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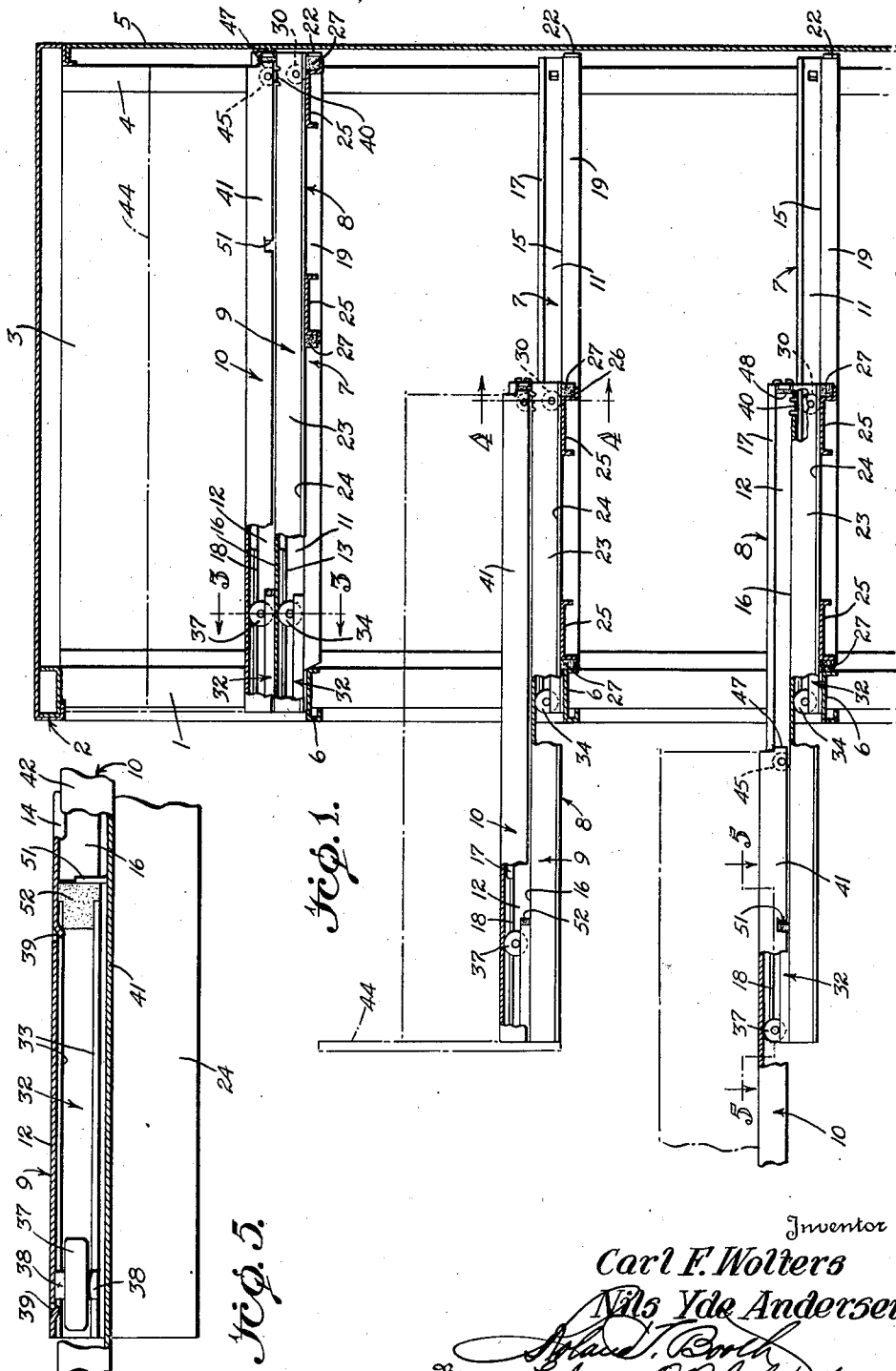
C. F. WOLTERS ET AL

2,331,529

DRAWER SUSPENSION

Filed March 8, 1941

2 Sheets-Sheet 1



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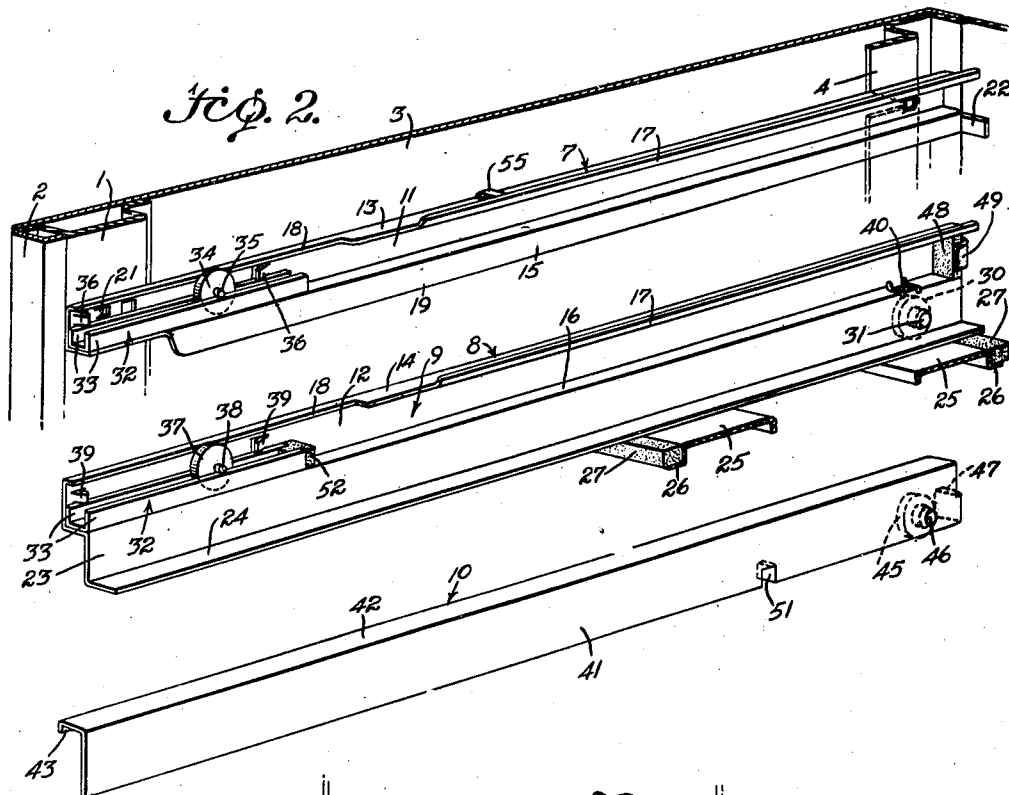
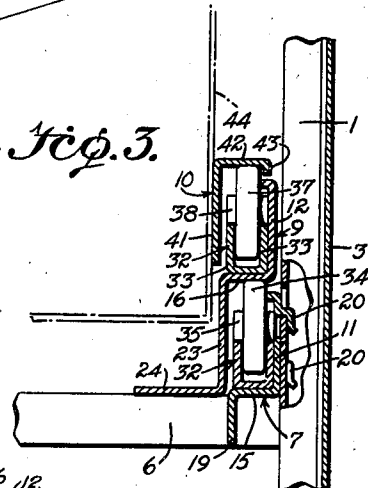
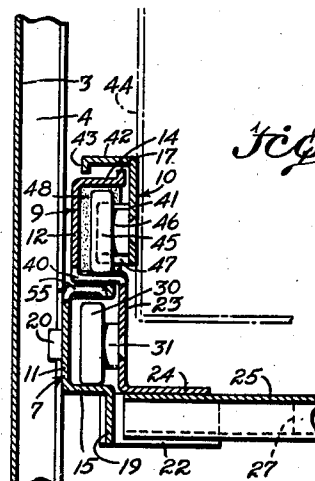
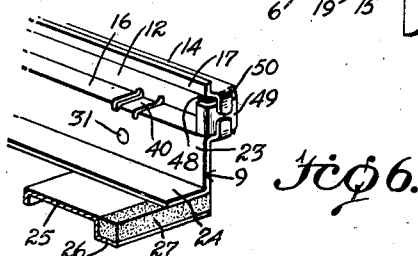
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DRAWER SUSPENSION

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6 Claims. (Cl. 45-77)

This invention relates to improvements in drawer suspensions.

The invention provides a drawer suspension designed for manufacture from sheet metal at a low cost and to incorporate into the construction wearing qualities that substantially increase the life of the drawer suspension in comparison with previous types of drawer suspensions.

The invention provides a drawer suspension in which the drawer tracks are mounted for over-travel in connection with the intermediate carrying means and at the same time are constructed for having the intermediate carrying means operate in an intermittent progressive manner in the movement of the drawer carried thereby between open and closed positions for obtaining cooperation to reduce wear.

The invention provides a detent for cooperation with the drawer and intermediate tracks for moving the intermediate carrying means outwardly with the drawer track in the outward movement of the drawer from the casing, in order to secure a smoother operation of the drawer and drawer suspension with a reduction of wear and the operation of the drawer with a minimum of effort.

The invention provides a drawer suspension in which the casing and intermediate tracks are formed to have their major structural portions of substantially duplicate shape in cross section so that bearing members for supporting rollers in journaled relation thereon, may be mounted on the front ends of said tracks in a convenient manner to obtain free traveling movement between the tracks so that substantial life can be built into the drawer suspension by providing bearing members of simple construction that may be made of hardened metal to increase the wearing qualities.

Another feature of the invention resides in having the cross members of the intermediate tracks formed to provide spaced parallel flanges for cooperation with inwardly extending bottom flanges on the intermediate tracks in order to retain stop members rigidly engaged therebetween for arresting the movement of the intermediate tracks at their forward and rear limits of travel.

In the drawings:

Figure 1 shows a vertical longitudinal cross section through a file cabinet illustrating three drawer compartments and drawer suspensions for three drawers, one in each compartment. The top suspension is shown with the parts in the position they occupy when the drawer is closed or housed

in the cabinet. The suspension for the second drawer is shown with the intermediate carrying means at its forward limit of movement and the drawer track and drawer in the same position.

5 The suspension for the third drawer from the top is illustrated in the forward position for supporting the drawer with the rear end in front of the front wall of the casing.

Figure 2 shows the drawer guide assembly for one side of the casing in perspective, with the parts in disassembled relation and portions of the cabinet and the drawer suspension broken away and shown in cross section.

10 Figure 3 is a cross section on a larger scale taken on line 3-3 of Fig. 1.

Figure 4 is a cross section on a larger scale taken on line 4-4 of Fig. 1.

Figure 5 is a cross section on a larger scale taken on line 5-5 of Fig. 1.

20 Figure 6 shows a fragment of the rear end of the intermediate carrying means in perspective.

The file cabinet comprises a casing that may be constructed in a well known manner and is illustrated as having a front frame member 1 formed of sheet metal in channel shape to provide a rigid front frame structure for the cabinet or casing. The top, side and bottom walls of the casing are formed of sheet metal and have the front edges folded around frame 1 as indicated at 2 in Figs. 25 1 and 2.

The side walls 3 of the casing carry an angular supporting strip 4 at the rear edges, while rear wall 5 closes the rear end of the cabinet. This provides a casing or cabinet construction having an open front which is divided into a plurality of drawer compartment openings by means of striker bars 6 extending transversely across the front end of the cabinet between the side portions of front frame member 1, as shown in Fig. 1.

40 The drawer suspension forming the subject matter of the present invention has a casing track 7 carried by the casing or cabinet, an intermediate carrying means generally indicated at 8 having an intermediate track 9, and a drawer track 10.

45 There are two sets of tracks 7, 9 and 10, used in providing the drawer suspension, each set being mounted at one side of the drawer and cabinet, and each one being formed in an opposite manner relative to the other. The description of one set of these tracks for the drawer suspension will be sufficient to fully describe the invention.

Each casing track 7 and intermediate track 9 is formed of a sheet metal strip in a rather similar manner. Casing track 7 and intermediate track 9 each has side sections 11 and 12 respec-

tively, formed with laterally extending upper track sections 13 and 14 respectively, and laterally extending lower track sections 15 and 16 respectively. The sizes and dimensions of these portions of both the casing and intermediate tracks 7 and 9, are identical. Both tracks 7 and 9 are formed at the free edges of upper track sections 13 and 14, with upward extending lips 17 extending from the rear end to a point forwardly of the center portion thereof, but terminating in spaced relation from the front ends of the respective tracks. Upper track sections 13 and 14 each has the front end portion formed with a cut out section indicated at 18. In other respects the casing and intermediate tracks 7 and 9 respectively, have different features of construction.

Casing track 7 is formed to provide a downwardly extending flange 19 on the free edge of lower track section 15 having the front end terminating rearwardly of the front end of the track section, as clearly illustrated in Figs. 1 and 2. This is for the purpose of having lower track section 16 mounted in the cabinet with its lower face arranged either in contact or close proximity with the upper face of striker bar 6.

Casing track 7 is mounted on the casing or cabinet by having portions of side section 11 adjacent the front and rear ends offset outwardly to provide securing tongues 20 adapted to interengage in openings formed in the side portions of front frame 1 and angle supporting strips 4 in interlocking relation. A retaining tongue 21 formed in the forward end of side section 11 may be bent laterally to interengage in an opening in front frame 1 for retaining casing track 7 in interlocked relation on the casing. This construction for mounting the casing track is illustrated in Patent No. 1,934,644, dated November 7, 1933.

A rear stop 22 is mounted on flange 19 and projects laterally and inwardly from the rear end of flange 19, as clearly shown in Fig. 2.

Intermediate track 9 has a depending flange 23 on the free edge of lower track section 16 extending throughout the length thereof. Flange 23 terminates in an inwardly extending flange 24. Intermediate tracks 9 at opposite sides of the cabinet or casing are connected by a pair of cross members 25 having the ends suitably secured by spot welding or the like to inwardly extending flanges 24, as illustrated in Fig. 2. An offset flange 26 is formed on the front edge of front cross member 25 and on the rear edge of the rear cross member. Flanges 26 are arranged in spaced parallel relation to flanges 24 for receiving and clamping a cushioning and stop block 27 therebetween. Stops 27 are clamped in position when cross members 25 are assembled to flanges 24, these stops being arranged at each side of the casing, those at one side being shown in Fig. 2. Stops 27 may be formed of blocks of rubber or other similar material for arresting the forward and rearward motion of intermediate carrying means 8. They also tend to reduce noise when they are made of rubber or other similar material.

Intermediate carrying means 8 is formed by cross members 25 in their assembled relation on a pair of spaced parallel intermediate tracks 9 to form a unitary structure. Stops 27 are positioned so as to engage laterally projecting stops 22 at the rear ends of the casing tracks 7 at opposite sides of the casing and striker bar 6, at opposite limits of movement as shown in Fig. 1.

A bearing roller 30 is rotatably mounted on stud 31 secured at the rear end of intermediate track 9 to the central portion of depending flange 23. Roller 30 is supported in outwardly spaced relation from flange 23 as shown in Fig. 4 for rolling engagement on casing track 7 between upper and lower track sections 13 and 15 respectively. This provides a bearing support for the rear end of intermediate track 9.

Front bearing members 32 are formed of sheet metal bent into U shape to provide a pair of spaced parallel supporting flanges 33. Bearing members 32 are tempered or hardened after bending so they will be highly resistant to wear. One of these bearing members 32 is mounted with the central portion joining flanges 33 seated on lower track section 15 of casing track 7, one flange 33 having the outer surface engaging the inner surface of side section 11. A bearing roller 34 is provided on opposite sides with journals 35 having the peripheries engaged on the upper edges of supporting flanges 33 for travel back and forth between opposite ends of the bearing member in the movement of a drawer between the open and closed positions. Bearing member 32 may be suitably attached to casing track 7 by spot welding or the like. The periphery of bearing roller 34 engages the under face of lower track section 16 of intermediate track 9 as shown in Figs. 1 and 3, for supporting the front end of tracks 9 of intermediate carrying means 8. Tongues 36 are formed in side section 11 of casing track 7 to project inwardly over the upper edge of the adjacent supporting flange 33, as shown in Fig. 2. Tongues 36 are adapted to engage one of the journals 35 on bearing roller 34 for limiting the travel of roller 34 on the bearing member.

Intermediate track 9 carries a bearing member 32 on the forward end of lower track section 16 as shown in Fig. 2, in the same manner as casing track 7. Bearing member 32 receives bearing roller 37 having journals 38 in rolling engagement with the upper edges of supporting flanges 33. Projections 29 extending inwardly from side sections 12 limit the travel of bearing roller 37 on bearing member 32 in the same manner as above described in connection with projections 36.

At the rear end portion intermediate track 9 has lower track section 16 formed with a pair of transversely extending slots providing a strap section 40 offset downwardly from the upper face of lower track section 16 to form a detent.

Drawer track 10 is formed from a strip of sheet metal of angular shape in cross section having a side section 41 and a track section 42 extending laterally from the upper edge of side section 41 and terminating in a depending lip 43. Drawer track 10 is spot welded or otherwise suitably secured to a side wall of drawer 44, indicated by dot and dash lines. Drawer track 10 is assembled with track section 42 engaging the periphery of bearing roller 37 in the manner shown in Fig. 3, while the rear end carries a roller 45 rotatably mounted on stud 46 suitably secured to the rear end portion of vertical side section 41 as illustrated in Figs. 1, 2 and 4. Roller 45 has bearing engagement between upper and lower track sections 14 and 16 of intermediate track 9 and is positioned so that when the drawer track is at its rear limit of movement in the housed position of the drawer in the casing, the periphery will engage detent 40. A rear stop projection 47 is formed by a laterally extending

flange on the rear end of side section 41 for engagement with a cushion block 48 retained in position at the rear end of intermediate track 9 between upper and lower track sections 14 and 16 by projections 49 and 50 respectively. This limits the rearward movement of the drawer and drawer track 10 in and relative to the intermediate carrying means. The forward movement of drawer track 10 relative to intermediate track 9 is limited by means of stop projection 51 formed in side section 41, as shown in Fig. 2, engaging stop block 52 mounted in the rear end of bearing member 32 carried by intermediate track 9.

It will be noted that when the intermediate carrying member is in assembled relation intermediate track 9 will be disposed above casing track 7, and drawer track 10 will be disposed above intermediate track 9, in the manner illustrated in Figs. 3 and 4. In this way, there is direct distribution of weight and leverage from the drawer track through bearing rollers 34 and 37 respectively, to casing track 7. Part of the weight and leverage is distributed through rollers 30 and 45 respectively. This distribution from drawer track 10 to casing track 7 is also direct.

In the normal operation of this drawer suspension, intermediate and drawer tracks 9 and 10 respectively, are in substantially complete overlapping relation with each other and casing track 7 when the drawer is housed in the casing as shown by the drawer suspension for the top drawer in Fig. 1. In this position stop 27 carried by rear cross bar 25 will rest in substantial engagement with stop 22, and stop projection 47 will engage stop block 46, while the periphery of bearing roller 45 engages detent 40. In this position it will be noted that bearing rollers 34 and 37 are at the rear limit of travel on bearing members 32.

In moving the drawer from the housed position toward the open position, detent 40 engaging the periphery of roller 45 will cause intermediate carrying means 8 including intermediate track 9 to move forwardly until stop 27 carried by the forward cross member 25 engages striker bar 6, as shown by the second drawer from the top of the casing, as illustrated in Fig. 1. This will arrest and stop the movement of intermediate carrying means 8 whereupon further outward movement of the drawer will cause roller 45 to disengage detent 40 and have rolling engagement on either upper or lower track section 14 or 16 respectively, depending upon the center of gravity of the weight in the drawer and its position with respect to bearing roller 37.

The drawer track will move outwardly relative to intermediate carrying means 8 and track 9 to the position shown by the third drawer from the top in Fig. 1 where stop projection 51 engages stop 52 and limits further relative movement of drawer track 10 on intermediate track 9. In this position of the parts of the drawer suspension in which the drawer track and the intermediate track are at the outer limits of movement, drawer 44 is supported by the drawer suspension outwardly in front of the cabinet with the rear wall of the drawer located in a position in front of the front wall of the casing.

A detent 55 may be formed in the same manner as detent 40 in upper track section 13 of casing track 7 to receive the periphery of bearing roller 30 when intermediate track 9 is at its outer limit of movement. Detent 55 will normally retain the intermediate carrying means at

its outer limit of movement while the drawer and drawer track 10 are moved from the outer open position of the drawer toward the closed position in the casing. When drawer track 10 moves inwardly to the position shown by the second drawer from the top in Fig. 1, stop projection 47 will engage stop block 48 and further movement of the drawer toward housed position in the casing will then carry the intermediate carrying means with the drawer and drawer track until the drawer reaches the closed position as shown by the top drawer in Fig. 1.

In this way the intermediate carrying means is constructed so that the cooperation obtained between the bearing rollers and the detent gives the intermediate carrying means an intermittent progression with and relative to the drawer track. This intermittent progression of the intermediate carrying means obtains a substantial improvement in the operation of the drawer suspension because it reduces wear to a substantial extent. This is obtained by reason of the fact that the leverage applied by the weight of the drawer to the casing track through rollers 30 and 34 is reduced to a minimum during the travel of the intermediate carrying means between the open and closed positions. The intermittent progression of the intermediate carrying means is reversed in its sequence in the inward movement of the drawer from that obtained when the drawer is moved outwardly to the open position.

By the provision of bearing member 32, and by the construction of casing track 7 and intermediate track 9 to have the side and track sections thereof formed in a duplicate manner, it has been found that a considerable reduction in the cost of constructing the drawer suspension has been obtained with a considerable increase in the wearing life compared with other types of drawer suspensions. The use of bearing members 32 constructed and assembled as described provides for the employment of a hardened sheet metal structure giving the drawer suspension wearing qualities far in excess of many well known forms of drawer suspension. A cooperation is obtained between the track structures and bearing members 32 in supporting and retaining rollers 34 and 37 in assembled relation by reason of the stop projections 35 and 39 that cooperate to engage the journals of the bearing rollers for limiting their travel on bearing members 32.

A very efficient stop structure is obtained by assembling stop blocks 27 between flanges 26 and 24 in the assembly of cross members 25 with intermediate tracks 9. It will be noted that each of the tracks are formed from strips of sheet metal by simple folding operations and by simple offsetting operations to provide the stops as above described.

The intermediate carrying means is readily assembled on the casing tracks by inserting bearing rollers 30 and the ends of cross members 25 through cut out sections 18 above bearing roller 34 and bearing member 32.

The drawer and drawer track is assembled on the intermediate carrying means by inserting the rear end of the drawer track in the cut out section 18 of the intermediate track above bearing roller 37 and member 32 when the drawer track is held with the forward end above the rear end.

The invention claimed is:

1. A drawer suspension for mounting a drawer in its casing, comprising a track to be mounted

on said casing, a track to be mounted on said drawer, an intermediate track, said casing and intermediate tracks each formed from sheet metal strips to provide a side section and upper and lower track sections extending longitudinally of each track and of substantially duplicate shape in cross section, a plurality of hardened metallic bearing members, one mounted on the front end portion of the upper face of each lower track section of said casing and intermediate tracks respectively, each bearing member having a pair of spaced parallel supporting flanges extending upward from said lower track section, a roller engaged between the flanges of each bearing member and provided with journals engaging and supported on the upper edges of said supporting flanges, said intermediate track being mounted partially above said casing track with the lower face of said lower track section engaged with the periphery of the roller on the bearing member of said casing track for support thereon for free traveling movement, another roller between said casing and intermediate tracks for supporting the rear end of said intermediate track, said drawer track being mounted partially above said intermediate track and supported thereon by the roller on the bearing member of said intermediate track, a roller between the rear ends of said drawer and intermediate tracks, and stops for limiting forward and rearward travel of said drawer and intermediate tracks relative to each other and said casing track.

2. A drawer suspension for mounting a drawer in its casing, comprising a track to be mounted on said casing, a track to be mounted on said drawer, an intermediate track, said casing and intermediate tracks each formed from sheet metal strips to provide a side section and upper and lower track sections extending longitudinally of each track and of substantially duplicate shape in cross section, a plurality of hardened metallic bearing members, one mounted on the front end portion of the upper face of each lower track section of said casing and intermediate tracks respectively, each bearing member having a pair of spaced parallel supporting flanges extending upwardly from said lower track section, a roller engaged between the flanges of each bearing member and providing with journals engaging and supported on the upper edges of said supporting flanges, each of said side sections being formed with lateral projections adjacent opposite end portions of said bearing members extending over the upper edges of the adjacent side sections for engaging the journals on said rollers and limiting the longitudinal travel of said rollers on said bearing members, said intermediate track being mounted partially above said casing track with the lower face of said lower track section engaged with the periphery of the roller on the bearing member of said casing track for support thereon for free traveling movement, said drawer track being mounted partially above said intermediate track and supported thereon by the roller on the bearing member of said intermediate track for free rolling movement relative to said intermediate track, and means for limiting the forward and rearward movement of said casing and intermediate tracks relative to each other and said casing track.

3. A drawer suspension for mounting a drawer in its casing, comprising a track to be mounted on said casing, a track to be mounted on said drawer, an intermediate track, said casing and

intermediate tracks each formed from sheet metal strips to provide a side section and upper and lower track sections extending longitudinally of each track and of substantially duplicate shape in cross section, a plurality of hardened metallic bearing members, one mounted on the front end portion of the upper face of each lower track section of said casing and intermediate tracks respectively, each bearing member having a pair of spaced parallel supporting flanges extending upwardly from said lower track sections, a roller engaged between the flanges of each bearing member and provided with journals engaging and supported on the upper edges of said supporting flanges, said intermediate track being mounted partially above said casing track with the lower face of the lower track section engaged with the periphery of the roller on the bearing member of said casing track for support thereon for free traveling movement, said drawer track being mounted partially above said intermediate track and supported thereon by engaging the roller on the bearing member of said intermediate track, a roller rotatably mounted on the rear end of said drawer track and engaged between the upper and lower track sections of said intermediate track for cooperation with the roller on the bearing member of said intermediate track to provide free traveling movement of said drawer track on said intermediate track, said lower track section of said intermediate track being formed adjacent to the rear end thereof with an offset section forming a detent for receiving the periphery of the roller on the rear end portion of said drawer track, said detent and roller on said drawer track cooperating to cause said intermediate track to move with said drawer track from the housed position of said tracks in said casing with said drawer when said drawer is moved outwardly from said casing, stop means for limiting the outward movement of said intermediate track on said casing track operable to cause the roller on said drawer track to disengage from said detent for relative movement of said drawer track outwardly on said intermediate track into a position where said drawer is supported in front of said casing.

4. A drawer suspension for mounting a drawer in its casing, comprising a track to be mounted on the casing, a track to be mounted on the drawer, intermediate carrying means, bearings supporting said drawer track for free movement on said intermediate carrying means and said intermediate carrying means for free movement on said casing track, said intermediate carrying means comprising a pair of spaced parallel tracks at opposite sides of said drawer for cooperation with casing and drawer tracks on opposite sides of said drawer, said intermediate tracks at the opposite sides of said drawer being each formed of sheet metal having the lower edge portions extended inwardly toward each other in aligned relation forming bottom flanges, a pair of cross members mounted in spaced parallel relation below said intermediate tracks and having the opposite end portions thereof secured to said inwardly extending bottom flanges, said intermediate tracks and cross members constituting a carriage, each of said cross members being formed of sheet metal and having a marginal flange offset into spaced parallel relation relative to the inwardly extending flanges on said intermediate tracks, and stop members mounted between the offset flanges of said cross members and the inwardly extending flanges of said in-

intermediate tracks and retained in assembled relation on said carriage by said flanges for limiting the movement of said intermediate carrying means in both directions relative to said casing tracks, and means for limiting the relative movement of said drawer tracks in both directions on said intermediate carrying means, whereby a drawer supported by said drawer tracks may be moved into a housed position in said cabinet and into an outwardly projecting position in front of said cabinet.

5. A drawer suspension for mounting a drawer in its casing, comprising a track to be mounted on the casing, a track to be mounted on said drawer, an intermediate track, said casing and intermediate tracks each formed from sheet metal strips to provide a side section and upper and lower track sections extending longitudinally of each track section, of substantially duplicate shape in cross section and having the front end of the upper track section of each formed with a cut-out section forming a top opening, a plurality of hardened metallic bearing members, one mounted on the front end portion of the upper face of each lower track section of said casing and intermediate tracks respectively, and having the rear end terminating forwardly of the front end of the upper track section formed by said cut-out section, a roller mounted on the top portion of each bearing member for travel thereon, said intermediate track being mounted partially above said casing track with the lower face of the lower track section engaged with the periphery of the roller of the bearing member on said casing track for support thereon for free traveling movement, said drawer track being mounted partially above said intermediate track and supported thereon by engaging the roller on the bearing member on said intermediate track, a roller rotatably mounted on the rear end of said drawer track and engaged between the upper and lower track sections of said intermediate track for cooperation with the roller on the bearing member of said intermediate track to provide free traveling movement of the drawer track on said intermediate track, a stop on said drawer track forwardly of the roller on the rear end thereof for engaging the rear end of the bearing member on the intermediate track for limiting forward movement of the drawer track on the intermediate track, a stop for limiting rearward movement of said drawer track on said intermediate track, said stops normally retaining said drawer track assembled on said intermediate

track against detachment in endwise movement thereof, said first-mentioned stop and the roller on the rear end of said drawer track being movable through said top opening to disengage and engage said drawer track on said intermediate track, a roller journaled on the rear end of said intermediate track and engaged between the upper and lower track sections of said casing track for cooperation with the roller on the bearing member of said casing track to provide free traveling movement of the intermediate track on said casing track, and stop means for limiting forward and rearward movement of said intermediate track on said casing track and normally retaining said tracks against detachment in endwise movement thereof, said intermediate track being disengaged and engaged on said casing track by disengaging said stop means and moving the roller on the rear end of said intermediate track through the top opening in said casing track.

6. A drawer suspension for mounting a drawer in its casing, comprising a track to be mounted on said casing, a track to be mounted on said drawer, an intermediate track, said casing and intermediate tracks each formed from sheet metal strips to provide a side section and track sections extending longitudinally of each side section, a plurality of hardened metallic bearing members, one mounted on the front end portion of the upper face of a track section of said casing and intermediate tracks respectively, a roller supported for longitudinal movement on each bearing member, each of said side sections being formed with lateral projections adjacent opposite end portions of said bearing members with portions lying in the path of movement of the rollers on said bearing members for engaging and limiting the longitudinal travel of said rollers on said bearing members, said intermediate track being mounted with the lower face of a track section engaged with the periphery of the roller on the bearing member of said casing track for support thereon for free traveling movement, said drawer track being supported by the roller on the bearing member of said intermediate track for free rolling movement relative to said intermediate track, and stops for limiting forward and rearward travel of said drawer and intermediate tracks relative to each other and said casing track.

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