Oct. 21, 1958 R. H. REISS ET AL 2,857,233

DRAWER SUSPENSION AND GUIDE STRUCTURE

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Fig. 1.

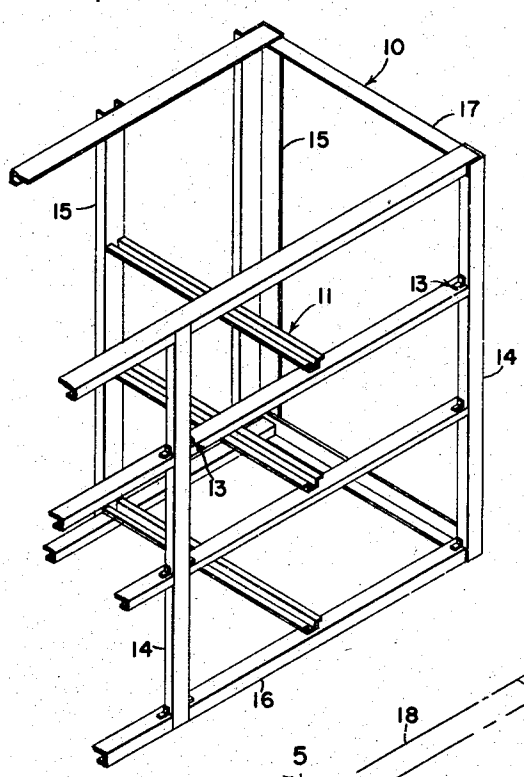


Fig. 3.

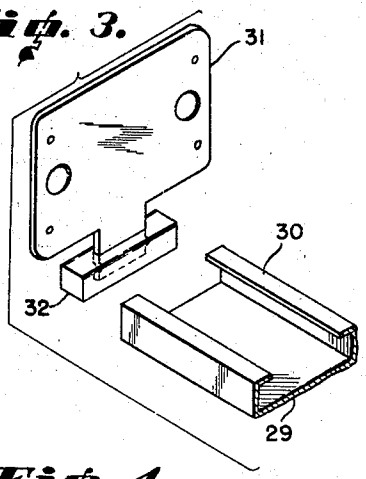
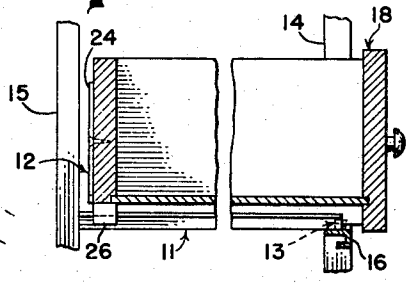


Fig. 4.



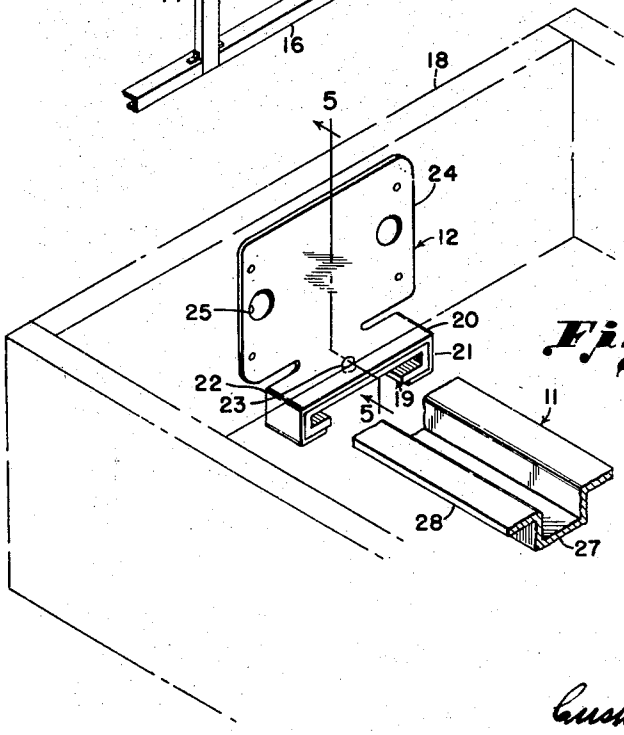
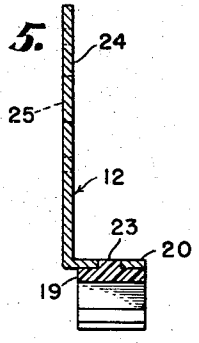


Fig. 2.

Fig. 5.



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Fig. 6.

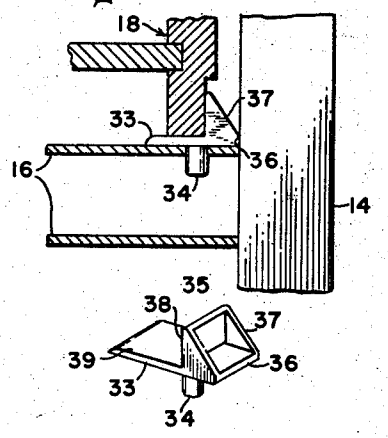


Fig. 9.

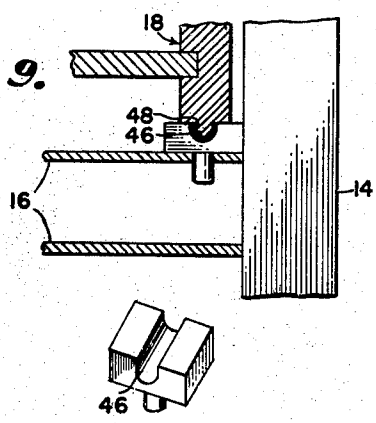


Fig. 7.

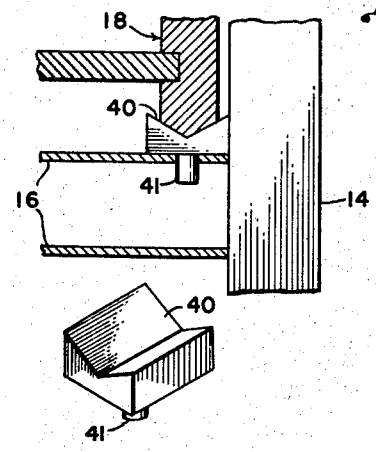
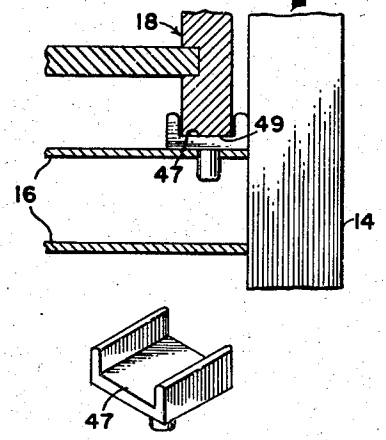


Fig. 10.



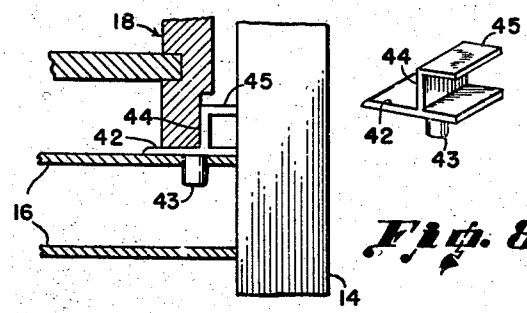


Fig. 8.

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DRAWER SUSPENSION AND GUIDE STRUCTURE

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Application April 19, 1955, Serial No. 502,314
2 Claims. (Cl. 312—347)

This invention relates to a sliding drawer construction, of the type used in furniture, and, particularly, in bureaus, cabinets, and desks. The novel drawer construction includes improved means for slidably supporting a drawer so as to render the sliding movement thereof quiet and facile.

The principal difficulty encountered in the manufacture and utilization of sliding drawers is the fact that such structures tend to become difficult to operate after prolonged use. With respect to wooden drawers, a loose fit is usually necessary to allow for expansion of the wood members during periods of high humidity. Thus, the normal wear and tear on a drawer can be quite severe and the constant strain on the support means usually results in a faulty running drawer. It can be appreciated that such breakdown in the drawer construction can result in inefficiency as well as inoperability of the drawer structure.

Efforts have been maintained to facilitate the sliding movement of a mounted drawer by means of efficient, yet economical support and guide members. Roller bearings have been typically used but are very expensive and, in addition, are susceptible to mechanical breakdown and noise.

With the above in mind, the primary object of this invention is to provide a drawer support and guide structure adapted to reduce the effort required to move the drawer and, in addition, to provide quiet operational movement.

A more specific object of the invention is to provide a sliding drawer construction comprising a frame having a drawer compartment, a drawer shiftable in said compartment, means for slidably supporting and guiding said drawer, said means comprising a longitudinally extending guide rail mounted within said frame beneath said drawer, a guide member secured to said drawer and disposed beneath the central portion thereof, said guide member being slidably mounted on said guide rail by T-slot connection and the portion of said member engaging the said rail being of an anti-frictional material adapted to enhance the sliding characteristics of said guide member, and an anti-frictional guide element secured to said frame on each side of the forward end of said drawer compartment, said elements having surfaces in edgewise engagement with the undersurface of said drawer to thereby slidably support and laterally guide the same.

An additional object of the inveniton is to provide an improved sliding drawer construction and arrangement including nylon wear blocks mounted on the forward portion of the drawer compartment to thereby slidably support and laterally guide said drawer.

A further object of the invention is to provide a sliding drawer construction including a metal guide rail which is a structural member of the frame in which the drawer construction is incorporated, said guide rail cooperating with a nylon guide member to serve as the drawer back support and guide.

Still another object of the invention is to provide improved mechanisms to accomplish the foregoing objectives, which can be applied to an existing structure without major modifications.

Other and further objects and advantages of the present invention will be apparent from a consideration of the following description of a specific embodiment shown for purposes of illustration in the accompanying drawings in which:

Figure 1 is a fragmentary perspective view showing a frame including a guide rail to furnish center support and nylon guide elements to furnish side support of the drawer compartment;

Figure 2 is a perspective view showing the drawer in phantom line, and showing a segment of the guide rail as well as the guide member mounted on the back of the drawer compartment;

Figure 3 is an exploded perspective view of a modified form of the guide member and rail;

Figure 4 is a sectional view of a mounted drawer showing guide rail and guide member as well as guide element positioned to support said drawer;

Figure 5 is a transverse sectional view through the guide member, taken on the line 5—5 of Figure 2;

Figure 6 is a fragmentary sectional view showing the preferred form of guide element mounted on the front portion of the drawer compartment; and

Figures 7–10 are fragmentary sectional views showing modifications of said guide element.

In the accompanying drawing, the support and guide means are shown diagrammatically and only those parts are illustrated which are required to show the cooperative relation of the instrumentalities of the present invention with the drawer and frame.

The improved sliding drawer construction embodying this invention is shown with respect to the metal frame **10** illustrated in Figure 1, having guide rails **11** integral therewith and adapted to slidably mount a tier of drawers through the coaction of said guide rails **11**, guide member **12** (Figures 2–5), and guide elements **13**, the latter being specially formed drawer support wear blocks.

The frame **10** may be of any suitable construction. It is herein shown as formed of metal frame members and comprises front and rear uprights **14** and **15** between which extend cross members **16** and **17**. The guide rails **11** are also a part thereof, as noted above.

The drawer **18** (Figures 2 and 4), wherewith this invention is associated, can also be constructed of metal. It is formed in the usual manner with a depth and width dependent upon the size of the frame **10** and the number of drawers arranged therein.

The guide rails **11** cooperate with guide member **12**, the said guide member being slidably mounted on said guide rail by T-slot connection. The portion of said guide member **12** engaging said rail **11** preferably comprises a liner **19** (Figure 2) of anti-frictional material, such as nylon, having a horizontal upper wall **20** and dependent angular flange portions **21** on each end of said wall. Metal plate **22** embraces said liner and a stud **23** is integral with the liner and is used to attach the said liner to the metal plate as shown in Figure 5.

Guide member **12** also includes a plate **24** having holes **25**, which are utilized to fix said guide member to the back to the drawer **18** as illustrated in Figure 4.

In mounting the guide member **12** on said drawer **18**, it should be noted that the lower margin of the drawer is cut away in the area where the guide member is affixed thereto. As shown at **26** (Figure 4), sufficient clearance is provided for the drawer to avoid the guide rail during actuation thereof.

The guide rail **11** can comprise a channel **27** having the free edges of the legs thereof turned outwardly to provide marginal flanges **28**. As illustrated in Figure 2, the flanges **21** and wall **20**, of guide member **12** embrace the liner **19** and these elements together define a T-slot

which is mounted on the marginal flanges **28** of said guide rail **11**.

Figure 3 illustrates a modified form of guide rail and guide member. In this modification, the T-slot is provided by a guide rail including a channel **29** having the free ends thereof turned inwardly to provide marginal flanges **30** forming the said T-slot. The modified guide member includes plate **31**, to be attached to the drawer, and a bar of anti-frictional material **32** attached to plate **31** as shown and engageable in said T-slot.

The guide elements **13** are mounted on the forward portion of the drawer compartment as shown in Figure 1. The preferred form of these guide elements is illustrated in Figure 6.

The guide element **13** includes a horizontal wall **33** having a stud **34** depending therefrom for securing said element to the frame **10**. An upwardly extending vertical wall **35** is spaced inwardly from one end **36** of the horizontal wall **33**. Strengthening means comprising triangular side walls **37** extend between the top of the said vertical wall **35** and the said end **36** of the horizontal wall **33**.

The surface **38** of said vertical wall and the upper surface **39** of said horizontal wall extending from the said surface **38** of said vertical wall define drawer engaging surfaces. These surfaces act to support the drawer **18** on each side thereof and coact with guide member **12** and guide rail **11** to form the novel drawer suspension of the invention.

Figures 7–10 illustrate modifications of the guide element previously described with respect to Figure 6.

In Figure 7, a guide element is shown including a V-shaped wall **40** to which is attached a stud **41**, said stud functioning as a securing means. The surface of this V-shaped wall engages the drawer **18** to thereby slidably support and guide the same.

The modification of the guide element shown in Figure 8 includes horizontal surface **42** having stud **43** depending therefrom. An upwardly extending vertical wall **44** is spaced inwardly from one end of the horizontal wall. An upper horizontal wall **45** extends laterally from the top of the vertical wall **44** to operate as a strengthening and spacing means. The horizontal wall **42** and vertical wall **44** furnish the drawer engaging surfaces as illustrated.

Figures 9 and 10 can be considered to show modifications of a tongue and groove assembly. In both illustrated modifications the surfaces **46** and **47**, respectively, comprise the groove. The undersurface of the drawer **18**, designated **48** and **49**, respectively, functions as the tongue in the tongue and groove assembly. As can be appreciated, in both instances, the groove is the drawer engaging surface which slidably supports and guides the drawer.

The guide elements **13** and the guide member **12** provide the only points of contact between the frame **10** and the drawer **18**. As noted heretofore, this novel support and guide system makes the sliding of the drawers much easier and more quiet than is afforded by the conventional direct sliding contact. To that end, the guide elements, and contact surfaces of the guide members, are formed of a tough material that has an inherent quality of lubricity so that they provide a smooth, slipping contact with the parts which they contact. Synthetic materials such as "nylon" or "Teflon" have been found to possess this quality of lubricity to a very acceptable degree, yet are relatively inexpensive to manufacture. However, natural materials possessing the necessary characteristics might also be used.

Accordingly, they are preferably used in the present development. The result is a drawer which shifts with the ease comparable to that obtained by the use of roller bearings. However, the cost of construction is materially less than that of roller bearing construction and noise is eliminated.

In the operation of the apparatus of the present invention, guide elements **13** are suitably mounted in the front corners of the drawer compartment as illustrated in Figure 1. In addition, guide member **12** engaging guide rail **11** is attached to the center rear portion of the drawer **18**. This system of support provides a three point suspension for the drawer, to wit, at its center rear area, and at each of the two sides. Thus, since the three points lie in a plane, the problems of drawer fitting and ease of operation, noted heretofore, are solved. When the drawer is moved, it rides on the guide rail through the contacting surface of the guide member, and on the guide elements, the result being that the drawer shifts with ease comparable to a roller bearing construction.

It must be understood that the invention is not limited to the details of construction shown in the accompanying drawings and described above, but includes all the modifications coming within the scope of the appended claims and their equivalents.

We claim:

1. A sliding drawer construction comprising a frame having a drawer compartment, a drawer shiftable in said compartment, means for slidably supporting and guiding said drawer, said means comprising a longitudinally extending guide rail mounted within said frame beneath said drawer and including an upright and U-shaped central channel portion having the upper ends of the vertical legs thereof turned outwardly to provide horizontal marginal flanges, a guide member secured to said drawer substantially along the longitudinal center line thereof and extending downwardly beneath said drawer, said guide member including an opening slidably receiving on said guide rail, said opening being of generally rectangular and horizontally elongated outline and being defined by: an upper horizontal surface, parallel vertical surfaces depending downwardly from opposite ends of said horizontal surface, and lower substantially coplanar horizontal surfaces extending inwardly from the lower ends of said vertical surfaces and terminating in free ends spaced apart a distance at least as great as the distance between the vertical legs of a said U-shaped channel portion of said guide member; said horizontal flanges of said guide member being slidably disposed between said upper and lower horizontal surfaces with said channel portion being disposed between the free ends of said lower horizontal surfaces, all of said surfaces being of anti-frictional material, and an anti-frictional plastic guide element secured to said frame on each side of the forward end of said drawer compartment, said elements having surfaces in edgewise engagement with the under surface of said drawer to thereby slidably support and laterally guide the same.

2. The structure defined in claim 1 wherein said guide rail is constructed of metal and further wherein said anti-frictional material of said surfaces of said guide member is an anti-frictional plastic.

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