Dec. 15, 1959 R. W. ATEN 2,917,040

HINGE CLIP

Filed Aug. 16, 1954

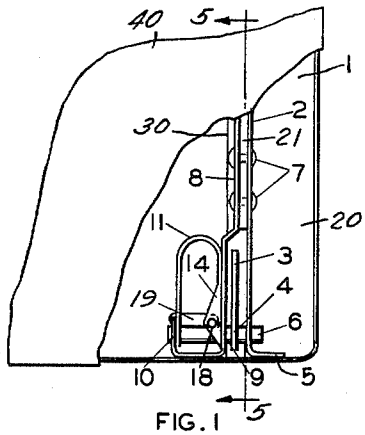


FIG. 1

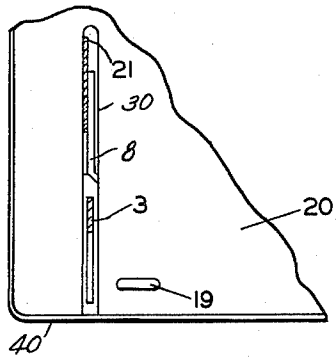


FIG. 2

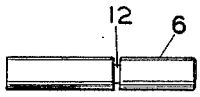


FIG. 3

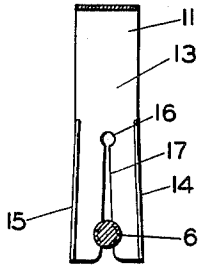


FIG. 4

FIG. 5

FIG. 6

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United States Patent Office 2,917,040 Patented Dec. 15, 1959

2,917,040

HINGE CLIP

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Application August 16, 1954, Serial No. 450,053

6 Claims. (Cl. 126—194)

The present invention relates to hinge structures and to the combination of a hinge structure and a door and more particularly to an improved hinge structure for the oven doors of ranges by means of which the door may be easily and quickly mounted upon or removed from the range.

In doors for appliances and more particularly for the oven of ranges, it is desirable to provide a hinge structure by means of which the door may be readily mounted upon the range and quickly removed therefrom at desired intervals to provide access to the oven or to adjustable brackets arranged within the range which have a portion extending through an opening in the inner wall of the door and upon which the door is pivotally mounted. It is particularly desirable that the mounting be such that the door may be assembled apart from the range and quickly connected to the range without disassembly.

It is an object of the present invention to provide a hinge structure for doors and particularly for the doors of the oven of a range in which improved means are provided for pivotally mounting the door on the range including means for resiliently maintaining the pivoting means in place.

Another object of the invention is to provide an improved hinge structure for pivotally mounting a door upon a bracket in which resilient means are provided which may be actuated in one direction to remove the pivoting means from a bracket on which the door is mounted and in which the pivoting means may be first retracted and then released to enable the door to be again mounted on the bracket.

A further object of the invention is to provide the combination of a door with an improved hinge structure including a bracket upon which the door is pivotally mounted and in which resilient means are provided for maintaining the pivoting means in place when the door is mounted on the bracket and in which the door is provided with a slot through which an instrument may be inserted to engage the resilient means to move the pivoting means in one direction against the force of the resilient means so that the door may be removed from the bracket and in which the door may be again mounted upon the bracket when the door is installed in place and the force upon the resilient means is released.

The invention will be better understood by reference to the accompanying drawings in which:

Fig. 1 is a front elevational view of the hinge structure with the outer cover of the door removed and showing one of the side frames and the inner wall of the door, parts of which are broken away;

Fig. 2 is a rear elevational view of the inner wall of the door with parts broken away, and the horn-shaped portion of the bracket for supporting the door being shown partly in cross section;

Fig. 3 is a side elevational view of the pivot pin utilized in the hinge structure;

Fig. 4 is an enlarged vertical medial cross sectional view of the hinge clip and illustrating the hinge pin in position;

Fig. 5 is a fragmentary sectional view showing the mounting of the oven door on the range housing, the door being shown in section taken along the line 5 . . . 5 in Fig. 1; and

Fig. 6 is a view similar to that shown in Fig. 1 with the pivot pin shown in its retracted position to enable the oven door to be assembled upon or removed from a bracket secured to the range.

While the improved hinge structure of the present invention is of general application and may be utilized in connection with door structures of any desired type in which the door is pivotally mounted on brackets, for purposes of illustration, it is shown associated with the door of an oven for ranges which door is designated generally by the numeral 1 and which is provided with a pair of side frames 2 arranged within the door, only one of which is shown. In pivotally mounting oven doors on ranges, it is the practice at the present time to provide a pair of brackets which are usually arranged within and secured to the front wall of the range and which are preferably adjustably mounted in place as shown more particularly in Serial No. 449,932, filed on even date herewith, now Patent No. 2,823,663.

As illustrated in the copending application to which reference has been made and as shown in the present drawings, a bracket 25 is provided having a horn-shaped portion 3 which extends through an opening 30 in the rear wall 20 of the door and terminates in a downwardly extending portion 4 having an aperture therein and, in accordance with the present invention, an improved hinge structure is provided for pivotally mounting the oven doors in place which pivoting means may be easily withdrawn from the aperture in the bracket when it is desired to remove the door from the range. The bracket 25 is suitably secured to the inner face of the front wall 31 of the range housing, as shown in Fig. 5 herein and more particularly described in the copending application referred to.

In addition to its back wall 20, the oven door has an outer or front wall 40 spaced from the back wall and having edge flanges which extend across corresponding edge flanges on the back wall 20. This hollow, unitary construction of the oven door is conventional.

In ranges as usually constructed, a pair of brackets is provided, one of which is pivotally connected to one side and the other of which is pivotally connected to the other side of the door of the range. The hinge structure associated with one bracket, however, is similar to the hinge structure associated with the other bracket and consequently only one of the hinge structures is shown. It may be stated, however, that if the door is provided with only a single pivoting means, a single bracket and one hinge structure may be sufficient.

As shown in Fig. 1 of the drawings, the frame 2 of the door is provided with an outwardly extending flange 5 which may be secured to the door by suitable means, such as welding, and is also provided with an aperture adjacent its lower end through which a pivot pin 6 is adapted to extend when the door is mounted upon the bracket 25. Secured to the frame 2 of the door by suitable means, such as rivets 7, is a support 8 which is inclined inwardly relative to the neck portion 3 of the bracket 25 and then extends downwardly and terminates in a substantially U-shaped bottom portion providing spaced arms 9 and 10, each of which is provided with an aperture which apertures are in alignment with each other and the aperture in frame 2 and also with the aperture in the downwardly extending portion 4 of the bracket 25 when the door is mounted upon the bracket.

In accordance with the present invention, resilient means, such as a leaf spring **11** is provided which is associated with the support **8** and the pivot pin **6** in such a manner that the pivot pin may be easily and quickly retracted or withdrawn from the aperture in the lower end portion **4** of the bracket **25** and the aperture in frame **2**. As shown, the pivot pin **6** is provided with a circular groove **12** intermediate its ends which groove is arranged adjacent to the arm **9** of support **8** when the pivot pin is in its operative position. The leaf spring **11** is of a substantially inverted U-shape, one of the legs of which is provided with an aperture to receive the pivot pin **6**. The other leg **13** of the leaf spring is provided with inwardly extending flanges **14** and **15**, Fig. 4, which stiffen the spring at this point and are provided with aligned apertures **18**, Fig. 1, arranged adjacent pin **6** when the door is pivotally mounted on the brackets. The leg **13** is also provided with a central aperture **16** and a slot **17**, which extends to the extremity of the leg. The edges of which slot are cut away to provide a seat for engagement with pin in the groove **12**.

The leg **13** of leaf spring **11** is biased outwardly so that when the door is pivotally mounted on the brackets, it will maintain the pivoting pin in place. In accordance with the present invention, means are provided which are accessible from outside of the inner wall of the door to move the spring leg **13** and hence the pin **6** to the left as shown in Fig. 6 for removing pivot pin **6** from the frame **2** and the horn portion **3** of the bracket **25**. For this purpose, the aligned apertures **18** provided in flanges **14** and **15** are opposite to a slot **19** provided in the inner wall **20** of the door, the slot also being in alignment with the apertures **18** in flanges **14** and **15** of the leaf spring. A pointed instrument, such as a pin, not shown, may be inserted through the slot **19** and into one or the other of the aligned openings **18** to move the leg **13** of the leaf spring toward the left to the position shown in Fig. 6, thereby retracting or withdrawing the pivot pin from the aligned apertures in frame **2** and the lower portion of bracket **25**. The other pivot pin on the opposite side of the door is removed from the frame and the other bracket in a similar manner. Upon release of leg **13** of the leaf spring, it will of course assume the position shown in Fig. 1 and when it is desired to again mount the door upon the brackets, the leg **13** of the leaf spring may again be moved toward the left from the position as shown in Fig. 1, the door may be arranged to receive the horn-shaped portion of bracket **25** at which time the apertures in support **8** and frame **2** may be aligned with the aperture in the downwardly extending portion **4** of the bracket and when the leg **13** of the leaf spring is released, the pin passes through the horn and wall **2** and the door is thus pivotally mounted on the bracket.

As shown in the drawings and more particularly in the copending application to which reference has been made, the plate **21** of a connector is also secured between the frame **2** of the door and the support **8**. Plate **21** extends through the opening in the rear wall **20** of the door and is connected at its lower end to suitable counter balancing springs.

It will thus be seen that I have provided a hinge connection which is very easy and economical to install. It may also be installed quickly and without special tools since an ice pick, nail or similar article may be used to engage with the aperture in the spring. It is also important to note that the door may be completely assembled apart from the range along with the spring device and the final attachment of the door readily made after assembly of the other parts without dismantling the door.

Having thus described the invention it will be appreciated that numerous and extensive departures may be made therefrom without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A hinge structure for pivotally mounting a door on a bracket having an aperture therein, said hinge structure including a support having spaced arms having aligned apertures, a substantially U-shaped leaf spring having spaced first and second legs, the first leg having an aperture in alignment with the apertures in the arms of said support and which engages one of the arms on said support, a pivot pin extending through the aligned apertures in the arms of said support, the aperture in the first leg of the leaf spring, and the aperture in said bracket, said pivot pin having a circular groove therein intermediate its ends and the second leg of said leaf spring having a slot provided with diverging edges which extend into the groove of said pin and the second leg of said spring being movable to withdraw the pivot pin from the aperture in the bracket.

2. In combination, a panel having a transversely protruding support at one side, a bracket, said support and said bracket having aligned apertures at one side of the panel, a hinge pin at said one side of the panel, a U-shaped spring biasing the pin to a position in which it extends through said apertures to provide a pivotal connection of the panel to the bracket, and said panel having an opening opposite to the pin which is elongated substantially parallel to the pin to receive a tool for retracting the pin out of the aperture in the bracket to disconnect the panel from said bracket, said U-shaped spring having spaced legs, one of said legs being connected to the hinge pin and carrying a flange formed with an opening aligned with said opening in the panel.

3. In a hinge structure, the combination of a support having spaced arms provided with aligned apertures, a substantially U-shaped spring mounted between said arms of said support and presenting spaced legs which normally engage the inner sides of the arms of said support, one of said legs on the spring having an aperture aligned with the apertures in said arms of said support, a pin extending slidably through said apertures in said arms of said support and said one leg of the spring, and the other leg of the spring being connected to said pin and normally engaging the inner side of one arm of the support to position the pin extending beyond said one arm of the support, said other leg of the spring being displaceable away from said one arm of the support to retract the pin.

4. The hinge structure of claim 3, wherein said pin is formed with a circumferential groove and said other leg of the spring engages the pin at said groove.

5. The hinge structure of claim 4, wherein said other leg of the spring carries a transverse flange having an aperture.

6. A spring clip for engagement with a grooved hinge pin on an oven door comprising a U-shaped resilient body formed with spaced parallel legs one of said legs being formed with an opening to permit the pin to pass freely therethrough, the other of said legs being slotted from the end into the body to provide separate arms and the inner end of the thus formed slot being enlarged to increase the resiliency of the arms, said arms being formed with seats near their outer ends for engagement with said pin, and flanges on the outer edges of said arms to stiffen the arms from the enlarged part of the slot to their outer ends, one of said flanges being formed with an aperture for operative engagement with a tool.

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