Nov. 21, 1933. E. L. WILSON 1,936,124

OVEN, CUPBOARD, AND OTHER SIMILAR APPARATUS

Filed Sept. 12, 1931 2 Sheets-Sheet 1

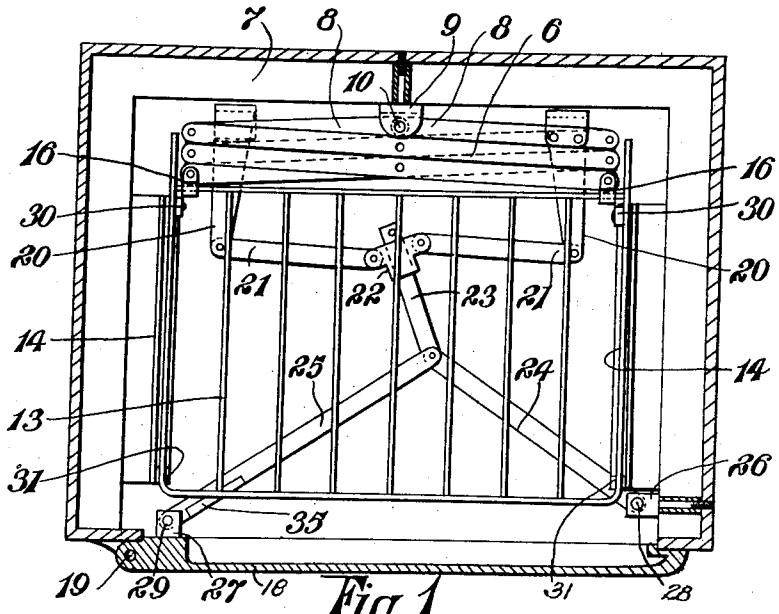


Fig. 1.

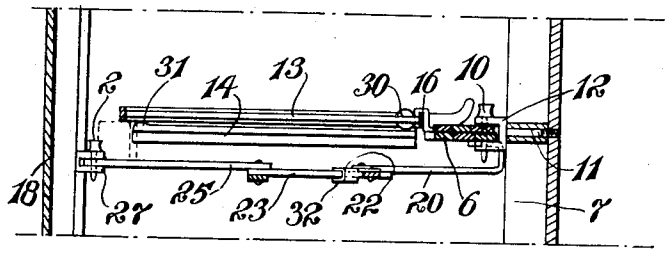


Fig. 4.

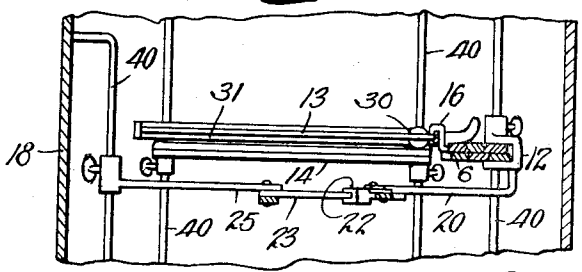


Fig. 5.

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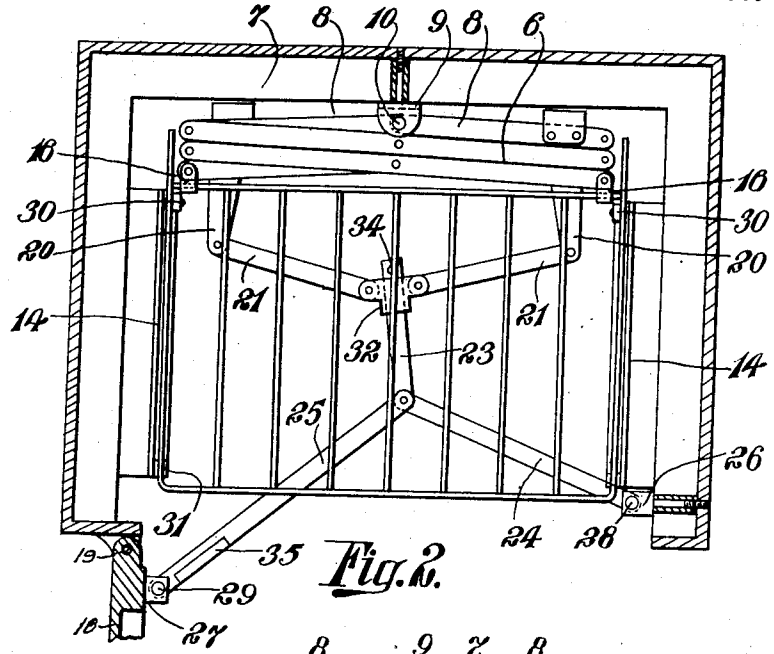


Fig. 2.

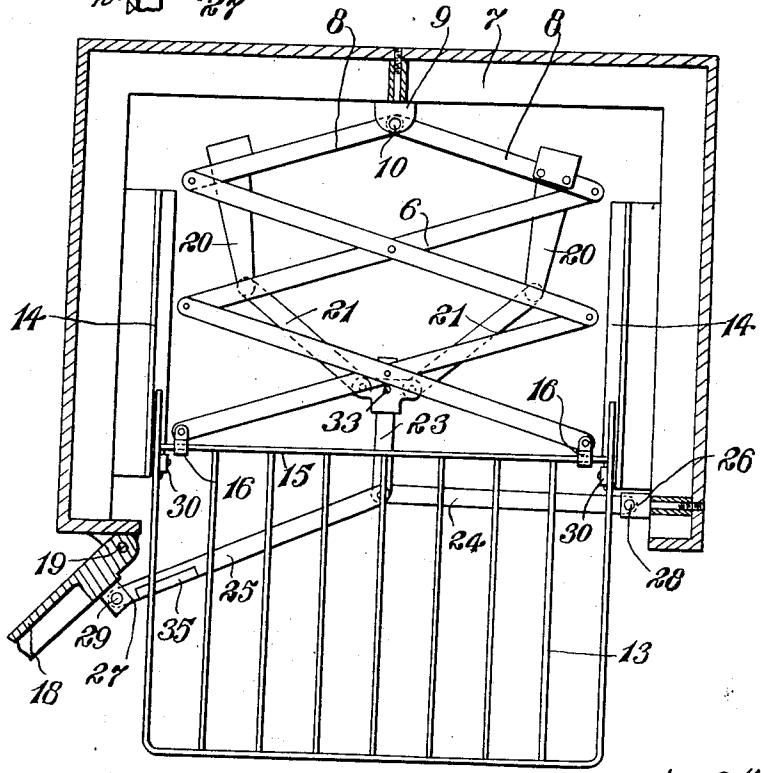


Fig. 3.

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OVEN, CUPBOARD, AND OTHER SIMILAR APPARATUS

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Application September 12, 1931, Serial No. 562,545, and in Great Britain September 12, 1930

7 Claims. (Cl. 312—174)

This invention relates to ovens, cupboards and the like and has for its object to provide means whereby when a door of such a device is moved to the open position, a shelf or shelves are drawn outwards or projected therefrom, preferably after a desired amount of lost motion, and correspondingly when the said door is moved to the closed position, the shelf or shelves are retracted, that is moved back into their normal position in the oven, cupboard or the like.

In general, ovens, cupboards and the like constructed according to the invention comprise a series of interconnected lazytong links and levers detachably or otherwise connected with a shelf or the like of the oven or cupboard to be projected and retracted, a suitable member or members of the lazytong system being connected to the door in a suitable position, through a link and lever, or other mechanism, permitting a desired amount of lost motion, of such a character and in such a manner that when the door is opened, through a desired angle, say for example substantially 90°, the lost motion takes up the movement, but upon further opening movement, the connection between the door and the lazytong member or members is effective to operate the lazytong system and cause it to project the shelf or the like a desired degree from the oven, cupboard or the like, suitable guides or supports being provided to permit the movements of the said shelf or the like. Correspondingly, upon moving the door from the fully open position to the closed position, at the first part of the movement, the shelf is retracted into the oven, cupboard or the like so that the closing of the door can be effected without risk of fouling the projecting shelf or the like.

A single lazytong and associated mechanical system can be provided in connection with the door, to operate upon and move a single shelf or the like, or to move an inner part of the oven, cupboard or the like, or in some cases more than one lazytong and associated mechanical system may be operated from the same door, to move more than one shelf or the like, or an inner portion of the oven, cupboard or the like.

The invention is particularly suitable for and advantageous when used in domestic and other cooking ovens, such as those utilizing gas, electricity or otherwise as the heating medium, because in this case it enables the roasting or other shelf (which may be of grid-like form) to be controlled. This control allows the shelf to be projected when the oven door is fully opened, enabling the dish or the like containing the food to be placed thereon or lifted therefrom in an extremely convenient manner and without risk of burning the hands, whilst at the same time when the shelf has been brought to the retracted position, it enables the door to be opened through a wide angle, without moving the shelf, so that the progress of the cooking operation can be observed without disturbing it.

In order that the invention may be better understood, it will now be described with reference to the accompanying drawings in which:—

Figs. 1, 2 and 3 show somewhat diagrammatically sectional plan views of an oven mechanism according to one embodiment of the invention, in the closed position of the oven door, the partly opened position of the said door and the fully opened position respectively.

Fig. 4 shows a somewhat fragmentary sectional side elevation.

Fig. 5 is a vertical sectional view of a modified form of the invention.

The particular means for carrying the invention into effect as applied to an oven and shown on the drawings comprises a set or series of lazytong links or levers 6 arranged as shown in a substantially horizontal plane, with their pivots vertical, across the back 7 of the oven or the like at a suitable level. The outer ends of the levers if desired may rest upon inwardly projecting guides or the like carried by the sides of the oven, and the rearmost links 8 only extend from the outer extremities to the centre, that is to say, these rearmost links are, as shown, half links, and at the centre point they are pivotally connected to a suitable lug or lugs 9 formed with or attached to the back of the oven by means of a removable bolt, pin or the like 10.

The lug or lugs 9 may be formed in any manner, but as shown, comprise a bolt 11 formed with a forked head 12 between the limbs of which the links 8 are pivoted by means of a bolt, pin or the like 10.

As will be seen from the drawings, when the lazytong system is in the retracted position the links lie closely one against the other and if desired the rearmost links may be shaped to fit against the back of the oven.

The shelf 13 to be projected, preferably, and as shown is in the form of a roasting shelf of grid-like nature, comprising a rectangular frame, the side members of which come upon inwardly projecting guides 14 suitably attached to the sides of the oven. For example, they may be attached to the detachable side members (not shown on the drawings) usually found adjacent the side walls on the interior of gas ovens.

The rear transverse member 15 of the frame or shelf 13, when the shelf is in the retracted position (Figs. 1 and 2) comes closely adjacent the front links of the lazytong system, the free outer ends of which links carry hook-like clips or projections 16, which engage over this transverse portion 15, so that the frame 13 is caused to partake of any movements imparted to the lazytong system.

In the drawings, the pivot or hinge of the oven door 18 is indicated at 19. The door 18 is connected to the lazytong system, in the embodiment of the device shown in the drawings, by the following mechanism.

Each of the rearmost links 8 of the lazytong system has attached thereto a somewhat L shaped member 20 by riveting or otherwise (or these parts may if desired be formed as one, for instance they may be cast together), the lower arm of which comes horizontal and extends beneath the lazytong system. Towards the free outer ends these lower arms have pivotally connected thereto links 21. The other ends of these links 21 are pivotally connected to a somewhat T shaped member 22 adjustably positioned by means of a locking screw or the like upon a central rod 23 of desired length. The free end of the rod 23 has pivotally connected thereto two further links 24 and 25. The link 24 passes to a lug or lugs 26 on one inner side face of the oven as shown, which lugs and their method of connection may be similar to the lugs 9, whilst the other link 25 passes to similar lugs 27 on the inner surface of the door 18 in a desired position relative to the axis of the door, and the link 25 is pivotally attached to the lugs 27. It should be realized that the links 24 and 25 are retained in position in the lugs 26 and 27 respectively by removable pins or bolts 28 and 29. In the closed position of the door, the links 21, the rod 22 and the links 24 and 25 assume the substantial position shown in Fig. 1.

When opening the door 18, the opening movement is communicated to the link 25, which pulls upon the central rod 23 and also causes the link 24 to turn about its pivot towards the front. Combined movements cause the central rod 23 also to be drawn towards the front and the two links attached to the T fitting 22 are therefore also caused to turn about their connections with the L shaped members 20. The links and rods are so relatively positioned and of such relative dimensions and the pivots and eyes therefor so arranged and of such relative sizes that the door can be moved as indicated in Fig. 2, through about 90° before the links 21 come into such a position that a pull is imparted to the members 20. This, as will be realized, allows the door 18 to be opened through 90° without disturbing the shelf 13 and permits access to be obtained to the other shelves and the like of the oven.

Upon still further opening movement being given to the door 18, however, a pull is imparted to each of the fittings 20 by the links 21, and this pull is imparted to the rearmost links 8. This causes these links 8 to move about their central pivot 10 and in turn causes the lazytong system to be extended so that the outer ends of the front links thereof move through a greatly extended path, as is usual in lazytong systems. As, however, the outer ends of these front members are in connection with the shelf 13, through the hooks or fittings 16, it will be realized that the final opening movement of the door causes the full projection of the shelf 13. This is the position shown in Fig. 3, and it will be realized that from the position shown in Figs. 2 and 3, the door 18 has been moved into such a position that the shelf 13 in moving forwards does not come into contact therewith.

Although a simple slideway 14 has been shown, it is preferred to use a slideway with overhanging portions coming above the top of the side members of the frame 13, so that when the shelf 13 is in its fully projected position it does not tilt.

To assist the action, moreover, if desired towards the rear portion, the shelf 13 may be furnished with wheels or rollers 30 for rolling on the guideways 14, and at the front, the guideways may be furnished with an upstanding projection or projections 31 to minimize the frictional contact. The upstanding projections 31 can if desired be replaced by other wheels or rollers, carried by the guideways 14. The rod 25 is formed or provided with an upstanding projecting portion 35 which comes beneath the shelf 13 when the latter is projected and assists in its support.

When the door 18 is closed from the fully open position (Fig. 3), the first movement causes the front links 24 and 25 to force the central rod 23 rearwardly, and this in turn through the links 21 imparts motion to the two L shaped members 20, which readily brings the rear links 8 to their closed position. These rear links 8 in turn cause the quick closing of the lazytong system, and this, as will be understood, effects the retraction of the shelf 13.

As will be realized, the pivotal connection between the front links 24 and 25 and their lugs, and the pivotal connection 10 of the lazytong system, can quickly be removed, leaving the whole mechanism free to be withdrawn from the oven, and as readily and quickly inserted thereinto. In this manner, by providing suitable lugs in desired positions in the oven, and on the door, existing ovens may have mechanism for effecting movements of the shelves readily installed therein.

The construction in some cases, however, can as shown in Fig. 5 take the form of vertically extending rods 40, ribs or the like at the side and back of the oven, and at a desired position on the door, to form the foundation for receiving the connection of the shelf moving device, so that these connections can readily be adjusted in a vertical direction, permitting the fitting to be brought to any height in the oven, thus permitting the fitting to be used in conjunction with a grid, baking shelf or otherwise, located where desired.

The somewhat T shaped fitting 22 to which the links 21 are pivoted preferably comprises a clip-like portion 32 to embrace and be slidable upon the central rod 23, and a locking set screw 33 (Fig. 3) passing therethrough and into one of a number of recesses or holes 34 in the end of the rod 23; in this manner the said fitting 22 can be adjustably positioned on the rod 23, amongst other purposes to permit the movement of the shelf, at any desired and suitable angular opening of the door.

If desired, one or more of the links or rods may also be made in a form to be extended or shortened, and be set and retained at any required length.

Although the particular link and lever system described for imparting the movement of the door to the lazytong system is particularly advantageous, it is obvious that it may be replaced by other link and lever, or other mechanism having a similar effect, that is capable of acting upon the rear members of the lazytong system, to effect the extension of the lazytong, after a desired opening of the door, and also to effect the collapse or closing of the said lazytong system, on

the first movement of the door from the fully open towards the closed position.

The connection between the lazytong system and the shelf or the like to be operated can be varied as desired and to adapt it to any particular use.

It will be realized that in place of the lazytong system acting upon a single shelf or the like, it may act to project a compartment, drawer or the like, and also it will be realized that in place of a single lazytong system being employed, more than one such system may be utilized to effect the movements of desired parts.

In some cases, constructions according to the invention may be attached to a rectangular or other framework adapted readily to be disposed within and if necessary fixed in existing ovens, it only being necessary to provide a suitable connection to the door.

In such a construction, the frame may be a casting or built up, and adapted to slide into the oven and to be supported at the sides by the usual ledges or projections, and fixed at the front by suitable adjustable or other catches, engaging the front of the oven on the interior. This frame carries bearings for the pivots such as 10 and 28 and the upper surface forms a suuport for the sliding grid, shelf or the like, which at the rear may have rollers to run on the upper surface of the frame. The frame also at the front may carry rollers for the grid or shelf to run on.

This construction renders it possible to supply or sell a complete fitting ready to go into any existing oven and only necessitates in addition attaching one single fitting to the door to carry the pivot such as 29; this fitting may be attached by one-hole fixing.

The invention has been particularly described as applied to ovens, but it should be realized that it may be used with equal facility in the case of cupboards, wardrobes or otherwise, and in any case where a movable door is in association with shelves or the like.

The invention is not limited to the precise forms or details of construction described, as these may be varied to suit particular cases.

What I claim and desire to secure by Letters Patent in the United States of America is:—

1. The combination with a housing having a movable door connected thereto, of a movable shelf portion, a system of lazytong links connected to said door and to said shelf portion for projecting the latter forward, connecting links whereby said lazytong links are connected to the door, and means including said connecting links, whereby the first part of the opening movement of the door does not actuate the lazytong links, while subsequent movement causes said links to project the shelf portion rapidly forward.

2. The combination, with a housing having a movable door connected thereto, of a slidably mounted shelf portion, a system of lazytong links arranged at the rear of said shelf portion, connecting means between said lazytong system and said shelf portion, and means connecting the door and the rearmost links of said lazytong system, whereby the first part of the opening movement of the door is not communicated to said lazytong system while subsequently said links are brought into action to project the shelf portion forward.

3. The combination, with a housing having a movable door connected thereto, of a slidably mounted shelf portion, a system of lazytong links arranged at the rear of said shelf portion, a link connected to the door, a further link connected at the remote end of said link and leading to a fixed point in the housing, a rearwardly projecting link pivoted to the joint between the said links, a T-shaped head carried on said last-mentioned link, and further links between said T-shaped head and the two rearmost links of the lazytong system, all of said links being so proportioned that during the first part of the opening movement of the door no substantial movement is applied to the lazytong system while after a predetermined movement the lazytong links serve to project the shelf portion rapidly forward.

4. The combination, with a housing having a movable door, of a horizontally slidable shelf portion, guideways for said shelf portion to enable same to be projected forward out of the housing, a system of pivoted links arranged at the rear of said shelf portion, said links being pivoted together as a lazytong system, a central fixed support for a pair of said links, a forwardly projecting arm connected with each link of said pair of links, connecting links between the movable door and said forwardly projecting arms, including lost motion means whereby the first portion of the opening movement of the door is without effect on the pivoted link system, while further movement causes same to project the shelf portion forward in its guideways.

5. A housing embodying a shelf, guideways in said housing for said shelf, a system of lazytong links arranged at the rear of said shelf, said links pivoting around a fixed lug at the rear of said housing, forwardly projecting arms on the rearmost links on each side of said system, a pivotal door to said housing, a connecting link between a lug on said door located comparatively close to said hinge, and the free end of a further link pivoted to a fixed point in said housing, a rearwardly projecting rod pivoted at the joint between said two links, and a T-shaped head carried on said rearwardly extending rod and pivoted to links leading to the said forwardly extending arms, all of said links being so proportioned that the first part of the opening movement of the door causes rotational movement of said T-shaped head while further movement causes said head to move in a forward direction to cause the lazytong links to project said shelf forward rapidly.

6. A housing comprising an inserted shelf supporting unit, guideways in said unit, a shelf carried on said guideways, means for projecting said shelf forward when desired, said means incorporating lazytong mechanism, a door, connecting links between said shelf-moving means and a lug connected to the said door, including means whereby the first portion of the opening movement of the door has no effect on the links serving for projecting the shelf forward, while further movement of the door causes said shelf to be projected forward rapidly.

7. A housing embodying a movable shelf, guideways for said shelf, a system of lazytong links arranged at the rear of said shelf and pivoted to a fixed lug at the rear of said housing, connecting means between said lozytong link system and two sets of lugs, one associated with vertically extending guides on the housing and the other on vertical guides on the moving door, said connecting means including means whereby during the first part of the opening movement of the door, no movement is applied to said shelf, while further movement of said door causes said lazytong links to project the shelf forwardly.

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