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3,298,768

DRAWER RAIL STRUCTURE

Filed March 31, 1965

2 Sheets-Sheet 1

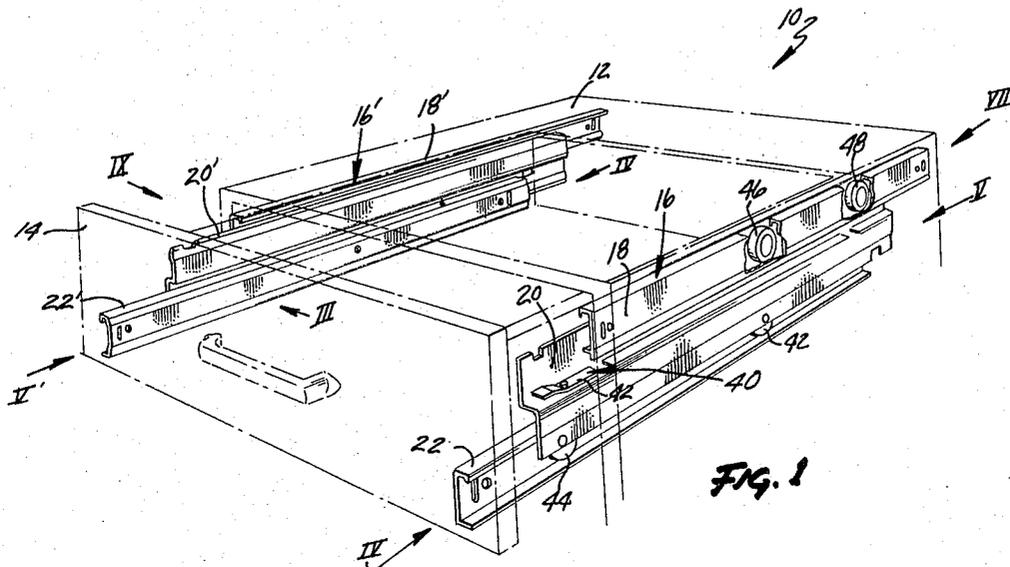


FIG. 1

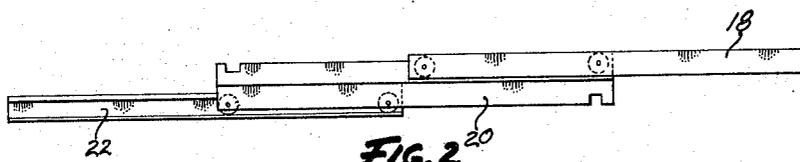


FIG. 2

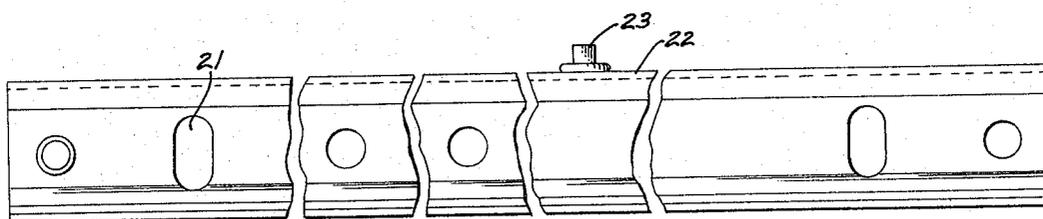


FIG. 3

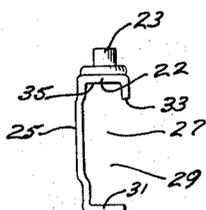


FIG. 4

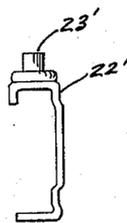


FIG. 5

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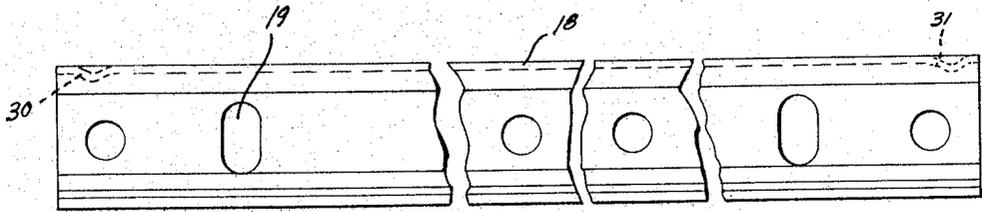


FIG. 6A

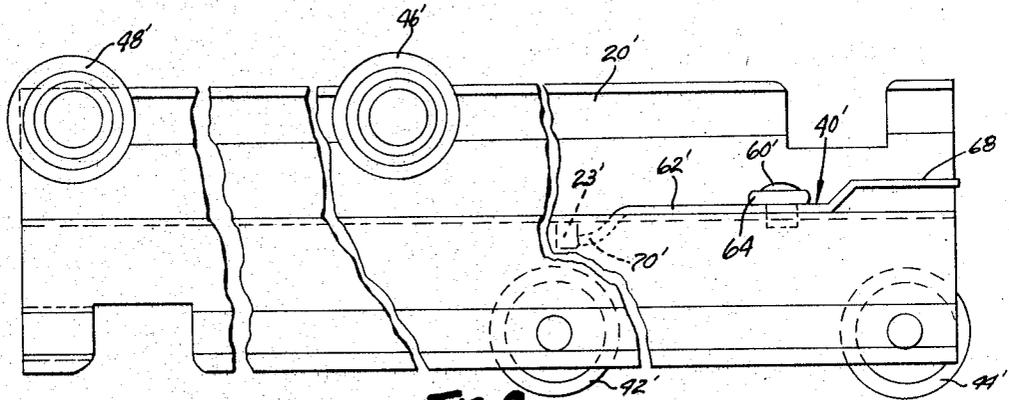


FIG. 9

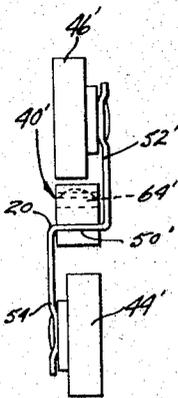


FIG. 10

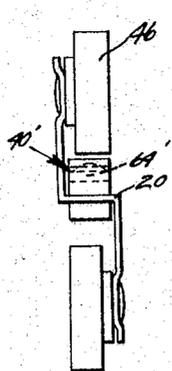


FIG. 8

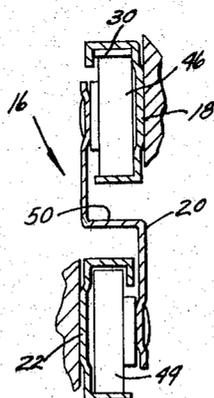


FIG. 11

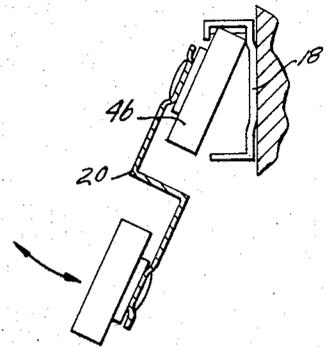


FIG. 12

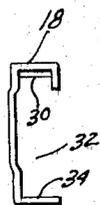


FIG. 6

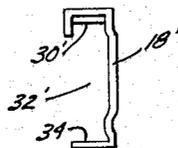


FIG. 7

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**DRAWER RAIL STRUCTURE**

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5 Claims. (Cl. 312-339)

This invention relates to drawer rail assemblies, and particularly to a drawer rail assembly capable of simple secure attachment to a cabinet and to the drawer, by the purchaser, while being relatively inexpensive to manufacture due to interchangeability of the rail components between opposite sides of the drawer.

Frequently, relatively inexpensive drawer rail assemblies are advantageous for wooden drawers and cabinets where complex, highly precise rail assemblies are not practical for economic reasons. These rail assemblies should allow full drawer extension and enable smooth opening and closing action. However, inexpensive assemblies are known to have certain definite disadvantages as presently manufactured.

One such disadvantage is the substantial side sway and instability occurring at full extension. This causes a tendency of the rails to pull loose from their mounting after considerable drawer rail usage. Another disadvantage is the difficulty of initially mounting these rails, and particularly the positioning and alignment of the elements for mounting. Associated with this problem is the difficulty of assembling the rails prior to or subsequent to mounting to enable easy mounting, yet to effect a secure assembly once mounted.

Another difficulty is the problem of inserting the intermediate rail into the cabinet rail after assembly and still being able to use a sturdy, stable, stop assembly. The stop between the intermediate rail and cabinet rail should be rigidly and fixedly attached, and should be inexpensive. This frequently requires these two rails to be interconnected at the factory rather than enabling simple mounting of the cabinet rail by itself, followed by insertion of the intermediate rail.

Although the stop between the intermediate rail and the cabinet rail should be rigidly fixed, the stop between the drawer rail and the intermediate rail must be manually shiftable to allow removal of the drawer with its attached drawer rails as necessary. On inexpensive rail assemblies, this should also be a simple inexpensive structure, yet effective and sturdy.

It is an object of this invention to provide a full extension drawer rail assembly capable of relatively inexpensive manufacture, with interchangeability of rail component stock from one side of the drawer to the other, and preferably between the case rail and drawer rail.

Another object of this invention is to provide a full extension drawer rail assembly subject to simple, easy mounting and assembly by the purchaser, with the intermediate rail being snapped into position in the cabinet rail after mounting of the cabinet rail by itself. Yet, the assembly has minimal side sway with excellent resulting stability and minimal tendency to pull loose from the mounting.

Another object of this invention is to provide a drawer rail assembly with a unique, effective, but inexpensive, releasable stop assembly between the intermediate rail and the drawer rail to allow drawer removal, but without adding considerable expense to the assembly.

These and several other objects of this invention will become apparent upon studying the following specification in conjunction with the drawings in which:

FIG. 1 is a perspective view of a drawer and cabinet utilizing two sets of the novel rail assemblies;

FIG. 2 is a side elevational view of one of the rail assemblies;

FIG. 3 is an enlarged side elevational view of the outside face of the right drawer channel rail in FIG. 1;

FIG. 4 is an enlarged, front end elevational view of the rail in FIG. 3;

FIG. 5 is an end elevational view of the opposite rear end of the rail in FIG. 3, or representing the front end of the drawer rail in the left rail assembly in FIG. 1;

FIG. 6 is a rear end elevational view of the right cabinet rail in FIG. 1 and also representing the front end elevational view of the left cabinet rail in FIG. 1;

FIG. 6A is a side elevational view of the inside face of the left cabinet rail in FIG. 1;

FIG. 7 is a front end elevational view of the right cabinet rail in FIG. 1;

FIG. 8 is a front end elevational view of the right intermediate rail in FIG. 1, and also representing the rear end view of the left rail;

FIG. 9 is an enlarged elevational view of the outside face of the left intermediate rail in FIG. 1;

FIG. 10 is a front end elevational view of the left intermediate rail in FIG. 1;

FIG. 11 is a sectional elevational view of the right drawer rail assembly in FIG. 1; and

FIG. 12 is a sectional elevational view of two of the rails in FIG. 11, showing the insertion and/or removal of the intermediate rail into operative engagement with the case rail.

Referring now specifically to the drawings, the complete drawer assembly 10 in FIG. 1 includes, in phantom, a case or cabinet 12, and a drawer 14, the drawer being suspended in the cabinet by a right hand drawer rail assembly 16 and a left hand drawer rail assembly 16', on opposite sides of the drawer.

Rail assembly 16 includes a case rail 18, an intermediate rail 20, and a drawer rail 22. Case rail 18 is mounted to the inside face of the cabinet or case by suitable screws utilizing the screw holes 19 (FIG. 6A) on opposite ends. Drawer rail 22 is mounted to the drawer by suitable screws through holes 21 (FIG. 3) in the same fashion.

It will be realized that the opposite rail assembly 16' includes corresponding rail elements, namely case rail 18', intermediate rail 20', and the drawer rail 22'. In fact, throughout this specification, reference will be made to one or the other rail assemblies, depending upon which one best shows in the drawings the particular feature discussed. It should be realized, therefore, that the particular feature cited for one assembly will also be found in the other assembly in duplicate fashion. They are mounted in mirror image of each other. As will be explained hereinafter, each is also interchangeable with the corresponding rail element on the other side of the drawer due to their particular structural configuration and assembly.

Actually, the drawer channel rails are essentially the same as the case channel rails, both having identical cross-sectional configurations. More specifically, referring to FIGS. 3, 4 and 5, the drawer channel 22 shown is essentially a channel-shaped or C-shaped element in cross-sectional configuration. Mounted intermediate its ends, to the top thereof, is a rigid, upwardly projecting stop pin 23. The channel in FIG. 4 is the same in cross-sectional configuration as channel 22' shown in FIG. 5 with its stop 23'. Each is of elongated nature, having a back surface, e.g. 25 (of rail 22) for mounting to the drawer, and an elongated slot opening 27 on the opposite side leading into the elongated wheel receiving track space 29. This track space extends between the underside 35 of the top portion or leg, and the horizontal lower track surface 31. The lower leg of the element forming this lower track surface extends horizontally and terminates in its horizontal plane without an upwardly projecting flange. Projecting downwardly from the outer edge of the top of the chan-

3

nel is a vertical flange 33' for retaining roller wheels of the intermediate rail within the channel.

Reference to FIGS. 6 and 7 will show that the construction of the case channel elements 18 and 18' have essentially the same cross-sectional configuration as the drawer channels. Each has an inner roller track space (32 and 32') and lower track surfaces (34 and 34'). Each also has a downwardly projecting front end stop (30 and 30') and a rear end stop (31 and 31') deformed into the upper horizontal leg.

It will be seen that the drawer rail channel and case rail channel elements are of the same rolled stock so as to be useful for either side, or with slight modification, useful as drawer channels or case channels.

The intermediate rail construction is the same for both intermediate rails 20 and 20', except for stop assemblies 40 and 40'. If rail 20' (in assembly 16') were to be inserted in assembly 16, the stop would have to be moved from one end to the other. Otherwise, the constructions are identically alike. Each of these intermediate rails 20 or 20' is basically a double L-shaped element (i.e. Z-shaped) in cross-sectional configuration, each having a pair of spaced lower rollers 42' and 44' in the middle and the front of the rail, and a pair of upper rollers 46' and 48' in the middle and rear of the rail. In other words, the element has a cross section shaped like a Z with each of its connected legs generally normal to the adjacent leg. These vertical wheel type rollers are rotatably mounted to the intermediate rail member on opposite sides of central horizontal cross leg 50. They are attached to vertical legs 52 and 54 or 52' and 54' of the intermediate rails. These wheel type rollers are positioned inwardly from the rail legs, and their peripheries project above or below the intermediate rail to be received by the respective case channels and drawer channels on opposite sides of the drawer.

The cross leg 50' for example, of rail 20', also mounts the stop lever subassembly 40' which cooperates with the pin 23' on the drawer channel. This lever is mounted in its central portion to the cross leg 55 by a headed rivet 60'. This rivet extends down through the central portion of stop lever 62' with sufficient clearance to allow the lever to be shifted slightly on the rivet, and extends down through cross leg 50' of the intermediate rail where it is deformed to be secured. Intermediate the upper surface of lever 62' and the head of the rivet is a resilient, polymeric, compressible annular washer 64'. This compressible polymeric element can be rubber, plastic or other polymeric material. The lever has a front elevated end portion 68' which is manually depressible. It has a front end abutment portion 70' which projects down through an opening in leg 50' to abut stop pin 23' (shown in phantom in FIG. 9 for purposes of illustration). Depression of end 68' on the lever causes pivotal shifting thereof on the rivet by compression of one side of the annular washer 64' to elevate end 70' out of engagement with stop pin 23' for release of the drawer rail from the intermediate rail. With release of the lever, the resilient washer biases the lever back into its initial position because of its inherent characteristics.

When the three components of each drawer rail assembly are to be assembled like the assembly 16 shown in FIG. 11, the upper rollers 46 and 48 mounted to the upper end of the intermediate rail fit within the case rail channel 18 while the lower rollers 42 and 44 fit within the drawer channel element 22. Insertion of rollers 42 and 44 into the drawer channel is achieved merely by inserting the rollers into the end of the drawer channel and pushing the rails together so that the stops 23 and 23' push the tapered ends 70 and 70' of the stop levers up out of the path to thereby interengage them.

Assembly of the intermediate rail to the case rail is rather uniquely done. Referring to FIG. 12, the intermediate rail 20 is tilted, i.e. rotated an acute angle on its elongated axis, with its top edge toward case channel 18,

4

to insert the upper edge rollers 46 and 48 beneath the downwardly projecting roller retention flange of the channel. It then is pushed back to its vertical upright position illustrated in FIG. 11 to slide the bottom edge of the rollers over the track surface on the bottom of the case channel. This actually normally "snaps" the rollers into position because the diagonal distance across such roller is slightly larger than the track space height. Once in position, the rollers will not fall out since the drawer and drawer rails mounted as shown in FIG. 12 prevent the unit from tilting back again (until the drawer is removed), and the upper retention flanges on the channels prevent the rollers from tilting out the opposite direction or sliding sideways. These flanges also prevent any significant side sway because the wheel type rollers are allowed only limited lateral movement.

Removal of these intermediate rails from operative engagement with the case rail is by an opposite movement, i.e. tilting the intermediate rails back out through the position illustrated in FIG. 12 and then retracting the rollers out of the elongated slot opening. It will be realized that by utilizing the retention flange on this receiving opening of the case channel, the insertion opening height is less than the diameter of the rollers fitted therein, while the wheel receiving space in the channels is greater in height than the wheel diameter. Also, to enable insertion and removal, the distance from the lower edge of the opening to the top (35) of the wheel receiving space in the channel is greater than the wheel diameter to receive it, while the distance from the lower portion of the wheel receiving space to the top of the receiving opening, specifically the depending flange, is less than the wheel diameter to prevent it from falling out again.

Manufacture of the assembly is relatively inexpensively done since all of the components can be roll formed with just two different basic configurations, that of the channel and that of the double L-shaped intermediate rails. Further, the case rails and drawer rails are substantially the same except for the stop elements applied thereto. The intermediate rails are the same, except the stop levers are mounted in mirror image with respect to each other. They can thus be used interchangeably and manufactured relatively inexpensively.

With assembly of the units by the purchaser, case channels 18 and 18' can be mounted by screws to the cabinet with the other components. Drawer channels 22 and 22' are screwed in place to the drawers. Then, the intermediate rails are inserted into the case channels in the manner illustrated in FIG. 12 by tilting them and snapping them into position, laterally, with the wheels between stops 30 and 31 which retain the upper roller wheels in the cabinet channel track. The drawer is then inserted by interengaging the drawer channels with the intermediate rails by temporary shifting of the stop levers. The unit is then complete for use.

Additional advantages than those noted may be apparent to those in the art upon studying the description of this invention. Also, it is conceivable that minor details of the construction may be modified within the concept presented. Hence, the invention is intended to be limited only by the scope of the appended claims, and the reasonably equivalent structures to those defined therein.

I claim:

1. A drawer rail assembly including a drawer rail, a case rail, and an intermediate rail; said case rail and drawer rail both being open sided channel elements having an inner track space, and having wheel retention flange means at the open sides defining an elongated receiving opening at said open sides; said intermediate rail element being shaped in cross section like a Z on its side having each of its connected legs generally normal to the adjacent leg, and having a plurality of vertical wheel type rollers rotatably mounted thereto on opposite sides of the cross member of said intermediate element to comprise upper rollers and lower rollers; fixed stop means between said

5

case rail and said intermediate rail to limit relative extension therebetween; the height of said case rail track space being greater than the diameter of said wheels, and the height of said opening being less than the diameter of said wheels; the vertical height between the top of said track space and the bottom edge of said opening being greater than the wheel diameter, and the vertical distance from the bottom of said track space to the top of said opening being less than the wheel diameter; whereby said upper rollers are insertable laterally into said case rail by tilting the top edge of said intermediate rail toward said case rail to insert said upper rollers, and then tipping said intermediate rail back to the vertical position to insert the entire upper rollers.

2. A drawer rail assembly including a drawer rail, a case rail, and an intermediate rail; said case rail and drawer rail both being C shaped channel elements in cross section, with its legs generally normal to each other, and having a depending, upper wheel retention flange extending downwardly from the upper outer edge thereof, and a bottom track surface extending only horizontally and terminating in the horizontal plane of the surface; said intermediate rail element being shaped in cross section like a Z on its side having each of its connected legs generally normal to the adjacent leg, and having a plurality of vertical wheel type rollers rotatably mounted thereto on opposite sides of the cross leg of said intermediate element to comprise upper rollers and lower rollers; said wheel rollers having a diameter less than the height of the inside of said case rail and greater than the distance from said flange to said bottom surface; a rigid stop means between said intermediate and case rails to limit intermediate rail extension; said upper rollers being insertable laterally into said case rail by tilting the top edge of said intermediate rail toward said case rail to insert said upper rollers behind said case rail flange, and then tipping said intermediate rail back to the vertical position to push said upper rollers across said bottom track surface for interengagement of said intermediate rail and said case rail; said intermediate rail having a stop lever, and said drawer rail having a projecting stop in alignment with said lever to normally abut it; a headed rivet extending through said lever with clearance and through said intermediate rail to connect them, and a compressible resilient polymeric washer around said rivet, between its head and said lever, to enable temporary lever depression by shifting on said rivet for release from said stop.

3. An assembly for a drawer, including two sets of rails, each having drawer rail, a case rail, and an intermediate rail; said case rail and drawer rail both being C shaped channel elements in cross section, with its legs generally normal to each other, and having a depending, upper

6

wheel retention flange extending downwardly from the upper outer edge thereof, and a bottom track surface; said intermediate rail element being shaped in cross section like a Z on its side having each of its connected legs generally normal to the adjacent leg, and having a plurality of vertical wheel type rollers rotatably mounted thereto on opposite sides of the cross member of said intermediate element to comprise upper rollers and lower rollers; said drawer and case rails being interchangeable from one set to the other; and said intermediate rails being interchangeable between sets by rotating each 180° around its longitudinal dimension and rotating it end for end, laterally, 180°.

4. A drawer rail assembly including channel shaped drawer and case rails and an intermediate rail shaped in cross section like a Z on its side with its legs generally normal to each other; rollers between said rails; said intermediate rail having a stop lever attached to the cross leg of said intermediate rail, with one end elevated, to form a manually depressible portion, and the other end projecting through said cross leg; and said drawer rail having a projecting stop in alignment with the other end of said lever to normally abut it and limit rail extension; a headed rivet extending through the center of said lever with substantial clearance, and through the cross leg of said intermediate rail to interconnect them; and a compressible resilient polymeric washer around said rivet, between its head and said lever, to enable temporary lever shifting by depression of said one end to lift said other end out of abutment with said stop, to allow longitudinal separation of said drawer rail and intermediate rail.

5. A drawer rail assembly including a drawer rail, a case rail, and an intermediate rail; said intermediate rail having a stop lever, and said drawer rail having a projecting stop in alignment with said lever to normally abut it; a headed rivet extending through said lever and said intermediate rail to connect them, and a compressible resilient polymeric washer around said rivet, between its head and said lever, to enable temporary lever depression by pivoting on said rivet for release from said stop.

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