June 27, 1967 D. G. SMITH 3,327,701

HINGE MECHANISM

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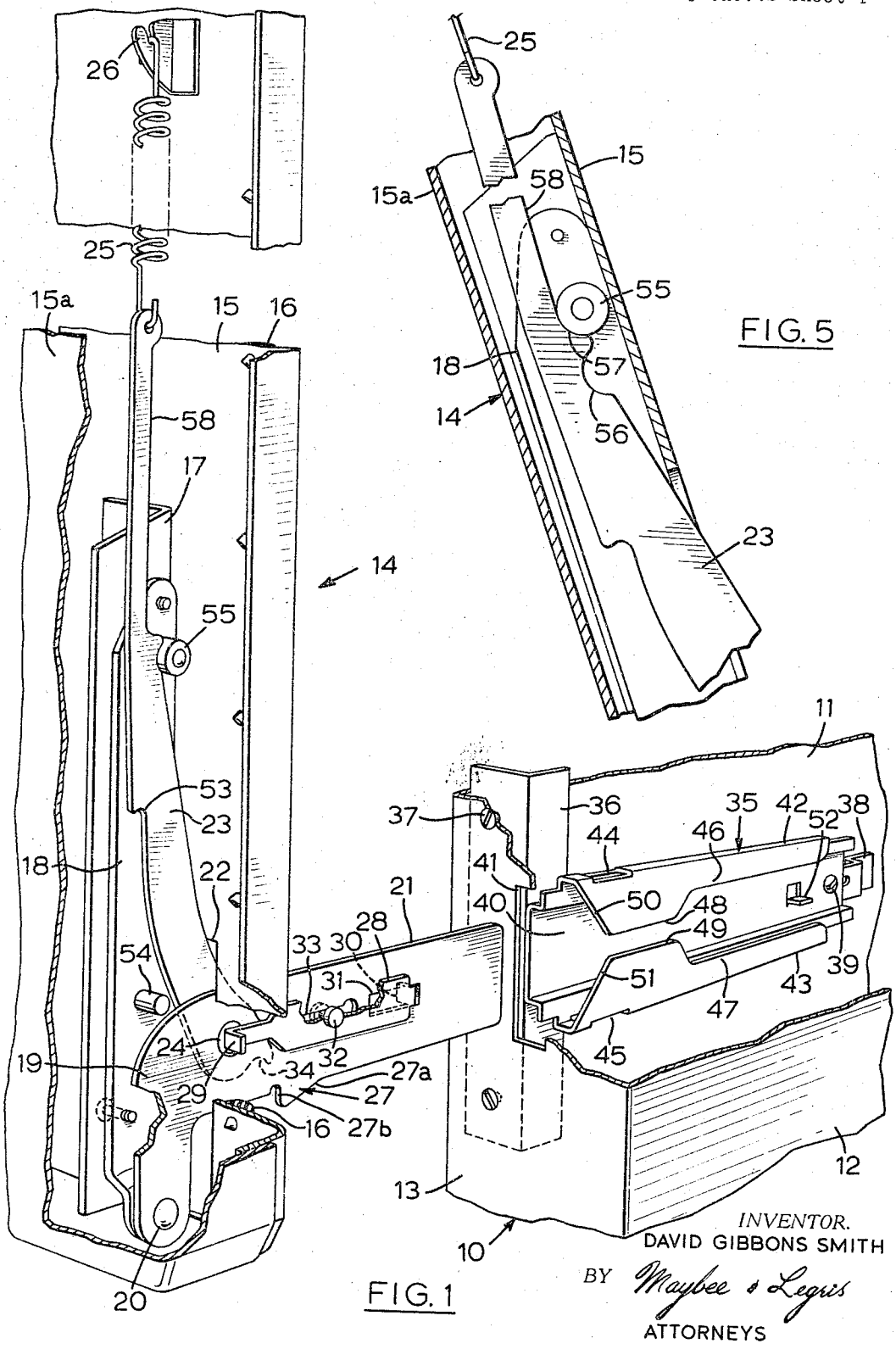


FIG. 1

FIG. 5

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FIG. 4

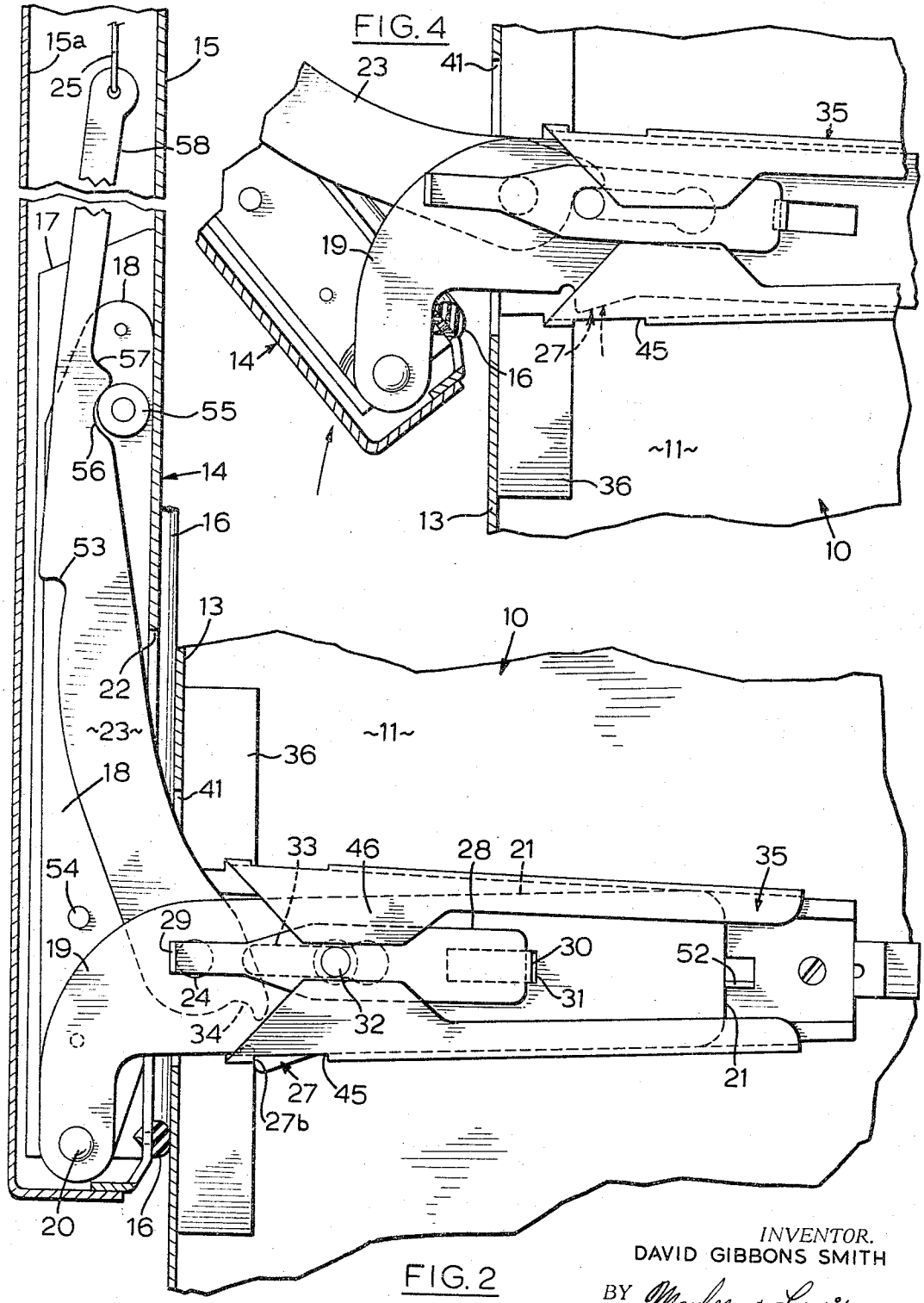


FIG. 2

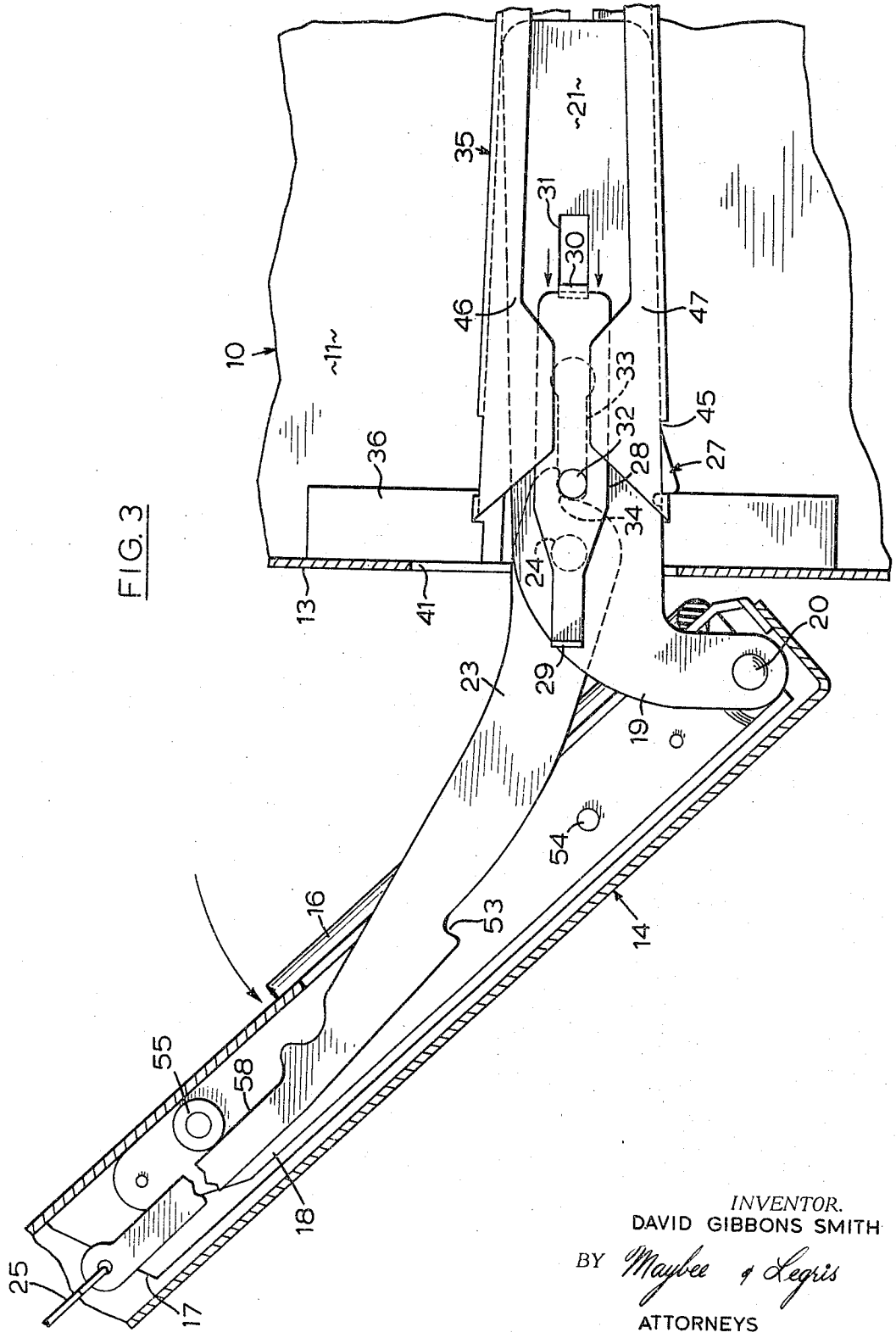
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FIG. 3



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United States Patent Office 3,327,701 Patented June 27, 1967

3,327,701

HINGE MECHANISM

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Filed June 13, 1966, Ser. No. 556,932
7 Claims. (Cl. 126—194)

This invention relates to hinge mechanisms and is particularly concerned with means for providing a releasable hinged connection between a hinged member and a support. The invention constitutes an improvement over the hinge mechanisms described in United States Patent 2,842,117 of July 8, 1958, and United States Patent 3,067,736 of Dec. 11, 1962, issued to the same assignee as the assignee of the present application.

The hinge mechanism of the present invention is particularly suitable for use in cooking stoves for the purpose of supporting the oven door, although other applications of an analogous nature are envisaged. As is well known, the interior of the oven of a cooking stove requires periodic cleaning and the presence of the door, when in the open position, renders the interior of the oven less accessible than might be desired. Accordingly several attempts have been made to provide removable doors so that the interior of the oven in readily accessible for cleaning purposes.

It is an object of the present invention to provide a robust hinge mechanism which is carried by the hinged member and is adapted to constitute a readily releasable connection between the latter and its support.

A hinge mechanism in accordance with the present invention comprises a hinge plate pivotally connected to the hinged member and having a projecting arm which cooperates with and is releasably secured by a retaining socket mounted on the support, the projecting arm carrying a locking abutment adapted to engage a cooperating locking formation in the retaining socket and a manually releasable catch for preventing relative displacement between the locking abutment and the cooperating formation.

In a cooking stove having an oven with a door which is hinged about a horizontal hinge line, as described below, the hinged member will be constituted by the oven door and the support will be the wall of the oven itself.

One preferred embodiment of the invention, as applied to a cooking stove, will now be described by way of example with reference to the accompanying drawings, in which:

FIGURE 1 is a cut-away perspective exploded view of a portion of the oven door and stove body;

FIGURE 2 is a side elevation of the hinge mechanism taken in section through the oven door and stove body, the door being closed and securely mounted on the stove body;

FIGURE 3 is a view similar to FIGURE 2 showing the door partly open and the hinge mechanism immobilized;

FIGURE 4 shows a detail of the hinge mechanism when the hinge mechanism is immobilized and the door is partly disengaged from the stove body; and

FIGURE 5 shows a detail of the hinge mechanism when the door is in the broil position.

Referring now to the drawings and in particular to FIGURE 1, the stove body, which constitutes the support of the present invention and is indicated generally at **10**, comprises a sheet metal structure providing at each side of an oven an inner wall **11**, which forms the inner surface of the oven, an outer wall **12**, which forms the external surface of the stove body, and a front wall **13** which constitutes the peripheral rim of the oven opening. The walls **11**, **12** and **13** are extended to form the top, bottom and back of the oven in the conventional manner and the

hollow space between the walls is filled with heat insulating material.

The door of the oven, which constitutes the hinged member of the present invention and is indicated generally at **14**, comprises a hollow sheet metal structure having an outer sheet metal shell **15***a* and an inner wall **15** which cooperates with the oven opening to close the latter, a peripheral sealing strip **16** of deformable heat resistant material being secured to the wall and being adapted to seal against the front wall **13** of the stove body. The door is stiffened by vertical angle members, such as **17**, secured to the inside of the wall **15** and the interior of the door structure is insulated in accordance with conventional practice.

The door **14** is detachably mountable on the stove body **10** for pivotal movement about a horizontal hinge line with respect to the oven opening. Rigidly secured to the angle member **17** is a vertical bar **18**, to the lower end of which a hinge plate **19** is pivotally connected by a hinge pin **20**, the horizontal hinge line extending through the axes of the pin **20** and a corresponding hinge pin at the opposite edge of the door **14**. The hinge plate **19** lies in a vertical plane, and is of cranked formation, an arm **21** of the hinge plate extending horizontally in a direction transverse to the hinge line and projecting through a slot **22** in the inner wall **15** of the door **14**. A link **23** is pivotally connected at one end to the hinge plate at **24**, and the other end of the link is connected by a coiled tension spring **25** to a fixing member **26** welded to the wall **15** of the door **14**. The arrangement is such as to bias the door in a clockwise direction about the horizontal hinge line, with respect to the hinge plate **19**, thereby biasing the door into its closed position.

The lower edge of the projecting arm **21** is formed with a wedge-shaped locking abutment **27** having a sloping leading edge **27***a* and a vertical rear edge **27***b*, this locking abutment being adapted to engage a cooperating locking formation in the stove body as described hereinafter. Also mounted on the arm **21** is a manually operable sliding carrier plate **28**, one end of which is turned out to provide a finger gripping portion **29** and the other end of which is turned in to provide a guiding abutment **30** which slides in a longitudinal guide slot **31** in the arm **21**. The carrier plate **28** also carries a transverse pin **32** which slides in an elongated slot **33** in the arm **21** aligned with the guide slot **31**. The pin **32**, which constitutes a catch member and is operable in the manner described below, is movable between a first position at which the abutment **30** engages one end of the slot **31** (FIGURE 1) and a second position at which the abutment **30** engages the other end of slot **31**, the slot defining the limits of movement of the catch member. The lower end of the link **23** is formed with a detent **34** which engages the transverse pin **32** or catch member when the latter is in its second position as shown in FIGURE 4.

The arm **21** of the hinge plate **19** is adapted to cooperate with a retaining socket **35** which is rigidly mounted within the side wall of the stove body **10**. The retaining socket **35** comprises a channel-shaped member which is mounted horizontally, one end of the member being welded to a flange of an angle member **36** secured to the front wall **13** of the stove body by bolts **37**, and the other end of the member being secured to a fixing lug **38** which is welded to wall **11** of the stove body. In order to facilitate assembly of the retaining socket during manufacture, the lug **38** is formed with an elongated screw-receiving slot which receives a fixing screw **39**. At its forward end the retaining socket **35** provides an entry aperture **40** in the form of a vertically elongated slot, to receive the arm **21**, the entry aperture being located behind an aperture **41** in the front wall **13** of the stove body.

The channel-shaped member constituting the retaining socket **35** has upper and lower edges **42**, **43** each of which includes an aperture **44**, **45**, herein referred to as a locking aperture, and the mouth of the channel is formed with a pair of opposed vertical flanges **46**, **47**. Each flange provides a horizontal edge **48**, **49**, and is tapered to provide a sloping edge **50**, **51** between the forward end of said horizontal edge and the entry aperture **40**. Towards the rear end of the retaining socket **35** is a stamped out lug or ear **52** constituting an abutment stop for the end of the hinge plate arm **21**.

As will be readily understood the locking aperture **44** serves no useful purpose in the case of the particular retaining socket illustrated, but the symmetrical construction of the retaining socket is convenient in that it enables identical sockets to be used at opposite sides of the stove body.

In order to mount the door **14** on the stove body, the end of the hinge plate arm **21** is inserted through aperture **41** so that it enters the entry aperture **40** of the retaining socket, and is slid home so that the end of the arm engages the abutment stop **52** and the locking abutment **27** drops into the locking aperture **45**. The sliding carrier plate **28** is next operated to bring the pin **32** into engagement with the horizontal lower edge of the vertical flange **46**, against which it abuts so that the arm **21** cannot be lifted and hence the locking abutment **27** cannot be displaced from the locking aperture **45**. The door cannot, therefore, be accidentally detached from the stove body.

In order to release the hinge mechanism from the retaining socket, for the purpose of removing the door **14**, the door must first be opened to provide access to the carrier plate, as shown in FIGURE 3, and the carrier plate is slid outwardly to withdraw the catch member or transverse pin **32** to its second position at which it is disengaged from the lower edge of the flange **46**. In this second position the catch member also engages the detent **34** at the lower end of link **23**, thereby limiting clockwise movement of the latter and immobilizing the hinge mechanism. The door **14** can now be raised as illustrated in FIGURE 4, the locking abutment **27** thus being lifted from the aperture **45**. In this position the hinge mechanism can be readily withdrawn from the retaining member **22**, and the door **14** thereby detached from the stove body.

The outer edge of the link **23** is provided with a hook abutment **53** which engages a fixed stop pin **54** when the door **14** is in its fully opened position and prevents further opening of the door. The stop pin **54** is fixed to the bar **18** rigidly mounted within the door body, and this bar also carries a roller **55** which is adapted to engage with a cam formation on the inner edge of the link **23**. This cam formation includes a first detent or notch **56** which the roller **55** engages when the door is in its closed position as shown in FIGURE 2, and a second detent **57** which the roller **55** engages when the door is in its partly open or broil position as shown in FIGURE 5. When the door is moved towards its fully open position, against the bias of spring **25**, the roller **55** engages a straight portion **58** of the link **23** and the movement of the door is limited only by the engagement of the abutment **53** with the stop pin **54**.

It will be appreciated that although only one hinge has been described and illustrated, in an application to an oven door of a cooking stove as described two hinges would be required, the second hinge being of identical construction to the first and being mounted on the opposite edge of the door.

What I claim as my invention is:

1. Means for detachably mounting a hinged member to a support for pivotal movement about a horizontal hinge line comprising a hinge plate pivotally connected

to the hinged member and extending therefrom in a direction transverse to said hinge line, the hinge plate lying in a substantially vertical plane, a locking abutment projecting from the lower edge of the hinge plate, a movable catch member mounted on the hinge plate, and a retaining socket rigidly mounted on the support for receiving and releasably securing the hinge plate, the retaining socket comprising a horizontally mounted channel-shaped member having upper and lower edges and providing a vertically elongated entry aperture for the hinged blade, said lower edge providing a locking aperture positioned to engage said locking abutment and said upper edge carrying a vertical flange with a horizontal lower edge cooperating with said movable catch member, said catch member being movable between a first position at which it engages the lower edge of said vertical flange whereby to prevent lifting of the locking abutment out of the locking aperture and a second position at which it is disengaged from said lower edge whereby to permit lifting of the locking abutment from the locking aperture and hence removal of the hinged member from the support.

2. Means for detachably mounting a hinged member to a support according to claim **1**, wherein the movable catch member comprises a pin which is carried by a slidable carrier mounted on the hinge plate for longitudinal sliding movement thereon, means being provided for limiting the extent of sliding movement of the carrier on said plate.

3. Means for detachably mounting a hinged member to a support according to claim **2**, wherein the slidable carrier is formed with a first transverse projection accessible for manual operation of the carrier, and a second transverse projection engaging with a longitudinal guide slot in said hinge plate.

4. Means for detachably mounting a hinged member to a support according to claim **1**, wherein the retaining socket includes an abutment stop spaced from the locking aperture by a distance such that the locking abutment engages the locking aperture when the hinge plate abuts against said stop.

5. Means for detachably mounting a hinged member to a support according to claim **1**, wherein said vertical flange is tapered between one end of the horizontal lower edge thereof and said entry aperture.

6. Means for detachably mounting a hinged member to a support according to claim **1**, wherein the hinged member is biased in one direction, relative to the hinge plate, about said hinge line by means comprising a link pivotally connected at one end to the hinge plate and connected at its other end to the hinged member by a tension spring, the link carrying a detent which, when the hinged member is pivotally moved to a predetermined position about said hinge line and the catch member is moved to its disengaged position, cooperates with the catch member so as to maintain the hinged member in said predetermined position against the spring bias.

7. Means according to claim **1**, wherein said lower edge of the channel-shaped member carries an upwardly extending vertical flange opposing the vertical flange carried by said upper edge and said upper edge is provided with a locking aperture, the vertical flanges and locking apertures being symmetrically disposed with respect to a horizontal median plane of the channel-shaped member.

References Cited

UNITED STATES PATENTS

2,780,219	2/1957	Polloch	126—194
3,072,117	1/1963	Stoligrosz	126—191
3,150,658	9/1964	Ferland	126—191

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