Nov. 21, 1939. C. F. WILEY 2,180,573

STOVE DOOR ASSEMBLY

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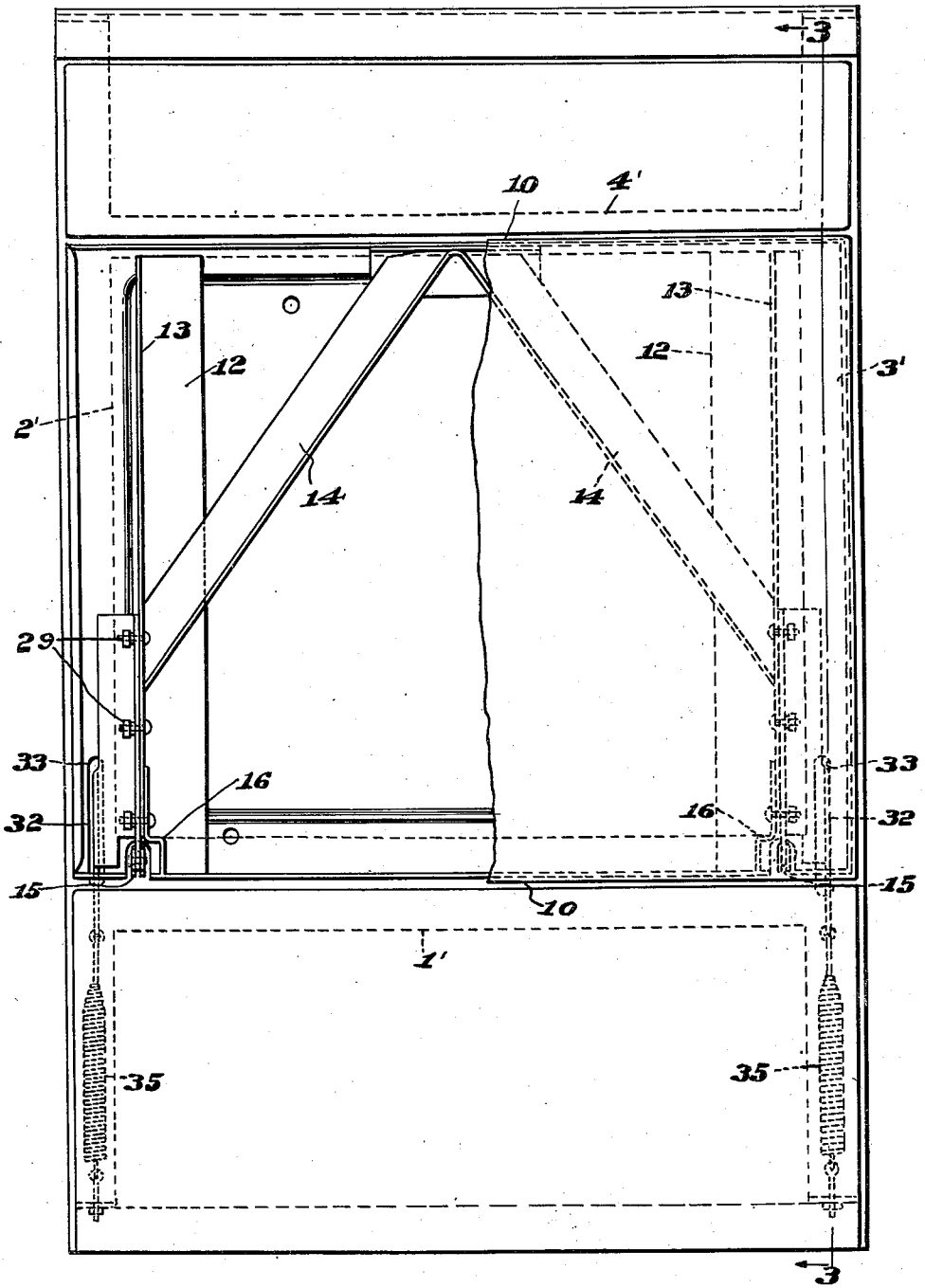


Fig. 1

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Fig. 2

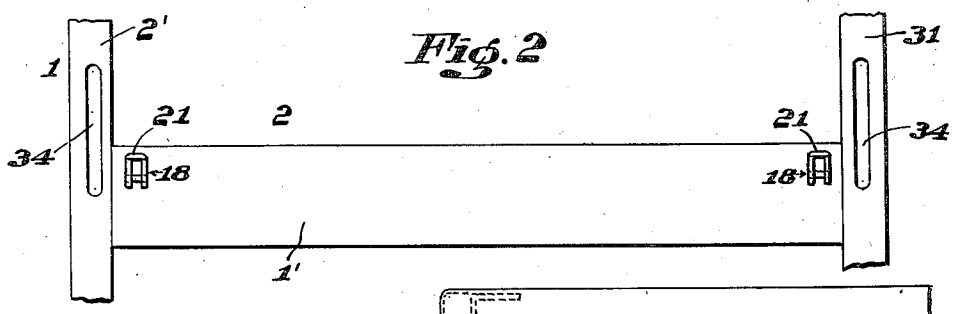


Fig. 3

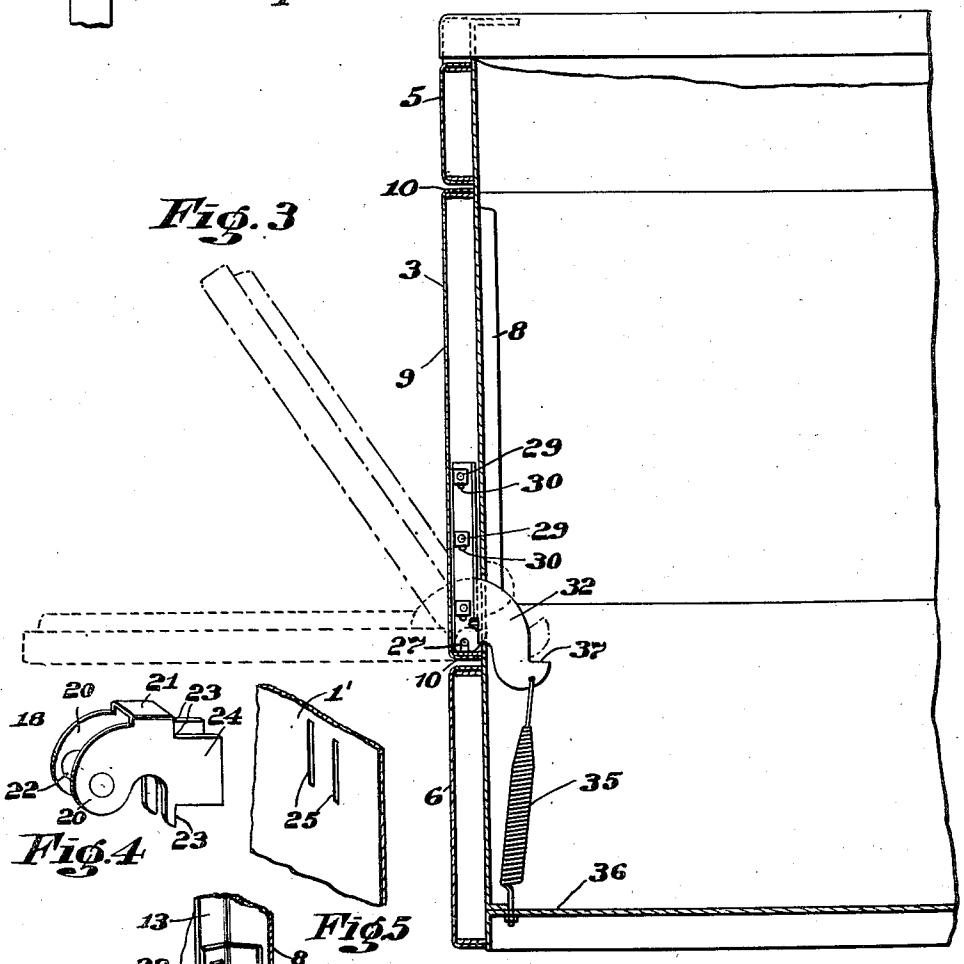


Fig. 4

Fig. 5

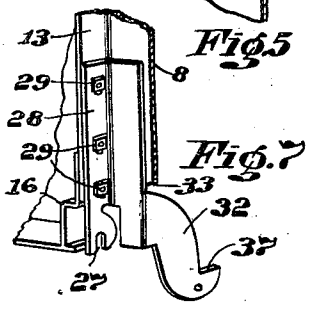


Fig. 7

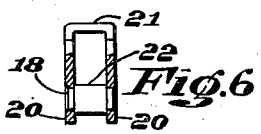


Fig. 6

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STOVE DOOR ASSEMBLY

Clarence F. Wiley, Norton, Mass., assignor to Glenwood Range Company, Taunton, Mass., a corporation of Massachusetts

Application November 4, 1938, Serial No. 238,719

6 Claims. (Cl. 126—191)

The invention relates to a stove door that is hinged and spring controlled, of which the more common type is the well known drop door, and one in which the connections are entirely concealed when the door is closed.

The object of the invention is to simplify, strengthen and generally improve the whole assembly.

The invention can best be seen and understood by reference to the drawings in which—

Fig. 1 is a rear elevation of a door assembly embodying the invention, a portion being broken away to show interior parts.

Fig. 2 is a front elevation of a fragmentary part of the construction shown in Fig. 1.

Fig. 3 is a section on a reduced scale on the line 3—3 of Fig. 1.

Fig. 4 shows in perspective one of the hinge elements attachable to a frame bar of the stove.

Fig. 5 shows in perspective a fragmentary part of the frame bar to which the element shown in Fig. 4 is attached.

Fig. 6 is a front elevation partly in section of the element shown in Fig. 4; and

Fig. 7 shows in perspective one of the hinge elements attachable to the door, and fragmentary parts of the door to which it is attached.

1 represents the frame of the stove having various openings in it including a doorway 2. This doorway is closed by a drop door 3, to the control of which the present invention pertains.

The door is one arranged to close against the frame 1, or rather against the bars 1^1, 2^1, 3^1 and 4^1 that form the part of the frame which surrounds the doorway. Above and below the door are generally arranged panels, of which the panels 5 and 6 are examples. These panels are shown in order to indicate that the edges of the door lie snugly adjacent the edges of the panels, the door and panels cooperating to impart a panelled front to the stove.

The door 3 made of sheet metal has a dished back or lining plate 8, and a panel forming face plate 9. 10 represents the edges of the door formed by overlapping flanges extending from the side edges of the respective plates.

The back 8 of the door is preferably made of relatively heavy metal, and on the inside is reinforced at either side by strips 12, 12. These strips run parallel with the sides of the door, lying inwardly removed from the side edges thereof, and are provided each with an outturned flange 13 which assists in reinforcing the strip and provides, also, support for some of the hinge connections later to be referred to. The strips are welded to the back plate. Further reinforcement of the back plate and applied strips is provided by braces 14, 14 welded to the plate and strips. The bottom edge of the door is cut away at separate points to provide openings 15, 15, and these openings are continued a short distance into the back plate 8. Adjacent these openings the flanges 13, 13 of the strips 12, 12, and also the flanged edge of the plate 8 are reinforced by bent strips 16 which are welded to the flanges and edge of the plate.

The door 3 is hinged directly to the frame of the stove, or rather to the frame bar 1^1 forming the part of the frame at the bottom of the doorway. The hinged connections between the door and frame bar comprise elements secured both to the frame bar and to the door, and these elements are entirely concealed when the door is closed.

18, 18 represent those of the hinge forming elements for the door which are secured to the frame bar 1^1. These elements are alike structurally and each is died out and bent up from a single blank of sheet metal. Each element has curved arms 20, 20 parallelly arranged in spaced relation to each other, and connected by a web 21 common to both. Each set of arms bears a pin 22 passed through them with engagement preferably such that those portions of the pin extending through the arms will be reduced in diameter and headed, on which account the pin will be securely held in place and will assist the web 21 in maintaining a proper spaced relationship between the arms and prevent their separation. Back of the arms 20, 20, and their connecting web, the element has flange forming edges 23 which, in the applied element bear against the face of the frame bar when the element is held in place fixedly secured thereto. The fixing of the element to the frame bar is accomplished by tongues 24, 24 on the element which extend through slits 25, 25 cut through the frame bar 1^1. After passing through these slits the tongues are bent down into engagement with the bar and welded to it.

The elements 18, 18 are mounted upon the frame bar 1^1 in positions which correspond with the openings 15, 15 in the edge of the door in order that the door may fit down over these elements and conceal them when the door is closed. The elements are, also, so precisely disposed as to provide bearings for the hinge elements borne by the door for the pins 22, 22 borne by the arms of the elements on the frame bar 1^1 forming the pivotal bearings for the hinge forming elements carried by the door.

Formed and arranged to engage the pins 22, 22 are the forked ends 27, 27 of bars 28, 28 fixed to the flanges 13, 13 on the strips 12, 12 which reinforce the back plate 8 of the door. These forked ends of the bars are made of a width to fit snugly between the arms 20, 20 of the elements 18 for holding the door in place against lateral displacement. The door pivots, or turns, by the forked ends 27, 27 of the bars 28, 28 turning upon the pins 22, 22, and the forked ends of the bars are applied to the pins simply by a thrust movement. In other words, the door itself is applied to make its pivotal or hinge connection simply by a thrust movement which brings the forked ends of the bars into hinged or pivotal engagement with the pins on which they turn. With the hinged or pivotal connections thus obtained the axis on which the door turns lies within the door between the plates of which it is composed. The axis lies, also, outwardly displaced from the frame bar 1^1 on which the door is mounted to turn, and inset from the bottom edge of the door. As the door turns from a closed to an open position the bottom edge of the door will turn forwardly and upwardly on an arc around the axis of the door. In the mounting of the door it is necessary that the pins 22, 22 on which the door is turning shall be sufficiently spaced from the frame bar 1^1 as to permit of such turning. It is also necessary that the axis of the door should be so positioned with relation to the bottom edge of the door that when the door is closed its bottom edge will not engage the edge of the adjacent panel 6 and will lie properly positioned in relation to it. This end is secured by adjustably securing the bars 28, 28 to the flanges 13, 13, and this adjustable retention is preferably obtained by attaching the bars to the flanges by screws 29 which pass through slots 30 in the bars and thread into the strips. This permits of the bars 28, 28, when the screws are tightened, being secured in any desired properly adjusted position.

Fixed to the door offset from the points of its hinge connections and lying within the angles between the sides of the door and its bottom so as to be aligned with the bars 5 and 6 of the frame, are arms 32 which extend, respectively, through slots 33 in the back plate 8 and slots 34 in the frame bars 2^1 and 3^1. The fixing of these arms to the door is obtained by the attachment of the arms to the bars 28, 28 which are attached to the door as aforesaid. Each of the bars 28, 28 is an angle bar, one section being adjustably attached to the door and the other section bearing against the back plate 8 of the door and it is to this section that the arm 32 is secured preferably by integral connection. In fact each angle bar 28, its forked end 27, and the arm 32 carried by it, are all died out and formed from a single blank.

The arms 32 render through the slots 34 in the frame bars as the door is opened and closed. The arms are downwardly curved arms and turn on an arc substantially co-axial with the axis of the door. Fixed to the ends of the arms are spring connections 35, the ends of which are secured within the stove to the frame bars 36 at the bottom thereof. The arms and spring connections operate to hold the door closed and to return it to a closed position when open. The tension of the springs through the arms operate, also, after the door is hung to maintain the hinge connections between the door and the elements fixed to the frame on which the door is turning by maintaining engagement between the forked ends 27, 27 borne by the door and the pins 22, 22 borne by the frame, for, as previously described, engagement between these parts is initially obtained simply by a thrust movement. The door may be lifted off after disconnecting the springs.

The door is held in a full open position by engagement between the arms 32, 32 and the side bars 2^1 and 3^1 of the frame. As the door is opened the arms 32, 32 will draw through the slots 34, 34 in the frame bars 2^1 and 3^1 until the full opening of the door when edges 37, 37 on the arms will engage the frame bars at points lying above the slots 34, 34 therein, whereupon the door will be maintained in its full open position.

I claim:

1. In a stove having a frame formed with a doorway combination comprising elements fixed to the frame in spaced relation to each other adjacent said doorway and providing an axis outwardly displaced from said frame, a door for said doorway closing against the frame, said door having spaced openings in the edge thereof by which the door may fit over said elements attached to the frame concealing them when the door is closed, elements within the door fixed thereto adapted and arranged to have hinged engagement with said elements fixed to the frame through thrust engagement therewith whereby the door is hung to turn on said axis, and tension means functioning to maintain said hinged engagement of the door and for holding the door closed and for returning it to a closed position when open.

2. In a stove having a frame formed with a doorway the combination comprising elements fixed to the frame in spaced relation to each other, each of said elements including spaced arms and a pin borne by said arms, said pins for the respective elements providing an axis outwardly displaced from said frame, a door for said doorway closing against the frame, said door having spaced openings in the edge thereof by which the door may fit over said elements attached to the frame concealing them when the door is closed, elements within the door fixed thereto having forked ends adapted to fit between the spaced arms of said respective elements fixed to the frame and have engagement with the pins carried by said arms for hingedly hanging said door, and tension means functioning to maintain engagement between said forked ends and said pins and for holding the door closed and for returning it to a closed position when open.

3. In a stove having a frame formed with a doorway the combination comprising elements fixed to the frame in spaced relation to each other adjacent said doorway and including parts providing an axis outwardly displaced from said frame, a door for said doorway closing against the frame, elements within the door fixed thereto adapted and arranged to have hinged engagement with said axial forming parts fixed to the frame whereby the door will pivotally turn thereon and an edge portion of said door overlap and conceal said elements fixed to the frame, and means for adjustably securing thereto said elements fixed to the door, whereby the overlap of the door in relation to said elements fixed to the frame may be adjustably determined.

4. In a stove having a frame formed with a doorway the combination comprising elements fixed to the frame in spaced relation to each other adjacent said doorway and providing an axis outwardly displaced from said frame, a door for said doorway closing against the frame, said

door having spaced openings in the edge thereof by which the door may fit over said elements attached to the frame concealing them when the door is closed, elements within the door fixed thereto adapted and arranged to have hinged engagement with said elements fixed to the frame through thrust engagement therewith whereby the door is hung to turn on said axis, and means for maintaining the hinge forming engagement between said elements when the door is closed or open and during the opening and closure thereof.

5. In a stove having a frame formed with a doorway the combination comprising elements fixed to the frame in spaced relation to each other adjacent said doorway and including pins providing an axis outwardly displaced from said frame, a door for said doorway closing against the frame, said door having spaced openings in the edge thereof by which the door may fit over said elements attached to the frame concealing them when the door is closed, elements within the door fixed thereto and adapted and arranged to have hinged engagement with said pins fixed to the frame through thrust engagement therewith for hingedly hanging said door, and means for maintaining the hinge forming engagement between said elements when the door is closed or open and during the opening and closure thereof.

6. In a stove having a frame formed with a doorway and spaced sets of slits formed in the frame adjacent said doorway, elements attached to the frame at points defined by said slits, each of said elements comprising a bent piece having spaced arms parallelly arranged with tongues at the back extending through said slits in the frame and secured within the frame, and pins borne by said arms, a door for said doorway closing against the frame, said doorway having spaced openings in the edge thereof by which the door may fit over said elements attached to the frame concealing them when the door is closed, elements within the door fixed thereto having forked ends adapted to fit between the spaced arms of said respective elements fixed to the frame and have engagement with the pins carried by said arms for hingedly hanging said door, and means for maintaining the hinge forming engagement between said elements when the door is closed or open and during the opening and closure thereof.

CLARENCE F. WILEY.