May 8, 1951 H. G. KNUTH 2,551,843

DRAWER ALIGNING MEANS FOR CABINETS

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Fig. 1.

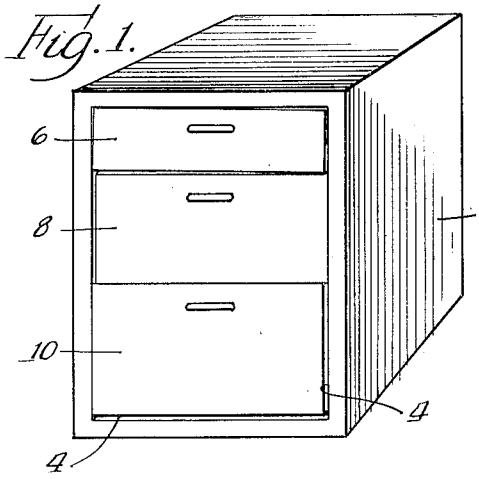


Fig. 2.

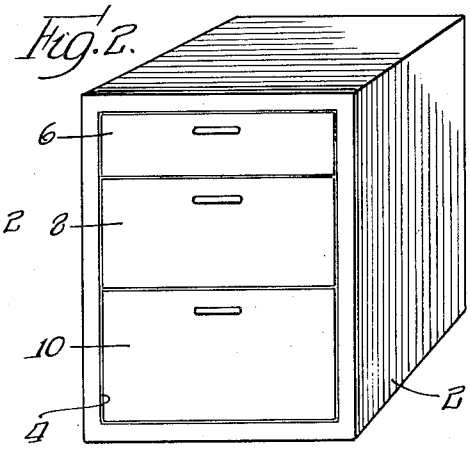


Fig. 3.

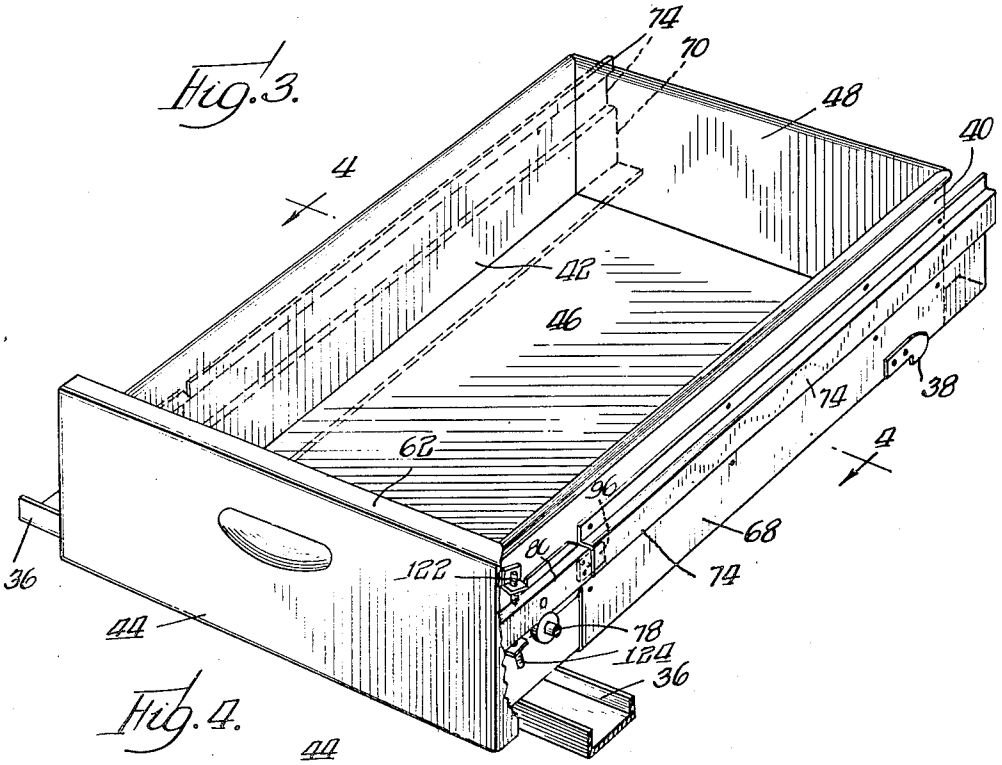
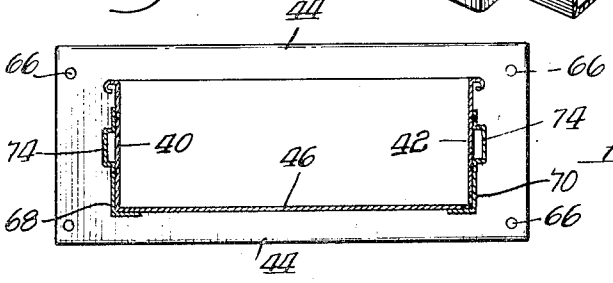


Fig. 4.



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Fig. 5.

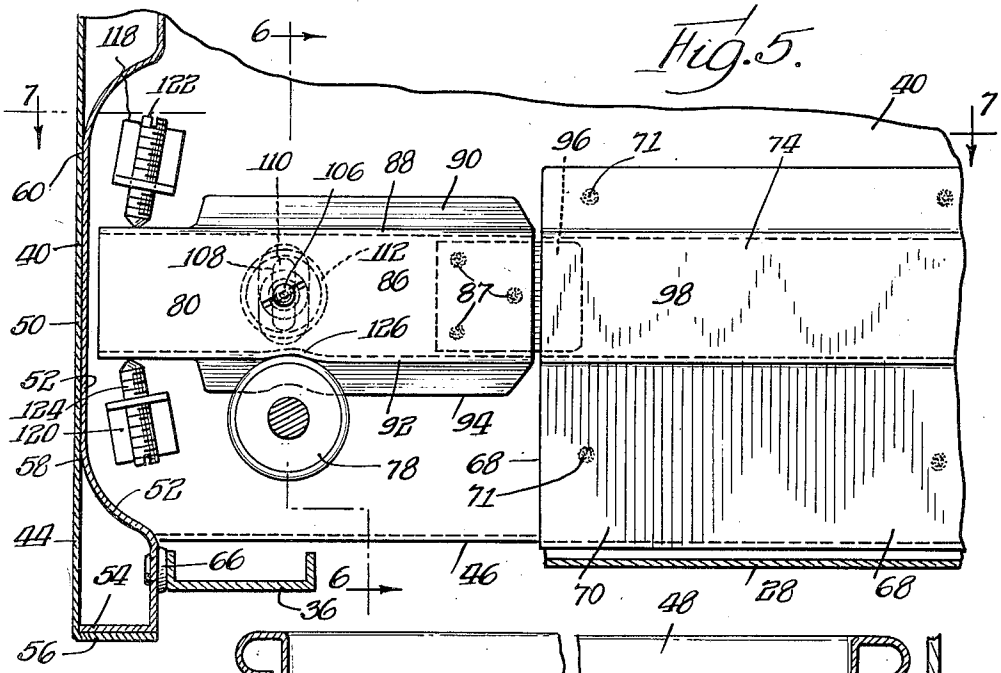
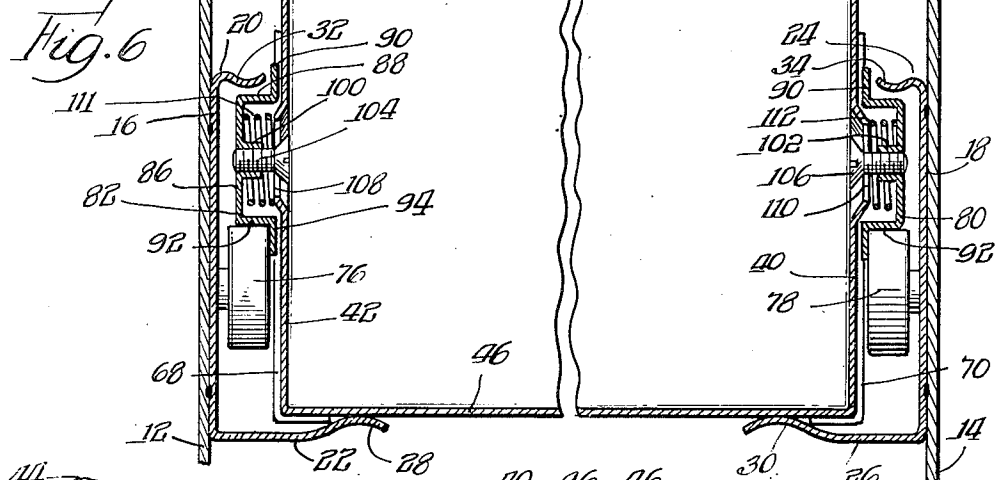


Fig. 6



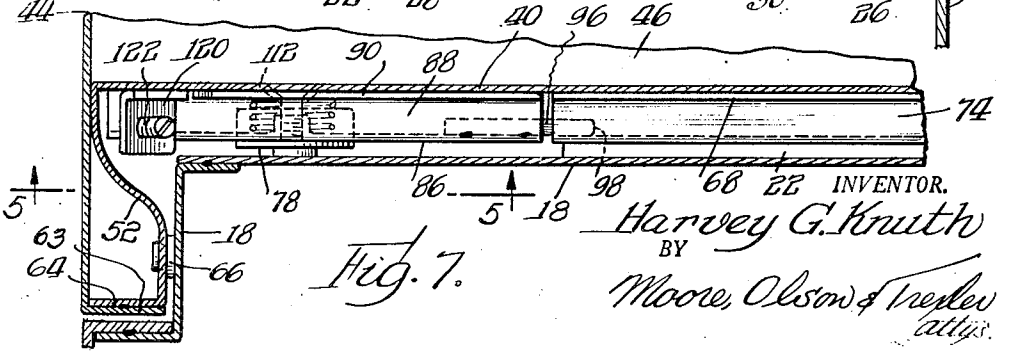


Fig. 7.

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DRAWER ALIGNING MEANS FOR CABINETS

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14 Claims. (Cl. 312—343)

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This invention relates to cabinets and other devices which have drawers, preferably of the slidable type.

In the manufacture of cabinets of the sliding drawer type considerable difficulty has been experienced heretofore due to the fact that the front of the drawer has not always exactly fitted the drawer opening, so that when in closed position the front of the drawer, when closed in its opening, would be tilted either vertically or horizontally with respect to the opening and would make an improper fit. In the manufacture of cabinets and sliding drawers of sheet metal parts, and in assembling these parts by spot welding them together to form such a cabinet, it has been very difficult to maintain tolerances sufficiently accurate so that each and every welded assembly would be identical and fit perfectly into a given drawer opening. Such difficulties in the past have delayed work on an assembly line due to the fact that the workmen had to remove the drawer slides and place shims under the slides, and make other crude adjustments. None of these prior adjustments were sufficiently positive and hence disrupted the continuous assembly process. Furthermore, in the field, contractors very often removed drawers from several cabinets, then installed the cabinets, sometimes not too perfectly, and then when the drawers were replaced the drawers were out of alignment and showed the deficiencies illustrated in Figure 1 of the drawings wherein the top drawer is tilted diagonally with respect to its opening, the middle drawer is spaced away from the left hand side of the opening and from the top, and the bottom drawer is spaced from the bottom opening and the right side. All of these misalignments presented a very unsightly appearance for the front of the cabinet when the drawers were in closed position. In addition it caused great difficulty because it generally required the trip of a service man to make the crude adjustments of the drawers.

The object of the present invention is to overcome these difficulties by providing means for adjusting the position of each drawer front with respect to its opening whereby a drawer may be adjusted vertically with respect to its opening and/or whereby a drawer may be adjusted both vertically and horizontally with respect to its opening, and/or whereby a drawer may be adjusted in a horizontal plane with respect to its opening, by the means disclosed in the present application, or its equivalent.

Another object of the invention is to provide a

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drawer with adjusting mechanism whereby the drawer can be adjusted, even by the user, in a very quick and easy manner. In short, it may be corrected on the job by anyone, in a very simple way.

Yet another object of the invention is to provide a very simple and economical adjustment for a drawer with respect to its opening in the cabinet to provide the hereinbefore mentioned adjustments.

These and other objects of the invention will be apparent from a perusal of the following specification, when taken in connection with the accompanying drawings, wherein:

Figure 1 represents a view showing the manner in which different drawers of a cabinet can and do get out of adjustment with respect to the opening of the cabinet, each one of the three drawers of the figures showing different types of misalignments;

Figure 2 shows the same cabinet with the drawers adjusted in accordance with the principles of the herein disclosed mechanism;

Figure 3 is a perspective view with certain parts broken away, showing the drawer adjusting mechanism as applied to one of the drawers of the cabinet;

Figure 4 is a section taken on the line 4—4 of Figure 3;

Figure 5 is a view partly in section, on line 5—5 of Figure 7, showing the front of the drawer and its adjustment mechanism;

Figure 6 is a section taken on the line 6—6 of Figure 5; and

Figure 7 is a section taken on the line 7—7 of Figure 5.

Referring now to the details of the invention, there is provided any type of cabinet 2. In the present instance it is preferably shown as a cabinet formed of sheet metal, although the details of the invention are not necessarily limited thereto. However the sheet metal cabinet is the preferred construction. The cabinet comprises the usual housing having a perfectly rectangular opening 4 into which slide one or more drawers. In the present instance the cabinet is illustrated as having a vertical tier of three drawers 6, 8 and 10, which when in closed position completely fill the front opening 4 of the cabinet and close the same. As is well known in the art, these drawers and the inner frame of the cabinet are provided with track means which permits each drawer to be pulled out of the cabinet to a forward position, or alternatively to a closed position such as shown for instance

in Figure 2. The cabinet frame at the two sides of each drawer opening is provided with horizontally extending supports 12 and 14, see Figure 6, to which are preferably connected spring metal guides 16 and 18. These guides include the inwardly extending spring metal fingers 20 and 22, 24 and 26. The longer, inwardly extending flanges 22 and 28 of the guides are provided at their ends with curved upwardly extending portions 28 and 30 which underlie and contactingly support and guide the bottom of each drawer. The top spring metal flanges 20 and 24 are also formed with bowed portions 32 and 34 to provide upper guides for the track mechanism on the drawer whereby to hold the drawers down with respect to the cabinet supports or frames 12 and 14 while at the same time permitting the horizontal sliding movement of the drawers. In addition, at the front of the cabinet there is provided for each drawer opening a transversely extending channel bar 36 which acts as a rigid stop in connection with a stop member 38 attached to the rear end of the sides 40 and 42 of the drawer.

Each drawer, in addition to the two side members, comprises a front panel 44, a bottom 46, and a rear panel 48. As shown clearly in Figure 5, the front panel 44 is formed of two pieces 50 and 52 of sheet metal which have the bottom overlapping portions 54 and 56 which are welded together along the bottom of the drawer. These two sheet metal pieces 50 and 52 are in firm contact from approximately the point 58 to the point 60 to provide rigidity and thence are formed at the top with overlapping flanges identical with the bottom construction, the upper outer flange portion 62 being shown in Figure 3. In addition, at the sides the front of the drawer is provided with overlapping flanged portions 63 and 64, Figure 7, which are welded together for rigidity. The member 52, as shown in Figures 4, 6 and 7, is provided with rubber bumpers 66 which are adapted to engage stop bar 36 and the inner front wall of the stationary guide 18 in the closed position of the drawer. In addition, each drawer comprises elongated track plates 68 and 70, which track plates are welded to the sides 40 and 42 of the drawer as at 71 (see Figure 5). Each one of the track plates 68 and 70 is provided with a bent out rail portion 74, providing a horizontal underside or track which is adapted to roll along on rollers 76 and 78 which are mounted on the side frame members 12 and 14 and the guides 16 and 18, as shown in Figure 6. These rollers 76 and 78 are free to revolve on their pivotal axes.

Means is provided for adjusting the drawers both vertically and horizontally with respect to the drawer opening and this comprises a forward track section for each side of the drawer. These forward track sections are shown at 80 and 82 in Figure 6. One of the track sections 80, is shown in side view in Figure 5. Each track section comprises a rail section preferably of the shape shown in cross section in Figure 6, involving a vertical wall 86, an upper transverse wall 88, an upstanding flange 90, a lower transverse wall 92 which forms the track portion beneath which the roller 78 rolls, and a depending flange 94. The flanges 90 and 96 preferably do not extend the full length of the flanged wall portions 88 and 92 so as to provide for adjustment with adjusting screws hereinafter mentioned. To the inner vertical wall 86 of each track section there is welded as at 87 a bar-like extension 96 which fits rather loosely into the channel-like portion 98 of one of the main track members 74 and 76. In short, the tongue 96 projects into the channelway 93 so that the short track section 80 can pivot in a vertical direction about its rear point and also by said loose fit of such construction each of the short track sections can move laterally in horizontal directions with respect to its associated track portion 98, and consequently with respect to the drawer. Each short track section 80 and 82 has its walls centrally and circularly apertured and threaded as at 100 and 102 to receive adjusting screws 104 and 106. The shanks of the screws likewise pass through elongated slots 108 and 110 formed in the side walls 40 and 42 of the drawer. The elongated slot 110 is clearly shown in Figure 5 of the drawings. In addition, springs 111 and 112 are confined about the screws 104 and between the outer walls 40 and 42 of the drawer and the inner walls of the track sections 80 and 82. The action of the spring takes place against the inner walls of the drawer and these track sections. The track section flanges 114 and 116 bear against the side of the roller 76 and 78. Since these rotatable rollers 76 and 78 are free to rotate but not to move laterally, the rollers serve to confine the track sections against outward movement beyond a predetermined point, and since the springs 111 and 112 are pressing against these sections, the urge of the spring will necessarily have an anchorage against the inner wall of the short track sections 80 and 82 and also against the inner opposite side of the drawer.

The outer face of each side wall 40 and 42 of the drawer has welded thereto upper and lower brackets 118 and 120 disposed above and below the front portion of each of the short track sections 80 and 82 and these brackets are threaded to receive the turnable screws 122 and 124. Each screw is provided with a preferably pointed end adapted to engage the upper and lower flanges 88 and 92 of the short track sections. Thus by changing the adjustment of these screws 122 and 124 the short track section 80, see Figure 5, may be adjusted about its rear pivotal portion 98 so that the one end of the drawer may be adjusted in a vertical plane, and since the opposite side of the drawer has a corresponding adjustment, either side of the drawer may be tilted up or down with respect to the other side of the drawer. This constitutes the vertical adjustment of the drawer.

In the same manner, by tightening or loosening the screws 104 and 106 the drawer may be shifted to the right or to the left, depending upon the needed adjustment. If to be shifted to the left, as shown in Figure 6, the screw 104 is tightened and the screw 106 is loosened, so as to permit the spring 112 to push the drawer side 40 to the left. The corresponding adjustment of the drawer to the right is accomplished by adjusting the screws in the reverse manner.

The under flanges 92 of the short track sections 80 and 82 are provided with upwardly depressed portions 126 so that when these portions contact the rollers they will act as stops and as means for holding the drawer in exactly closed position.

Referring now to Figure 1, in order to correct the tilting conditions of the top drawer 6 with respect to its opening, the operation would be to loosen lower screw 124, see Figure 5, and tighten upper screw 122, reversing the operation on the opposite side of the cabinet, that is, loosening the lower screw and tightening the upper screw. This

would align the drawer 6 to the condition shown in Figure 2. With respect to drawer 8 in Figure 1, this would be corrected by tightening the screw 104 on the left hand side of the drawer and loosening the screw 106 on the right hand side of the drawer to produce the corrected situation shown at 8 in Figure 2. The correction of drawer 10 as shown in Figure 1 would be accomplished by first loosening both of the lower screws 124 and tightening both upper screws 122 on both sides of the drawer and then loosening screw 104 and tightening screw 106.

Obviously the invention is not limited to the specific details of construction disclosed herein but is capable of other modifications and changes without departing from the spirit and scope of the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination with a cabinet including a frame forming a drawer opening and including opposed stationary frame members on opposite sides of and within the opening, anti-friction means carried by said opposed stationary frame members, a drawer having sides and a front to close said opening, the opposite sides of said drawer having track means supported on said anti-friction means whereby said drawer may move in said opening to open position and to a closed position wherein the drawer front closes said opening, and means for horizontally adjusting the drawer relative to said track means.

2. In combination with a cabinet including a frame forming a drawer opening and including opposed stationary frame members on opposite sides of and within the opening, anti-friction means carried by said opposed frame members, a drawer having sides and a front to close said opening, the opposite sides of said drawer having track means supported on said anti-friction means whereby said drawer may slide in said opening to an open position and to a closed position wherein the drawer front closes said opening, means for adjusting the drawer vertically in respect to said track means, and means for adjusting the drawer horizontally with respect to said track means whereby to adjust the front of the drawer vertically and horizontally with respect to said opening.

3. In combination with a cabinet having a rectangular opening, said cabinet including frame members disposed within the cabinet on opposite sides of said opening, roller means rotatably mounted on said opposed sides, a drawer having a front rectangular panel of a size to fit the front opening of the cabinet, said drawer having opposed sides, track means on the sides adapted to roll on said roller means, said track means having a forward relatively shiftable section, and means for independently adjusting opposite sides of the drawer with respect to said relatively shiftable section of the track means.

4. In combination with a cabinet having a rectangular opening, said cabinet including frame members disposed within the cabinet on opposite sides of said opening, roller means rotatably mounted on said opposed sides, a drawer having a front rectangular panel of a size to fit the front opening of the cabinet, said drawer having opposed sides, track means on the sides adapted to roll on said roller means, the opposed tracks mounted on opposite sides of the drawer each comprising a separable portion forming a continuation of the remaining portion of said track means and shiftable relative thereto, and means for adjusting each side of the drawer with respect to said separable track means.

5. In combination with a cabinet having a rectangular opening, said cabinet including frame members disposed within the cabinet on opposite sides of said opening, roller means rotatably mounted on said opposed sides, a drawer having a front rectangular panel of a size to fit the front opening of the cabinet, said drawer having opposed sides, track means on the sides adapted to roll on said roller means, said track means on each side of the drawer including at its forward end a laterally shiftable, relatively short segment forming a continuation of the main track, resilient means disposed between said relatively short segment of track means and each side of the drawer and adjustable from either side of the drawer for shifting said drawer laterally of said track means, and means interconnecting the relatively short track means and the drawer for adjusting opposite sides of said drawer vertically with respect to said short track means.

6. In combination with a cabinet including a frame forming a drawer opening and including opposed supporting frame members on opposite sides of and within the opening, anti-friction means carried by said opposed frame members, a drawer having sides and a front to close said opening, the sides of said drawer having track means cooperating with said anti-friction means whereby said drawer may move in said opening to an open position and to a closed position wherein the drawer front closes said opening, said track means including on each side of the drawer a forward section, shiftable transversely of the slidable movement of said drawer, adjustable means transversely to shift said drawer transversely of the direction of sliding movement of the drawer on said track means, and means associated with said forward sections of said track means on opposite sides of the drawer for vertically shifting said drawer with respect to said track means.

7. In combination with a cabinet having a rectangular opening, a drawer having a front configured exactly to close said opening, said drawer having sides, each of said sides having a horizontal, longitudinally extending track thereon, said track at its forward portion having a shiftable section forming a continuation of the remaining section of the track, each of said drawers having a vertical slot in the side thereof, an adjusting screw passing through said vertical slot and engaging a threaded portion of said shiftable track, spring means confined by the said shiftable track and the adjacent side of the drawer, roller means mounted upon an inner frame wall of the cabinet and adapted to overlie said track, and means on the side wall of the drawer above and below the forward portion of said track, there being adjusting means to engage the upper and lower portions of said shiftable track section and drawer to elevate or depress said drawer with respect to said track means.

8. In combination with a cabinet having a rectangular opening, a drawer slidable therein and having a front fitting said opening, an anti-friction roller within the cabinet on opposite sides and adjacent said opening, horizontal track means carried by the drawer adapted to overlie and run upon said anti-friction rollers, the forward part of said track means being shiftable

with respect to the remainder of said track means, adjustable means associated with said shiftable part of the track means and drawer for shifting the drawer horizontally in either direction with respect to said track means, and adjustable means associated with the shiftable part of the track means and said drawer for adjusting either side of said drawer in a vertical direction, either upwardly or downwardly.

9. In combination with a cabinet having a rectangular opening, a drawer slidable therein and having a front fitting said opening, an anti-friction roller within the cabinet on opposite sides and adjacent said opening, horizontal track means carried by the drawer adapted to overlie and run upon said anti-friction rollers, the forward part of said track means being shiftable with respect to the remainder of said track means, the underside of said shiftable part of said track means including a depression adapted to overlie said roller when the front of the drawer is in closed position, adjustable means associated with said shiftable part of the track means and drawer for shifting the drawer horizontally in either direction with respect to said track means, and adjustable means associated with the shiftable part of the track means and said drawer for adjusting either side of said drawer in a vertical direction, either upwardly or downwardly.

10. In combination with a cabinet having a rectangular front opening, opposed stationary frame members extending longitudinally within the cabinet, guideways mounted upon the opposed inner walls of said frame member, an anti-friction roller mounted on each guideway at the front portion thereof, a drawer having a front adapted in closed position to fit said cabinet opening, said drawer having a bottom, the lower portion of each guideway extending inwardly and being formed of spring metal to underlie and slidingly guide the bottom of said drawer, the opposite sides of said drawer having track means extending longitudinally thereof, the upper portion of each said guideway having inwardly extending spring portions adapted to overlie said track means to guide the same, said track means having a bottom horizontal shoulder adapted to roll upon said friction roller, and means for vertically adjusting the drawer in respect to each of the forward portions of said track means, and means for horizontally shifting the drawer relatively to said track means.

11. In combination with a cabinet including a frame forming a drawer opening including support members on opposite sides of and within the opening, means forming a guideway carried by said supporting members on opposite sides of the opening for slidingly supporting the rear portion of the drawer, anti-friction means carried by the opposed frame members adjacent the opening of the cabinet, a drawer having sides and a front to close said opening, the sides of said drawer having track means adapted to move on said anti-friction means whereby said drawer may shift in said opening to an open position or to a closed position wherein the drawer front closes said opening, a forward portion of said track means being separable and relatively shiftable with respect to the remainder of said track means, said forward portion of said track means resting upon said anti-friction means as the drawer approaches closed position, means adjustably to shift the forward portion of the track means vertically relative to the drawer, and means to adjustably shift the drawer horizontally with respect to the track means, whereby to align the vertical and horizontal edges respectively of the drawer with the vertical and horizontal edges of the cabinet drawer opening.

12. In combination with a cabinet including a frame forming a drawer opening and including opposed stationary frame members on opposite sides of and within the opening, anti-friction means carried by said opposed frame members, a drawer having sides and a front to close said opening, each of the sides of said drawer having track means supported upon said anti-friction means whereby said drawer may slide in said opening to an open position and to a closed position wherein the drawer front closes said opening, means for vertically adjusting each side of the drawer with respect to the front portion of the associated track means for adjusting each side of the drawer vertically with respect to said opening, and means mounted on each of said track means for horizontally adjusting the drawer with respect to the track means.

13. In combination with a cabinet having a rectangular opening, said cabinet including frame members disposed within the cabinet on opposite sides of said opening, a drawer having a front rectangular panel of a size to fit the front opening of the cabinet and opposed sides, support means comprising roller means and track means for supporting said drawer upon said frame members, said track means being adapted to roll on said roller means and having a forward, relatively shiftable section, and means for independently adjusting opposite sides of the drawer with respect to said support means.

14. In combination with a cabinet having a frame forming a drawer opening, and including opposed stationary frame members on opposite sides of and within the opening, anti-friction means carried by said opposed frame members, a drawer having sides and a front to close said opening, track means associated with each side of the drawer and supported on said anti-friction means, and means connecting said track means to the drawer whereby the drawer may slide in said opening to an open position and to a closed position wherein the front of the drawer closes said opening, said connecting means including means for vertically adjusting the front of the drawer with respect to the track means, and a rearward connection between the track means and the drawer automatically operable to permit relative movement between the track means and the drawer during relative vertical adjustment between the drawer and the track means.

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