March 3, 1953 R. E. SLOPA 2,629,893

YIELDABLE ADJUSTABLE HINGE

Filed June 3, 1950

Fig. 1.

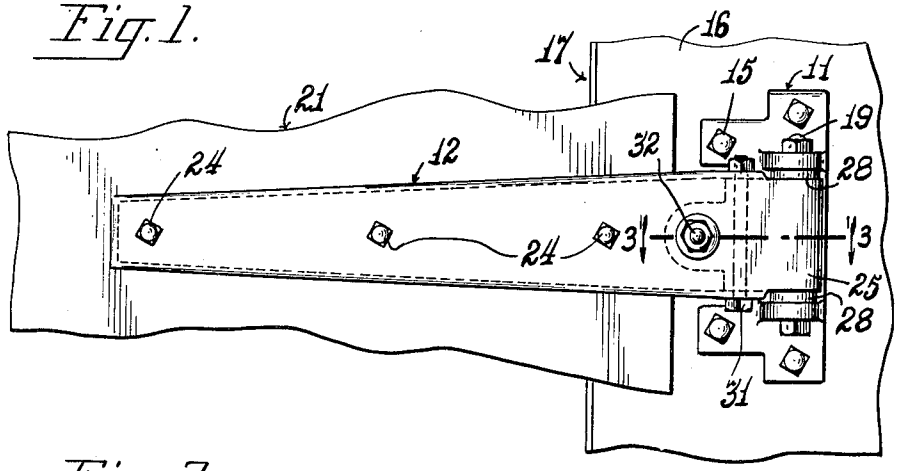
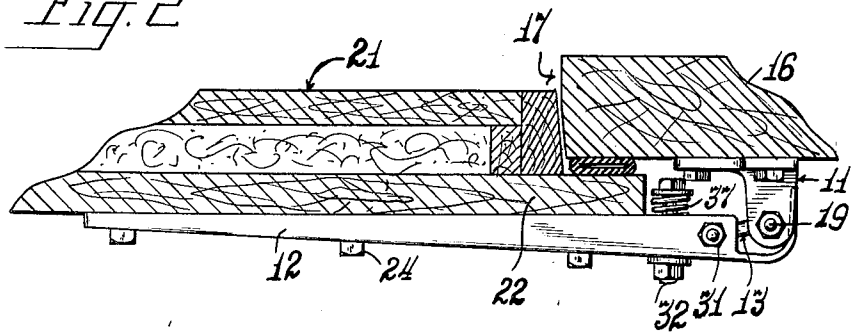


Fig. 2



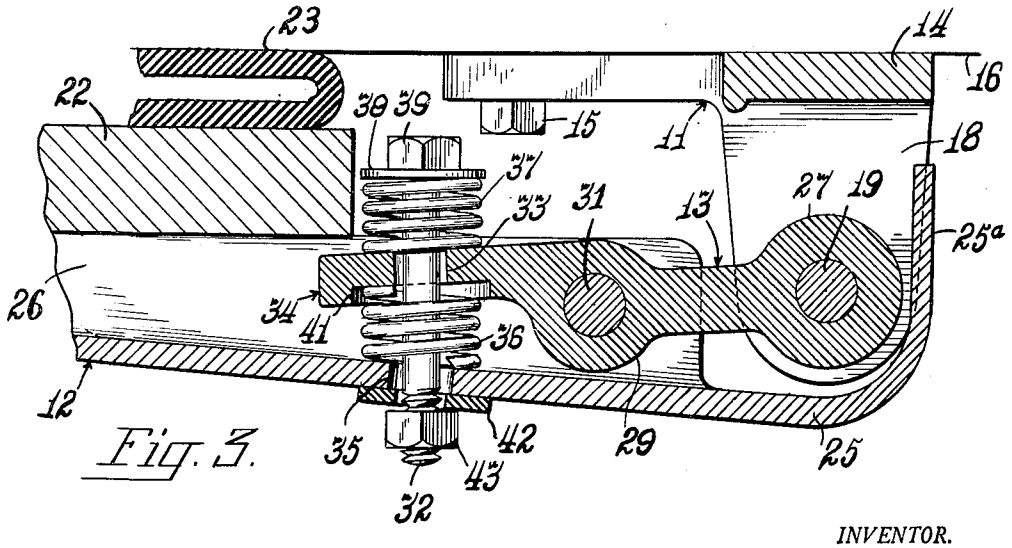


Fig. 3.

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Patented Mar. 3, 1953 2,629,893

UNITED STATES PATENT OFFICE

2,629,893

YIELDABLE ADJUSTABLE HINGE

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Application June 3, 1950, Serial No. 166,017

1 Claim. (Cl. 16—131)

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The invention relates to improvements in the construction of an adjustable spring hinge, and is particularly concerned with the structure and function of a ruggedly constructed shock-proof hinge for use on refrigerator chamber doors and the like.

The hinge structure disclosed herein is of the type shown in my copending application Ser. No. 17,199, filed March 26, 1948, which matured February 19, 1952, as Patent No. 2,586,573, and application Ser. No. 69,299, filed January 5, 1949. The present structure distinguishes over the structures disclosed in the applications aforesaid by the inclusion of a normally concealed link which is pivotally secured at one of its ends and intermediate its length so as to present a free end portion or arm which is yieldably and adjustably connected to the hinge leaf. Although the yieldable adjustable means is concealed when the door is in its closed position, ready access may be gained to such means for part replacement when the door is in its open position. It is, therefore, an object of the present invention to provide a novel free swinging yieldable spring hinge structure adapted to compensate for any strain upon a refrigerator door supported thereby owing to icing or other conditions which may prevent full closing and sealing.

Another object is to provide a rugged novelly constructed yieldable spring hinge structure with novel means to insure a tight sealing contact between the refrigerator door and the door frame in which it is mounted.

Another object is to provide a hinge structure for a refrigerator chamber door with means to compensate for gasket wear and accumulation of ice around the opening to be sealed by said door.

Another object is to provide a hinge structure of the character described with yieldable means to permit and to compensate for relative movement between related parts resulting from unusual pressure resisting opening and closing of a door supported thereby.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed claim.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claim which follows.

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In the drawings:

Fig. 1 is a front elevational view of a mounted, yieldable spring hinge embodying the present invention.

Fig. 2 is a horizontal plan view of the hinge, showing portions of the enclosure wall and door in section.

Fig. 3 is an enlarged fragmentary sectional detail view, taken substantially on line 3—3 of Fig. 1.

Referring to the accompanying drawings, the hinge assembly illustrated includes a mounting bracket 11, a hinge leaf 12 and a connecting link 13. Although only one hinge assembly and but a fragment of a door frame and a door are illustrated, it should be understood that two or more hinge assemblies may be used depending upon the size of the installation. The bracket 11 preferably is fabricated by casting and it includes a mounting plate 14 suitably apertured to receive lag bolts 15 constituting means by which the mounting bracket is firmly secured to the face of a wall or door frame 16 surrounding a door opening 17. The bracket 11 has a pair of spaced integral ears 18 having aligned apertures to receive therethrough a pintle bolt 19.

The door opening 17 is adapted to be closed by a door 21 having on its marginal edges an overhanging flange 22 carrying on its under face a sealing gasket 23. When the door is in closed position, the flange 22 overlies the marginal area of the door frame 16 with the gasket 23 firmly compressed between the flange 22 and side frame 16 to thereby provide a hermetic seal around the door opening.

The hinge leaf 12 is secured firmly to the outside face of the door 21, as by means of lag bolts 24, with an end portion 25 of said hinge leaf extending beyond the hinged edge of the door 21. The hinge leaf preferably is substantially U-shaped in transverse section and tapers longitudinally and it includes side walls 26, the free edges of which rest firmly upon the face of the door 21. Upon referring to Fig. 3, it will be noted that the projecting end portion 25 of the hinge leaf 12 overlies an area between ears 18 of bracket 11 and that it includes a tail portion 25a which extends rearwardly substantially at right angles to the main body portion for a purpose to be understood presently.

The bracket 11 and the hinge leaf 12 are connected together by the heavy link 13 which, as is best shown in Fig. 3, is provided on one end with a transverse bearing portion 27 of a length corresponding substantially to the distance be-

tween the spaced apart ears 18. This link end is fitted between the ears 18 and receives the bolt 19 therethrough to afford a loose hinge connection between the link end and the mounting bracket 11. If desired, anti-friction bearings 28 of any conventional construction may be installed on the pintle bolt 19, one inwardly of each ear 18.

A tubular bearing portion 29 is formed in the intermediate area of the link 13. This bearing portion 29 is apertured to receive therethrough a pintle pin 31 which extends through aligned apertures in the hinge leaf side walls 26 so as to provide a loose hinge connection between the intermediate portion of the link and the hinge leaf 12.

Free movement between the link 13 and hinge leaf 12 is prevented in the present construction by the provision of suitable means connecting said members. Again referring to Fig. 3, such means includes a tie bolt 32 which extends freely through a hole 33 in the free end or arm 34 of the link 13. The bolt also extends through a corresponding hole 35 in the overlying wall of the hinge leaf 12. Compression springs 36 and 37 are suitably mounted on the tie bolt 32, one on either side of the link arm 34. As illustrated, the spring 36 is arranged between one face of the arm 34 and a washer 38 is carried beneath the bolt head 39. The other spring 36 is interposed between the opposed ends of the link arm 34 and the inside face of the hinge leaf 12. If desired, one or both faces of the arm 34 may be recessed, as illustrated at 41, to receive the related end portions of the spring 36 and 37. A washer 42 and nut 43 are arranged on the projecting threaded end of the tie bolt 32 to afford means whereby tension of the springs 36 and 37 may be increased or decreased to suit various requirements of use.

The hinge assembly described hereinabove is such that any obstruction present on the door frame of a kind that will interfere with tight sealing contact between said frame and the door gasket 23 is compensated for through the yieldable connection between the hinge leaf 12 and the free end or arm 34 of the link 13. Gasket wear also is compensated for by adjustment of the tension springs 36 and 37. The spring 37 functions to absorb shock arising from any sudden blow applied to the door or to the hinge either while the door is in its open position or in its closed position, thus minimizing the possibilities of hinge breakage.

The spring assembly and link are fully concealed from view by the overlying hinge leaf end portion 25 and tail portion 25*a* while the door is in closed position. Spring tension adjusting may be made from the front of the door by manipulation of the nut 43.

Although an exemplary form of the yieldable spring hinge construction has been shown in detail in the accompanying drawings and described in the foregoing specification, it is to be understood that the novel features thereof may be embodied in hinges constructed other than as shown and that the invention is capable of embodying modifications in its details of construction without departing from the spirit of the invention or the scope of the appended claim.

I claim:

A hinge comprising a bracket to be secured to a door frame, a hinge leaf to be secured to a door, a link underlying a portion of said hinge leaf, a pivot connecting one end of the link to the bracket, a pivot connecting the link between its ends to the hinge leaf, a tie bolt loosely connecting the free end of the link with the hinge leaf, and a pair of compression springs carried about said tie bolt one on each side of the link, said bolt being adjustable so as to increase or decrease the tension of the springs.

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