Aug. 18, 1931. A. B. HERMAN 1,819,644

DOOR HINGE CONSTRUCTION FOR STOVES

Filed Oct. 3, 1930 2 Sheets-Sheet 1

Fig. 1.

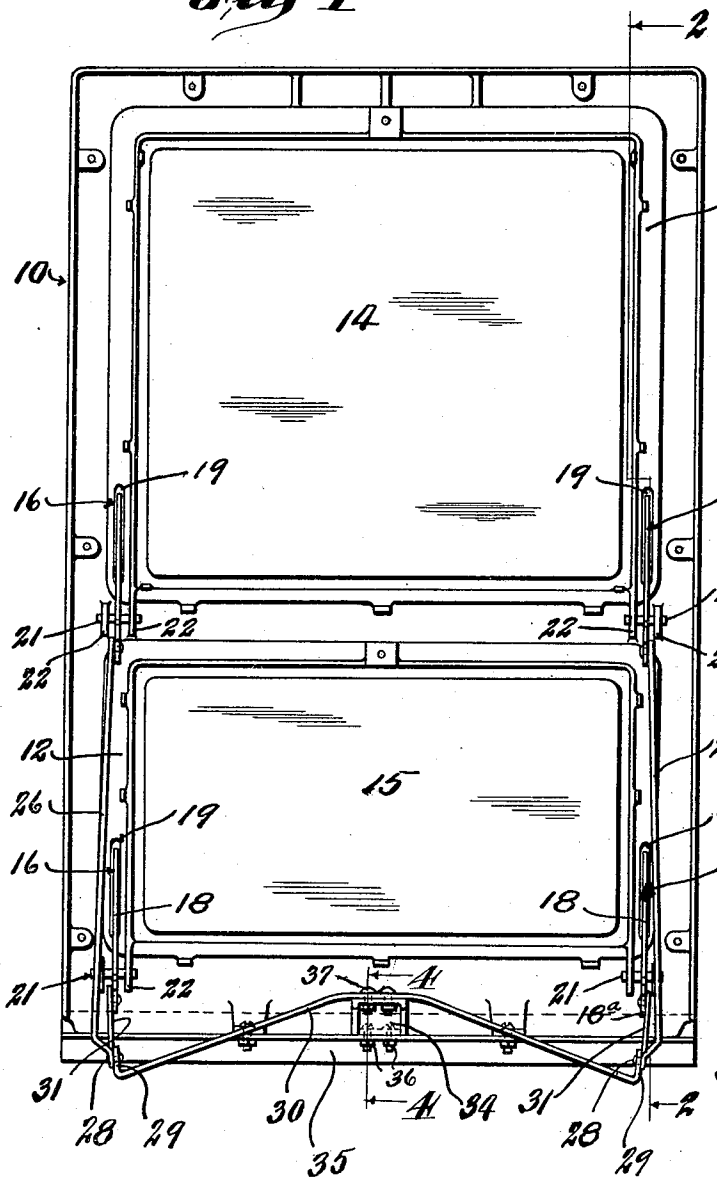
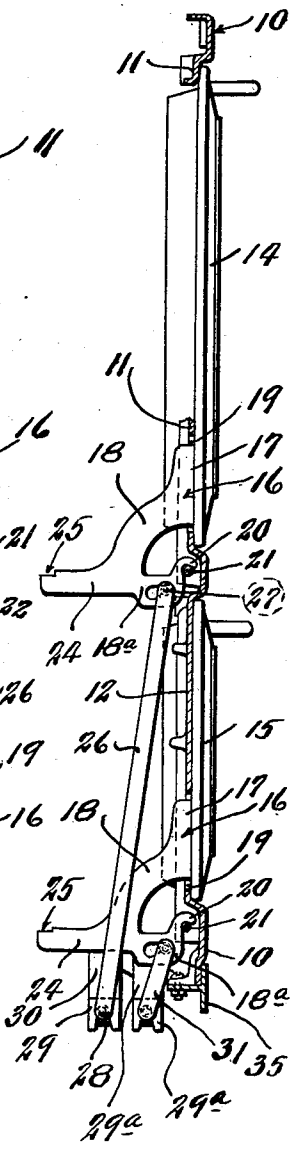


Fig. 2.



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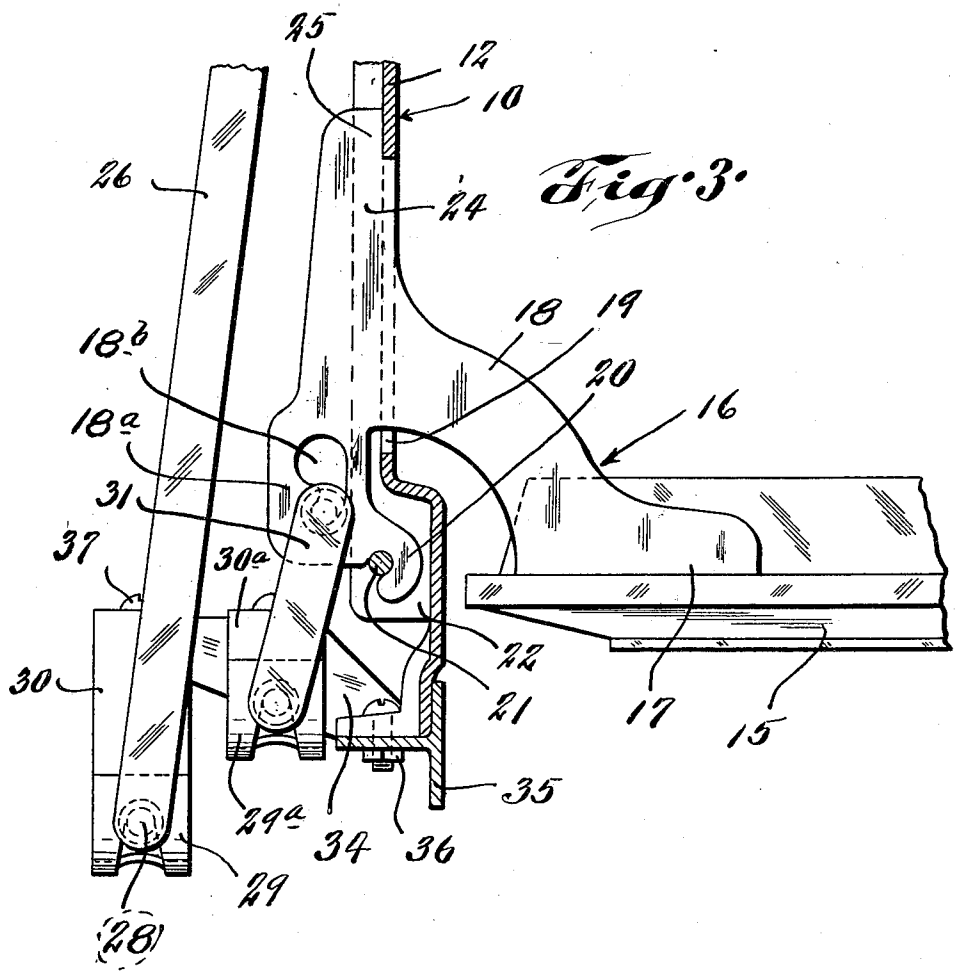
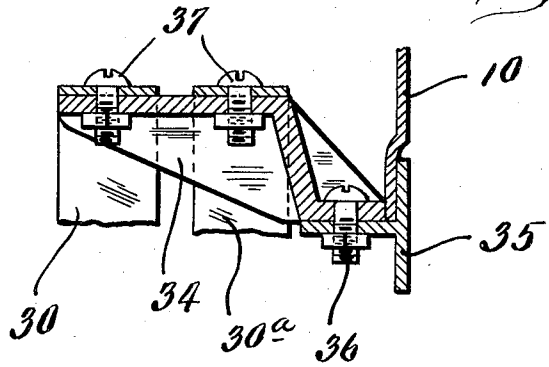


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE

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DOOR HINGE CONSTRUCTION FOR STOVES

Application filed October 3, 1930. Serial No. 486,209.

This invention relates to new and useful improvements in hinge construction for oven doors, the objects of the invention being the provision of a hinge construcion which is of strong and durable construction, noiseless in operation, economical to manufacture, which efficiently counterbalances the door so that the latter is not subject to violent movements during the opening thereof.

Other objects of the invention are to provide a door hinge so constructed that when the door occupies open position the lower edge thereof is spaced a suitable distance from the front wall of the stove.

Further objects of the invention are to provide a stove door hingedly mounted and having a pivotal link connection with the ends of a leaf spring, the pivotal connection of said link with the door being so arranged as to stress said spring when the door is moved into open position, thereby counterbalancing said door in open position.

Still further objects of the invention are to provide a mounting adapted to be secured to the frame of the stove and support a leaf spring at a single point intermediate the ends thereof, the ends of said spring being operatively connected to the hinge member of the door.

With these and other objects in view, my invention consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevational view looking against the inner side of the door panel of the stove.

Figure 2 is a vertical cross section taken on line 2—2 of Figure 1 and showing the doors in elevation.

Figure 3 is an enlarged detail view showing one of the doors in open position.

Figure 4 is an enlarged cross section taken on line 4—4 of Figure 1.

Generally the doors for oven and broiler compartments of cooking stoves are hingedly mounted at their lower ends and when open occupy horizontal positions. It has been customary to use coiled springs for counterbalancing the doors when the latter occupy open positions. This type of counterbalancing means is noisy and cannot be utilized successfully to assist in supporting the door when in open position. Furthermore, the assembling and disassembling of the door is handicapped by virtue of the fact that such springs are placed under tension when operatively connected.

In my invention a leaf spring is supported by the framework of the stove below the lowermost door and the door is connected thereto by means of suitable links, the ends of which have pivotal connections with the hinge of the door and one end of the spring. These links can be readily detached from the hinge member. When the door is in open position said links in combination with the spring reinforce the support for said door and form a noiseless uniformly tensioned means for counterbalancing the door.

Referring by numerals to the accompanying drawings, 10 indicates the front wall of a stove provided with an oven door frame 11 and a broiler door frame 12. An oven door 14 closes the opening formed by the oven door frame and a broiler door 15 closes the lower opening formed by the broiler door frame. The general construction of the door is of usual type and need not be described herein. Each door has secured thereto near each lower corner a bracket 16 consisting of an inward portion 17 and an outer portion 18.

Portion 17 lies against the inner face of the door and is secured thereto in any suitable manner preferably by welding or riveting. Portion 18 extends outwardly at right angle to portion 17 and to the respective door. The door frames 11 and 12 are provided near their lower corners with elongated vertically disposed openings 19 through which said portions 18 extend into the respective compartments.

The lower end of each portion 18 terminates in a hook portion 20 which is adapted to engage a horizontally disposed pin 21 mounted in the wall 10 below the lower corner of each door opening. Hook portion 20 and pins 21 constitute the hinges or axes about which the respective doors operate.

Each pin 21 is mounted in a pair of lugs 22 formed integral with the front wall 10 near the lower corner of each door opening. These lugs project rearwardly from said wall and the pins 21 of each door opening are aligned axially. Preferably each pair of lugs is arranged to each side of bracket portion 18 so that the pin 21 is arranged substantially in vertical plane with portion 17 of the bracket.

Each hook 20 is arranged above the respective pin and partially encircles the same. This hook forms the extremity for the forward projecting portion 18*a* which latter is formed integral with the lower end of portion 18. Arm 24 extends rearwardly from the lower end of said portion 18 and is provided at its end with a shoulder portion 25 which when the door is moved into open position is adapted to engage the upper end of slot 19 and provide a stop for said door. When the door occupies closed position (see Figure 2) said arm 24 and forwardly extending portion 18*a* occupy horizontal positions. When the door occupies open position (see Figure 3) extension 18*a* and arm 24 occupy vertical positions above the respective pins 21. Arms 24 not only form stops for the door but also support the latter in horizontal position, the portions 25 transmitting the stress to which the door is subjected to the frame 10 through the interengagement of the latter above the upper ends of slots 19. Preferably portions 18 are curved concentrically with pin 21 so as to clear the lower end of slots 19. A link 26 is arranged to each side of portion 18 of door 14 and the upper end of each link is provided with a horizontally disposed pin 27 which is pivotally arranged in position 18*a*. Links 26 extend downwardly below the door 15 and the lower ends of said links are provided with horizontally disposed inwardly projecting pins 28 which pivotally engage upwardly turned ends 29 of a leaf spring 30.

Comparatively short links 31 are similarly engaged at their upper ends with portions 18*a* of door 15 and have their lower ends pivotally engaging upwardly turned ends 29*a* of springs 30*a*.

In order to facilitate assembly and disassembly of the parts, pins 27 and 28 are provided with enlarged heads and portions 18*a* are provided with bayonet slots 18*b* which permit the removal of pins 27 through the enlarged ends of said slots. The restricted ends of said slots are preferably arranged adjacent to hook portions 20 so as to help to retain the pins in engaged positions. The upturned ends 29 and 29*a* of the respective springs are provided with slots 32 which open downwardly. The pins 28 are in engagement with said slots and are held to their seats in the upper ends thereof by the tension of said springs.

Springs 30 and 30*a* are arranged in parallel relation with each other below the door 15 and are supported at their centers by a bracket 34 which is secured at one end to the lower member 35 of front wall 10 by suitable fastening devices 36. The other end of said bracket extends rearwardly under said springs and the latter are secured thereto by bolt and nut devices 37. As seen in Figure 1 said springs are bowed upwardly so that the central or fixed portion thereof is considerably higher than the slotted ends of said springs.

When one of the doors is moved into open position the ends of the corresponding spring are moved upwardly against the tension of said spring. Thus the resiliency of the leaf spring is utilized to counterbalance the weight of the door so that the latter is prevented from receiving violent movements. At the same time the slot and pin connection between the links and the parts with which said links are associated permit ready detachment of said links so that the doors can be easily removed from the door frames.

I claim:

1. In a door construction for cooking stoves, the combination with a door frame, of a pair of horizontally disposed pins mounted on the inner side of said frame adjacent to the lower corners thereof, a door for said frame, a bracket secured to each lower corner of the door and projecting rearwardly therefrom, the lower end of each bracket being provided with a forwardly extending portion terminating in a hook pivotally engaging the corresponding pin, and a rearwardly extending arm adapted when the door occupies open position to engage said door frame and form a stop for said door, a link pivotally depending from each hook portion, and a leaf spring supported by said door frame and having its ends pivotally engaged by the lower ends of said links whereby said spring is stressed from its normal position when said door occupies open position, thereby counterbalancing the weight of the latter.

2. In a door construction of the class described, the combination with the front wall of a stove provided with a door opening, of a pair of horizontally disposed pins mounted on the inner side of said wall coaxially with each other and below said door opening, a door for said opening, a bracket secured to said door near each lower corner thereof, each bracket being provided with a rearwardly projecting portion, the lower end of which has a forwardly extending hook portion and a rearwardly extending arm, said hook portion being pivotally mounted on the corresponding pin and said rearward arm being adapted to engage said wall when said door occupies horizontal position, thereby forming

a stop therefor, a link pivotally connected to each hook portion and extending downwardly therefrom, a leaf spring arranged below said door opening parallel with said wall and having its ends pivotally connected to the lower ends of said links, and means for supporting said spring at a point intermediate of the ends of said spring whereby when said door is moved into open position the ends of said spring are flexed upwardly to counterbalance the weight of said door.

3. A door construction of the class described comprising in combination a stove wall provided with a door opening, a door for closing the same, a pair of spaced lugs extending rearwardly from said wall below the lower corner of each opening, a horizontally disposed pin arranged in each pair of lugs, said pins being arranged coaxially with each other, a bracket fixed to said door adjacent to each door corner thereof, each bracket being provided with a rearwardly and downwardly curved extension, the lower end of which terminates in a forwardly extending hook portion and a rearwardly extending arm, said hook portion being pivotally mounted on the corresponding pin and said rearward arm being adapted to engage said wall and form a stop for the door when the latter occupies open position, a horizontally disposed leaf spring arranged below said door opening parallel with said wall, a bracket secured to said wall and supporting said leaf spring at a central point, and means pivotally connected to said brackets and to the ends of said spring whereby when said door is moved into open position the ends of said spring are moved upwardly against the tension of said spring thereby counterbalancing the movement of said door.

4. In a door construction of the class described, the combination of a door frame provided near each lower corner with a vertically disposed slot, a bracket secured to said door adjacent to each lower corner thereof and extending rearwardly therefrom through the corresponding slot, a horizontally disposed pin mounted on said door frame below the lower end of each slot, each bracket being provided with a rearwardly extending portion projecting through said slot and curved downwardly, the lower end of said portion being provided with a forward extension having an upwardly presented hook pivotally engaging the corresponding pin, and a rearward arm adapted when the door occupies open position to engage the upper end of said slot and form a stop for said door, a semi-elliptic spring disposed below said door frame and supported at a central point, and a link pivotally connected at its upper end to said bracket adjacent to and below said pin and pivotally connected at its lower end to the corresponding end of said leaf spring whereby when said door is moved into open position said links are moved upwardly thereby moving the ends of said spring upwardly against the tension of said spring.

5. In a cooking stove construction, the combination with a front wall therefor having a pair of superimposed door openings, of doors therefor, each door being provided near its lower corners with a pair of brackets having portions extending rearwardly through vertically disposed slots formed in said wall, the lower end of each rearward extension being provided with a forwardly presented hook, a pair of coaxially spaced pins arranged below each door opening for engaging the hooks of the corresponding brackets and form pivots for the respective door, a pair of laterally spaced semi-elliptic springs arranged below the lowermost door, a bracket secured to said wall and extending rearwardly therefrom, means for securing the central portions of said springs to said bracket, and links arranged in pairs, the upper ends of each pair being pivotally connected to the rearward extensions of the brackets of each door adjacent to and below the hook portions of said brackets, and the lower ends of each pair of links being pivotally connected to the upturned ends of the respective spring whereby when the door occupies closed position the pivotal connections between the respective pair of links and said brackets is disposed below the hooks of said brackets and when said door occupies open position said pivotal connections are moved upwardly above said hooks, thereby placing the respective spring under tension for counterbalancing the weight of said door.

6. In a stove door construction of the class described, the combination of a stove wall provided with two door openings arranged in a vertical plane, a door pivotally mounted along its lower edge for closing each opening, a pair of leaf springs arranged below the lowermost door opening parallel with said wall, an extension on the inner side of said wall supporting said springs intermediate their ends, a pair of long links pivotally connected at their upper ends to said upper door and at their lower ends to the ends of one of said springs, and a pair of comparatively short links pivotally connected at their upper ends to the lower door and at their lower ends to the ends of the other spring.

In testimony whereof I hereunto affix my signature this 29th day of September, 1930.

ALFRED B. HERMAN.