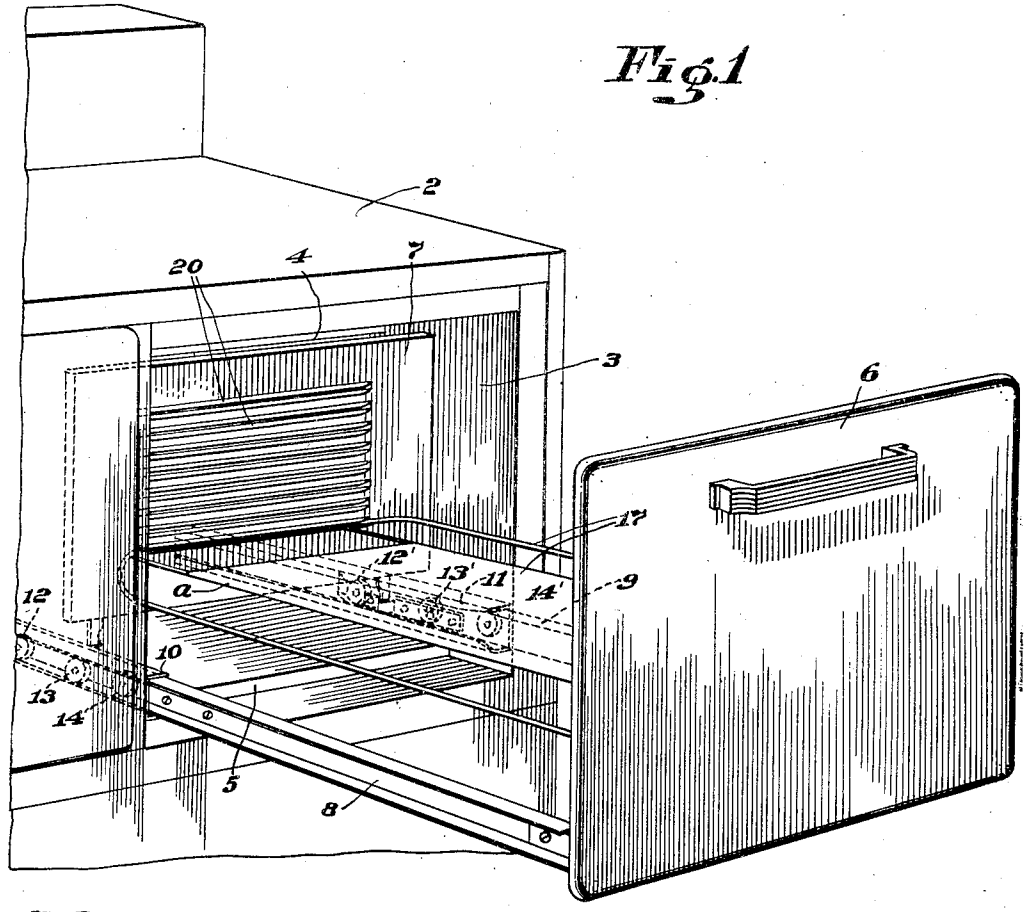
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RANGE

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Fig. 1



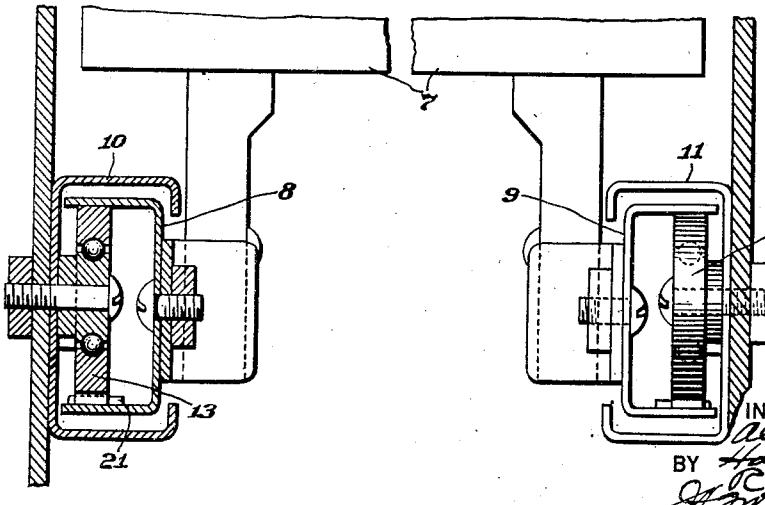


Fig. 2

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RANGE

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Fig. 3

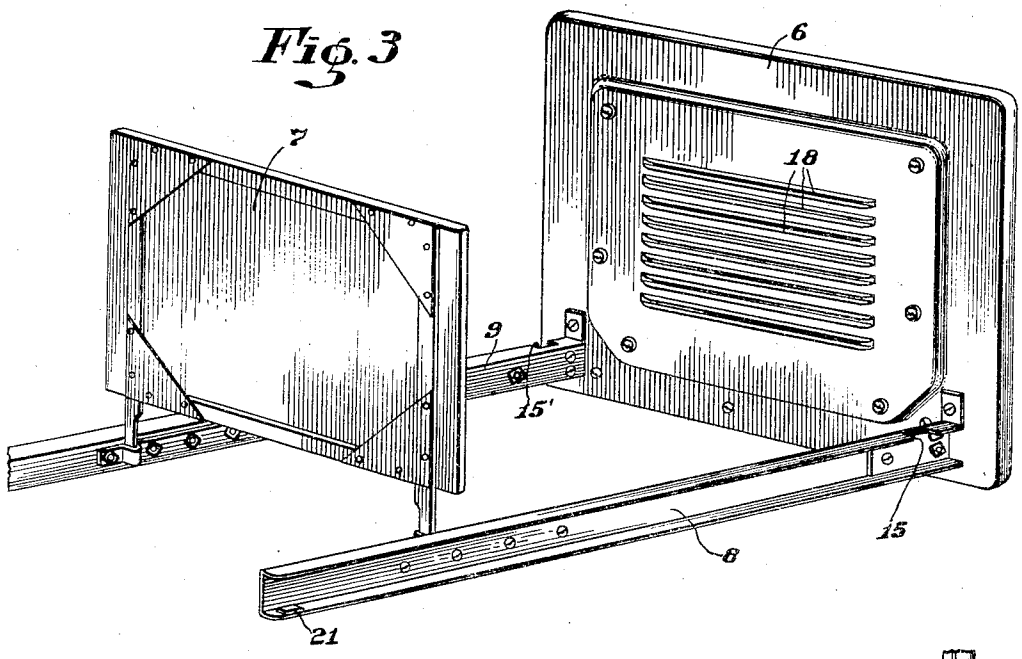
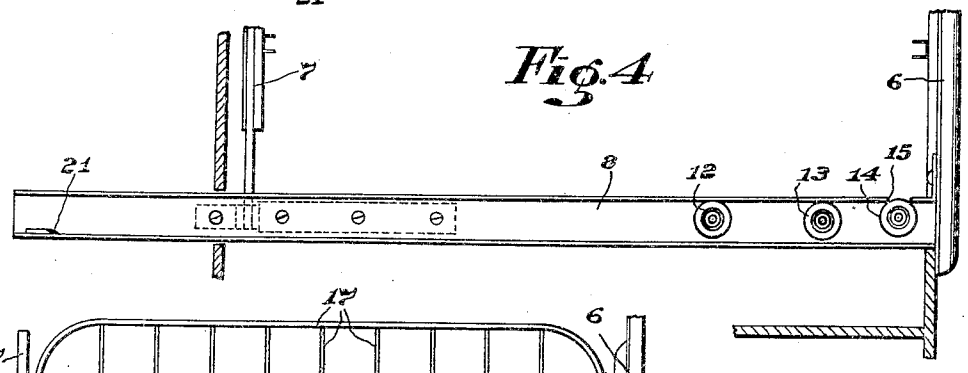


Fig. 4



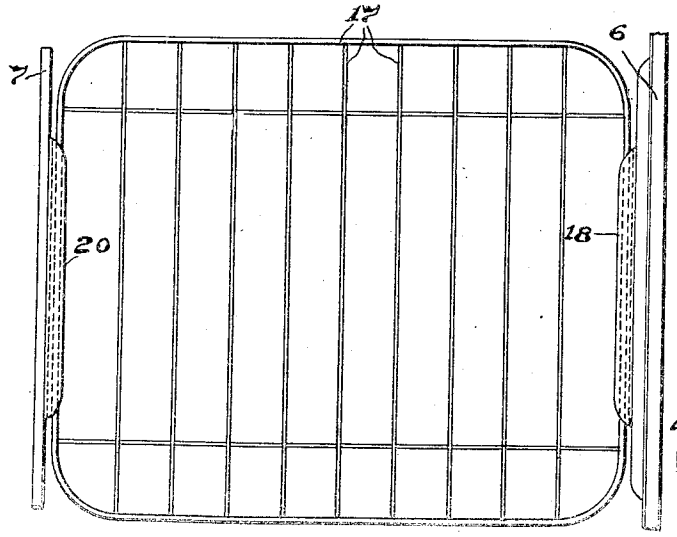


Fig. 5

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UNITED STATES PATENT OFFICE

2,133,639

RANGE

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Application July 24, 1936, Serial No. 92,332

5 Claims. (Cl. 126—340)

This invention relates to cooking ranges, and is more especially concerned with oven structures of such ranges. The invention aims to improve such structures with a view to facilitating the use of the oven, reducing the labor involved in connection with baking, roasting, and similar operations performed in the oven, and conserving the heat generated in the oven for the purpose of performing these operations.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a perspective view of a portion of a range equipped with an oven structure embodying this invention;

Fig. 2 is a vertical, sectional view, with parts in elevation, through the lower portion of the oven;

Fig. 3 is a perspective view of the oven drawer;

Fig. 4 is a side elevation of parts of said drawer; and

Fig. 5 is a plan view of a portion of the drawer, showing a rack mounted therein.

The drawings show the invention as embodied in an electric range, although it will be understood that the invention is equally applicable to ranges heated in other ways. A portion of such a range is indicated in Fig. 1 at 2, the oven chamber being shown at 3, and the upper and lower electric heating units for it being indicated at 4 and 5, respectively.

Slidably mounted in the oven is a drawer comprising front and rear end pieces 6 and 7 rigidly connected together by two channel bars 8 and 9. The front and rear ends of these bars are also connected by metal members which cooperate with the bars to form a skeleton or frame on which the end pieces are supported. The front end piece 6 forms the closure for the oven chamber and corresponds, in general, so far as this function is concerned, to an oven door. For the purpose of slidably supporting the drawer, two stationary channel bars 10 and 11 are secured rigidly to the opposite side walls of the oven to receive the channel bars or runners 8 and 9, respectively, of the drawer, as best shown in Fig. 2. Considering for the moment the channel bar 10, as shown in Figs. 1 and 2, it will be observed that it is equipped near the front of the oven with three rolls, designated at 12, 13 and 14, respectively, each of the ball bearing type, and like the middle roll 13 shown in Fig. 2. The upper flange or rail of the runner 8 rides on these rolls and, in certain positions of the drawer, the lower rail of this runner also runs on the rolls. At the opposite side of the oven the channel 11 is similarly equipped with rolls indicated by the same, but primed, numerals.

With this arrangement the drawer may be moved in or out with a minimum of effort. While this is a substantial advantage from the standpoint of the housewife, nevertheless this very condition makes it necessary to provide some means for holding the oven closed with the front end piece 6 firmly against the front walls of the oven chamber in order to avoid the escape of heat from the oven. Latches are objectionable for this purpose, both because they require operation, and also for the reason that many states have regulations providing that the oven shall be capable of opening automatically in the event of an explosion in it. It is one of the objects of this invention to solve this difficulty.

In the arrangement shown, a thoroughly satisfactory solution for this problem has been provided by mounting the front roll 14, Fig. 4, at a slightly higher elevation than those in the rear of it, and cutting out a portion of the upper rail of the channel bar 8 to provide a shoulder 15, Figs. 3 and 4. This shoulder is located at such a distance from the front end piece 6 that as the latter moves rearwardly in closing the drawer, and when it has almost reached its closed position, the shoulder at that time has just ridden over the top of the roll 14 and is resting on the rearward slope of this roll. Consequently, the weight of the drawer, and the load which it carries, acts through this shoulder and the roll to complete the closing movement of the drawer automatically. The same construction is provided at the opposite side of the drawer including the parts 14' and 15'. These parts also act in the manner just described and cooperate with the parts 14 and 15 to produce said closing movement of the drawer.

Fig. 4 shows approximately the position of the parts with the drawer fully closed, and it will be evident that these same rolls, and the rail shoulders which bear on them, tend to yieldingly hold the drawer in its closed position. It will also be evident from an inspection of Fig. 4 that any opening movement of the drawer will be resisted by the fact that the shoulder 15 must ride up on the roll 14, and that this resistance will continue until the shoulder has reached the top center of the roll, at which time it will disappear and the drawer then can be opened as freely as

though this shoulder construction were not present. Since both this resistance to opening, and also the automatic final closing movement of the drawer, are produced by gravity, their effect will be made more pronounced by any increase in the weight of the drawer or its load.

The utensils holding the food which is to be baked, roasted, or otherwise cooked in the oven, are supported on one or more racks which preferably are of the general form shown at 17 in Fig. 5, or at 17' in Fig. 1. They are mounted in ribbed or grooved members 18 and 20 secured to the inner surfaces of the end plates 6 and 7, respectively. These supporting ribs are disposed horizontally and the racks are of a width only slightly less than that of the oven, so that they are held in a laterally centered position in the drawer by the walls of the oven, except when the drawer is fully open. At that time the racks can be slipped laterally out of their supporting members 18 and 20, adjusted up or down, or disposed in any manner suited to the requirements of the particular work in hand. When the drawer is again closed it may be that one or more of the racks will be slightly displaced laterally. However, the ends of these racks are rounded or bevelled in a horizontal plane so that when the drawer is closed, the rounded or bevelled edge of any slightly misplaced rack will engage the upright front edge of the oven wall as the drawer is closed, and such engagement, combined with the closing movement of the drawer, will slide the rack or its guides 18 and 20 into an approximately laterally centered position in the drawer, this action taking place automatically and without any attention on the part of the housewife.

The rack 17' is essentially like that shown at 17 except that it is equipped with a plate *a*, Fig. 1. This rack is designed to be placed in the bottom pair of grooves in the end plates 6 and 7 where it will be positioned immediately above the lower heating unit 5. Here the plate *a* acts as a baffle and distributes the heat more uniformly than otherwise would be the case. In other words, it forms a false bottom for the drawer, no bottom plate being included in the construction of the drawer itself.

It should be observed that this drawer construction permits the housewife to slide the entire load in the drawer completely out of the oven and into a position where she can inspect it, make any changes in it desired, and return it again without lifting any of the trays, pans, or other utensils. Thus this construction materially lightens the labor involved in cooking in an oven.

This work is further facilitated by providing means for stopping the opening movement of the drawer in two positions; one in which the drawer is not fully open, but is nearly so, thus permitting a complete inspection of the contents of the drawer while still holding the racks locked between the walls of the oven against substantial lateral displacement, and a second, fully-open position in which the racks are entirely outside the oven and can be removed or readjusted, as desired.

For this purpose a small lug 21, Fig. 3, is welded or otherwise rigidly secured to the lower rail of the channel 8, Figs. 3 and 4, near its rearward end. This lug is so spaced from the front of the drawer that when the drawer has been opened to the first position above described, it will engage the rear roll 12 and thus arrest further opening movement. At this time the greater part of the drawer is out of the oven so that the lower rail bears against the roll 12 with considerable pressure. Thus the lug acts as an effective stop. However, if the housewife desires to open the drawer further, she can easily do so by lifting the front end of the drawer slightly, at the same time pulling on it, thus causing the lug 21 to ride under the roll 12, and releasing it from the roll. The further opening movement brings this lug into contact with the second roll 13 where it again stops the opening movement of the drawer. In this position the lug is even more effective than before because the drawer is farther out and is exerting a greater leverage serving to press the lug 21 upwardly against the roll 13. However, if it is desired to take the drawer out of the range completely, this can be done by grasping it at opposite sides, lifting the front far enough to free the lug from the roll 13, and drawing it forward completely out of the channels 10 and 11. A similar lug is secured to the bar 9. It will be observed that the runners 8 and 9 project for a considerable distance back of the rear end plate 7 and extend through holes in the back wall 22, Fig. 4, of the oven chamber when the drawer is in its closed position. This arrangement gives that length to the runners necessary to support the drawer securely when it is in its fully opened position. It may also be noted that in this position the bottom flange of the runner 8 bears hard against the lower side of the roller 13 while the top flange rides on the upper side of the roller 14, a corresponding relationship existing at the opposite side of the drawer. Thus the drawer is easily moved inward even though it may carry a heavy load.

Upon opening the oven of any range, there is an out-rush of heat and in an electric range the thermostatic control for the oven usually will operate very quickly to turn the current on to the heating units. In order to conserve the greater part of this heat and to reduce the waste of electrical energy when the oven is open, the rear end plate 7 is made as large as possible consistent with the necessary clearances, so that it will approximately close the front of the oven when the drawer is in either of the open positions above described. Obviously in the first of these positions the end plate 7 is located just back of the front end of the oven chamber, while in the fully opened position it is slightly in front of the open end of the chamber. Thus the hot air in the oven will be largely trapped and the rate of interchange of this air with that outside the oven will be reduced to negligible limits.

While we have herein shown and described a preferred embodiment of our invention, it will be understood that the invention may be embodied in other forms without departing from the spirit or scope thereof.

Having thus described our invention, what we desire to claim as new is:

1. In a range, an oven structure comprising an oven chamber, an open-sided oven drawer mounted in said chamber for horizontal sliding movement into and out of said chamber, said drawer comprising front and rear end plates and bars connecting said plates and cooperating with them to form a rigid drawer structure, said bars extending rearwardly a considerable distance beyond said rear end plate and forming runners, two stationary channel bars secured to the opposite side walls of said oven chamber, said runners being mounted in said stationary bars,

and rolls cooperating with said channel bars to slidably support said runners.

2. In a range, an oven structure comprising an oven chamber, an open-sided oven drawer mounted in said chamber for horizontal sliding movement into and out of said chamber, means in said drawer for adjustably supporting horizontal racks on which the cooking utensils rest, said means supporting said racks for horizontal sliding movement laterally of the drawer into and out of the drawer, and means for arresting the opening movement of said drawer before it reaches its fully open position and while the rear ends of said racks are still within the oven, said arresting means being releasable to permit a further opening movement of said drawer, and means for stopping the latter movement at a predetermined point after the racks have cleared the oven.

3. In a range, an oven structure comprising an oven chamber, an open-sided oven drawer mounted in said chamber for horizontal sliding movement into and out of said chamber, said drawer comprising front and rear end plates and bars connecting said plates and cooperating with them to form a rigid drawer structure, said bars extending rearwardly a considerable distance beyond said rear end plate and forming runners, two stationary channel bars secured to the opposite side walls of said oven chamber, said runners being mounted in said stationary bars, a plurality of rolls cooperating with each of said channel bars to slidably support said runners, and means cooperating with said rolls to stop said drawer in a fully opened position and in another position in which the drawer is sufficiently open for the inspection of its contents but in which the rear end plate is inside the oven.

4. In a range, an oven structure comprising an oven chamber, an open-sided oven drawer mounted in said chamber for horizontal sliding movement into and out of said chamber, said drawer comprising front and rear end plates and bars connecting said plates and cooperating with them to form a rigid drawer structure, said bars extending rearwardly a considerable distance beyond said rear end plate and forming runners, two stationary channel bars secured to the opposite side walls of said oven chamber, said runners being mounted in said stationary bars, rolls mounted to revolve on stationary axes and cooperating with said channel bars to slidably support said runners, said runners having parts engaging said rolls and serving to produce a final closing movement of said drawer by gravity.

5. In a range structure according to preceding claim 1, an arrangement in which said runners are channel bars and a plurality of said rolls are located closely adjacent to the front of the oven chamber on each side thereof where the bottom flange of each runner will bear against the lower side of one roll while the top flange rides on another roll when the drawer is in its open position, said runners having parts cooperating with said rolls to stop the drawer in a plurality of open positions.

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