United States Patent

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[54] **DRAWER SLIDE CONSTRUCTION**
10 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **312/341,** 308/3.8
[51] **Int. Cl.** **A47b 88/00,** A47b 95/00
[50] **Field of Search** ..... 308/3.6, 3.8, 3.9; 312/338—350, 334, 333

[56] **References Cited**

UNITED STATES PATENTS

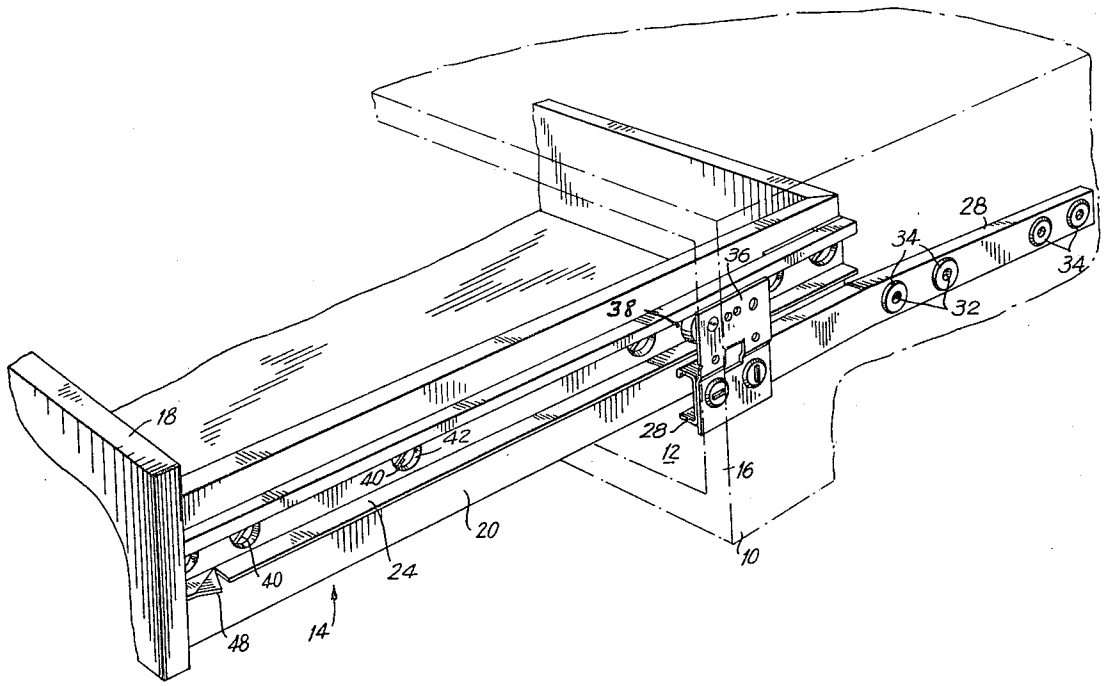
2,739,028	3/1956	Siggia	312/341
2,747,943	5/1956	Metcalf	308/3.8
2,871,085	1/1959	Diack	312/339
3,243,247	3/1966	Knape	312/333
3,328,106	6/1967	Mullin	308/3.6X

FOREIGN PATENTS

803,331	10/1958	Great Britain	312/339

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ABSTRACT: A self-closing slideable drawer is provided with tracks on each side having a roller vertically offset from its track adjacent its rear, which roller cooperates with a corresponding stationary track on each side of the cabinet, which tracks have a roller vertically offset therefrom adjacent its respective front, and which roller is received within its mating drawer track. One set of rollers on one side of the drawer has a smaller width than the other side, and the tracks have stops for in and out position of the drawer.



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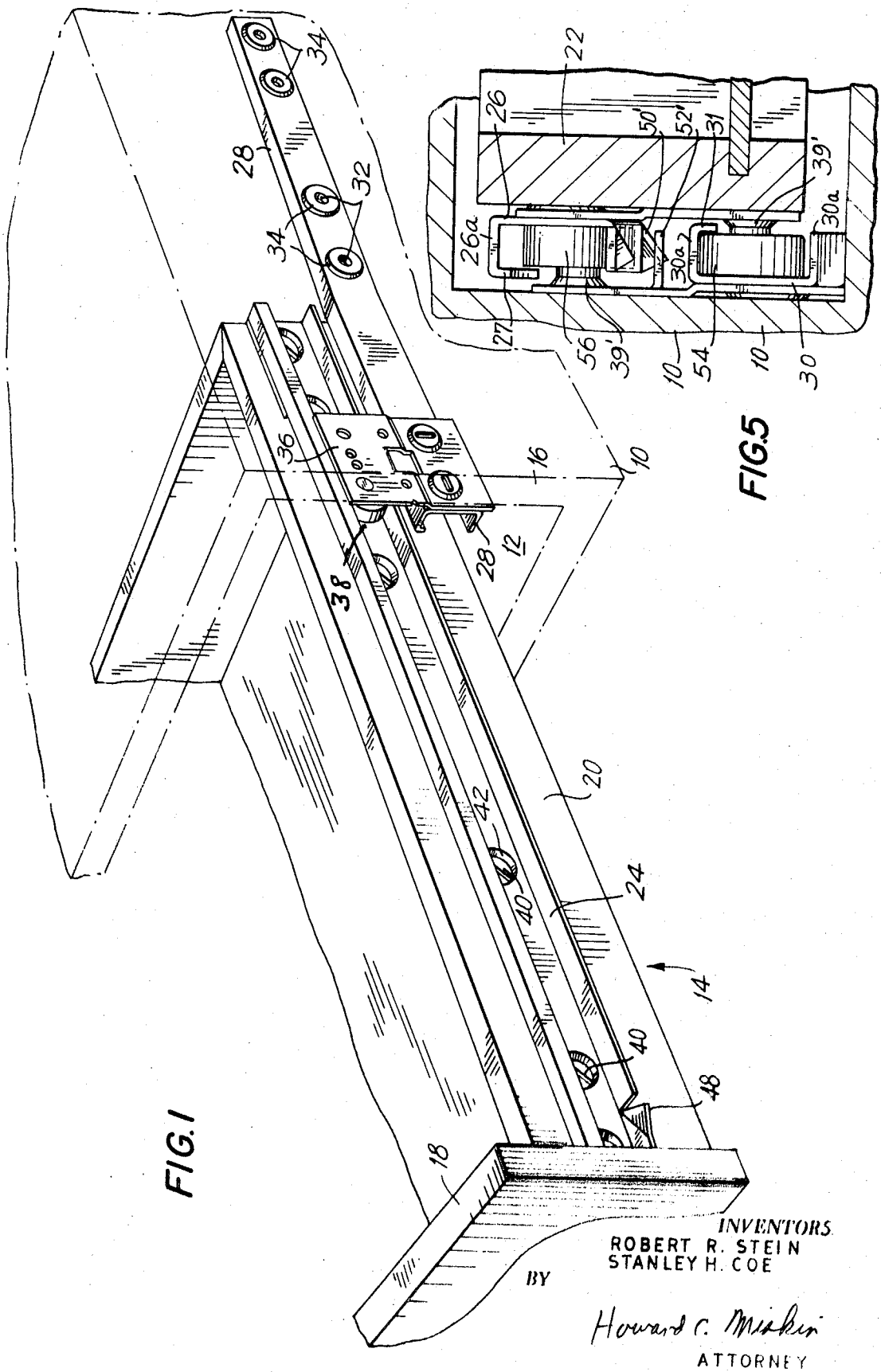


FIG.1

FIG.5

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FIG. 2

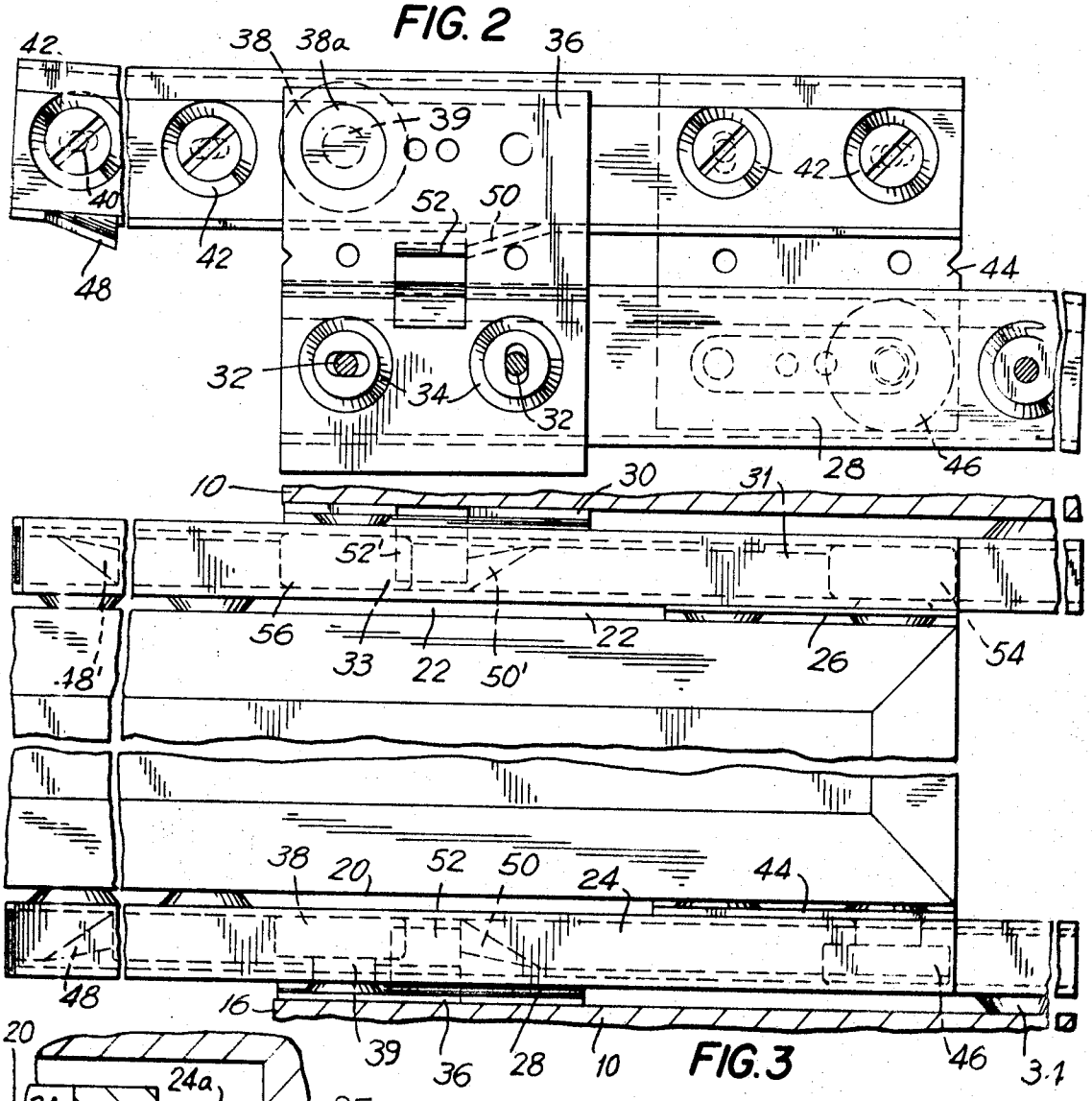


FIG. 3

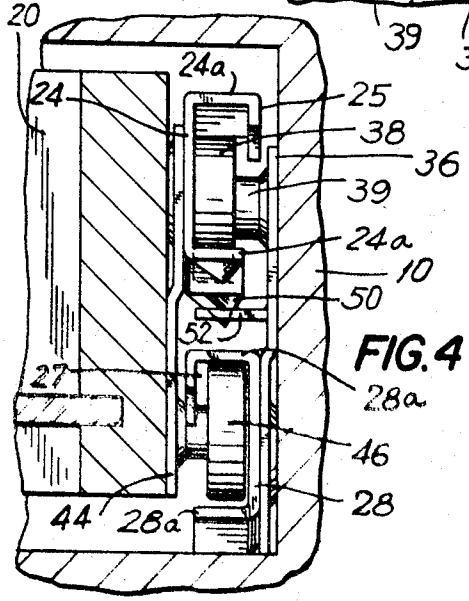


FIG. 4

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DRAWER SLIDE CONSTRUCTION

This invention relates to a drawer slide structure, and more particularly to a thin drawer slide having good tracking during travel, and which is supported in its fully extended position.

A variety of drawer roller supports are known in the art and are a great improvement over the older slide guide systems because of the general ease with which the drawers can be opened and closed, even through fully loaded, and which avoid the essentially custom-fitting normally required during installation of the slide guides.

While the advantages of drawer slides are apparent, drawer slide assemblies have been used essentially for the more expensive applications, such as electronic component assemblies, expensive furniture, or expensive kitchen cabinets, because of the complicated manufacturing process to produce slides, the space required to install the slides decreases drawer space, and the essentially precision dimensions required to fit the drawer to the cabinet.

The present invention overcomes the disadvantages by providing an inexpensive interfitting, self-closing drawer slide structure, which results in a minimum width dimension required, precision action without requiring precision installation methods, and a small number of components.

It is therefore an object of this invention to provide a drawer slide structure composed of a minimum number of component parts, which can be manufactured economically.

It is a further object of the present invention to provide a drawer slide structure having guided travel, which can be assembled economically without requiring precision interfitting of the track and channel components during installation.

A still further object of the present invention is to provide a smooth-acting drawer slide structure having components which can be readily assembled by unskilled help, and which has self-contained limit stops for closed and extended positions.

Another object of the present invention is to provide a relatively heavy-duty drawer slide structure, which is simple, inexpensive, reliable, smooth in operation, and utilizes relatively small side space in the cabinet.

A further object of the present invention is to provide a self-closing drawer slide structure, which will result in the drawer closing automatically after being closed a certain distance regardless of the position of the weight in the drawer, and yet maintain the drawer in substantially level position.

A still further object of this invention is to provide a drawer slide structure, which proper alignment of the structure is achieved relatively easily during installation without special tools, devices or techniques, and which is durable during prolonged use.

These and other objects and advantages of this invention will become more apparent upon reading the specification in conjunction with the accompanying drawings, wherein corresponding reference numerals refer to similar components in each of the several views.

FIG. 1 is a perspective view showing one side of one type of a drawer slide structure made in accordance with this invention, connected to a conventional cabinet and drawer;

FIG. 2 is an enlarged side elevational view of an assembled drawer track and cabinet track shown in FIG. 1, in a fully extended position;

FIG. 3 is a top plan view of the drawer slide structure in partially open position;

FIG. 4 is an enlarged front elevational view of the present invention of the right side of the structure, as viewed in FIG. 1, showing its relationship to a fragment of the drawer and cabinet; and

FIG. 5 is an enlarged front elevational view of the left side of the structure, as viewed in FIG. 3, showing its relationship to a fragment of the drawer and cabinet.

The drawer slide structure includes tracks, which are adapted to be secured to each side of the cabinet, and aligned with a drawer opening formed therein, and drawer tracks which are adapted to be secured to the sides of the drawer, which is received in the drawer opening of the cabinet. Each of the drawer tracks and cabinet tracks have vertically offset rollers or wheels, which are positioned so as to be aligned with its corresponding mating track when the drawer is inserted into the cabinet. Each of the drawer tracks and cabinet tracks have only a single roller which is journaled to it. The drawer track has its roller adjacent its rear and the cabinet track has its roller adjacent its front. Heretofore, the drawer opening in the cabinet had to be relatively precisely made so as to accurately position the cabinet tracks at their correct distance apart, so as to receive the rollers mounted on the drawer tracks. This required a relatively high skill of worker and increased the cost of assembling the cabinet and the slide structure. If there were any errors in the width of the opening, then the width of the drawer had to be modified, or else either the drawer tracks or cabinet channels had to be offset or shimmed from their respective bases, which is time-consuming and required a degree of skill. While the term "cabinet" has been used generally, it can be any type of furniture or cabinet, such as a desk, bureau, file cabinet, kitchen cabinet, console, or the like.

Referring to the drawings in detail, cabinet **10** has an opening **12** which receives a drawer **14**. The front portion of cabinet **10** is indicated at **16**. The drawer, as shown, is of conventional design having a front **18** and sides **20** and **22**. The height of the drawer sides **20** and **22** is slightly less than the height of the drawer opening **12**, for reasons which will be explained more fully hereinafter.

The drawer slide assembly includes tracks **24** and **26**, which are positioned on opposite sides of drawer **14** for movement therewith, and tracks **28** and **30**, which are supported by the sidewalls of the opening **12** in cabinet **10**, and are stationary with respect thereto. Track **24** cooperates with track **28** and similarly track **26** cooperates with track **30**. Tracks **24**, **26**, **28** and **30** are preferably channel-shaped, as shown best in FIGS. **4** and **5**.

Tracks **28** and **30** are connected to the cabinet wall by means of screws or other fasteners **32**, extending through holes in depressions or wells **34** in the base of the channel. Depressions or wells **34** allow round or flathead screws to be used in installation, which heads remain below the level of the surface and cannot interfere or bind the drawer slide structure in operation. The openings in wells **34** can be elongated horizontally or vertically to allow for adjustment. Adjacent the front end of track **28** is a vertical extension or flange portion **36**, as seen best in FIGS. **1** and **2**. Flange portion **36** rotatably supports a wheel or roller **38**, which extends outwardly from flange **38** into drawer opening **12**. Roller **38** is vertically oriented with respect to track **28** and is matingly received within track **24** on drawer **14**.

Track **24** has a generally U-shaped channel cross section and is affixed to sidewall **20** of drawer **14** by means of screws or the like **40**, which are located in holes in wells or depressions **42**. The rear end of track **24** is provided with a downwardly extending flange **44**, which rotatably supports a roller **46**. Roller **46** extends outwardly from flange **44** and is vertically aligned with track **24**, and is matingly received within track **28**. Track **24** is provided with a partially struck-out portion **48** adjacent front panel **18** of drawer **14**, which extends generally downwardly towards the rear and also with a downwardly extending struck-out portion **50** adjacent its rear end facing the front. Flange **36** has an outwardly extending finger **52** facing drawer side **20** which is positioned to contact struck-out portions **48** and **50** during travel of slide **24**, and which act as inner and outer stops for the slide structure, respectively. As seen best in FIG. **4**, rollers **38** and **46** are thinner than the width of the legs **24***a* and **28***a* of the channels of tracks **24** and **28**, for the reasons which will be explained more fully hereinafter.

On the opposite side of drawer **14**, drawer track **26** mates with cabinet track **30** and are identical to corresponding tracks **24** and **28**, respectively, described above, with the

exception of the width of roller **54**, rotatably connected to flange **31** of track **26**, and the width of roller **56**, rotatably connected to flange **33** of track **30**. The remaining elements of tracks **26** and **30** are substantially a mirror image of the corresponding elements of tracks **24** and **28**, and hence will not be described in detail, but will be shown with corresponding primed numerals being provided on tracks **26** and **30**. Rollers **38** and **46** are of smaller width than the width of the legs **24***a* and **28***a* of the channel-shaped tracks **24** and **28**, respectively, which allows the width of the cabinet opening to vary up to one-eighth of an inch or more than specified without the use of shims. The reduced width of rollers **38** and **46** allows mating within their respective tracks, even though the centers of the tracks are not precisely aligned with their mating rollers. The opposite set of rollers **54** and **56** have a width substantially equal to the width of legs **26***a* and **30***a* of the channel-shaped tracks **26** and **30**, respectively, so as to prevent any side-play of the drawer reciprocating within the cabinet opening **12**, which provides a smooth, uniform, straight movement, both loaded and unloaded, even through though the cabinet opening is one-eighth of an inch overwidth than the drawer, and rollers **38** and **46** are smaller in width than their respective channels of the corresponding tracks **24** and **28**.

Roller **38** preferably has a hub **38***a* and is journaled on a rivet shaft **39**, which is riveted to channel **24**. Preferably roller **38** is made of a self-lubricating material, such as nylon or Teflon, surrounding ball bearings, which provides quiet and smooth rolling action. It is also of sufficient size to provide easy operation of the slide units. Rollers **46**, **54** and **56** are made similarly.

Tracks **26** and **30** are provided with normally directed shoulders **27** and **31**, respectively. Shoulders **27** and **31** are to prevent sideways or transverse movement of rollers **56** and **54**, respectively. Also, as shown, tracks **24** and **28** similarly have normally directed shoulders **28** and **27**, respectively.

The self-closing feature is achieved by having tracks **28** and **30** inclined slightly downwardly from about 2°to about 4°from the horizontal at a position remote from the front end of the tracks, and similarly, having the front portion of tracks **24** and **26** inclined upwardly from about 2°to about 4°from the horizontal remote from the rear end of tracks **24** and **26**, respectively. Advantageously, the angular displacement begins along the corresponding tracks about seven (7) inches away from the front portion **16** of cabinet **10**. The downward inclination of tracks **28** and **30** and the equal, but opposite upward inclination of tracks **24** and **26** maintain drawer **14** always in a level position.

Struck-out portions **48** and **48'** on tracks **24** and **26**, respectively, are positioned so as to engage the finger **52** on flange **36** when the drawer is in its fully closed position. The use of portions **48** and **48'** avoids any undue stress or marring of front **18** of drawer **14** hitting the front **16** of cabinet **10** during the closing of the drawer. Previously, drawer front **18** was used as a stop. Oftentime slamming the drawer shut caused the front of the drawer to be forced away from the side panels of the drawer. The self-closing feature similarly maintains the drawer in its closed position without the addition of any added wells, locks, or the like.

When the drawer is reciprocated to its fully opened position, drawer **14** is supported by wheels **38** and **56**, respectively and rollers **46** and **54** are in rolling contact with either the upper or lower surfaces of channels **28** and **30**, respectively, depending on any given position of the drawer **14**, upon whether the center or gravity of drawer **14** and its contents is rearwardly or forwardly of rollers **38** and **56**, respectively. When the drawer **14** is in its fully opened position, struck-out portions **50** and **50'** engage stops **52** and **52'**, respectively, thereby providing a double limit stop.

The drawer **14** may be completely removed from cabinet **10** by lifting the front of the drawer upwardly, as seen best in FIGS. **2**, **4** and **5**, so that struck-out portions **50** and **50'** clear stops **52** and **52'**, respectively, and the drawer **14** is moved forwardly and can be completely removed. As seen best in FIGS. **4** and **5**, a slight clearance is provided from the top of side panels **20** and **22** of drawer **14** and the top of cabinet opening **12**, so as to allow sufficient clearance for struck-out portions **50** and **51'** to clear stops **52** and **52'**, respectively, when drawer **14** is lifted.

Drawer **14** is inserted into drawer cabinet opening **12** by rolling rollers **46** and **54** into their mating tracks **28** and **30**, and positioning rollers **38** and **56** in the channels of tracks **24** and **26**. Struck-out portions **50** and **50'** being tapered in the opposite direction, easily slide over finger **52**. Once the center of gravity of drawer **14** passes beyond wheels **38** and **56**, respectively, the weight of the drawer will cause drawer **14** to move downwardly towards the rear of the cabinet providing for self-closing. Self-closing takes place regardless of the position of the weight in the drawer due to the gravitational force. Also, once drawer front **18** moves to within seven (7) inches of the front **16** of cabinet **10**, the drawer automatically closes by reason of the point of bending along the corresponding tracks.

From the above disclosure it is seen that the drawer slide of this invention is simply constructed. By forming struck-out portions, the tracks can be made by a stamping process and by reducing the width of the wheels on one side of the drawer slide structure only, the cabinet opening can vary about one-quarter of an inch from the specified dimension, without affecting the smooth movement of the drawer. The structure disclosed has a self-closing feature and has both in and out stops to save the drawer front and prevent the drawers from falling out accidentally. The stamping operation also allows the tracks to provide simple means for recessing the heads of fasteners and simultaneously form bosses, and the offsetting of wheels mounted on flanges offset from the tracks allows for a thinner slide assembly, thereby increasing the drawer space.

While a preferred embodiment of this invention has been described, it will be understood that modifications and improvements may be made thereto. Such of these modifications and improvements as incorporate the principles of this invention are to be considered as included in the appended claims, unless these claims by their language expressly state otherwise.

We claim:

1. A drawer slide assembly for reciprocally supporting a drawer for movement into and out of an opening in a cabinet, comprising first and second tracks on each side of the cabinet and aligned with the drawer opening formed therein, said first and second tracks being parallel and vertically offset, said first tracks adapted to be secured to said cabinet and said second tracks adapted to be secured to said drawer, each of said first tracks having a vertically offset flange adjacent its forward end and adjacent the drawer opening, each of said second tracks having a vertically offset flange adjacent its end disposed most remotely from said drawer opening, and rollers journaled on each of said flanges, the rollers journaled on said first tracks flanges being in rolling contact with said second tracks and the rollers journaled on the flanges of the second tracks being in rolling engagement with said first tracks, said drawer and said second tracks being movable with respect to said first tracks, the rollers on one side of said drawer opening having a width less than the width of their mating tracks.

2. A drawer slide structure, as in claim **1**, wherein the rearward portions of said first tracks are downwardly inclined from a point intermediate of their ends.

3. A drawer slide structure in accordance with claim **2**, further including the forward portions of said second tracks being upwardly inclined from the horizontal from a point intermediate from their ends.

4. A drawer slide structure in accordance with claim **3**, wherein the angle of inclination of the first and second tracks is from about 2°to about 4°.

5. A drawer slide structure in accordance with claim **4**, wherein the angle of inclination upwardly is equal to the angle of inclination downwardly.

6. A drawer slide structure as in claim 1, wherein said tracks have horizontal surfaces spaced vertically apart a distance greater than the diameter of their mating rollers.

7. A drawer slide structure in accordance with claim 6, wherein one of said surfaces has a normally directed shoulder parallel to the tracks, and defining a space greater than the width of said mating rollers.

8. A slide structure in accordance with claim 1, wherein said second tracks have stop means to limit the extent of movement of said drawer within predetermined limits.

9. A drawer slide structure in accordance with claim 8, wherein said stop means include partially struck-out portions from said second tracks, a finger extending outwardly from the flange of the first tracks, which fingers cooperate with corresponding struck-out portions of said second tracks.

10. Apparatus in accordance with claim 9, wherein the side panels of the drawer are of a height less than the height of the drawer opening by a distance at least as great as the outwardly struck portions performing the stops, so as to allow removal of the drawer by lifting.