Oct. 26, 1954 G. B. KURTZON ET AL 2,692,802

DRAWER SLIDE

Filed July 1, 1950 2 Sheets-Sheet 1

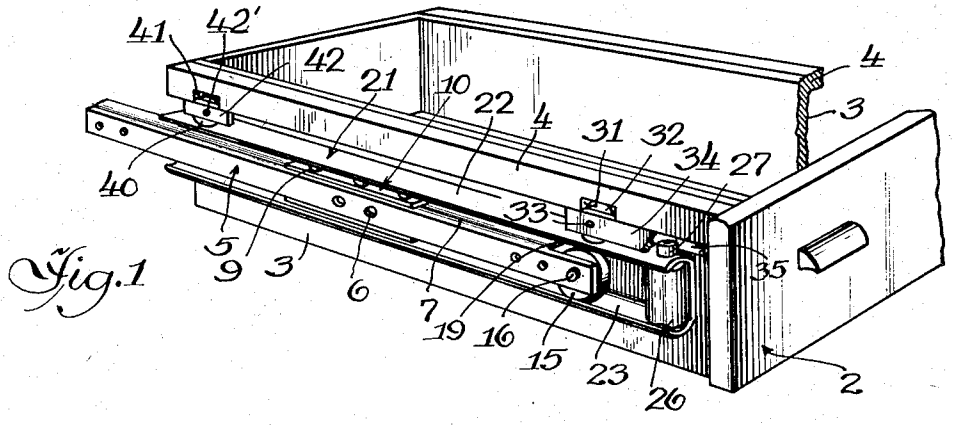
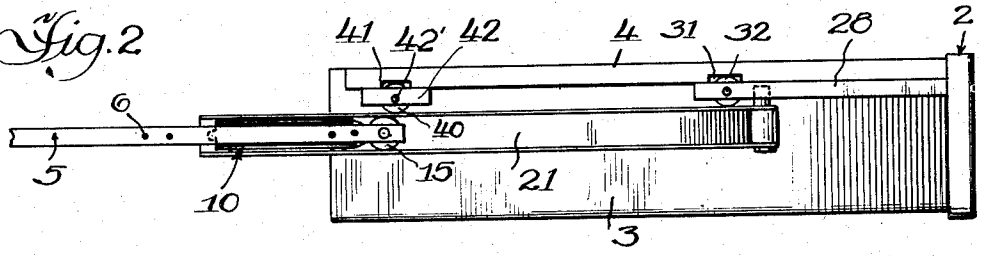



Fig. 1

Fig. 2



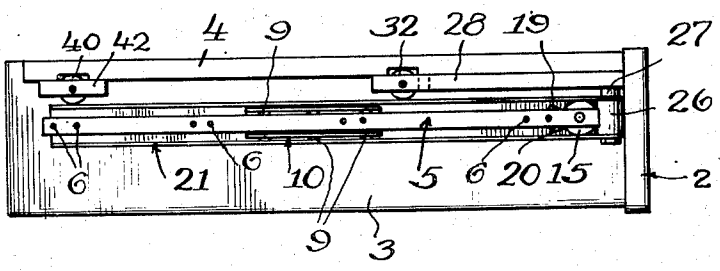
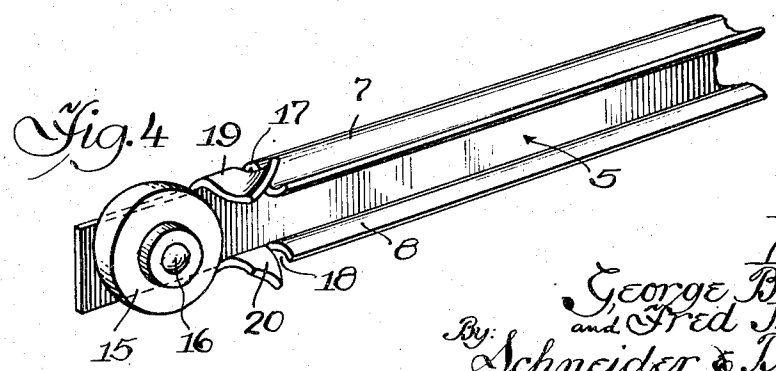




Fig. 3

Fig. 4




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Fig. 5

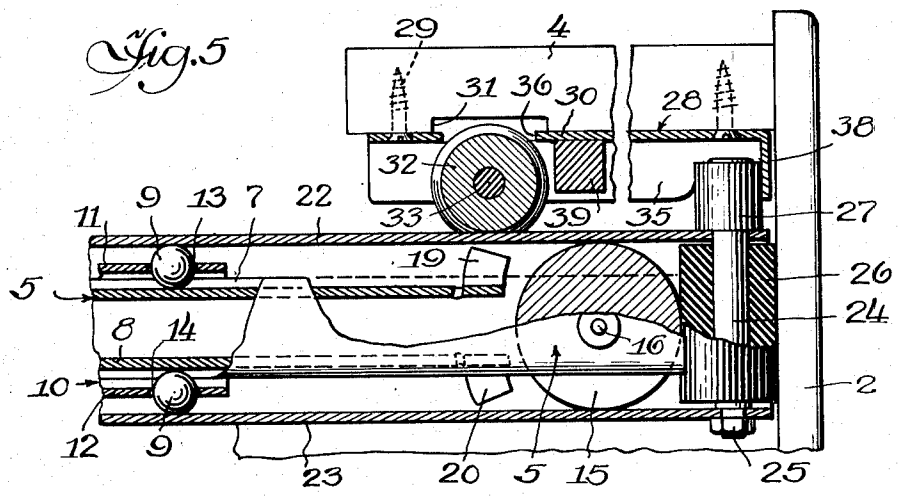



Fig. 6

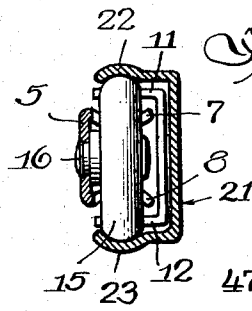



Fig. 7

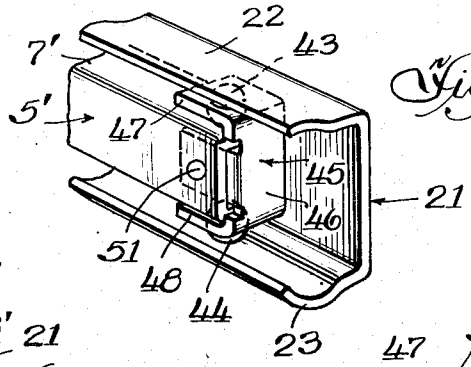



Fig. 8

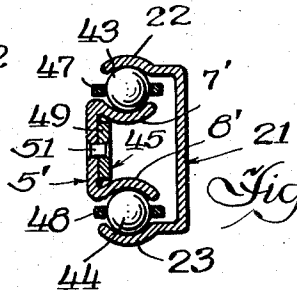



Fig. 9

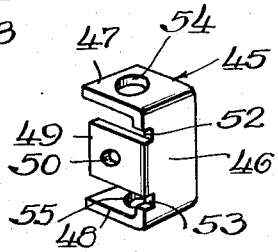



Fig. 10

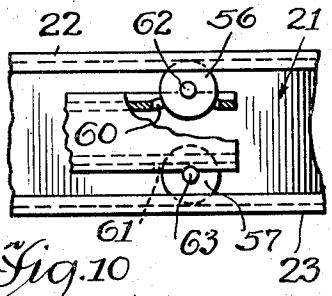
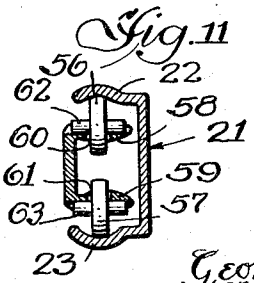



Fig. 11




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## DRAWER SLIDE

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Application July 1, 1950, Serial No. 171,686

4 Claims. (Cl. 308—3.8)

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This invention relates to a drawer slide, and particularly to means for permitting full extension of the slide with a minimum of play between the various parts and for providing extra support for the drawer when the slide is fully extended.

The present invention comprises a ball bearing drawer slide in which a stationary channel, secured to the housing in which the drawer slides, is provided adjacent its front end with a roller or equivalent means providing extra support for the drawer in extended position. The roller, in addition to providing extra support for the drawer in extended position, also minimizes the play between the various parts of the slide mechanism without interfering with the free sliding movement of the drawer.

The structure by which the above advantages are attained will be described in the following specification, taken in conjunction with the accompanying drawings showing illustrative embodiments of the invention, in which:

Figure 1 is a fragmentary perspective view of a drawer with a slide embodying the invention secured thereto, parts being broken away to facilitate the illustration;

Fig. 2 is a side elevation of the drawer and slide with the slide in fully extended position;

Fig. 3 is a side elevation of the drawer and slide with the drawer fully closed;

Fig. 4 is a fragmentary detail perspective view showing the front end of the stationary channel, which is adapted to be secured to the housing in which the drawer slides, in the position seen when looking outwardly from the drawer;

Fig. 5 is an enlarged fragmentary longitudinal section view through the front portion of the drawer and slide, with portions in elevation, showing the positions of the various parts including the roller support and slide mechanism, when the drawer is in closed position;

Fig. 6 is a vertical cross sectional view of the roller support and slide mechanism;

Fig. 7 is a fragmentary perspective view showing a modified embodiment of the invention;

Fig. 8 is a vertical cross sectional view of the structure shown in Fig. 7;

Fig. 9 is a detail perspective view showing the support for the ball bearings in the embodiment of Figs. 7 and 8;

Fig. 10 is a side elevation of another embodiment of the invention, with a part broken away to facilitate illustration of the structure; and

Fig. 11 is a vertical cross sectional view of the structure shown in Fig. 10.

In the drawings, Figures 1 to 6, showing the

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preferred embodiment of the invention, the reference numeral 2 indicates a drawer having a pair of side walls 3. Each side wall has a horizontal ledge 4 extending longitudinally adjacent its top edge along the entire length of the side wall. The ledge may be integral with the side wall, or may be secured thereto in any suitable manner. Ledges 4 provide clearance for a drawer slide on each side of drawer 2 between side walls 3 and the sides of the cabinet, desk or other article of furniture in which the drawer is mounted.

The drawer slide includes a stationary channel 5 which is provided with apertures 6 through which screws are driven into the side of the housing in which the drawer is mounted. The length of channel 5 is approximately equal to the depth of the drawer. Sides 7 and 8 of channel 5 are curved to make their outer longitudinal surfaces concave and thereby provide a ball track or race for ball bearings 9. A movable ball retainer 10 is slidably mounted on channel 5. The two side walls 11 and 12 of the retainer straddle the side walls of channel 5 and are apertured, as indicated at 13 and 14, for the reception of the ball bearings 9. The retainer moves along the track with these balls. Apertures 13 in side wall 11 keep the upper set of ball bearings 9 properly spaced longitudinally in the retainer, and apertures 14 in side wall 12 keep the lower set of balls spaced properly.

Side walls 7 and 8 are cut away adjacent the front end of channel 5, and a roller 15 is mounted on the channel by means of a stud 16. The roller may be of any suitable material, but is preferably made of metal. The diameter of roller 15 is of such size that the top surfaces of the upper balls 9 and the top surface of the roller lie in the same horizontal plane, and the bottom surfaces of lower balls 9 and the bottom surface of the roller are also in a common horizontal plane. Side walls 7 and 8 are cut transversely a slight distance to the rear of roller 15, as indicated at 17 and 18, and the portions of the side walls closest to the roller are flared outwardly to form ears 19 and 20 which protect the roller from contact with the forward edge of the ball retainer.

An extension channel 21 has a pair of side walls 22 and 23 straddling side walls 7 and 8, respectively, and ball retainer 10. Channel 21 is approximately the same length as channel 5, and its side walls are concave, as clearly shown in Fig. 6, so that one set of ball bearings 9 in retainer 10 is seated between opposing concave walls 7 and 22, and the other set of ball bearings

is seated between opposing concave walls 8 and 23.

In drawer slides as heretofore constructed, when the drawer is extended to its full open position the ball bearings 9 furnish the only points of support the extension channel has. This support has often proved to be inadequate, particularly if the drawer is heavily loaded, and the channel is often bent. The roller 15, spaced forwardly of the ball bearings, provides additional support so that even if the drawer is heavily loaded it may be fully opened without undue strain on channel 21. Even if channel 21 should become bent through misuse, roller 15 would help straighten it out if the drawer were moved back and forth with the bent portion passing the roller, since the roller is secured to stationary channel 5 and hence is fixed against transverse movement. Roller 15 fits between the opposing concave surfaces of side walls 22 and 23 fairly snugly, so that when the drawer is opened or closed there is no play between the periphery of the roller and the channel in which it rolls.

A post 24 extends across the front end of channel 21. The lower end of the post is secured by a nut 25 threaded on the post until it is tight against the outer surface of side wall 23 of extension channel 21. The post is encased in rubber to form a bumper 26 against which wheel 15 abuts when the drawer is moved to closed position. Any suitable stop member may be provided in the mechanism to limit the opening movement of the drawer.

The upper end of post 24 projects above wall 22 of extension channel 21 and is encased in rubber to form a bumper 27. A front upper channel 28 is secured to the underside of ledge 4 by means of screws 29 passing through top wall 30 of the channel. Ledge 4 is recessed, as indicated at 31, to provide clearance for a roller 32. A stud 33 mounted in side walls 34 and 35 of channel 28 rotatably supports roller 32 between the side walls. An aperture 36 in top wall 30, registering with recess 31 in ledge 4, provides clearance for roller 32. The underside of roller 32 engages the convex surface of side wall 22 of channel 21. The periphery of roller 32 is grooved to prevent it slipping off the convex surface of wall 22.

Side walls 34 and 35 of channel 28 straddle rubber bumper 27 which projects from side wall 22 of channel 21 forwardly of roller 32. The front wall 38 of channel 28 is bent downwardly so that it will engage bumper 27 when the drawer is moved to closed position. A metal stop member 39, secured to the underside of top wall 30 of channel 28 just forwardly of roller 32, engages bumper 27 and thereby protects roller 32 from hitting the bumper when the drawer is moved to open position.

To facilitate movement of the drawer, a roller 40, similar to roller 32, is mounted under ledge 4 adjacent the rear end of the drawer. Ledge 4 is recessed, as indicated at 41, to provide clearance for roller 40. This roller is mounted in a short channel 42 by means of a stud 42'.

In the embodiment of the invention illustrated in Figs. 7 to 9, inclusive, a pair of ball bearings 43 and 44 is substituted for the roller 15. The ball bearings are mounted in a retainer 45 comprising a front wall 46, top wall 47, bottom wall 48, and one side wall 49. The side wall is preferably apertured, as indicated at 50, and the bottom of channel 5' is similarly apertured adjacent its front end, to receive a rivet 51 by means of which retainer 45 may be secured to the channel. It is obvious, that the side wall of the retainer may be welded to channel 5' instead of being riveted thereto. Front wall 46 of the retainer is recessed, as indicated at 52 and 53, to provide clearance for the front end of side walls 7' and 8' of channel 5'.

Top wall 47 is provided with an aperture 54 large enough to receive ball 43 and to permit the ball to roll when the slide is moved by opening or closing the drawer. The ball engages the top concave surface of side wall 7' and the underside of side wall 22 of channel 21, which is also curved to fit the periphery of the ball. Top wall 47 of retainer 45 is positioned midway between walls 7' and 22. The lower ball 44 is similarly mounted in aperture 55 in bottom wall 48 between side walls 8' and 23.

In the embodiment of the invention illustrated in Figs. 10 and 11, a pair of vertically aligned rollers 56 and 57 is substituted for roller 15. Side walls 58 and 59 of the channel corresponding to channels 5 and 5' are each provided with a slot 60 and 61, respectively, slightly wider than the thickness of rollers 56 and 57 through each of which a portion of the periphery of one of the rollers extends. The slots are of less length than the diameter of the rollers so the major portion of each roller is kept between the side walls of the channel in which it is mounted and the side walls of channel 21. Each roller is mounted on a stud 62 or 63 so that the periphery of each roller is kept from engaging the ends of slots 60 or 61 and the rollers are free to revolve when the channel in which rollers 56 and 57 are mounted and channel 21 are moved longitudinally relative to each other. As in the previously described embodiments, the concave surfaces of side walls 22 and 23 of channel 21 form a trackway for rollers 56 and 57.

The relative position of the roller 15, balls 43 and 44, or rollers 56 and 57 is the same in each embodiment of the invention so that regardless of which structure is made, the front end of the stationary channel which is secured to the housing in which the drawer is mounted is provided with extra stability at a point spaced forwardly of ball retainer 10 when the drawer is fully open. Each of the structures described also eliminates the possibility of any play between channel 21 and the stationary channel when the drawer is slid in either direction.

Although we have described some embodiments of our invention in considerable detail, the description is intended to be illustrative, rather than restrictive, as many of the details may be modified or changed without departing from the spirit or scope of the invention. Accordingly, we do not desired to be restricted to the exact structures of the embodiments disclosed.

We claim:

1. In a drawer slide, a stationary channel, an extension channel having side walls straddling said stationary channel, a floating ganged ball bearing assembly interposed between said channels to facilitate relative movement therebetween, and roller means fixed to said stationary channel adjacent the front end thereof, said roller means providing additional support for said extension channel forwardly of said floating ganged ball bearing assembly when said extension channel is in extended position.

2. In a drawer slide, a stationary channel, an extension channel having side walls straddling said stationary channel, a floating ganged ball

bearing assembly interposed between said channels to facilitate relative movement therebetween, and a roller rotatably mounted in said stationary channel forwardly of said floating ganged ball bearing assembly with its periphery fitting within the walls of said extension channel, the diameter of said roller being substantially equal to the distance between the walls of said extension channel, whereby said roller provides additional support for said extension channel when in its extended position.

3. A drawer slide in accordance with claim 1, in which the roller means comprises a pair of vertically aligned rollers, one of said rollers being rotatably mounted in one wall of said stationary channel, the other roller of said pair being rotatably mounted in the opposite wall of said stationary channel, the peripheries of said rollers engaging opposite walls of said extension channel.



4. A drawer slide in accordance with claim 1, in which the roller means comprises a pair of balls rotatably mounted in fixed relationship to said stationary channel adjacent the front end thereof, each of said balls fitting snugly between one wall of said stationary channel and one wall of said extension channel.

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