though technically a trapezoid because no two of the links are exactly parallel. The general action is the action of a set of parallel arms.

Note, by comparing Figs. 1, 2 and 6 that the door not only swings on pivot 24, but the door moves bodily and carries the pivot 24, see Fig. 6, from its position shown in Fig. 1 to the position shown in Fig. 6 which is quite a little outward from the original position. But then, when the door is swung clear open, pivot 24 returns to the position shown at 24a in Fig. 6 and now lies in substantially the same position that it was when the door was closed as shown in Fig. 1.

This is a very desirable movement for the reason that the door is arrested in the perpen-

dicular or vertical position and it does not project much beyond the side of the cabinet by reason of the compound movement which not only throws the door out, but in the final position pulls the door in so as to get as much space and clearance adjoining the cabinet as possible.

The links **17**, together with the hinge casing attached to the door pillar forms a toggle in which the hinge casing is one arm pivoted on the link **23** as a support, and the links **17** pivoted at **29** to the casing are the other arm of the toggle. The knee of the toggle is at the pivot **29**. When the door is closed as shown in Fig. 1, the knee of the toggle is below a straight line between the two ends **18** and **24** of the toggle, and the door tends to keep closed, especially if a spring should be added to stress the hinge arms. When the door is in the position shown in Fig. 6, the hinge arms of the toggle are just ready to pass the center line of the toggle. And, when the door is in the position shown in Fig. 2, the toggle arms have passed the center line and are broken upwardly.

What I claim is:

1. A concealed hinge for a cabinet or other article having in combination a hinge butt for attachment to the face of a stationary pillar of a cabinet, provided with an outwardly extending long stationary arm having insets or step-downs therein to diminish the thickness of the hinge arm first beginning near the hinge butt and secondly at the free end of the stationary arm, a hinge casing with upper and lower plates for attachment to the pillar of a swinging door and below a recess provided in the door pillar, the hinge casing having a box portion at the middle fitted into said recess with outwardly projecting ears, one at its top and one at its bottom, and provided with a pair of clearance channels, a

pair of links pivotally connected to the first narrowed section of the stationary arm at a point adjacent the hinge butt, and with said ears, one link being above the stationary arm and the other below the stationary arm, and links connecting the free end of the stationary arm in the second inset and step-down with the center stop block, one link above and the other below the stationary arm, the said links forming roughly a parallelogram set of links for swinging the door and also moving the door bodily so that when the door is swung out to perpendicular position the jamb face of the door is swung in and the door is stopped in perpendicular position by means of the second mentioned links butting against the channel bottoms.

2. The combination claimed in claim 1 in which each one of these links is made up of two strips or plies.

3. The combination claimed in claim 1 in which the hinge casing is a die casting.

4. The combination claimed in claim 1 in which the hinge casing pivots on the second mentioned pair of links and this casing together with the first mentioned pair of links pivoted to the fixed arm adjacent the hinge butt form toggles which swing over lines through the ends of the respective toggles in opening and closing of the door to tend to keep the door in open or closed position.

ROBERT J. WILSON.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,078,786	Hanba et al.	Nov. 18, 1913
1,941,529	Bates	Jan. 2, 1934
2,164,757	Soss	July 4, 1939