

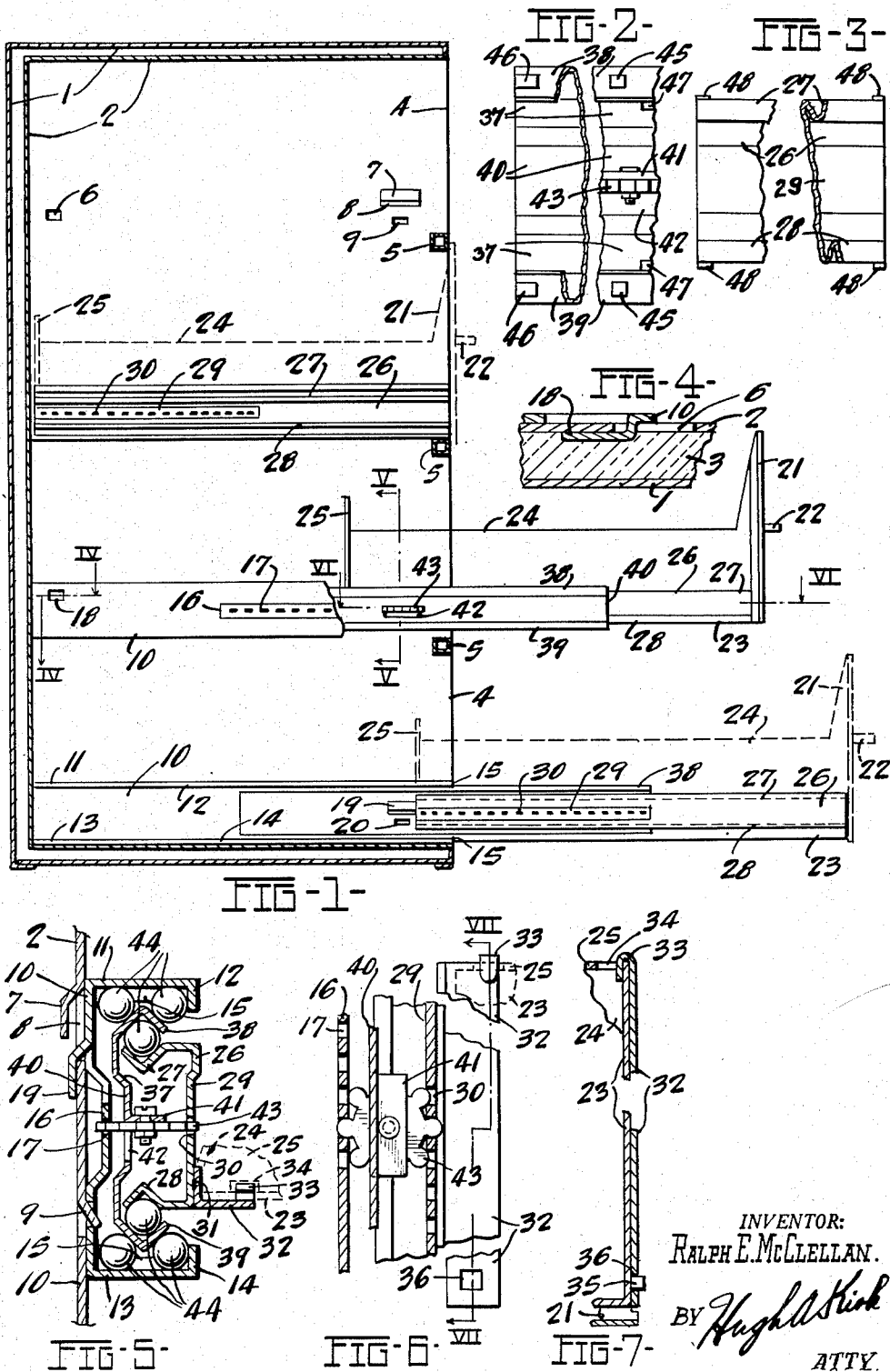
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CABINET AND DRAWER EXTENSION

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CABINET AND DRAWER EXTENSION

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This invention relates to relatively telescopic bearing-providing members, and particularly to anti-friction units for ready placement and removal.

This invention has utility when incorporated in extensions for drawers, as for filing cabinets. The unit is shown as a three element nesting wherein one member, say the outer, is adapted for ready attachment or mounting upon the inner wall of a support or cabinet. The third or inner member may have a seat for carrying a drawer. Intermediate the outer or first member and the inner or third member, is a second member with anti-friction spacing from the first and third members, which intermediate member is controlled, as by intermeshing means for proportional travel at a held ratio.

Referring to the drawings:

Fig. 1 is a vertical section thru a filing cabinet, say of the four drawer type, with drawer and parts broken away;

Fig. 2 is a fragmentary side elevation looking into the channel side of the intermediate member, to show the anti-friction ball stops, as well as the travel control pinion;

Fig. 3 is a fragmentary side elevation looking into the third member channel, showing its ball raceway end stops, this third member channel being open oppositely to the second member channel;

Fig. 4 is a section on an enlarged scale from the region of the line IV—IV, Fig. 1, showing the first member interlock connection with the cabinet at the first member rear portion;

Fig. 5 is a section on an enlarged scale on the line V—V Fig. 1, showing the first member forward portion cabinet interlock mounting, as well as the second member transmission pinion and one of the six ball anti-friction sets;

Fig. 6 is a fragmentary enlarged view from the line VI—VI, Fig. 1 of the second member pinion and the drawer mounting; and

Fig. 7 is a section on the line VII—VII, Fig. 6.

The cabinet

A four drawer type of sheet metal filing cabinet is shown with an outer wall 1, an inner wall 2, and a heat insulation filler 3 therebetween. The cabinet has a front opening 4 with drawer spacing front cross ledges 5. The cabinet inner wall 2 (Figs. 1, 4) has an opening 6. The drawer pocket or cabinet casing, near the opening 4, has in the cabinet inner wall 2 (Figs. 1, 5) an offset or minor hood section 7 with an opening 8 shielded thereby. Spaced downwardly from the hood 7 there is a spring tongue 9 deflected oppositely from the hood 7 as to the wall 2.

The cabinet-carried first member

The major or first member is shown as gen-

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erally of channel form having a web 10, an upper flange 11 leading to a downwardly directed minor flanged free end 12. Complementary thereto this first member has a lower flange 13 leading to an upwardly directed flanged free end 14. The four corners thus provided by this channel each provide two-point bearing ball raceway sections. The forward end of the channel has stops 15 to preclude balls from rolling clear of the raceways.

The forward major portion of the web 10 has an inward offset 16 (Figs. 1, 5) as a coacting seat means, herein shown as a rack 17.

Detachable mounting features for the first member with the cabinet comprise an offset tongue 18 (Figs. 1, 4) adapted to be thrust into the opening 6 in horizontally pushing the first member from the opening 4 into the cabinet. When so lodged, the forward end of the member may be depressed slightly to have an outwardly offset tongue 19 ride thru the opening 8. An opening 20, also in the web 9 and below the tongue 19, then has the spring tongue 9 engage in such opening 20. As bounding the offset 16 and away therefrom, this first member is now firmly seated against the inner face of the cabinet wall 2, in thereby providing a substantial mounting for a drawer.

The drawer-carried third member

A file drawer is shown with a double wall insulated front 21 provided with a handle 22. From the front there extends a drawer bottom 23 and side portions 24. The drawer is provided with a back 25.

While anchored with the drawer, in reality instead of being carried by the drawer, this third channel member carries the drawer. The channel as fixed with the drawer comprises a web portion 26 with a top V-ball race providing flange 27. Complementary to this upwardly open raceway 27, there is a downwardly open V-ball race way flange 28 (Fig. 5). The major after portion of the web 26 has an inward offset 29 centrally along which is coacting seat means, shown as a rack 30, spaced from and in centrally overlapping relation to the rack 17 in the closed position of the drawer.

Instead of being integral with the channel 26, 27, 28, there is fixed therewith by weld means 31 an L-section providing a ledge 32 upon which the drawer bottom 23 may rest. Detachable interlocking assembly is provided thru a hook 33 at the inner end of the ledge 32. As a drawer is thrust rearward along the ledge 32, the drawer bottom 23 lodges under the hook 33 as the hook passes thru an opening 34 in the drawer back 25 (Fig. 7). At this rearward limit of the drawer on the ledge 32, the drawer front may settle down to have a lug or projection 35 register with an opening 36 in the ledge 32. The drawer

bottom 23 is now snugly against the ledge 32 for the full length of the drawer in interlocked relation, so that at any drawer pulling or back thrusting, there is retained a positive and firm assembly of the drawer with the ledge and its third member channel. In practice the channels at the drawer are rights and lefts for co-operation with the proximate sides of the cabinet, upon which the cabinet carried first channel members are detachably fixed in registered relation as the drawer is closed.

The floating intermediate second member

The extension system or unit as herein disclosed comprises three channels: the fixed channel 11, 10, 13, detachably anchored with the cabinet; the drawer carried channel 27, 26, 28, located with its web 26 away from the web 10 and with the flanges 27, 28, extending toward the web 10 and embraced by the flanges 11, 13; and an intermediate channel embraced by the channel 10, 11, 13. This intermediate channel has a web 37 with an inverted V upper flange 38 as a multiple ball race way and a lower upright V flange 39 providing additional multiple ball race ways. The outer faces of these V-flanges 38, 39, are adapted to coact as complementary to pairs of race ways in the first member portions 10, 11, 12, and the portions 10, 13, 14. The inner faces of the V-flange 38 coact as complementary to the flange 27 in forming a ball race way; while the V-flange 39 similarly coacts as complementary to the flange 28 in forming an additional or lower ball race way.

The web 37 has an inward offset 49 to provide clearance relatively to the offset 16. Centrally of the longitudinal extent of the second member there is a tongue 41 thrown out of the offset 49 to leave an opening 42. Medially transversely of the three channel-nesting assembly, the tongue 41 locates a pinion 43 to extend one way toward the web 26 for meshing relation with the rack 30. The other way the pinion 43 simultaneously extends thru the window or opening 42 into meshing relation with the rack 17 of the web 10. The protrusion of the teeth of the pinion 43 does not come up to the overall width or thickness of the unit as determined by the length of the flanges 11, 13. The inward offsets 16, 29, locate the racks 17, 30, sufficiently inward for engagement with the pinion 43 for such to function with lateral clearance relatively to the drawer sides 24 and the cabinet inner walls 2. It is to be noted that in the disclosure, the pinion 43 is in reality not a load carrying member as between the drawer and the cabinet. The pinion 43 primarily operates to insure proportional floating or travel for the second member 37, 38, 39.

The anti-friction bearings

Similar diameter anti-friction balls 44 are provided in two sets of six balls each. Stops 15 preclude rolling out of the balls 44 from the forward end of the channel 11, 10, 13, while the rearward end of this channel is against the cabinet inner wall 2. Inasmuch as the second member race way providing flange is toward and thru the front end of the channel 11, 10, 13, the stops 15 coact to retain the balls 44. Stops 45 (Fig. 2) centrally of the length of the flange 38 and on each of the V-sides thereof restrict travel of the intermediate sets of balls 44. At the rear end of the flange 38 and on each of the V-sides here are stops 46. The rearward or second set of balls is thereby located to operate one way from the

pinion 43, as the forward set operates the other way. The flange 39 also carries the stops 45, 46. The pairs of the balls 44 at the race ways having outer sides toward the flanges 11 and 13, are thus confined in their rolling cycles.

The inner balls 44 riding between the flanges 38, 27 and the flanges 39, 28, are centrally kept from working away from the respective sets therefor by stops 47 (Fig. 2) at the inner faces of the flanges 38, 39. In order to retain these balls 44 of the inner race ways from rolling clear of the unit, the third channel member 27, 26, 28, has stops 48 (Fig. 3) at the opposite ends of the flanges 27, 28.

There is thus provided four point bearing for the balls 44 as spacing the flanges 27, 38; 28, 39. The opposing reverse V aligned race ways smoothly take on heavy loading. The work response thus taken by the floating extension or intermediate channel 38, 37, 39, has such transferred to ball pairs acting on the converse or outer V walls diverging from race way pairs. These balls 44 act as three point bearings, with positive holding against side sway relatively to the case in drawer shifting. The proportional travel for the floating second channel 38, 37, 39, taken on by the balls 44, is consistently carried thru due to the pinion 43 and the racks.

What is claimed and it is desired to secure by Letters Patent is:

1. A drawer slide assembly for a cabinet comprising three relatively movable members between said drawer and said cabinet, a first of said members having a cross section with four right angled corners as in a rectangle providing ball bearing races, a second of said members being disposed within said first member and having a cross section comprising a first pair of V-shaped portions wherein each outer side of each V-shaped portion provides a cooperating race surface diagonally across on of said corners, and each pair of adjacent inner sides of said V-shaped portions provides an additional race, the third of said members having at least a portion thereof disposed within said second member and having a cross section comprising a second pair of V-shaped portions providing cooperating race surfaces with said inner sides, and bearing balls in said races.

2. An assembly according to claim 1 including a rotating means mounted on said second member between said first and third members.

3. An assembly according to claim 2 wherein said rotating means is a pinion gear and said first and third members have racks cooperating therewith.

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