This invention relates to removable oven door structures, and has as its principal object the provision of an improved door hinge mounting arrangement whereby the door may be secured for pivotal movement between open and closed positions and also easily released and removed from the oven body.

Further objects and advantages of the invention will become apparent as the following description proceeds, and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

Briefly stated, in accordance with one aspect of this invention there is provided an oven door hinge structure in which supporting members secured to the door are arranged to engage pivotally mounted hinge members secured to the oven body, and to be locked thereto during movement of the door between open and closed positions, but easily removable when the door rests in a partially open position.

For a better understanding of this invention, reference may be made to the following description and the accompanying drawings in which:

Fig. 1 is a side elevation view of a cooking range embodying the present invention.

Fig. 2 is a fragmentary enlarged view of the door hinge structure utilized in the range shown in Fig. 1.

Fig. 3 is similar to Fig. 2 but shows the parts separated, as they appear when the door is held in a half-open position of the door body, one of the parts being broken away to show details of construction.

Fig. 4 is a fragmentary enlarged side elevation view of the range shown in Fig. 1, some of the parts being broken away to show details of construction.

Fig. 5 is a horizontal section through the door of the oven removed from the hinge structure.

Referring to the drawing, the reference numeral 1 designates a range body enclosing an oven 2, having a front opening, an oven door 3 provided with a handle 4 adapted to close the front opening of oven 2, and a hinge lever 5 associated with door 3 so as to move therewith about the pivotal axis of the door hinge mechanism, which is illustrated in detail in Figs. 4 and 5: A spring 6 is connected to range body 1 and to one end of hinge lever 5 so as to apply a force to door 3 biasing the door toward its closed position.

As best shown in Figs. 4 and 5, door 3 is secured to range body 1 by a pair of hinge mechanisms adapted to provide movement between a closed position, a partially open position, and a fully open position. The lower end of hinge lever 5 is adapted to cooperate with a stop member 7 carried on the front end of a leaf spring 8 secured to range body 1 and provided with a roller 9. The lower end of hinge lever 5 includes a concave surface 10, a concave notched portion 11 in which roller 9 is resting in Fig. 4 and which is provided to retain door 3 in its partially open position against the force of spring 6, and a surface 12 on which roller 9 rests when door 3 is in its closed position. It will be observed that when door 3 is in any position between its fully open position and its partially open position spring 6 applies a closing force to the door, while this closing force is neutralized by convex notch 11 when it is in engagement with roller 9, so that door 3 remains in the partially open position shown in Fig. 4.

As shown in Figs. 4 and 5, the hinge mechanism of the present invention includes a fixed hinge member 13 rigidly secured (by means of screws, for example) to range body 1 at the bottom of the front opening of oven 2, and a moveable hinge member 14 pivotally secured to hinge member 13 by means of a hinge pin 15 which extends through pin openings 16 in the side walls of the lower end of member 14. The upper end of hinge lever 5 is fixedly secured to hinge member 14 by any suitable means, such as spot welding or riveting, for example, so that hinge member 14 and lever 5 form a unitary structure arranged to pivot about the axis of hinge pin 15. Hinge member 14 is a hollow elongated box-like member having a wall 17 parallel to the pivotal axis of pin 15 and provided with a rectangular aperture 18 therein, the upper marginal edge of which forms a ledge element 19. As shown in Figs. 2 and 3, hollow box-like hinge member 14 houses a stop element 20 which is secured to one end of a leaf spring 21 supported on the other end of member 14 and arranged to hold stop element 20 in the position shown in Fig. 3. Stop element 20 projects through an opening 20a in member 14 and is adapted to cooperate with a stop formation formed on hinge member 13 so as to retain hinge members 13 and 14 in the position shown in Fig. 5 when the door is removed as shown therein, the stop formation on hinge member 13 being illustrated as an aperture 22 arranged to receive the end of stop element 20.

Door 3 is supported on box-like hinge member 14 by means of a projecting door supporting member 23 rigidly secured to the door and arranged to telescopically engage box-like member 14, and also to displace leaf spring 21 so as to withdraw stop element 20 from opening 20a so that it cannot engage stop formation 22. Door supporting member 23 has the general configuration of a prong and includes a ledge portion 24 located therein so as to be positioned in aperture 18 opposite ledge element 19 when door supporting member 23 and box-like member 14 are in telescopic engagement as shown in Fig. 4. Prong shaped member 23 is provided with convex guide surfaces 25, 26, 27 and 28 arranged to engage the inner surface of box member 14 and support the prong member therein. Referring to Fig. 4, when door 3 is withdrawn upwardly from the position shown, guide surface 25 disengages the rear wall of box member 14, thus permitting the door to be slightly tilted in a clockwise direction with respect to box member 14, so that ledge 24 clears ledge 19 as removal of the door continues.

In considering the operation of the hinge structure of this invention, it will be observed that when the door is in place as shown in Fig. 4 it performs the functions of an ordinary range oven door and may be moved from closed position to fully open position inasmuch as door supporting member 23 is supported in box-like hinge member 14 and retained against accidental removal therefrom by ledge 24 which engages ledge 19 if a force tending to remove the door is applied when the door is moved to or held in any position other than that shown in Fig. 4, since prong 23 cannot be tilted so as to withdraw ledge 24 from aperture 18 when wall 17 of hinge member 14 is pressed against the prong by the door closing force exerted by spring 6. Furthermore when the door is in any position other than that shown in Fig. 4 or the closed position, frictional forces at the points of contact between box member 14 and prong member 23 are produced by opposing rotational forces on these members, and these fric-
3. A door structure in accordance with claim 1 in which said second hinge member includes a hollow elongated box-like member and said door supporting member includes a projecting member adapted to telescopically engage said box-like member.

4. A door structure in accordance with claim 3 in which said stop element is secured to one end of a leaf spring supported within said box-like member so as to project through an opening therein, and said projecting member is arranged to engage said spring and withdraw said stop element from said opening.

5. A door structure in accordance with claim 2 in which said second hinge member includes a hollow elongated box-like member and said door supporting member includes a projecting member adapted to telescopically engage said box-like member.

6. A door structure in accordance with claim 5 in which said box-like member includes a wall parallel to the pivotal axis of said hinge members having a rectangular aperture therein, said first ledge element is formed on a marginal edge of said aperture, and said second ledge element extends outwardly from said projecting member.

7. A door structure in accordance with claim 5 in which said projecting member includes a plurality of convex guide surfaces spaced so that said projecting member may be partially withdrawn from said box-like member and tilted with respect thereto so as to disengage said ledge portions.

8. A door structure for a range oven or the like comprising a body defining the front opening of the oven, an oven door adapted to close said opening, a first hinge member rigidly secured to said body at the bottom edge of said opening, a second hinge member pivotally secured to said first hinge member and adapted to support said door in movement between its closed position and a partially open position and a fully open position, a door supporting member secured to said door and arranged to removably engage said second hinge member, a stop mechanism for preventing accidental removal of the door when it is desired to remove said door, and means for positioning said stop mechanism such that said stop mechanism is engaged when said door is partially opened and tilted with respect thereto so as to disengage said ledge portions.