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FILING CABINET DRAWER MOTION CONTROL MEANS

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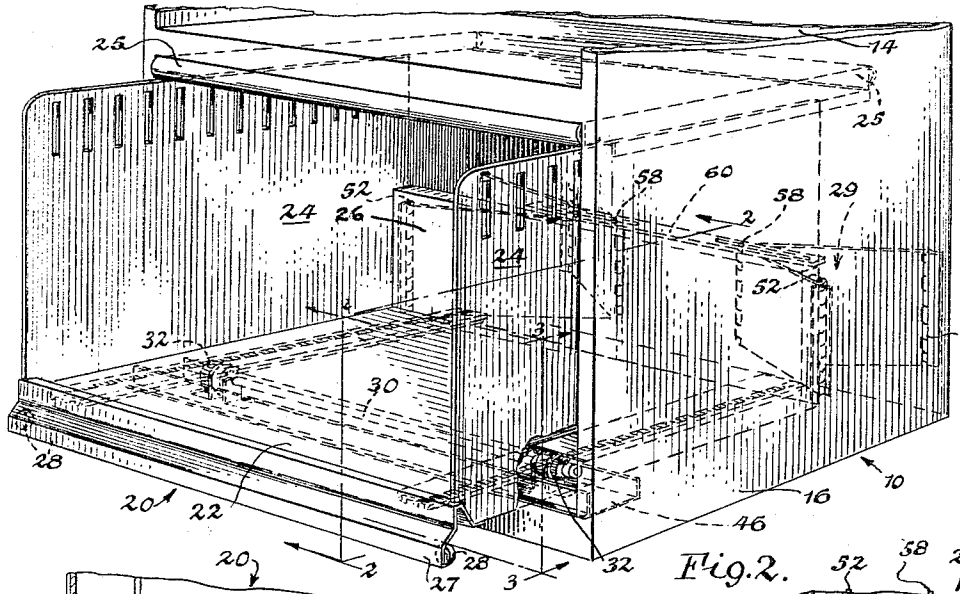


Fig. 1.

Fig. 2.

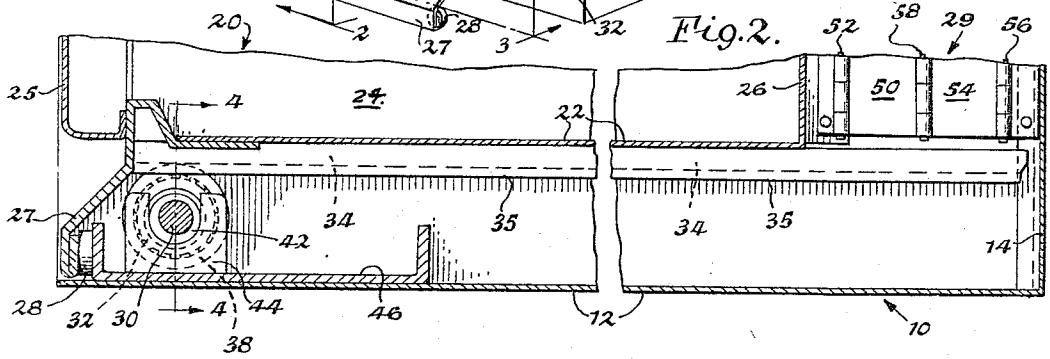


Fig. 3.

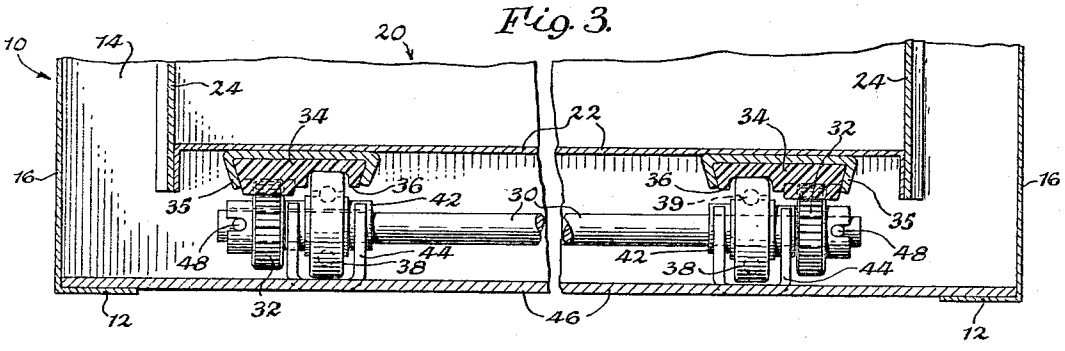
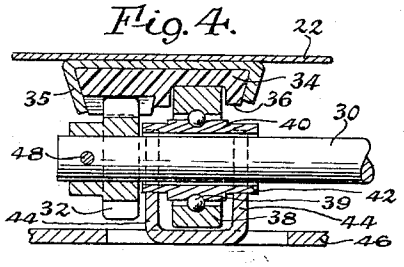


Fig. 4.



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FILING CABINET DRAWER MOTION CONTROL MEANS

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This invention relates to filing cabinets of the type comprising shells or casings mounting filing drawers or the like in horizontal sliding relation therein. More particularly, the invention relates to drawer suspension and travel guide mechanisms for simultaneously supporting and guiding the drawers against yawing relative to the cabinet casing when moving in and out thereof.

It is an object of the present invention to provide, in a filing cabinet or the like as aforesaid, an improved drawer support system comprising an improved rack-and-gear type mechanism at opposite sides of the casing; the gear means thereof being interconnected by a torque rod for equalizing the rate of drawer travel at opposite sides thereof, as the drawer moves in and out of the cabinet casing.

Other objects and advantages of the invention will be apparent from the following specification and the accompanying drawing showing by way of example one embodiment of the invention, wherein:

FIG. 1 is a perspective view, with portions broken away, of a filing cabinet embodying the invention; and showing therein a movable drawer in partially open position;

FIG. 2 is a fragmentary vertical sectional view, on enlarged scale, taken as suggested by line 2—2 of FIG. 1;

FIG. 3 is a sectional view, on enlarged scale, taken as suggested by line 3—3 of FIG. 1; and

FIG. 4 is a fragmentary sectional view, on enlarged scale, taken as suggested by line 4—4 of FIG. 2.

The invention may be embodied in any type or style of filing cabinet or the like, but as shown by way of example in the drawing herewith it is applied to a filing cabinet comprising a shell or casing designated generally at **10**. The shell is fabricated of sheet metal to include bottom flange, back, and side wall portions **12**, **14**, **16**, respectively; while being left open at the front area thereof. The casing is dimensioned and constructed to accommodate in free-moving relation therein a filing drawer such as of the type which is illustrated and indicated generally at **20**.

The drawer shown herein by way of example essentially comprises a bottom plate **22**; opposite side wall plates **24**, **24**; and a stiff back plate **26**. The drawer is open at its front end and is arranged to be covered when pushed into the casing (FIG. 2) by means of a retractable door panel **25** which is swingable into horizontal attitude for sliding back inside the casing as shown in FIG. 1 to "open" the cabinet. The bottom plate **22** of the drawer terminates as indicated at **27** (FIGS. 1, 2) in a bottom front edge flange portion which is preferably equipped with rubber "bumper" pads or the like as indicated at **28** to bear against the bottom structure of the cabinet when the drawer is in its fully retracted or "closed" position in the cabinet. Furthermore, as shown herein at FIG. 1, the drawer **20** is supported at its rear end relative to the cabinet shell by means of vertically disposed hinge brackets comprising "suspension" mechanisms **29** at the opposite sides of the drawer.

In addition to the "suspensions" **29—29** at the rear of the cabinet, a drawer support and motion equalizing device is employed at the front edge of the cabinet to further support and to stabilize the drawer in its movements relative to the cabinet, and to guide it against "racking"

or "yawing" as it moves in and out of the cabinet. This mechanism comprises an "equalizer" rod-and-gear device which as shown in the drawing herewith includes a torque rod **30** carrying at its opposite ends spur gears **32—32** which run in gear-rack portions of tracks **34—34** made of nylon or the like which are fixed to the bottom plate **22** of the drawer **20** as by means of channel-shaped holders **35**. The holders **35** are of course attached to the bottom plate **22** by any suitable means (not shown).

It is a particular feature of the present invention that the track devices **34** also include grooved, roller runway portions **36** (FIGS. 3, 4) accommodating in running relation therein the outer race portions **38** of ball-bearing devices **39—39** having corresponding inner races **40—40**. As shown in better detail in FIG. 4, the inner races **40** each include integrally formed hub portions **42—42** which extend axially at opposite sides thereof for cradled support in U-shaped bearing support brackets **44**, **44**. The brackets **44—44** may conveniently be fabricated by vertically bending appropriately shaped struck-out portions of a bearing support bar member **46** which as shown herein may comprise a channel-sectioned member fixed at its opposite ends to span the space between the cabinet casing bottom flange portions **12—12** (FIG. 3).

The parts are so dimensioned and arranged that the bearing devices **38**, **39**, **40**, vertically support the entire loads of the filing drawer on the bracket members **44**, **44**; thereby freeing the gear-meshing relationships of the spur gears **32** and the gear rack portions of the track members **34** from any binding interferences with free operation thereof. Furthermore, by virtue of this gear and bearing arrangement, any speed of rotation differentials existent because of operational diameter differences between the spur gears and bearing members are readily accommodated in free-rolling fashion between the parts, thereby avoiding any friction inducing sliding type relative movements between the gear and the bearing parts such as would chafe and deteriorate the parts and/or interfere with smooth running operations of the drawer.

The spur gears **32—32** are of course keyed to the opposite ends of the torsionally rigid "equalizer" shaft **30** such as by having their hub portions pinned to the shaft **30** as indicated at **48**. Therefore it will be appreciated that whenever the drawer **20** is motivated to travel either outwardly or inwardly of the cabinet casing **10** the gear rack portions of the tracks members **34—34** at opposite sides of the drawer will be so controlled by the gear and torque-bar device as to insure that each side of the drawer moves relative to the cabinet casing at a rate equal to the rate of travel of the opposite side of the drawer. Furthermore, this effect is obtained without any frictional or other interferences with free motion of the drawer. To stabilize the drawer against vertical rocking upon the support rollers **38—38** the hinge devices **29—29** are provided each to comprise a front plate or "leaf" portion **50** pivotally connected to the corresponding rear corner portion of the drawer by means of a pin **52**, and a rear leaf **54** connected to the cabinet rear wall by means of a pivot pin **56**. The leaves are in each case hingedly interconnected by means of a pin **58**. To limit the pull-out motion of the drawer a tension strut **60** is provided; its ends being slotted to slide-pivot engage the upper ends of the pins **58—58**. The strut **60** is longitudinally dimensioned so that it will prevent the hinge pins **58—58** from spreading further apart when the drawer is being pulled outwardly, than will permit the drawer to travel outwardly beyond its intended outermost position relevant to the cabinet.

Thus it will be appreciated that when the drawer is fully retracted into the cabinet the vertical loadings thereon are taken by the rollers **38—38** supporting the drawer

at its forward end while the support hinge devices **29—29** support the drawer at its rear end. Then, as the drawer is pulled forwardly and progressively out of the cabinet the drawer load becomes substantially centered over the rollers **38—38**, and then as the drawer reaches its fully extended position on the hinge supports **29—29** operate to prevent the drawer from pitching relative to the cabinet. Thus, throughout all motions of the drawer the vertical attitude thereof is stabilized by the hinge devices **29—29**, while the lateral or "yawing" attitude of the drawer is stabilized by the equalizer rod-and-gear device as explained hereinabove.

It will of course be understood that the improved equalizer bar gear and roller and bearing support arrangement of the invention may be applied to equal advantage and with equal facility to filling cabinet-drawer arrangements of other types, and wherein for example the drawer may be stabilized against vertical pitching by means of any other suitable "suspension" means, such as for example the conventional slide-suspension type devices, or the like. Hence, although only one form of the invention has been illustrated and described in detail herein by way of example, various changes may be made therein without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. In a filing device comprising a cabinet including bottom and side wall portions and a filing drawer adapted for bodily movement horizontally through an open front portion of said cabinet, a drawer support and movement control mechanism including,

a drawer front end support and lateral yaw control device comprising at each opposite side of said cabinet a combination gear rack and roller bearing track unit, each of said units comprising,

a track member mounted against the bottom of said drawer to extend in the direction of movements thereof, said track member including a gear rack portion and a parallel-disposed bearing run portion,

and a torque rod extending transversely of the forward end of said cabinet and having spur gears keyed to opposite ends thereof disposed respectively in operatively meshed relation with said gear rack portions,

bearing means comprising a pair of bearing devices each disposed adjacent an opposite end of said torque rod, each of said devices comprising an outer bearing race member disposed in rolling bearing engagement with the corresponding of said bearing run portions and an inner race bearing member, each of said inner race members having integrally formed axially extending hub portions,

bearing support members extending from the bottom wall structure of said cabinet and engaging said inner bearing hub portions whereby to mount said bearing members in drawer supporting manner while disposing said meshing gear and rack portions in vertical load pressure-free relation,

and a second drawer support means disposed rearwardly of said front end support and yaw control device operative to stabilize said drawer against vertical rocking upon said front end support device.

2. A filing device as set forth in claim **1** wherein said track members are formed of nylon or the like.

3. A filing device as set forth in claim **1** wherein said bearing devices are of the ball bearing type.

4. A filing device as set forth in claim **1** wherein said bearing support members comprise vertically standing cradle-shaped abutments struck out from and bent to extend vertically from the cabinet bottom structure.

5. A filing device as set forth in claim **1** wherein said second drawer support means is of hinged leaf type.

6. A filing device as set forth in claim **1** wherein said second drawer support means comprises paired vertical hinge type supports disposed at opposite rear side portions of said drawer and said cabinet respectively.

7. A filing device as set forth in claim **6** wherein said drawer support and movement control mechanism also includes a tension strut member pivotaly connected at its opposite ends to said hinge type supports to limit the operation thereof so as to thereby indirectly limit the extent of outward movement of said drawer relative to said cabinet.

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