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W. R. McDOWELL
MOVABLE DRAWER STRUCTURE

2,576,407

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2 SHEETS—SHEET 1

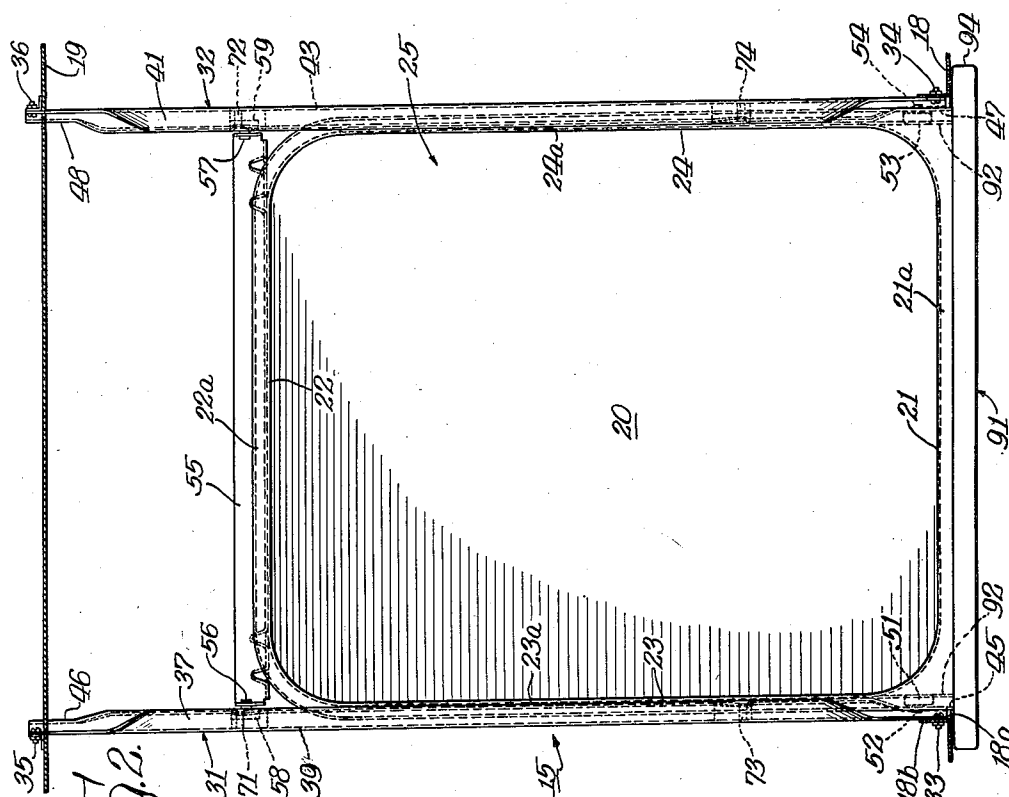


Fig. 2.

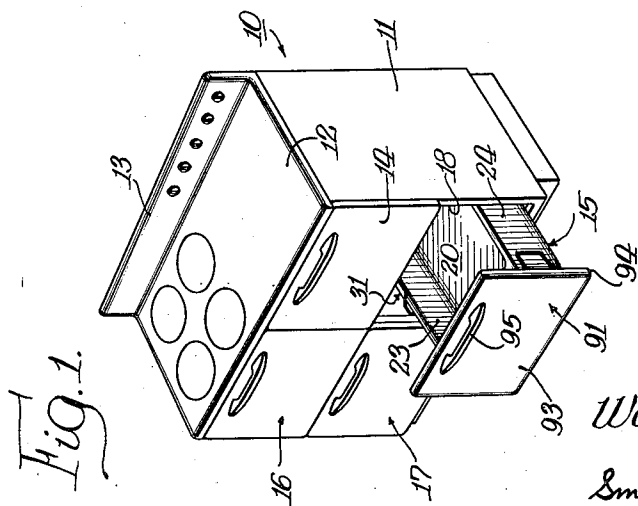


Fig. 1.

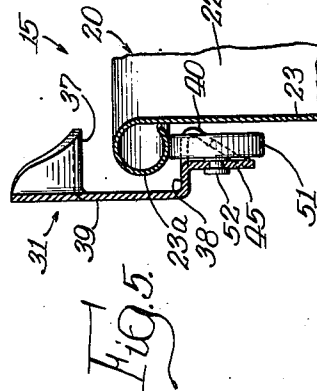


Fig. 5.

INVENTOR.
Walter R. McDowell,
BY
Smith, Olsen & Baird
Attys.

Nov. 27, 1951

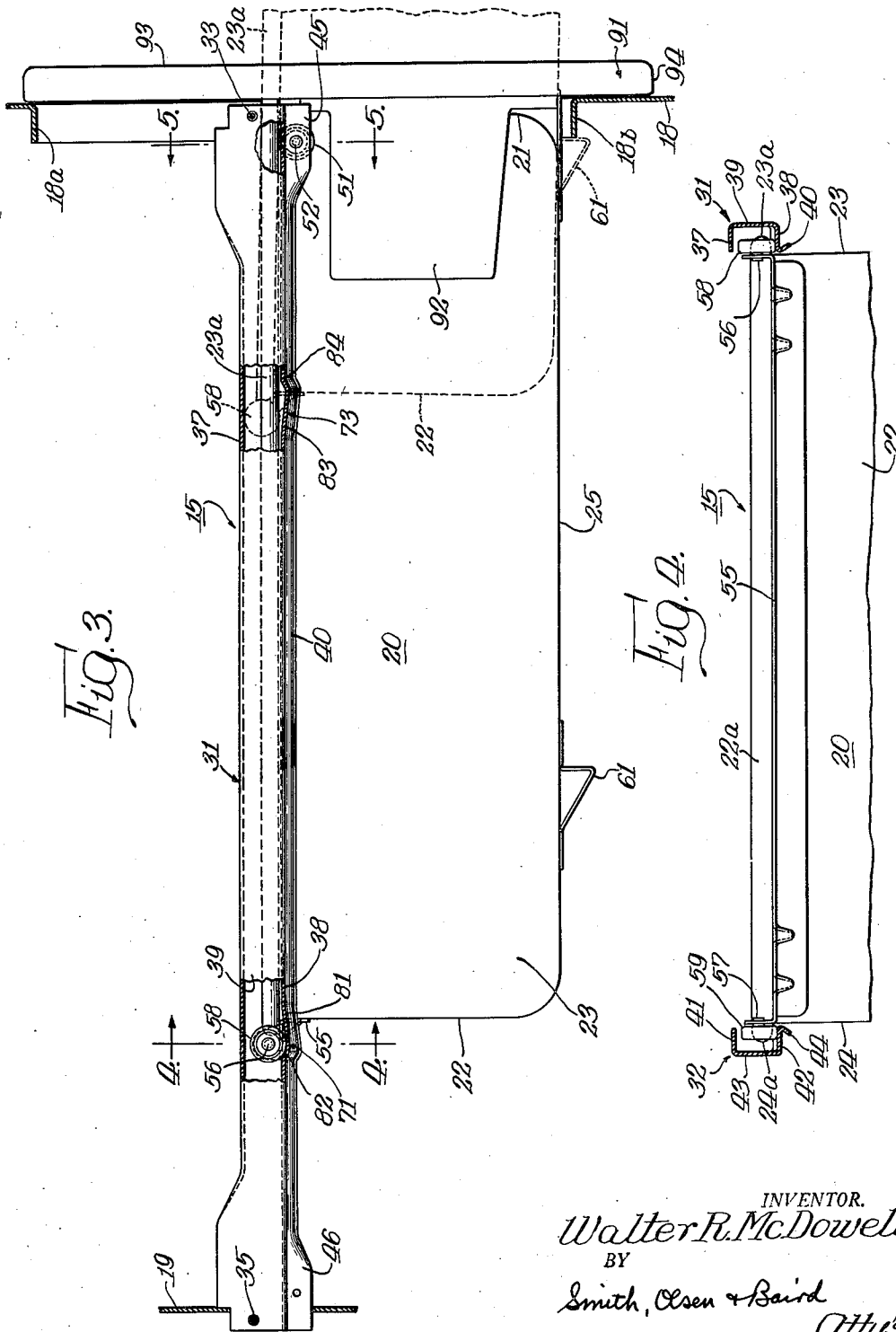
W. R. McDOWELL

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2 SHEETS—SHEET 2



INVENTOR.
Walter R. McDowell,
BY
Smith, Olsen & Baird
Attys.

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MOVABLE DRAWER STRUCTURE

Walter R. McDowell, Westchester, Ill., assignor
to Hotpoint Inc., a corporation of New York

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1 Claim. (Cl. 312-343)

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The present invention relates to movable drawer structures and more particularly to such drawer structures in electric ranges or the like.

An electric range usually comprises a body provided with one or more longitudinally extending drawer spaces receiving corresponding movable drawers employed for storage purposes.

It is a general object of the present invention to provide movable drawer structure of the character noted that is of improved and simplified construction and arrangement.

Another object of the invention is to provide drawer structure of the guided roller supported type that is easy to manipulate and quiet in operation.

Further features of the invention pertain to the particular arrangement of the elements of the movable drawer structure; whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawings, in which Figure 1 is a perspective view of an electric range incorporating a plurality of movable drawer structures embodying the present invention; Fig. 2 is an enlarged plan view of one of the drawer structures, illustrating the structural details thereof; Fig. 3 is a greatly enlarged side elevational view partly broken away, of the drawer structure shown in Fig. 2, illustrating the structural details of the side portion thereof; Fig. 4 is a fragmentary vertical sectional view of the drawer structure, taken in the direction of the arrows along the lines 4-4 in Fig. 3, illustrating the structural details of the upper rear portion thereof; and Fig. 5 is a greatly enlarged fragmentary vertical sectional view of the upper front portion of the drawer structure, taken in the direction of the arrows along the line 5-5 in Fig. 3, illustrating one of the front supporting rollers incorporated therein.

Referring now to Fig. 1 of the drawings, the electric range 10 there illustrated comprises an upstanding frame or body 11 provided with a substantially horizontally disposed cooking top 12 terminating adjacent to the rear thereof in an upwardly directed backsplash 13. The body 11 comprises an oven disposed in the right-hand upper portion thereof below the cooking top 12 and having an open front closed by a suitable door 14 hinged adjacent to the lower edge thereof in a manner not shown. Also the body 11 com-

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prises a storage space disposed in the right-hand lower portion thereof below the oven and receiving movable drawer structure 15 embodying the present invention. Further the body 11 comprises another storage space disposed in the left-hand upper portion thereof below the cooking top 12 and receiving movable drawer structure 16 embodying the present invention. Finally, the body 11 comprises a further storage space disposed in the lower left-hand portion thereof, below the drawer space receiving the drawer structure 16 and to the left of the drawer space receiving the drawer structure 15, which storage space receives drawer structure 17 embodying the present invention. In Fig. 1 the drawer structure 15 is illustrated in its partially open position, while the drawer structures 16 and 17 are illustrated in their fully closed positions. In the range 10 the oven door 14 and the fronts of the drawer structures 15, 16 and 17, when closed, provide a smooth continuous vertical four-section front wall disposed below the cooking top 12.

The body 11 comprises upstanding front and rear walls 18 and 19, between which the oven space and the three drawer spaces are arranged; the front wall 18 having three openings therein through which the three drawer structures 15, 16 and 17 are respectively movably arranged. Specifically, the drawer structure 15 is movably arranged in an opening 18a formed in the front wall 18; which opening 18a is provided with an inwardly directed surrounding flange or lip 18b, as best shown in Fig. 3.

Referring now more particularly to Figs. 2 to 5, inclusive, of the drawings the details of the drawer structure 15 are illustrated; which drawer structure 15 comprises a seamless one-piece deep-drawn drawer 20 formed of cold rolled deep drawing sheet steel provided with longitudinally spaced-apart front and rear walls 21 and 22, two laterally spaced-apart side walls 23 and 24 and a connecting bottom wall 25. In the drawer 20 the corners between the front and rear walls 21 and 22 and the side walls 23 and 24 are rounded; the rear wall 22 and the side walls 23 and 24 are provided with a continuous downwardly rolled rim, including corresponding sections 22a, 23a and 24a; and the front wall 21 is provided with a forwardly projecting flange 21a merging into the rim sections 23a and 24a. Thus it will be understood that the walls 21, 22, 23, 24 and 25, the rim sections 22a, 23a and 24a and the flange 21a are formed integrally from a suitable one-piece blank by the deep-drawing process mentioned.

Also the drawer structure 15 comprises two

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substantially horizontally disposed and laterally parallel spaced-apart longitudinally extending guide channels 31 and 32 positioned between the front and rear walls 18 and 19. The guide channels 31 and 32 are identical; the front ends of the guide channels 31 and 32 are secured to the respective upstanding side portions of the flange 18b carried by the front wall 18 and surrounding the opening 18a; and the rear ends of the guide channels 31 and 32 project through slots formed in the rear wall 19. Specifically, the front end of the guide channel 31 is secured to the adjacent portion of the flange 18b by an arrangement including a screw and cooperating nut 33; and the front end of the guide channel 32 is secured to the adjacent portion of the flange 18b by an arrangement including a screw and cooperating nut 34. The extreme rear end of the guide channel 31 is secured to an adjacent tab carried by the rear wall 19 by an arrangement including a screw and a cooperating nut 35; and the extreme rear end of the guide channel 32 is secured to an adjacent tab carried by the rear wall 19 by an arrangement including a screw and a cooperating nut 36. Thus it will be understood that the guide channels 31 and 32 are removably secured in place between the front wall 18 and the rear wall 19 and are laterally spaced-apart on the opposite sides of the longitudinally extending drawer space formed in the body 11.

The guide channel 31 comprises a central body portion provided with inwardly directed substantially horizontal parallel spaced-apart upper and lower flanges 37 and 38 and a connecting vertically extending web 39; the lower flange 38 being provided with an outwardly and downwardly bent lip 40. Likewise, the guide channel 32 comprises a central body portion provided with inwardly directed substantially horizontal parallel spaced-apart upper and lower flanges 41 and 42 and a connecting vertically extending web 43; the lower flange 42 being provided with an outwardly and downwardly bent lip 44.

The front and rear ends of the guide channel 31 are identical; the front and rear ends of the upper flange 37 being flattened into the plane of the web 39; the front end of the lower flange 38 being flattened to provide a vertical support 45 disposed inwardly from the web 39; and the rear end of the lower flange 38 being flattened to provide a vertical support 46 disposed inwardly from the web 39. Likewise, the front and rear ends of the guide channel 32 are identical; the front and rear ends of the upper flange 41 being flattened into the plane of the web 43; the front end of the lower flange 42 being flattened to provide a vertical support 47 disposed inwardly from the web 43; and the rear end of the lower flange 38 being flattened to provide a vertical support 48 disposed inwardly from the web 43.

The drawer 20 is supported by the guide channels 31 and 32 for movement into and out of the longitudinally extending drawer space provided in the lower right-hand portion of the body 11, the rim section 23a being arranged within the guide channel 31 and the rim section 24a being arranged within the guide channel 32. The front end of the guide channel 31 carries a roller 51 which is preferably of the ball-bearing type and supported by a pin 52 secured to the support 45. The roller 51 projects inwardly from the support 45 and the face thereof is spaced a short distance from the adjacent side wall 23 of the drawer 20; the peripheral surface of the roller 51 engaging and supporting the adjacent lower sur-

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face of the downwardly roller rim section 23a. Likewise, the front end of the guide channel 32 carries a roller 53 which is preferably of the ball-bearing type and supported by a pin 54 secured to the support 47. The roller 53 projects inwardly from the support 47 and the face thereof is spaced a short distance from the adjacent side wall 24 of the drawer 20; the peripheral surface of the roller 53 engaging and supporting the adjacent lower surface of the downwardly rolled rim section 24a. A laterally extending fixture 55 is secured to the rear wall 22 of the drawer 20 adjacent to and below the rim section 22a; and the opposite ends thereof carry outwardly extending pins 56 and 57 respectively mounting rollers 58 and 59 that are preferably of the ball-bearing type. The rollers 58 and 59 respectively project into the guide channels 31 and 32; the faces of the rollers 58 and 59 being spaced a short distance inwardly with respect to the webs 39 and 43. The peripheral surface of the roller 58 is adapted to engage either the upper flange 37 or the lower flange 38 depending upon the position of the drawer 20; and likewise, the peripheral surface of the roller 59 is adapted to engage either the upper flange 41 or the lower flange 42 depending upon the position of the drawer 20.

A downwardly extending front stop 61 is secured to the central lower portion of the bottom wall 25 adjacent to the rear wall 22 and is adapted to cooperate with the lower portion of the flange 18b surrounding the opening 18a formed in the front wall 18. Two main depressions 71 and 72 are respectively formed in the lower flanges 38 and 42 of the guide channels 31 and 32 respectively adjacent to the rear ends thereof and cooperate with the respective rollers 58 and 59 in a manner more fully explained hereinafter. Likewise, two auxiliary depressions 73 and 74 are respectively formed in the lower flanges 38 and 42 of the guide channels 31 and 32 respectively adjacent to the front ends thereof and are adapted to cooperate with the respective rollers 59 and 58 in a manner more fully explained hereinafter. The two main rear depressions 71 and 72 are identical, each including a gradually rearwardly declined front surface and an abruptly rearwardly inclined rear surface. Specifically, the main rear depression 71 includes the gradually rearwardly declined front surface 81 and the abruptly rearwardly inclined rear surface 82. The two auxiliary depressions 73 and 74 are identical, each including a gradually forwardly declined rear surface and an abruptly forwardly inclined front surface. Specifically, the auxiliary depression 73 includes a gradually forwardly declined rear surface 83 and the abruptly forwardly inclined front surface 84.

Further, the drawer 20 is provided with front cover structure 91 rigidly secured to the front of the flange 21a and to the side walls 23 and 24 and covering the front wall 21 and extending over the opening 18a formed in the front wall 18. Specifically, the cover structure 91 comprises two rearwardly extending plates 92 embracing the respective side walls 23 and 24 and welded thereto. Also the cover structure 91 is provided with a front wall 93 generally rectangular in configuration and provided with an inwardly turned surrounding flange 94. The front wall 93 and the flange 94 are suitably enameled or finished to match the other surfaces of the body 11, and are otherwise formed to provide a range 10 having an attractive appearance. Specifically, it will be un-

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derstood that the front wall 93 comprises the lower right-hand quadrant of the front wall of the body 11, when the drawer structure 15 occupies its fully closed position. Finally, the front wall 93 carries an operating handle 95 that may be suitably trimmed with chromium or the like.

Considering now the operation of the drawer structure 15, it will be observed that when the drawer 20 occupies its fully closed or pushed-in position, the front wall 93 is arranged flush with the front walls of the other drawer structures 16 and 17 and with the front wall of the door 14. Moreover, the drawer 20 is restrained in its fully closed position by the main rear depressions 71 and 72 respectively cooperating with the rear rollers 58 and 59 in order to hold the rear face of the front cover 91 in engagement with the adjacent front face of the front wall 18. In other words, when the front wall 93 is moved into its fully closed position flush with the other front walls mentioned, the rear face of the front cover 91 is just moved into striking engagement with respect to the front face of the front wall 18; as in-movement of the drawer 20 is arrested; whereby the cover structure 91 does not strike the front wall 18 with great force. This operation is achieved by virtue of the fact that the rollers 58 and 59 riding on the respective lower flanges 38 and 42 ride down the rearwardly declined surfaces provided in the rear depressions 71 and 72 respectively and then engage the abruptly rearwardly inclined surfaces of the rear depressions 71 and 72 respectively arresting further in-movement of the drawer 20 just as the cover structure 91 is moved into striking engagement with the adjacent portion of the front wall 18; whereby the drawer 20 is first drawn into its fully closed position and restrained therein.

In order to move the drawer 20 from its fully closed position towards its open or pulled-out position, it is only necessary to exert a slight pulling movement upon the handle 95 by virtue of the support of the drawer 20 by the ball-bearing rollers 51, 53, 58 and 59. Specifically, during initial out-movement of the drawer 20, the lower portions of the rim sections 23a and 24a ride upon the peripheral surfaces of the respective front rollers 51 and 53 and the rear rollers 58 and 59 respectively ride upon the lower flanges 38 and 42. Specifically, the upper peripheral portions of the front rollers 51 and 53 project slightly above the respective lower flanges 38 and 42; whereby the lower portions of the rim sections 23a and 24a cannot engage or scrape the respective adjacent lower flanges 38 and 42 incident to movement of the drawer 20. Also the upper and lower peripheral portions of the rear roller 58 respectively project above and below the upper and lower portions of the rim section 23a; whereby the respective upper and lower portions of the rim section 23a cannot engage or scrape the respectively associated upper and lower flanges 37 and 38 incident to movement of the drawer 20. Likewise, the upper and lower peripheral portions of the roller 59 respectively project above and below the upper and lower portions of the rim section 24a; whereby the respective upper and lower portions of the rim section 24a cannot engage or scrape the respectively associated upper and lower flanges 41 and 42 incident to movement of the drawer 20. As the drawer 20 is moved to a considerably withdrawn position, the front portion thereof disposed forwardly of the front rollers 51 and 53 weighs more than the rear portion thereof disposed rearwardly

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of the front rollers 51 and 53; whereby the front of the drawer 20 is tilted slightly downwardly causing the rear rollers 58 and 59 to disengage the respective lower flanges 38 and 42 and to engage the respective upper flanges 37 and 41. As out-movement of the drawer 20 is continued, the front rollers 51 and 53 continue to engage and support the respective lower portions of the rim sections 23a and 24a; while the rear rollers 58 and 59 continue to engage and ride upon the respective upper flanges 37 and 41. When the drawer 20 is moved into its fully withdrawn position, the front stop 61 engages the lower portion of the flange 18b surrounding the opening 18a formed in the front wall 18, thereby arresting further out-movement of the drawer 20.

At this time the drawer 20 may be wholly removed from the body 11 by lifting upwardly upon the handle 95 causing the lower portions of the rim sections 23a and 23b to disengage the respective front rollers 51 and 53, causing the rear rollers 58 and 59 to disengage the respective upper flanges 37 and 41 and to re-engage the respective lower flanges 38 and 42, and causing the front stop 61 to disengage the adjacent lower portion of the flange 18b. At this time by pulling outwardly upon the handle 95 the drawer 20 may be completely removed from the body 11, the rear rollers 58 and 59 disengaging the front ends of the guide channels 31 and 37.

Subsequently, the rear end of the drawer 20 may be again inserted into the opening 18a, the rear rollers 58 and 59 being aligned with respect to the guide channels 31 and 32. Thereafter, upon continued pushing upon the handle 95 the drawer 20 is moved inwardly and the front stop 61 rides over and behind the lower portion of the flanges 18b. At this time the drawer 20 again occupies its fully open position.

In order to return the drawer 20 to its fully closed position, it is only necessary to push upon the handle 95. Initial in-movement of the drawer 20 is again guided by the guide channels 31 and 32. Specifically, the front rollers 51 and 53 engage and support the lower portions of the respective rim sections 23a and 24a, and the rear rollers 58 and 59 engage and ride upon the upper flanges 37 and 38. After the drawer 20 had been moved to a considerable pushed-in position, the weight of the rear portion of the drawer 20 causes the drawer 20 to tilt about the front rollers 51 and 53; whereby the rear rollers 58 and 59 disengage the respective upper flanges 37 and 41 and again engage the respective lower flanges 38 and 42. When the drawer 20 is again moved to its fully pushed-in position the rear rollers 58 and 59 again cooperate with the rear depressions 71 and 72 respectively in order to draw the drawer 20 into its fully closed position and to arrest in-movement thereof and to restrain it in its fully closed position in the manner previously explained.

The drawer 20 may be subject to some lateral shifting movement as it is moved longitudinally into and out of the body 11 and in order to prevent the front rollers 51 and 53 from engaging the respectively adjacent side walls 23 and 24, the faces of the rollers 51 and 53 are respectively disposed outwardly with respect to the bends in the lips 40 and 44 respectively carried by the lower flanges 38 and 42. Specifically, the bend in the lip 40 carried by the lower flange 38 projects inwardly with respect to the face of the adjacent front roller 51 so that the adjacent side wall 23 strikes the bend in the lip 40 instead

of the face of the adjacent front roller 51 in the event of lateral shifting movement of the drawer 20. In a similar manner in order to prevent the rear rollers 58 and 59 from engaging the respectively adjacent side walls 23 and 24 of the drawer 20, the faces of the rollers 58 and 59 are respectively disposed outwardly with respect to the bends in the lips 40 and 44 respectively carried by the lower flanges 38 and 42. Specifically, the bend in the lip 40 carried by the lower flange 38 projects inwardly with respect to the face of the adjacent rear roller 58 so that the adjacent side wall 23 strikes the bend in the lip 40 instead of the face of the adjacent rear roller 58 in the event of lateral shifting movement of the drawer 20.

Finally, it is noted that the guide channels 31 and 32 are identical so that they may be assembled in the body 11 respectively right and left instead of left and right, as illustrated. In this case, the front rollers 51 and 53 may be respectively assembled upon the supports 48 and 46 disposed adjacent to the front wall 18 and the respective supports 45 and 47 disposed adjacent to the rear wall 19 are not utilized. Likewise, the auxiliary depressions 73 and 74 are then employed to cooperate with the respective rear rollers 59 and 58 carried by the drawer 20; whereas the main depressions 71 and 72 are not utilized. In other words, when the range 10 is being assembled no particular care must be exercised in assembling the guide channels 31 and 32 in the body 11, since all of the guide channels are pre-formed and are of identical construction. Specifically, the front rollers 51 and 53 are merely assembled upon two of the supports respectively carried by the guide channels 31 and 32; and the guide channels 31 and 32 are assembled into the body 11 with the rollers 51 and 52 at the front thereof; whereby two depressions will be automatically positioned adjacent to the rear of the guide channels 31 and 32 in order to cooperate with the rear rollers 58 and 59 carried by the drawer 20, regardless of the manner of assembly of the guide channels 31 and 32 left and right in the body 11.

In view of the foregoing, it is apparent that there has been provided improved movable drawer structure that is especially adapted for use in electric ranges or the like.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claim all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

In combination, structure provided with an upstanding front surface having a longitudinally extending drawer-space formed therein, a drawer provided with longitudinally spaced-apart upstanding front and rear walls and two laterally spaced-apart upstanding side walls and a connecting bottom wall and a surrounding top rim, said rim providing two laterally spaced-apart rim guides respectively projecting outwardly from said side walls, two longitudinally extending drawer-guide members secured to said

structure and disposed in a substantially horizontal plane, said members being disposed in substantially parallel laterally spaced-apart relation adjacent to the opposite sides of said drawer-space and respectively receiving said rim guides, two inwardly directed lower flanges respectively carried by said members and respectively disposed below said rim guides, two inwardly directed upper flanges respectively carried by said members and respectively disposed above said rim guides, two laterally spaced-apart main attachments respectively provided on the front ends of said members, two laterally spaced-apart front rollers respectively carried by said main attachments and respectively projecting slightly above said lower flanges and respectively supporting said rim guides, two laterally spaced-apart rear rollers respectively carried on the opposite sides of said drawer adjacent to said rear wall and respectively projecting both slightly above and slightly below said rim guides and respectively engaging said upper flanges when said drawer is moved to a considerably pulled-out position and respectively engaging said lower flanges when said drawer is moved to a considerably pushed-in position, an upstanding front cover carried by said front wall and projecting over the adjacent front surface of said structure and covering the front of said drawer-space when said drawer is moved into its fully pushed-in position, two laterally spaced-apart main off-sets respectively carried by said lower flanges adjacent to the rear ends thereof and respectively cooperating with said rear rollers to restrain said drawer in its fully pushed-in position, two laterally spaced-apart auxiliary attachments respectively provided on the rear ends of said members, and two laterally spaced-apart auxiliary off-sets respectively carried by said lower flanges adjacent to the front ends thereof, said auxiliary attachments being arranged to carry said rear rollers in order to serve the purpose of said main attachments and said auxiliary off-sets being arranged to cooperate with said rear rollers in order to serve the purpose of said main off-sets in the event said members are respectively secured to said structure in reversed right-hand and left-hand positions.

WALTER R. McDOWELL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,396,864	Mayne	Nov. 15, 1921
1,980,824	Raggio	Nov. 13, 1934
1,998,517	Moore	Apr. 23, 1935
2,029,718	Hobson et al.	Feb. 4, 1936
2,241,053	Brightman	May 6, 1941
2,293,210	Marzolf	Aug. 18, 1942
2,308,540	Rakow	Jan. 19, 1943
2,328,835	Motter	Sept. 7, 1943
2,343,692	Miller	Mar. 7, 1944
2,487,356	Meiners et al.	Nov. 8, 1949
2,496,673	Nielsen	Feb. 7, 1950