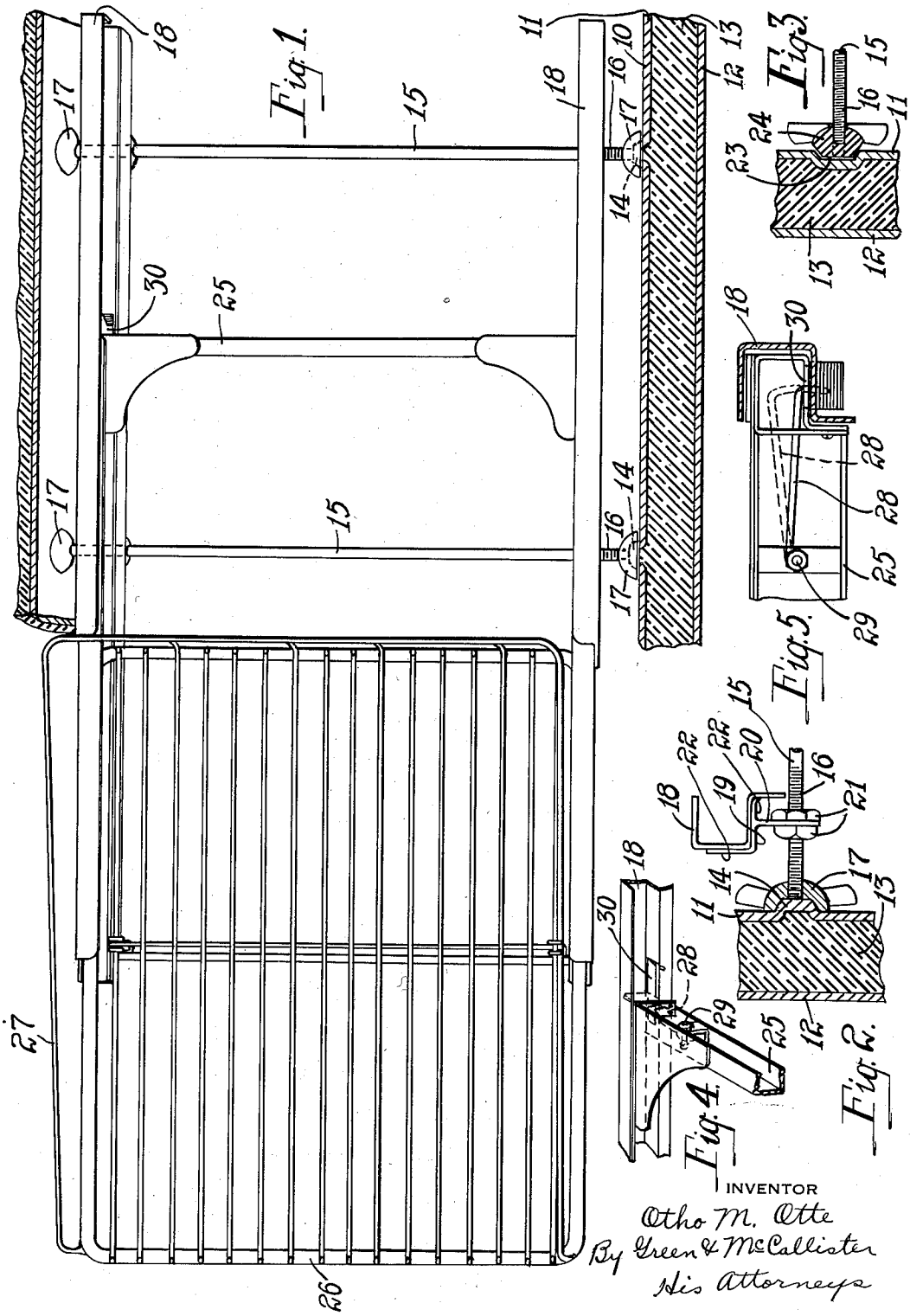
Oct. 20, 1931. O. M. OTTE 1,828,435

REFRIGERATOR TRAY SUPPORT

Filed Aug. 21, 1930 2 Sheets-Sheet 1




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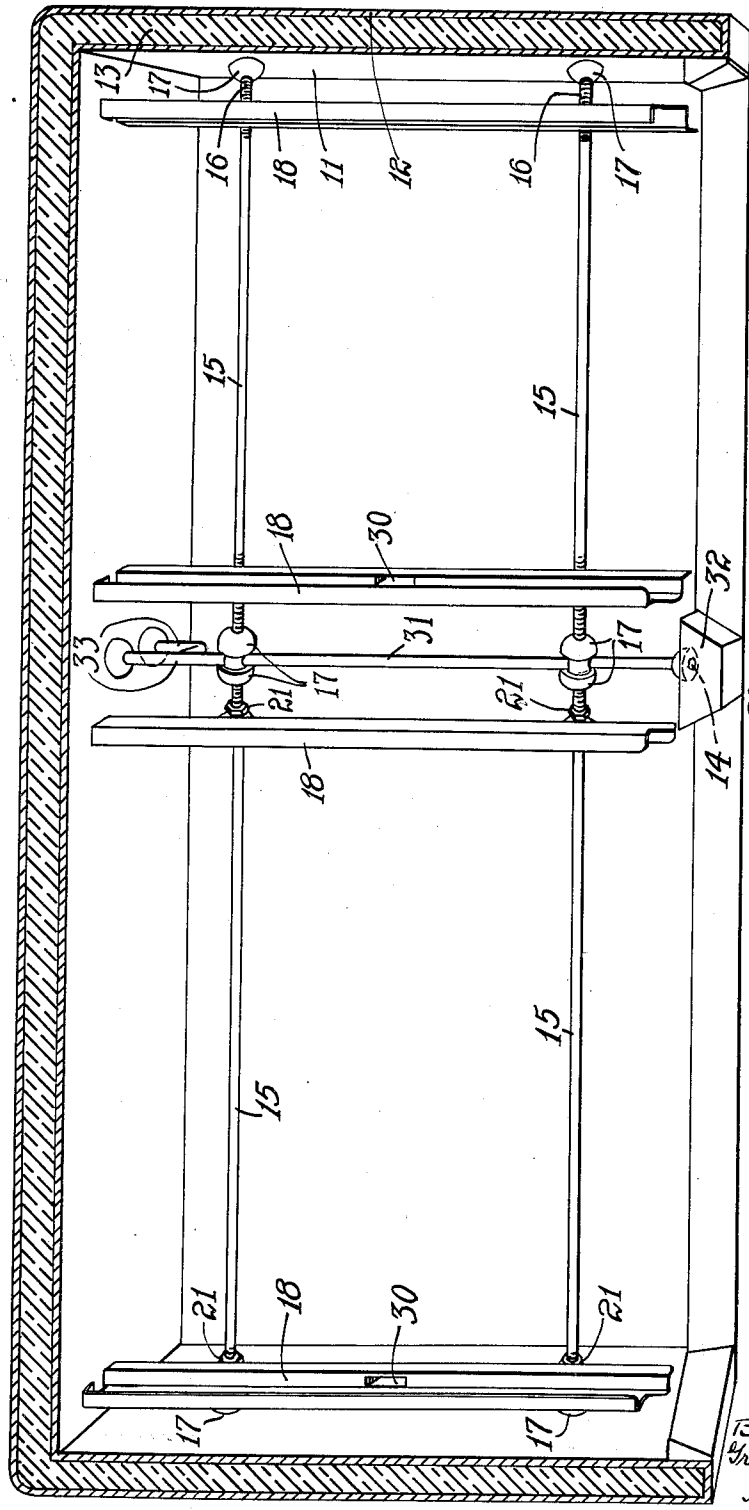



Fig. 6.

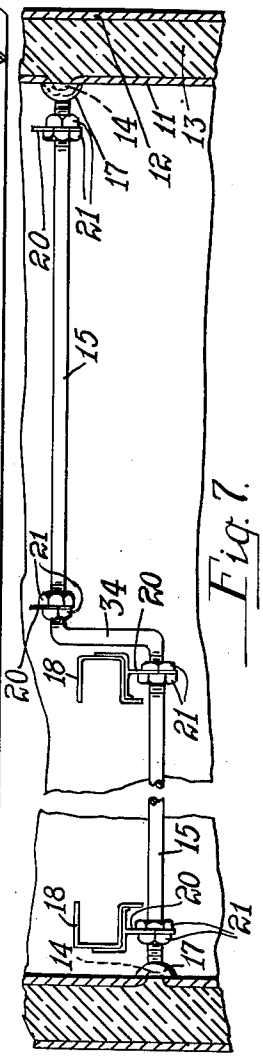



Fig. 7.

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# UNITED STATES PATENT OFFICE

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## REFRIGERATOR TRAY SUPPORT

Application filed August 21, 1930. Serial No. 476,809.

This invention relates to refrigerators and more particularly to shelves for refrigerator compartments which may be slid in and out of the refrigerator compartment (within which they are normally positioned) for the purpose of easily placing materials thereon and removing the same from said shelves.

With the advent of the present day household refrigerators and particularly those equipped with refrigerating units, it has become customary to make the interior walls of metal and to either coat the same with vitreous enamel or enamel paint or make the same from a rustless or stainless metal. The supports for the shelves are now usually struck up from the metal of the walls so as to form inwardly extending projections.

In designing the so-called sliding shelves for use in these refrigerators, a number of things must be taken into consideration in order to make such shelves satisfactory.

They must be relatively cheap to manufacture; they must be easy to assemble and install; they must be capable of being supported and removably held in place without materially departing from the type of shelf holding or supporting means now employed; they must be capable of being moved (slid) in and out of the refrigerator compartment without chattering and with little effort on the part of the user.

An object of this invention is to produce a sliding shelf structure for refrigerators having all of the above attributes and which from a commercial point of view is highly satisfactory.

Other and further objects will be apparent to those skilled in this particular art or will be pointed out hereinafter.

I have illustrated preferred embodiments of the invention in the accompanying drawings wherein:

Figure 1 is a plan view slightly in perspective of a supporting structure according to the present invention.

Fig. 2 is a detail of certain connections involved.

Fig. 3 is a view similar to Fig. 2 of a modification.

Fig. 4 is a fragmentary perspective view of a portion of a supporting framework and guideway member.

Fig. 5 is a fragmentary elevation and section of a pivoted locking means utilized in connection with the present invention.

Fig. 6 is a modified form of the invention as used for extended or multiple compartments; and

Fig. 7 is a fragmentary elevation and sectional view of a modified form of supporting rod.

Similar numerals refer to similar parts throughout the several views.

Referring first to Figs. 1 and 2, the numeral 10 indicates a fragment of a refrigerator construction wherein, for example, an inner and outer metallic lining 11 and 12 has an insulating layer 13 therebetween. The particular construction of the refrigerator is of no particular consequence here except that the inner layer should preferably be metallic, although such is not absolutely essential. In the present instance, however, the inner metallic lining 11 has formed therein a number of struck-up or punched-up portions 14 of such a character as to merely form a projection or protuberance without, however, in any way interrupting the continuity of the metal lining; in other words, the lining remains unbroken and unperforated at all times. These projections or protuberances 14 are easily formed at any suitable stage in the formation of the refrigerator. As indicated in Fig. 1 there are four such projections and there may be, of course, any desired number depending upon the number and arrangement of the supporting rods 15.

These rods, as shown, extend from side wall to side wall of the compartment and the ends thereof are threaded as at 16 for a considerable portion of their length. Threaded on these threaded portions 16 are the members or elements 17 which, in the embodiment shown in Figs. 1 and 2, consists of a cup-shaped element having a central interiorly threaded aperture so that it may be screwed on and off the rods 15, if desired. These elements are, in effect, wing nuts, the wings being, of course, entirely optional and merely

assisting in the tightening or handling thereof. By threading one of these nuts on each end of each rod, placing the rod in proper position and then screwing the nuts until they pass securely over the protuberances 14 gives, in effect, a rigid supporting rod held immovably in place until loosened or removed purposely by again unscrewing the nuts so as to permit removal for cleaning purposes or the like.

In order, however, to provide means for the reception of sliding trays or the like, I have provided the guideways 18 arranged transversely of the supporting rods which, in general, run across the compartment, whereas, the guideways are parallel to the depth dimension of the compartment. The guideways are not directly connected to the supporting rods although it might be possible to braze or weld the same directly thereto, but the supporting elements 19 are provided which consist of a depending flange 20, apertured to receive the supporting rods 15 and having a nut 21 on each side thereof so as to position the same at the desired location. At the top of the flange are a number of oppositely extending tabs or the like 22 which are spot welded or otherwise suitably secured to the exterior of the guideways. As shown in Fig. 3 instead of providing struck-up projecting, or protruding portions 14 in the metal lining 11 the same is provided with depressed portions 23 and the wing nut 24 is appropriately contoured to fit thereinto, the same being the reverse of the construction of Fig. 2.

A supporting framework 25 is provided for sliding action in said guideways 18 and a grid or support member 26 operates slidably in said supporting framework, the arrangement being such that the supporting grid is normally slidable halfway out of said supporting framework and said supporting framework is normally slidable halfway out of said guideways. The members lock in such positions so that in effect the grid or support member is completely outside of the compartment for the proper and efficient access thereto as will be understood. If desired, a rail member 27 may also be provided for suitable purposes. This rail or guard member prevents articles from falling or sliding from the tray, should the tray be jerked or moved forward too suddenly. It also acts as a protection for more or less fragile articles by keeping them from contact with their surroundings upon sudden movements of the tray. Tall articles or articles whose center of gravity is not low are especially so protected and preserved by this guard rail. The various locking means are releasable when so desired in order to completely withdraw the members from the compartment and from each other.

Figs. 4 and 5 show a simple, but effective locking means wherein the catch element 28 is pivotally connected at 29 to the supporting framework 25 and the catch element is, of course, adapted to drop into aperture 30 in guideways 18, as will be understood, in order to prevent accidental overwithdrawal of the elements involved, but said catch element being movable to dotted line position (Fig. 5) for releasing the same from locking position.

In many refrigerators, a comparatively long and narrow compartment is provided, that is, one having a great width compared to its depth and under such circumstances, I have invented a modified supporting structure which I find to be very satisfactory in use in such compartments. In this case also the inner lining member 11 of the refrigerator construction is provided with a plurality of struck-up, projecting, or protruding portions 14 in its side walls, it being understood, of course, that the construction of Fig. 3 can likewise be used if preferred. In addition to the side wall projections or supports, however, I have also provided similar back and front wall projections for a purpose and resulting in a construction to be now explained.

A central supporting rod 31 is provided having at its ends elements 17 adapted to cooperate with the projections or offset portions in the back and front walls of the compartment, it being understood that as a general thing the front wall of the compartment has been cut away leaving only a central element 32. This supporting rod is disposed transversely to the width of the compartment, that is, it is disposed substantially at right angles to the other supporting rods 15, which, instead of extending from side wall to side wall as in Fig. 1, reading from left to right of Fig. 6, extends from side wall to supporting rod and from supporting rod to side wall, the supporting rod 31 being provided with projections or offset portions 17 similar to those in the inner-lining 11. Thus, not only have I produced a supporting means for a tray in an elongated compartment, but I have in effect provided two independent tray supporting rod constructions, each of which, if so desired, can be used or removed independently of the other. Preferably, I provide the rearward end of supporting rod 31 with a branch or branches 33 so that a plurality of members are provided to cooperate with a plurality of projections or offset portions in the rear wall, thus providing a stronger and more rigid construction. In other respects the construction is the same as that explained more fully in connection with Figs. 1 and 2 and hence further explanation at this point in connection with Fig. 6 is believed unnecessary.

In Fig. 7 I have shown a still further modification adapted for use in that type of refrigerator, where the refrigerating unit is, for example, in the upper righthand corner of the refrigerator. In such a case, if a straight supporting rod structure, as above

disclosed, were used the space between the lower end of the refrigerating unit and the rod with its tray member thereon, would be too small to serve any useful purpose. Hence rather than waste that space, I have devised an arrangement whereby the rod is constructed with the middle thereof offset at 34 so as to bring part of it immediately below the refrigerating unit so that the next rod and tray therebeneath will provide a compartment of a size offering increased usefulness due to its additional height. Thus, the offset portions 24, although positioned on opposite walls, are not exactly disposed oppositely, but are disposed off-line to correspond to the bend or offset made in the rod 15 at 34.

It is understood, of course, that as many of these supporting rod constructions as is needed or desired may be used and in an average refrigerator probably three, four, five or more would be used between the bottom and the top of the refrigerator. As is evident all the elements are readily removable for cleaning purposes and the like merely by loosening the elements 17 cooperating with the irregularities in the side walls. If so desired, I may provide the inner lining of the refrigerator with a large number of these projections so that the supporting rods may be placed in variable locations depending upon the particular circumstances of use at any time.

While the invention is more particularly designed for use with refrigerator compartments, inasmuch as it is particularly important not to perforate the side walls thereof, I may nevertheless equally well utilize this construction in connection with ovens or the like where perforations may interfere with the heat conducting properties of the oven structure. I also contemplate the use of these supporting structures in constructing certain types of shelving and in cake or bread boxes and generally in a multitude of other connections as they may appear.

What I claim as new and desire to secure by Letters Patent is:

1. Means for supporting tray structures in refrigerator compartments having unbroken side walls consisting of struck-up portions in said side walls, supporting rods threaded at their ends extending between said struck-up portions, members on the ends of said rods for engaging said struck-up portions, and guideways connected to said rods for slidably receiving the tray structures.

2. Means for supporting tray structures in refrigerator compartments having unbroken side walls consisting of depressed portions in said side walls, supporting rods threaded at their ends extending between said depressed portions, members on the ends of said rods for engaging said depressed portions, and guideways connected to said rods for slidably receiving the tray structures.

3. Means for supporting tray structures in refrigerator compartments having unbroken side walls consisting of protruding offsets in said walls, supporting rods threaded at their ends extending between said offsets, cup-shaped members threaded on the ends of said rods for adjustable cooperation with said offsets, connecting members positioned on said rods, and guideways secured to said connecting members for slidably receiving the tray structures.

4. Means for supporting tray structures in refrigerator compartments having unbroken side walls consisting of receding portions in said walls, supporting rods threaded at their ends extending between said portions, projecting members threaded on the ends of said rods for adjustable cooperation with said portions, connecting members positioned on said rods, and guideways secured to said connecting members transversely of said rods for slidably receiving the tray structures.

5. Means for supporting tray structures in refrigerator compartments having unbroken side and end walls including offset portions in said side walls, members engaging therewith, supporting rods on which said members are positioned, and guideways supported by and connected to said rods and adapted to slidably receive said tray structure, said rods extending between said offset portions and being intermediately interrupted, and a transverse supporting rod engaging said end walls similarly to said first rods and side walls, said transverse rod having members adapted to engage with said first rods at the points of interruption.

6. In a compartment, unbroken side and end walls having offset portions therein, a transverse rod having offset portions opposite the offset portions of said side walls, longitudinal rods extending between said side wall offset portions and the offset portions in said transverse rod, means on said rods for engaging said offset portions, connecting members on said rods and guideways connected thereto for slidably receiving tray structures therein.

7. Means for supporting tray structures in refrigerator compartments having unbroken side walls consisting of protruding portions in said walls, supporting rods threaded at their ends extending between said portions, cup-shaped members threaded on the ends of said rods for adjustable cooperation with said portions, connecting members positioned on said rods, and guideways secured to said connecting members for slidably receiving the tray structures, said rods having portions thereof relatively offset.

8. In a refrigerator compartment having opposite unbroken walls provided with off-

set portions, supporting rods extending between said offset portions and having members cooperating therewith to maintain said rods in position, and guideways supported by and connected to said supporting rods for slidably receiving tray structures therein, said tray structures being provided with guard means for preventing unintended displacement of articles thereon.

9. A refrigerator embodying a provision chamber whose walls are provided with inwardly-extending spaced-apart projections, a frame-structure embodying means for engaging said projections to thereby support the frame and prevent its rear end tilting upwardly and a pair of guide-bars extending fore and aft of the provision chamber and spaced away from the side walls thereof to leave a free space between the bars and the walls, a food-supporting tray supported on said frame-structure and slidable fore and aft thereon so as to be capable of being withdrawn more or less from the provision chamber, and means carried by the food-supporting structure for engaging a stop on one of said guide-bars to arrest the outward movement of the tray-structure.

10. A refrigerator embodying a provision chamber whose walls are provided with inwardly extending projections, an open frame supported on said projections and locked against tilting at least at its rear end, while in place thereon, said frame being bodily removable from the provision chamber, said frame embodying projection engaging means and a pair of guide-bars extending fore and aft of the provision chamber and spaced away from the side walls thereof to leave a free space between the bars and the walls, a tray-structure supported on said guide-bars and slidable fore and aft thereon so as to be capable of being withdrawn more or less from the provision chamber, said tray-structure being detachable as a whole from said frame to permit it to be removed from the provision chamber independently of said frame, and stop means cooperating between said tray-structure and said guide-bars to arrest the outward movement of said tray-structure at a predetermined point.

In testimony whereof, I have hereunto subscribed my name this 18th day of August, 1930.

OTHO M. OTTE.