

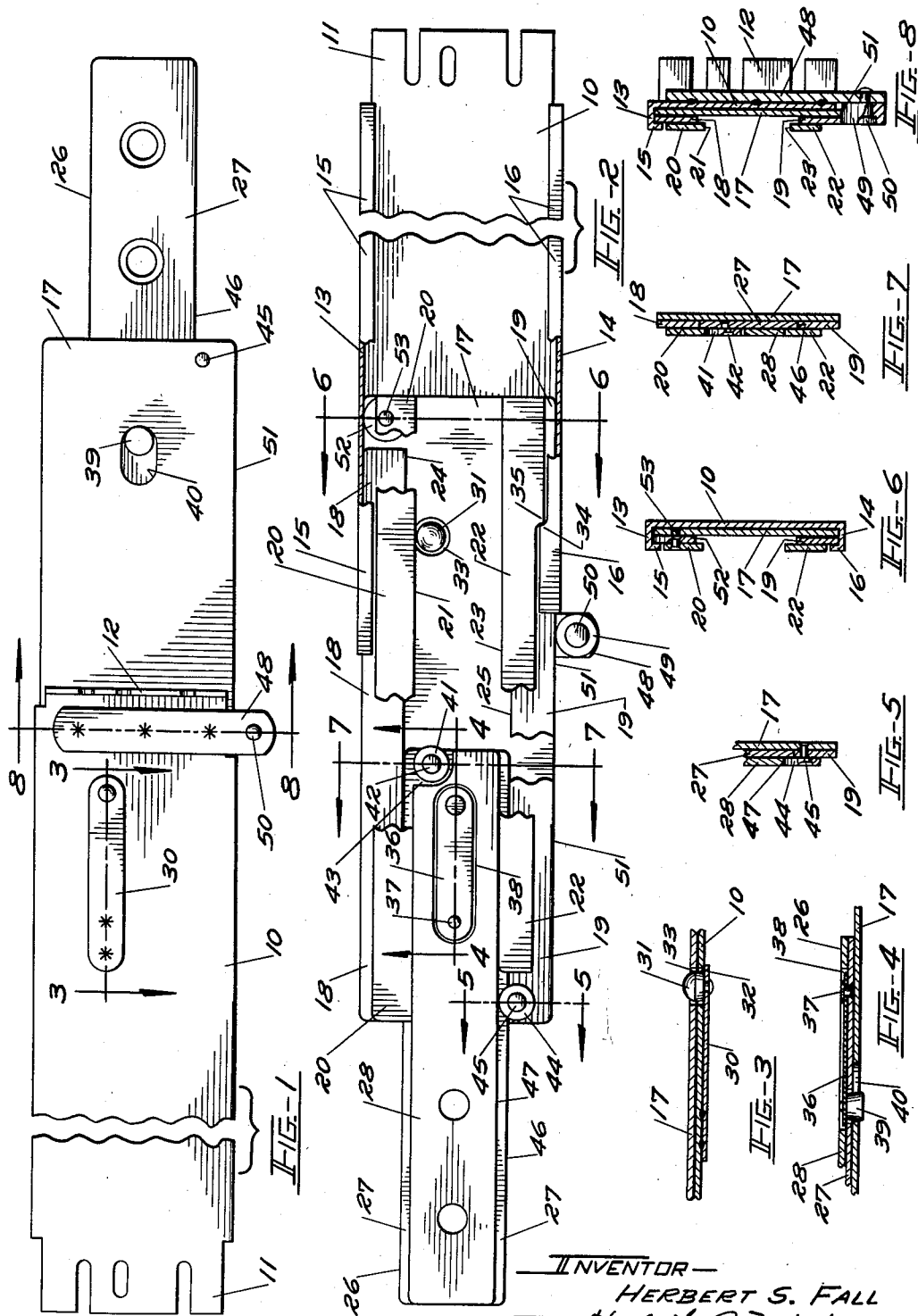
Dec. 23, 1958

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2,865,685

CABINET CHASSIS SUPPORTING TRACK

Filed April 15, 1957



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2,865,685

CABINET CHASSIS SUPPORTING TRACK

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Application April 15, 1957, Serial No. 652,930

2 Claims. (Cl. 308—3.8)

This invention relates to an extensible slide for mounting in cabinets to support primarily an electronic unit chassis so that the chassis may be pulled out from the cabinet, supported by the mechanism in the pulled out position, the unit worked upon, and the unit then pushed back into the cabinet all without having to remove the unit from the slide supporting mechanism.

Reference is made to my copending application for patent, Serial No. 568,810, filed March 1, 1956, terminating in Patent No. 2,809,085, October 8, 1957. The present invention is an additional improvement thereover, primarily directed to the use of rollers in supporting the chassis unit in its outwardly pulled position, providing for an easy start of return of the chassis unit into the cabinet, following the initial starting, the load being primarily carried by the mechanism under a sliding frictional bearing in the various parts of the track.

A primary purpose of the invention is to provide rollers specifically placed at definite positions whereby the overhanging load of the chassis will be primarily supported on a lower roller acting as a fulcrum and an upper roller supplying an anti-friction bearing and limit of the track portion directly attached to the chassis in resisting downward rocking of that track portion.

The track mechanism necessarily has to be made in an extremely thin section transversely of the cabinet since cabinets are designed to go into limited spaces and the internal dimensions thereof are quite limited, it being desirable that the chassis extend approximately from wall to wall within the cabinet and that the track supporting mechanism occupy as little of that space as possible. These restrictions therefore impose certain problems not only in making the track mechanism as thin as may be possible, but also in that thin construction be able to support loads on the order of two hundred pounds at the outermost ends of the extended track portions.

Further, the invention provides for a minimum number of parts readily latched into extended positions of the various elements, and unlatched for return of the elements into their positions contained within the cabinet. Included in the object of the invention is the relatively low cost of materials and labor involved in the manufacturing of the mechanism all without having to employ complicated dies and fixtures.

These and many other objects and advantages of the invention will become apparent to those versed in the art in the following description which is made in reference to the accompanying drawing, in which

Fig. 1 is a view in elevation of the cabinet wall side of a track assembly;

Fig. 2 is a view in outer side elevation;

Fig. 3 is a view in horizontal section on the line 3—3 in Fig. 1;

Fig. 4 is a view in horizontal section on the line 4—4 in Fig. 2;

Fig. 5 is a view in vertical section on the line 5—5 in Fig. 2;

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Fig. 6 is a view in vertical section on the line 6—6 in Fig. 2;

Fig. 7 is a view in vertical section on the line 7—7 in Fig. 2; and

Fig. 8 is a view in vertical section on the line 8—8 in Fig. 1.

A back plate 10 is a stationary member and is attached to the inner side of a side wall of a cabinet (not shown) by any suitable means, through the terminal end portion 11 and the flange 12. This plate is attached to lie horizontally.

The mechanism of the invention will be made in right and left hand assemblies, so that the description of one assembly will be sufficient to describe the other assembly. The assembly illustrated in the accompanying drawing is a left hand assembly.

The plate 10 has overturned top and bottom flanges 13 and 14 extending substantially at right angles to the plate 10 and terminating in opposing legs 15 and 16 respectively, thereby defining grooves between the plate 10 and the legs 15 and 16 over the flange portions 13 and 14.

An intermediate plate 17 has metal strips or bars 18 and 19 fixed to marginal edge portions of the plate 17 to have their upper and lower edges in the same planes respectively as the upper and lower edges of the plate 17. The plate 17 with these attached strips 18 and 19 is slidably entered along the face of the plate 10 with the upper and lower marginal edge portions of the plate 17, strip 18 and strip 19 entered respectively back of the legs 15 and 16 so that the intermediate plate 17 will be slidably guided in longitudinal travel along and over the back plate 10.

A bar 20 is fixed to the face of the bar 18 to drop therebelow by a marginal portion 21 in spaced relation from the face of the plate 17. This bar 20 is coextensive with the length of the underlying bar 18. Likewise a bar 22 is fixed to the bar 19 overlying it throughout substantially its entire length and to extend upwardly a distance to have a marginal edge 23 spaced above the edge of the bar 19. By reason of the locations of these bars 20 and 22, a groove is left between them and the plate 17 over the edges 24 and 25 of the underlying bars 18 and 19. These bars 20 and 22 are of a vertical width such that they clear the opposing edges of the legs 15 and 16 as best indicated in Figs 2 and 6.

A support plate generally designated by the number 26, in the form herein shown, is made up of a back plate 27 of a width and thickness which will permit it to enter freely between the edges 24 and 25 of the bars 18 and 19 and back of the overhanging bars 20 and 22. To the back plate 27, there is attached a front plate 28 having a vertical width which will permit it to be received between the opposing edges 21 and 23 of the bars 20 and 22 with a slight, running clearance therebetween. The support plate 26 actually rides on the edge 25 of the bar 19 by having the lower edge 46 of the plate 27 bear and slide along that edge 25.

In the structure so far described, the intermediate plate 17 may slide longitudinally in a guided and restrained relationship along the back plate 10, and the support plate 26 may slide in the guided and restrained relation along the intermediate plate 17.

It is desirable to supply limits in the form of shiftable abutments in order to limit the travel of the plates 17 and 26 one in relation to the other and also in relation to the plate 10. To limit outward travel of the intermediate plate 17 along the back plate 10, a leaf spring 30, Fig. 1, is fixed to the back face of the plate 10 and carries a button 31 which is normally entered through a hole 32 in the back plate 10 and a registering hole 33 through the intermediate plate 17. As a further insurance

of arresting outward travel of the intermediate plate 17 along the back plate 10, the leg 16 is provided with an abutment 34 in the path of an abutment 35 downwardly extending from the bar 22, Fig. 2. The button 31 while not serving as the primary stop for the outward travel of the intermediate plate 17 does serve as means for retaining the intermediate plate 17 in its outermost position of travel so that when the unit, whatever it may be, is mounted on the member 26, the intermediate plate 17 will not be tending to travel inwardly along the plate 10. The button 31 therefore is made with a rounded nose as indicated in Fig. 3 particularly, so that it may be automatically extended through the hole 33 when the intermediate plate 17 is pulled outwardly to its limit, and also may be pushed by the plate 26 upon inward travel back into the hole 33 a sufficient distance so that the intermediate plate 17 upon being pushed rearwardly of the plate 10, will further cam the button 31 down out of the way to permit the continued travel of the intermediate plate 17 to its innermost position.

The plate 26 is provided with a leaf spring 36 fixed by one end as by the rivet 37 within a slot 38 of the member 28 to normally rest against the plate 27 and carry a button, Fig. 4, 39 shiftably extending through the plate 27 in the path of a slot 40 provided in the intermediate plate 17. Thus, when the support member 26 is pulled outwardly from along the intermediate plate 17, Fig. 1, the button 39 may be urged to extend through the slot 40. Normally when the support member 26 is retracted and in its innermost position in reference to the intermediate plate 17, the button 39 will be riding against the face of the intermediate plate 17 under urge of the spring 36. The button 39 may be manually prestressed from the back side of the intermediate plate 17 so as to release it from engagement of either end of the slot 40 and thereby permit the support member 26 to be shifted. By holding the button 39 inwardly, the member 26 of course may be pulled freely from the outer end of the intermediate plate 17. However the normal action is that this button 39 will snap into the slot 40 and prevent the withdrawal of the member 26 from the member 17 unless it is intentionally desired to effect a complete withdrawal.

That much of the construction of the track mechanism will be found in my copending application Serial No. 568,810 which has terminated into Patent No. 2,809,085, to which reference above has been made.

To that structure there is added a number of rollers at certain zones.

A roller 41 is rotatably mounted at the rear upper corner portion of the support member 26, herein shown as being mounted directly on the plate 27 by means of a journal pin 42. The outer plate 28 is cut away as at 43 to provide clearance around the roller 41. This roller 41 is so located that its periphery will bear against the edge 21 of the bar 20 particularly when the support member 26 is pulled to its extreme outer position as indicated in Fig. 2.

A roller 44 is mounted on the intermediate plate 17 on the face of the bar 19 by means of a journal pin 45 to have its periphery normally bearing against the under edge 47 of the plate 28 when the support member 26 is in its outermost position.

A bracket 48 is fixed to the back plate 10 on its back side adjacent the flange 12 to extend therebelow a distance. A roller 49 is rotatably carried on a pin 50 fixed to the bracket 48, the roller 49 being located to bear against the edge 51 of the intermediate plate 17 as well as the corresponding edge of the bar 19 particularly when the intermediate plate 17 is in its extended position as indicated in Fig. 2. A roller 52 is rotatably mounted on a pin 53 which extends through both the bar 20 and the plate 17, Fig. 6, at the upper rear corner of the intermediate plate 17 to have the periphery of the roller 52 bear against the flange 13 when the intermediate plate

17 is in its extended position and tending to rock over the roller 49.

When the intermediate plate 17 and the support plate 26 are in their outermost positions as indicated in Fig. 2, the weight of the unit which may be carried by the support member 26 will cause the intermediate plate 17 to bear downwardly on the roller 49 which serves as a fulcrum, and cause the plate 17 to tend to rock upwardly by its inner end to bring the roller 52 into compressive contact with the flange 13. Thus in that position, the intermediate plate 17 is carried by the back plate 10 in respect to vertical positioning by the roller 49 and the roller 52. In like manner, the support plate 26 bears on the roller 44 as a fulcrum and has the roller 41 pushing upwardly against the edge 21 of the bar 20 so that the support plate 26 is thus supported vertically on the roller 44 and retained against rotation therearound by the roller 41 in the contact indicated.

When the support plate 26 carrying its load is to be pushed inwardly, the initial movement of the plate 26 will be such that the plate rides on the roller 44 with the roller 41 holding the inner end downwardly as above indicated, so that that initial travel is on the anti-friction roller 44 particularly, and as soon as the weight carried by the plate 26 is shifted inwardly of the intermediate plate 17 a sufficient distance, the plate 26 will then be frictionally riding on the edge 25 of the bar 19. In other words initial travel is on an anti-friction basis whereas subsequent travel is on the friction sliding basis.

When the support plate 26 reaches its innermost position of travel relative to the intermediate plate 17, and the button 31 is released from engagement therewith, the intermediate plate 17 will then start its inward travel along the back plate 10 bearing primarily on the roller 49 and held against rocking thereover by the roller 52. So, in this instance also, the intermediate plate 17 starts on the anti-friction bearings, and then subsequently slides on the lower flange 14 particularly in the friction manner.

As in all friction bearings, it is the initial starting of the bearing supported object which requires the greatest force, this force reducing in amount after the supported object is set into motion. Therefore by starting the load on the anti-friction rollers, the original force required is greatly reduced, and that motion of travel is continued then over the friction surfaces without requiring any appreciable increase in force required to return the shiftable plates 26 and 17 inwardly of the cabinet, that is inwardly along the plate 10. The amount of force required to return the electronic unit into the cabinet is desirably held at a minimum so as to reduce the amount of force otherwise required in pushing the unit back into the enclosing cabinet. Inasmuch as the load of the electronic unit will be carried directly by the support plate 26, there will be a tendency to maintain a bearing contact of the intermediate plate 17 on the roller 49 and of the support plate 26 on the roller 44 throughout the greater lengths of travel permissible. This is true because the outer end portion of the support plate 26 is that portion to which the carried unit will be attached. While various means of attaching the unit may be employed, and particularly means for rocking the unit, such attaching means does not form a part of the present invention and therefore is not shown nor described.

While I have herein shown and described my invention in the one form as now best known to me, it is obvious that structural variations may be employed without departing from the spirit of the invention, and I therefore do not desire to be limited to that precise form beyond the limitations which may be required by the following claims:

I claim:

1. In a load carrying, extensible track mechanism, a fixed plate; an intermediate plate; means slidably guiding and retaining said intermediate plate longitudinally of the fixed plate; a roller carried by said fixed plate at

an end portion thereof and below an edge of said intermediate plate; a second roller carried by said intermediate plate at one end thereof at an edge opposite to the edge over said fixed plate carried roller; a track member on said fixed plate along which said second roller may travel; a load support plate; means slidably guiding and retaining said support plate longitudinally of said intermediate plate; a third roller carried by said intermediate plate at an end portion opposite to its said one end thereof and under said support plate; a fourth roller carried by said support plate at an upper corner of an end portion thereof; and a track member along said intermediate plate, along which said fourth roller may travel; said intermediate plate fulcruming over said first roller and said second roller limiting rocking of the intermediate plate over the first roller; and said support plate fulcruming over said third roller and said fourth roller limiting rocking of the support plate over said third roller, upon said intermediate and support plates being extended from said fixed plate; said guiding and retaining means in both instances constituting opposing upper and lower grooves on said fixed and intermediate plates; tongues on said intermediate and support plates frictionally riding in said groove; said first and third rollers being at commonly directed ends of said lower grooves; the peripheries of said first and third rollers being by their upper sides substantially tangential with the under sliding surfaces of the intermediate and support plates.

2. A multi-part extensible load carrying track having a fixed part, an intermediate part, and a load carrying part, each of the last named parts being linearly ex-

tensible from the fixed part; straight line friction bearing means through which one track part is slidably supported by another part; a fulcrum roller on the under side at the outer end of each of said intermediate and fixed parts; said bearing means consisting for each of said parts, a plate member positioned between two vertically, spaced apart, opposing members to bear by a lower plate member edge along a face of one of the opposing members and the upper plate member edge being under and along in close proximity with said other opposing member, the plate member normally bearing on said one opposing member; the periphery of said roller being in the path of said plate lower edge and substantially tangential to said member face; said intermediate and load track parts frictionally sliding on said one opposing member, in each instance; said load part, upon approaching its fully extended position, tending to rock downwardly over said fulcrum roller and lift the plate from said one opposing member; and a second roller mounted on the rear upper end of each of said plate members in the path of and normally out of contact with said other opposing member and striking that other member and limiting the downward rocking of said plate.

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