April 22, 1969 W. D. TAYLOR 3,439,967

TILT-DOWN DRAWER CONSTRUCTION

Filed Nov. 13, 1967 Sheet 1 of 4

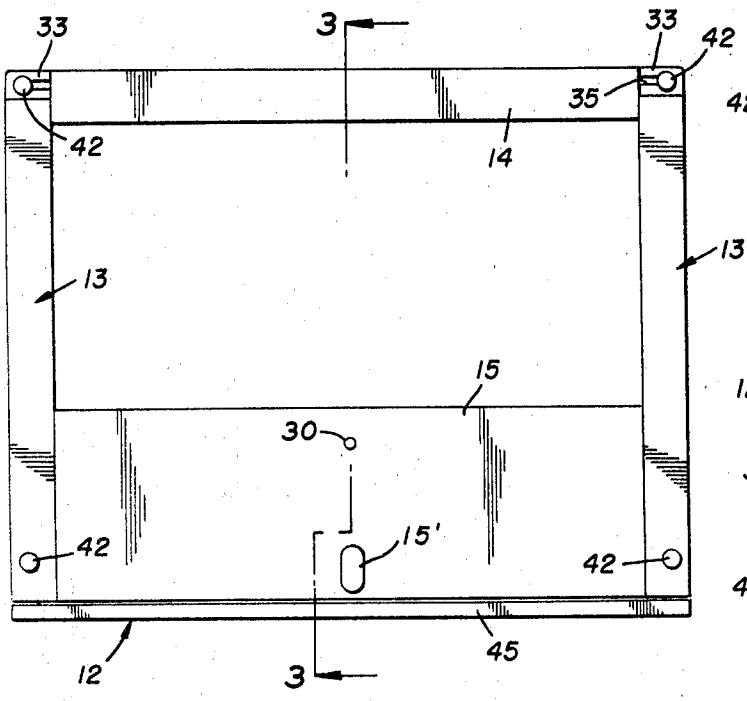


FIG. 1

FIG. 2

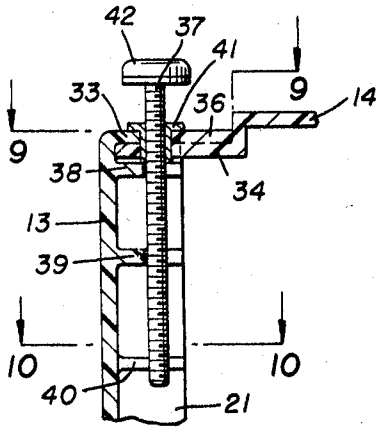


FIG. 8

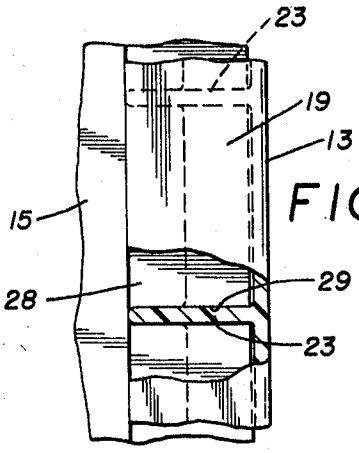


FIG. 7

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TILT-DOWN DRAWER CONSTRUCTION

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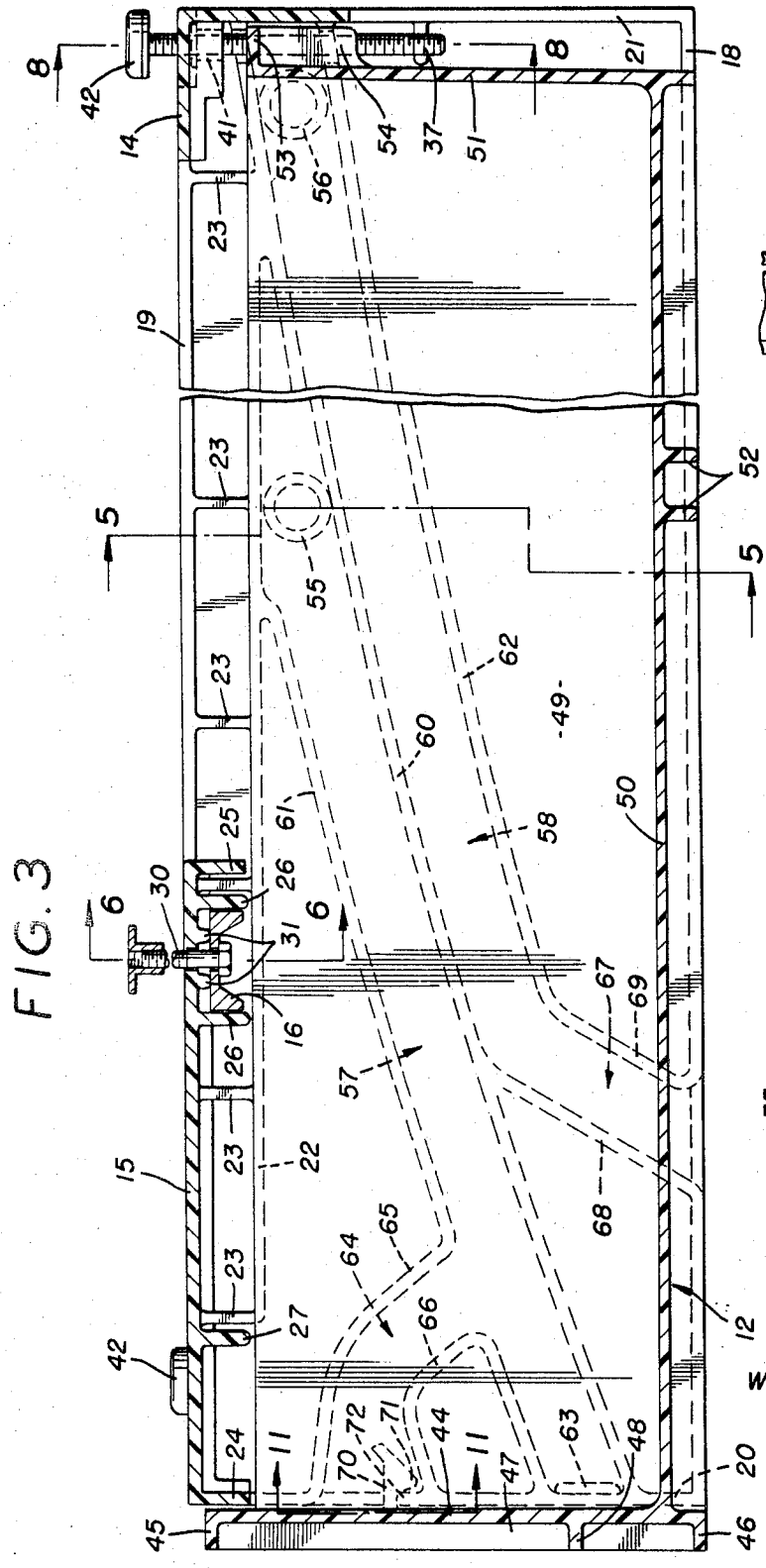


FIG. 3

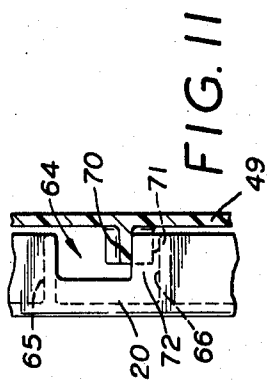


FIG. 11

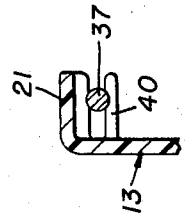


FIG. 10

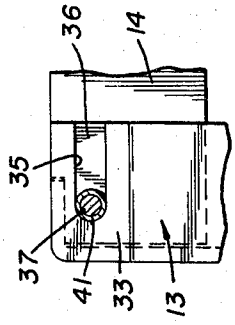


FIG. 9

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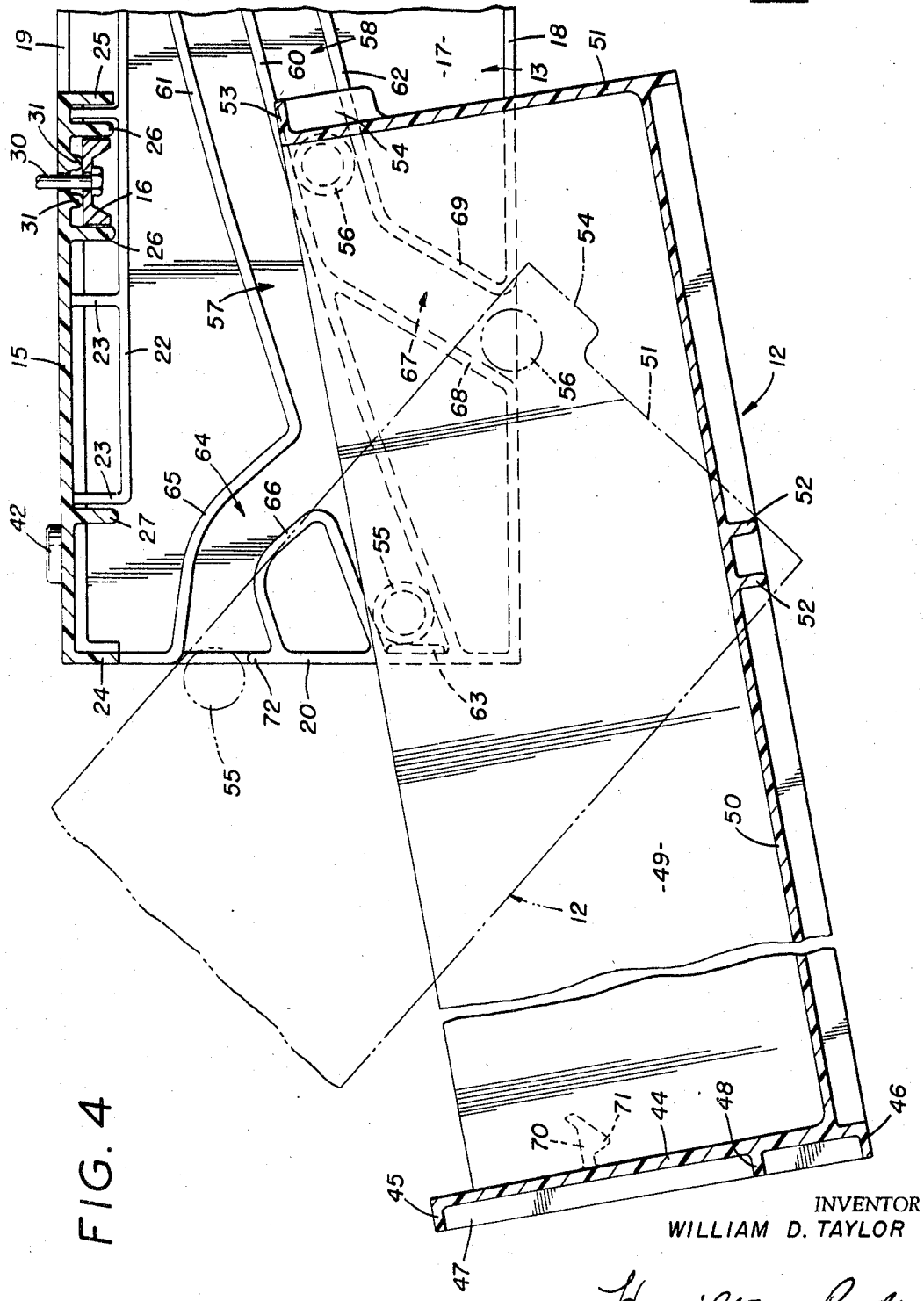


FIG. 4

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TILT-DOWN DRAWER CONSTRUCTION

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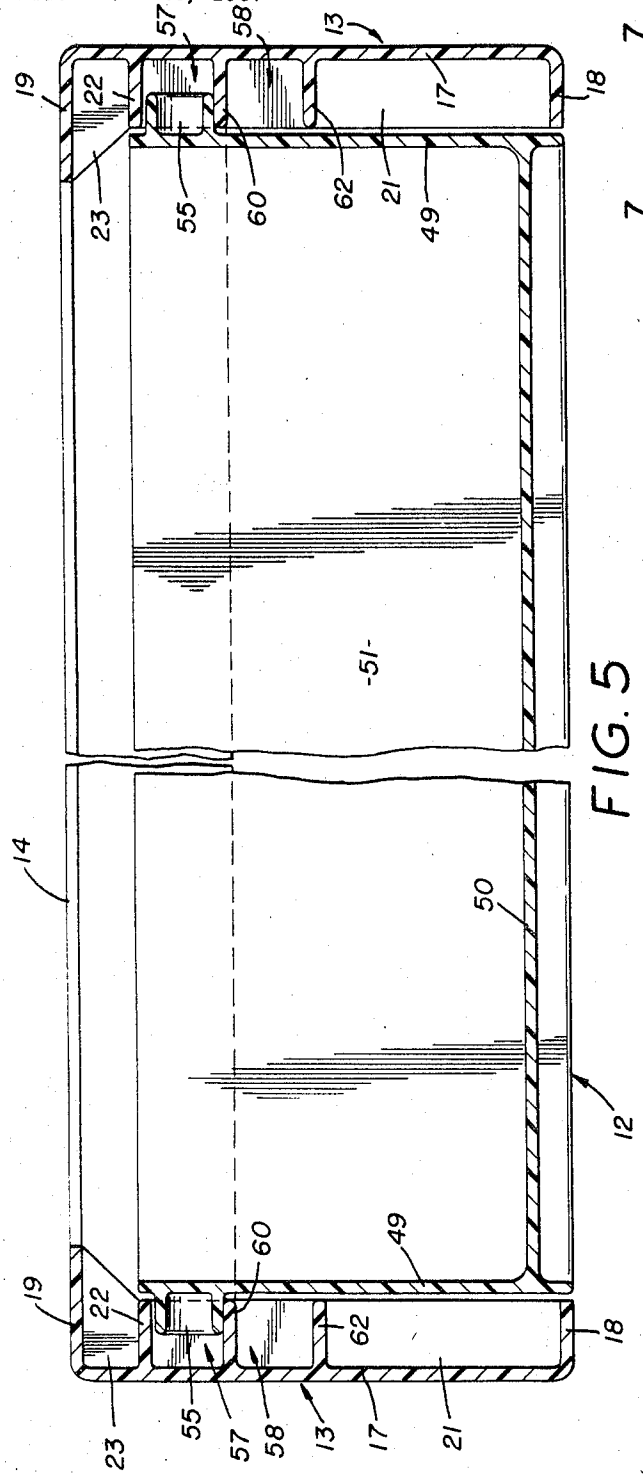


FIG. 5

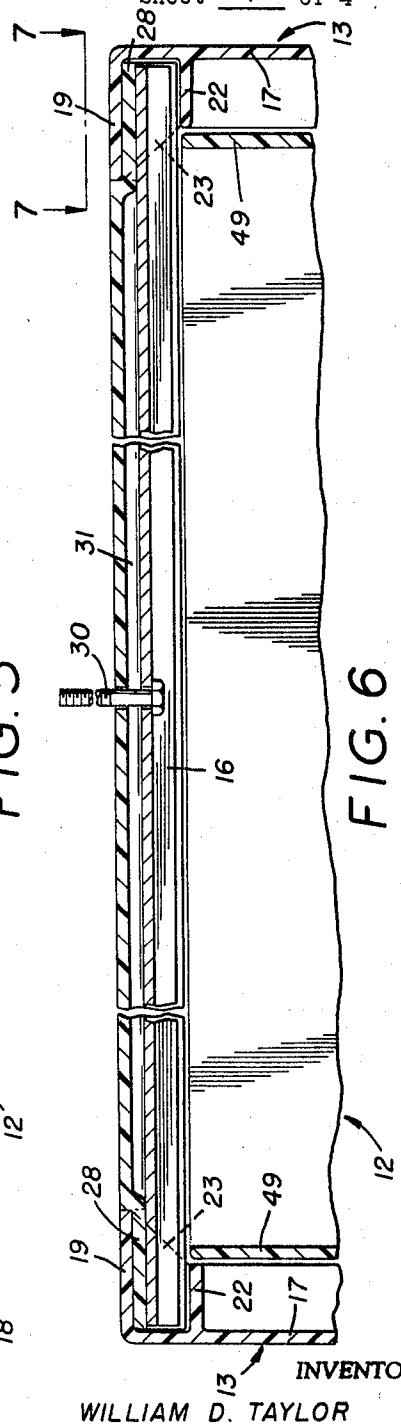


FIG. 6

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United States Patent Office 3,439,967
Patented Apr. 22, 1969

3,439,967

TILT-DOWN DRAWER CONSTRUCTION

William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio, a corporation of Ohio

Filed Nov. 13, 1967, Ser. No. 682,021
Int. Cl. A47b 88/00, 95/00
U.S. Cl. 312—307 10 Claims

ABSTRACT OF THE DISCLOSURE

A storage drawer preferably of plastic material mounted in a unitary frame having side guide rails connected by transverse spacer members, said drawer having spaced cam projections slidable in separate inclined tracks on the guide rails causing the drawer to tilt downwardly when pulled out and allowing removal of the drawer when tilted upwardly in pulled-out position.

The invention relates generally to storage drawers for a variety of articles, and more particularly to a drawer which tilts downwardly as it is pulled out to make its contents more accessible.

Background of the invention

Certain prior drawer constructions have provided rollers rolling in inclined side tracks for tilting the drawer downwardly when pulled out, but the drawer is apt to tilt downwardly to a jarring stop especially when loaded, and is not stable in pulled-out position. Also, it has been difficult to provide for easy removal of the drawer when desired without permitting accidental dropping of the drawer.

Further, when such prior drawers are mounted on installed cabinets or cupboards it has been a tedious operation to locate and attach the side drawer guides in proper alignment because the supporting surfaces are usually not level. Also, the provision and attachment of the several rollers has resulted in additional expense.

Summary of the invention

The present invention is an improved drawer and frame construction having a unitary frame which can be attached to a supporting cabinet surface by a single bolt and easily adjusted to proper alignment, said frame having separate inclined tracks for slidably receiving spaced cam projections on the drawer to control the tilting movement and to provide stable support for the drawer in pulled-out position and branch tracks permitting easy removal of the drawer by tilting it upwardly.

It is an object of the present invention to provide a novel and improved tilt-down drawer construction which is economically constructed, easily installed and sturdy and stable in all positions.

Another object is to provide an improved tilt-down drawer construction which is quickly and easily aligned with existing cabinets.

A further object is to provide an improved plastic tilt-down drawer construction which provides for easy removal of the drawer when desired but guards against accidental removal, and against jarring of the drawer when it is pulled out.

These and other objects are attained by the improved drawer construction shown and described herein, modifications thereof being within the scope of the appended claims.

Description of the drawings

FIG. 1 is a plan view of the improved tilt-down drawer construction showing the drawer in closed position.

FIG. 2 is a side elevation thereof.

FIG. 3 is an enlarged vertical sectional view on line 3—3 of FIG. 1.

FIG. 4 is a partial sectional view similar to FIG. 3, showing the drawer in fully withdrawn position, and showing in chain lines the drawer tilted upwardly for removal.

FIG. 5 is a transverse sectional view on line 5—5 of FIG. 3.

FIG. 6 is a partial transverse sectional view on line 6—6 of FIG. 3.

FIG. 7 is a partial plan elevation on line 7—7 of FIG. 5.

FIG. 8 is a partial vertical sectional view on line 8—8 of FIG. 3.

FIG. 9 is a partial plan sectional view on line 9—9 of FIG. 8.

FIG. 10 is a partial plan sectional view on line 10—10 of FIG. 8.

FIG. 11 is a partial vertical sectional view on line 11—11 of FIG. 3.

Description of the preferred embodiment

The drawer indicated generally at **12** is slidably supported in a frame having opposed side rails **13**, the top portions of which are connected by a rear transverse spacer bar **14** and a front transverse spacer bar **15**. The side rails and spacer bars are molded plastic material, such as medium impact polystyrene, and the front spacer bar is preferably reinforced by a metal channel **16** extending transversely between the top portions of the side rails, and under the top wall of front spacer bar **15**, as best seen in FIGS. 3 and 6.

The side rails **13** preferably comprise vertical longitudinally extending side walls **17** having inturned angular bottom flanges **18** and inturned angular top flanges **19** extending along their bottom and top edges, and connected to inturned angular front and rear flanges **20** and **21** extending along their front and rear edges, respectively. Inturned horizontal flanges **22** spaced below the top flanges **19** extend longitudinally of said side rails at drawer top level and are connected to said flanges **19** by longitudinally spaced gusset flanges **23**.

The front spacer bar **15** comprises a horizontal top wall with downturned angular flanges **24** and **25** extending along its front and rear edges, a pair of downturned transverse flanges **26** engaging the sides of metal channel **16**, and a downturned transverse flange **27** between front flange **24** and the foremost flange **26**. The side margins of the top wall of spacer **15** are downwardly offset to form marginal flanges **28** fitting under the top flanges **19** of the side rails (FIG. 6).

A center attaching bolt **30** extends through channel **16** between two shallow transverse abutment ribs **31** on the under side of the top wall of spacer bar **15**, with the marginal flanges **28** contacting the under sides of side rail top flanges **19**. This bolt provides a single attaching means for supporting the frame on the under side of a cupboard or cabinet shelf, and the channel **16** distributes the load to both side rails.

As shown in FIG. 7, the marginal flanges **28** are provided with slots **29** extending inwardly from their outer edges and receiving the gusset flanges **23** with a friction-tight fit, thus reinforcing the connections between front spacer **15** and the front ends of the side rails **13**. Preferably, the marginal flanges **28** are ultrasonically welded to the side rail top flanges **19** along longitudinal weld joints between the slots **29**. A spacer boss **15'** is preferably provided medially of the top surface of spacer bar **15** at the front thereof, to insure contact at that point with the under surface of the support, as tightening of bolt **30** tends to cause slight bowing of the spacer bar **15**.

The rear ends of the side rail top flanges **19** have down-

wardly offset terminal portions **33** which engage over downwardly offset terminal portions **34** on the rear transverse spacer **14**. As seen in FIGS. 8 and 9, the terminal portions **33** have slots **35** receiving interlocking ribs **36** on the terminal portions **34**. Adjusting screws **37** are screwed through the overlapping terminal portions **33** and **34** at the inner ends of slots **35**, and preferably extend through horizontal flanges **38**, **39** and **40** projecting inwardly from the rear vertical flanges **21** on the side rails, T-nuts **41** may be provided on the screws **37** to hold them in adjusted position.

Rubber bumpers **42** are provided on the tops of screws **37**, and also on the front end portions of side rails **13**, for contacting the under surface of a supporting surface such as the bottom of a cupboard on which the tilt-down drawer construction is mounted. Irregular or non-level surfaces on the supporting surface are compensated for by the adjusting screws **37** and the bumpers **42**.

The drawer **12** which is slidably mounted in the frame has a front wall **44** which may have a top and bottom outturned edge flanges **45** and **46**, and side flanges **47**. A horizontal reinforcing flange **48** extending between the side flanges may also be provided.

Vertical side walls **49** and a bottom wall **50** extend rearwardly from the front wall **44** and connect with a transverse rear wall **51** Preferably, the bottom wall **50** is spaced a slight distance above the bottom edges of front wall **44**, rear wall **51** and side walls **49**, and transverse reinforcing ribs **52** on the bottom wall extend between the bottom edges of side walls **49**. The upper edge of rear wall **51** preferably has an outturned edge flange **53**, and gusset flanges **54** coextensive with the flange **53** extend rearwardly from the upper portions of the side walls.

Two tubular cam elements **55** and **56** project laterally outward from each side wall **49** at the top edges thereof, cams **56** being located at the rear corners of the drawer adjacent to the gusset flanges **54**, and cams **55** being spaced forwardly a predetermined distance from the cams **56**. The cams **55** are slidably engaged in upper inclined cam tracks indicated generally at **57** in the frame side rails **13**, and the cams **56** are slidably engaged in lower inclined cam tracks indicated generally at **58** in the frame side rails **13**.

The drawer **12** may be integrally molded from a suitable plastic material, such as medium impact polystrene, which imparts sufficient strength and durability to the drawer and the cam elements **55** and **56**, while allowing them to slide easily in their respective tracks.

The cam tracks are formed by interior ribs on the frame side rails **13**, and are downwardly inclined forwardly. An intermediate rib **60** is common to both tracks, an upper rib **61** parallel to rib **60** bounds the upper track, and a lower rib **62** bounds the lower track. The rear end of each track **57** is closed by horizontal flange **22**, and the front end is closed by the vertical flange **20**. Preferably, a bumper **63** is located in the front end of each track **57**.

An upwardly and forwardly curved branch track indicated generally at **64** connects angularly with track **57** a short distance from the front end thereof on each side rail **13**. Each track **64** is formed by two spaced-apart ribs **65** and **66** which connected at one end with rib **61** of track **57** and at the other end with front flange **20** to form an open-ended branch track.

The forward end of lower track **58** connects angularly with a downwardly and forwardly inclined branch track indicated generally at **67**, and located a predetermined distance rearwardly of branch track **64** correlated to spacing between cams **55** and **56**, for a purpose to be described. Each branch track **67** is formed by two spaced-apart ribs **68** and **69**, a rib **68** being connected to intermediate rib **60** and rib **69** being connected to lower rib **62**. The lower ends of ribs **68** and **69** connect with bottom flange **18** to form an open-ended branch track.

As seen in FIG. 3, when the drawer is in fully closed position the cam elements **55** and **56** are located at the

rear closed ends of tracks **57** and **58**, respectively. The drawer is retained in this position by means of retainer lugs **70** projecting laterally from the front portions of the drawer side walls **49**. When the drawer is fully closed, the depending hooks **71** on the lugs **70** engage behind upward extensions **72** of the front flanges **20** of the side rails at the lower ends of tracks **64** where the ribs **66** connect with the front flanges **20**. When the drawer is pulled open it is raised slightly to permit the retaining lugs **70** to pass over the extensions **72**.

As the drawer is pulled out forwardly, the cams **55** and **56** slide forwardly downward in the inclined parallel tracks **57** and **58**, causing the drawer to tilt downwardly, until the cams **55** strike the resilient bumpers **63** in the closed front ends of upper tracks **57**. In this position a person standing in front of the drawer is better able to view the contents of the drawer than if it were pulled straight out in level position, particularly if the drawer is mounted at an elevation approaching eye-level, as on the bottom of a cupboard or the like. Since the drawer is always supported by the two spaced cams on each side, it is stable in all positions.

The drawer may be easily removed by merely pushing it inwardly a short distance while applying slight upward pressure until the cams **55** find and enter the upper branch tracks **64**, and then pulling the drawer forwardly while continuing to apply slight upward pressure, causing the drawer to tilt upwardly as the cam **55** follows branch track **64** and cam **56** follows branch track **67**. When cams **55** and **56** pass through the open ends of tracks **64** and **67**, respectively, the drawer is removed, as indicated in chain lines in FIG. 4.

The improved tilt-down drawer construction is lightweight, strong and durable, and attractive in appearance. It can be quickly and easily attached by a single bolt to the underside of and in alignment with existing cupboards and cabinet shelves and easily removed at any time. It has a cushioned stop when fully extended without likelihood of accidental removal and is stable in all positions. There are no rollers to malfunction or replace. A number of the frame and drawer units can be mounted side-by-side, giving an unbroken and attractive appearance to the whole assembly.

I claim:

1. A tilt-down drawer construction comprising a unitary frame adapted for attachment to the under surface of a support by a single attaching means, side rails on the frame, a drawer slidable in said side rails, inclined parallel upper and lower tracks on each side rail, a pair of longitudinally spaced cam elements on each side of said drawer slidable one in each track, said upper tracks being closed at their front ends, and branch tracks angularly connected to said upper and lower tracks and having their forward ends open to permit removal of said drawer by combined upward tilting and forward movement.

2. A tilt-down drawer construction as defined in claim **1**, in which the frame side rails and tracks are integrally molded of plastic material.

3. A tilt-down drawer construction as defined in claim **1**, in which the drawer and cam elements are integrally molded of plastic material.

4. A tilt-down drawer construction as defined in claim **1**, in which the frame side rails are connected by a transverse spacer member embodying a transverse reinforcing bar, and the single attaching means is secured to said bar.

5. A tilt-down drawer construction as defined in claim **3**, in which the cam elements are hollow cylinders.

6. A tilt-down drawer construction as defined in claim **1**, in which the frame has adjusting means on the side rails to compensate for uneven supporting surfaces.

7. A tilt-down drawer construction as defined in claim **1**, in which the closed ends of the upper tracks are provided with cushioning bumpers.

8. A tilt-down drawer construction as defined in claim

2, in which the drawer and cam elements are integrally molded of plastic material and the cam elements are hollow cylinders.

9. A tilt-down drawer construction as defined in claim 1, in which the frame side rails and tracks, and the drawer and cam elements are integrally molded of medium impact polystyrene.

10. A tilt-down drawer construction as defined in claim 4, in which the frame has adjusting means on the side rails to compensate for uneven supporting surfaces.

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JAMES T. McCALL, *Primary Examiner.*

U.S. Cl. X.R.

312—323, 330

U.S. DEPARTMENT OF COMMERCE

PATENT OFFICE

Washington, D.C. 20231

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,439,967 April 22, 1969

William D. Taylor

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 20, cancel "a", second occurrence; line 26, "51" should read -- 51. --; line 45, "polystrene" should read -- polystyrene --; line 62, "connected" should read -- connect --; line 65, after "of" insert -- each --; line 71, cancel "a". Column 4, line 9, "retaining" should read -- retainer --.

Signed and sealed this 1st day of September 1970.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents