Feb. 9, 1954 F. H. METCALF 2,668,745

EXTENSION DRAWER SUPPORT AND GUIDE STRUCTURE

Filed Nov. 19, 1949 3 Sheets-Sheet 1

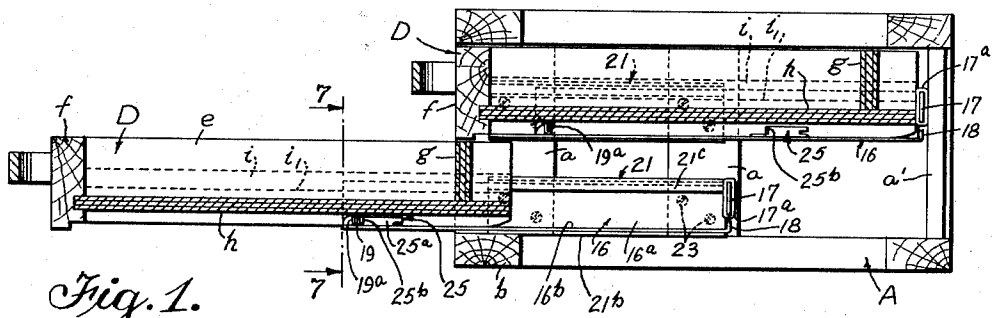


Fig. 1.

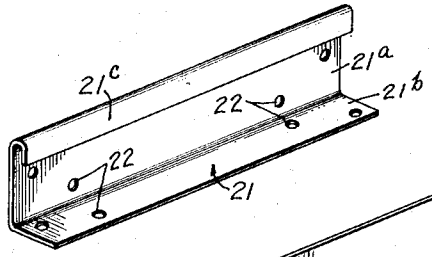


Fig. 2.

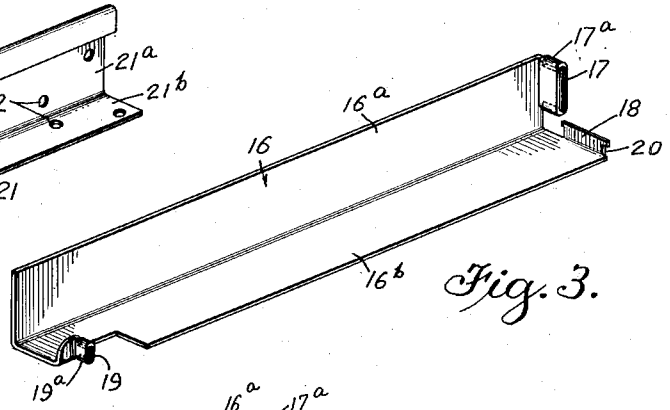


Fig. 3.

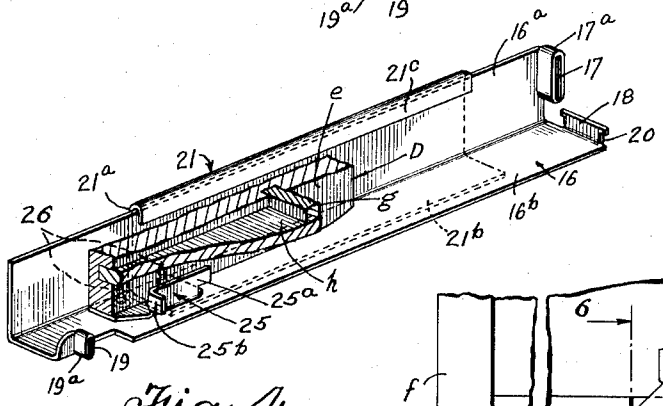


Fig. 4.

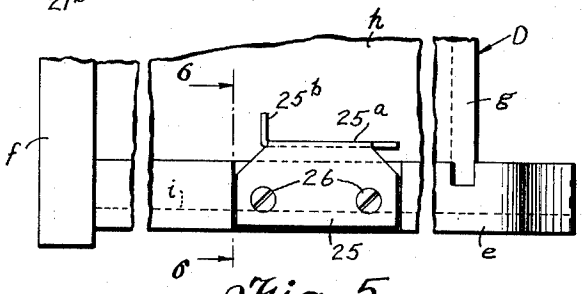


Fig. 5.

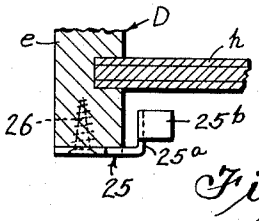


Fig. 6.

Inventor
Frank H. Metcalf.
By King & Rodgers
Attorneys

Feb. 9, 1954 F. H. METCALF 2,668,745

EXTENSION DRAWER SUPPORT AND GUIDE STRUCTURE

Filed Nov. 19, 1949 3 Sheets-Sheet 2

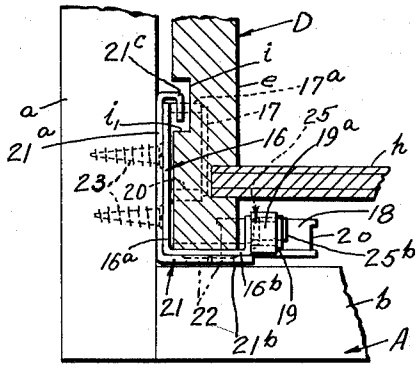


Fig. 7.

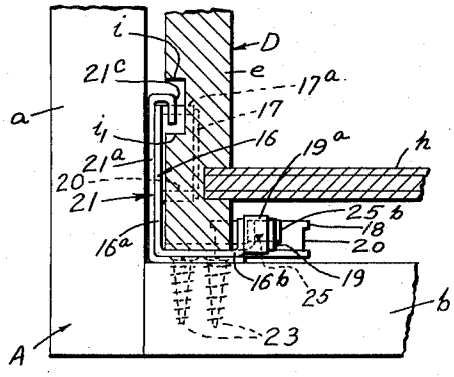


Fig. 8.

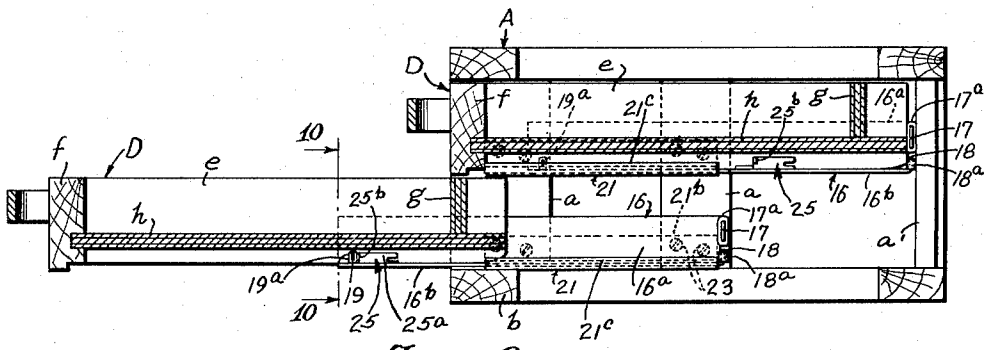


Fig. 9.

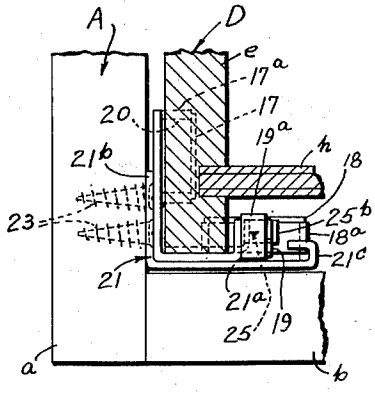


Fig. 10.

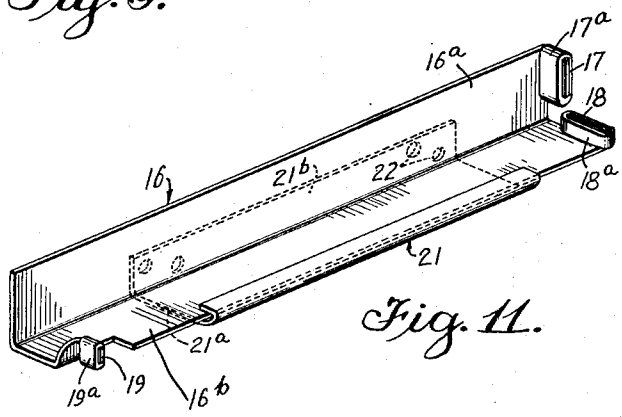


Fig. 11.

Inventor
Frank H. Metcalf.
By Knight & Rodgers
Attorneys

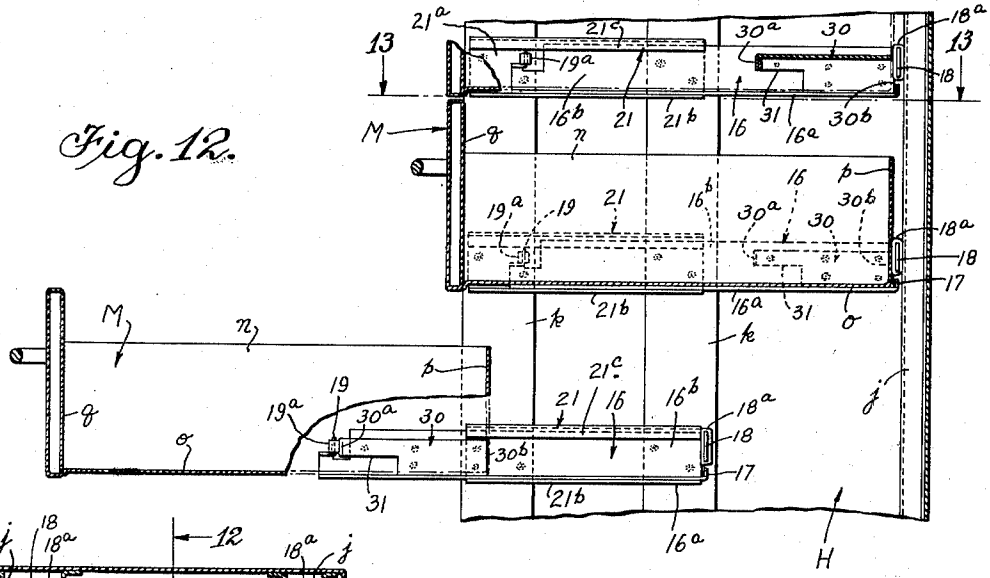
Feb. 9, 1954 F. H. METCALF 2,668,745

EXTENSION DRAWER SUPPORT AND GUIDE STRUCTURE

Filed Nov. 19, 1949

3 Sheets-Sheet 3

Fig. 12.



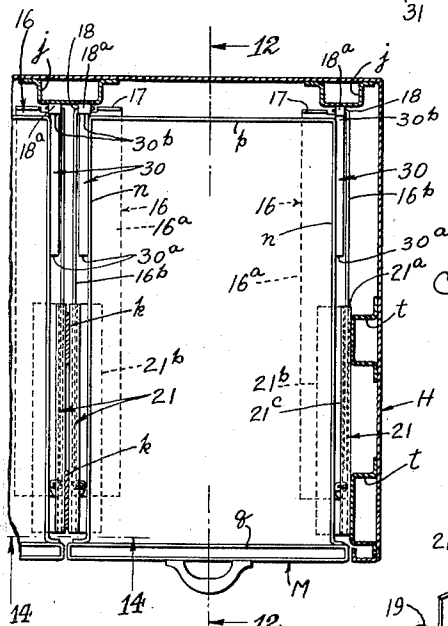


Fig. 13.

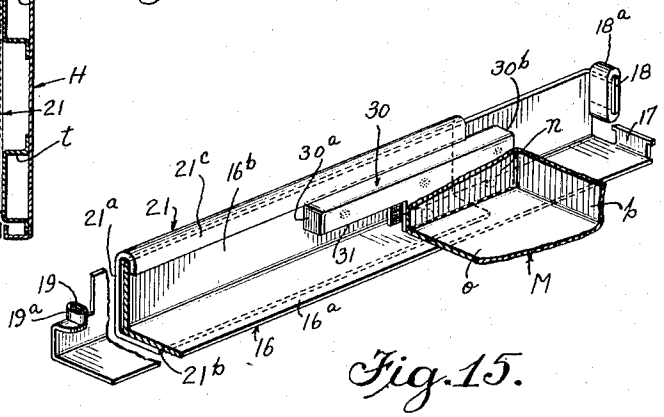


Fig. 15.

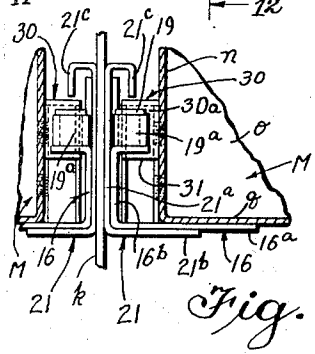


Fig. 14.

Inventor

Frank H. Metcalf.

By Knight & Rodgers

Attorneys

Patented Feb. 9, 1954

2,668,745

UNITED STATES PATENT OFFICE

2,668,745

EXTENSION DRAWER SUPPORT AND GUIDE STRUCTURE

Frank H. Metcalf, Los Angeles, Calif.

Application November 19, 1949, Serial No. 128,287

2 Claims. (Cl. 312—335)

1

This invention relates to supporting and guiding structures or apparatus for drawers, trays, slides, frames, and the like which are extensible from and retractable within a cabinet or the like. More particularly it has to do with structures or apparatus of the described type which are themselves extensible in part so as securely to support the drawer when the latter is fully extended as well as in all intermediate positions.

One object of the invention is to provide apparatus of the described type which will save space and costly framing in cabinets and other articles of furniture which are equipped with drawers, extensible shelves, and the like.

Another object is to provide simple and inexpensive extensible apparatus for drawers and the like, which apparatus is applicable to old as well as to new cabinets and other articles of furniture.

Another object is to fashion the apparatus from sheet material with a minimum of operations.

Still another object is to utilize as few parts as possible by making them interchangeable and adaptable to use in a plurality of positions.

Still another object is to make the apparatus in such form that is easy to mount and, once mounted, is readily assembled and disassembled for insertion and removal of the drawers or other slidable elements to be supported thereby.

Still another object is to combine strong support for drawers or the like in any position along with ease of operation and a minimum of wear and of noise during operation.

These and other objects will be apparent from the detailed description which follows:

In accordance with the present invention a drawer, sliding shelf or other equivalent device (herein referred to generically by the term "drawer") is guided in its movement and supported in all positions by a pair of elongate angle slides, one at each side of the drawer. The slides are mounted for longitudinal sliding movement on fixed tracks attached to the cabinet, and the drawer is mounted slidably upon the slides. The tracks, like the slides, are angular in cross section having continuous flat vertical and horizontal flanges. One flange on each track is bent over toward its other flange to form a channel within which the edge of one of the flanges of a slide will extend when the slide is properly mounted on the track. By preference the flanges of the slide are of equal width so that it can be mounted on the track with either flange extending into the channel. The track can be attached by either of its flanges to either vertical or horizontal supports within the cabinet; and drawer space is gained by providing supports within the cabinet extending in one direction only. The tracks are interchangeable for right or left side of the drawer. Stops preferably in the form of upturned lugs at the ends of the flanges of each slide are contacted by the end of the track and by stops on the drawer to determine the time and extent of the movement of the slides relative to the tracks. For flat bottomed drawers special guide and stop means are provided secured to the sides of such drawers.

2

In order to illustrate the invention and the manner of its use concrete embodiments thereof are shown in the accompanying drawings, in which:

Fig. 1 is a vertical sectional view through a cabinet showing two drawers one of which is in fully extended position;

Fig. 2 is a perspective view on an enlarged scale of one of the track or rail elements shown in Fig. 1;

Fig. 3 is a perspective view on the scale of Fig. 2 of one of the slides or support angles shown in Fig. 1;

Fig. 4 is a perspective view of an assembled track and slide with a cut away and sectioned portion of a drawer thereon showing the parts as they approach the fully extended position of the drawer;

Fig. 5 is a broken away bottom plan view on an enlarged scale of one of the drawers shown in Fig. 1;

Fig. 6 is a fragmentary transverse sectional view on the line 6—6 of Fig. 5;

Fig. 7 is a view partly in elevation and partly in section on the line 7—7 of Fig. 1 on an enlarged scale and showing only a corner portion of the cabinet and one drawer;

Fig. 8 is a view similar to Fig. 7 but showing the track attached to a horizontal portion of a cabinet rather than to a vertical portion as in Fig. 7;

Fig. 9 is a vertical sectional view through a cabinet as in Fig. 1 but showing a different mounting of the tracks;

Fig. 10 is a fragmentary elevational and sectional view similar to Fig. 7 but on the line 10—10 of Fig. 9;

Fig. 11 is a perspective view on an enlarged scale of track and slide assembled as in Figs. 9 and 10;

Fig. 12 is a vertical sectional view on the line 12—12 of Fig. 13 of a metal cabinet having flat bottomed drawers showing a modification of the

invention, one of the drawers being shown in fully extended position, certain parts being broken away or otherwise sectional to show details of the construction;

Fig. 13 is a horizontal sectional view on the line 13—13 of Fig. 12;

Fig. 14 is a fragmentary transverse sectional view on an enlarged scale on the line 14—14 of Fig. 13; and

Fig. 15 is a perspective view partly broken away of an assembled track and slide as shown in Figs. 12–14, but on a different scale, a portion of the rear corner of a drawer being shown mounted on the slide.

A small wooden cabinet A is shown in Fig. 1 having two wooden drawers D. Each drawer has sides *e*, front and rear ends *f* and *g*, respectively, and an elevated bottom *h*. Each drawer rests slidably upon and is supported by a pair of slides 16, one slide at each side of the drawer. Each slide 16 is formed of rigid sheet material, such as sheet or strip steel or other metal and, as shown in Fig. 3, is angular in cross section having continuous flat vertical and horizontal flanges 16*a* and 16*b* at right angles to each other. Rear end portions of both flanges 16*a* and 16*b* are bent inwardly within the angle of slide 16 to provide integral lugs 17 and 18, and a front end portion of the horizontal flange 16*b* is bent inwardly to provide an integral lug 19, said lugs serving as stops for purposes described hereinafter. Each of these lugs is notched or partly cut away at its sides as indicated at 20 (Figs. 3 and 4) to receive and hold a resilient bumper, such as a cylindrical piece of rubber indicated at 17*a* and 19*a*.

Each pair of slides 16 supporting a drawer D is received by and rests slidably upon a pair of fixed tracks or guide rails 21, one of which is shown by itself in Fig. 2. Said tracks are also formed of rigid sheet material, such as sheets or strips of steel or other metal. Like slides 16, tracks 21 are angular in cross section having continuous flat flanges 21*a* and 21*b* at right angles to each other. Both flanges are perforated as at 22 for the insertion of screws or other fastening means to secure the track in place within the cabinet. One flange such as 21*a* is rolled or bent over along its outer edge as at 21*c* (Fig. 2) to provide an elongate channel extending substantially the full length of the track in which an edge of one of the flanges on slide 16 is received when the slide is mounted on its track as indicated in Fig. 4. By preference, flanges 16*a* and 16*b* of each slide 16 are of equal width so that either may fit within the retaining channel formed by the bent over portion 21*c* of track 21, inasmuch as tracks 21 are interchangeable and either may be used as the fixed support for either side of each drawer D.

Figs. 1 and 7 shows tracks 21 for drawers D in place with flanges 21*a* vertically disposed and attached to verticals *a* of cabinet A by screws 23. Although these figures show the slides 16 and tracks 21 at only one side of the drawers D, it will be understood that similarly constructed slides and tracks are mounted in the same relationship but in laterally reversed positions at the other side of the drawers. Since the bent over portion 21*c* of flange 21*a* projects toward each drawer D, sides *e* of the drawers are grooved or routed as at *i* (Fig. 7) to provide clearance for movement of the drawer. As shown in Fig. 1 tracks 21 are mounted toward the front of cabinet A, usually about ¾ of an inch from the front face of the cabinet and are of the order of approximately

half the length of the drawer. Slides 16 are considerably longer, preferably nearly the length of the drawer, as indicated, and are arranged to move with the drawer toward the end of its movement in either direction. When the drawer is fully extended as indicated by the lower drawer D in Fig. 1, slides 16 project beyond cabinet A to an extent approximating one-third the length of the drawer. The vertical flange of each slide 16 seated within the channel formed by bent over portions 21*c* of each track 21 provides a rigid support for the slide to prevent tilting thereof under the weight of the drawer on the forward end of the slide, in all longitudinal positions of the drawer and slides. Also, the shoulder *i*₁ at the bottom of each groove *i* in the side walls of the drawer engages the lower edge of the bent over flange portion 21*c* of the track, to provide a rigid support for the weight of the drawer and its contents against sagging and substantially prevents downward tilting of the drawer in all positions of longitudinal movement thereof.

Forward movement of slides 16 with drawer D is effected by check plates 25 (Figs. 4, 5 and 6) countersunk in the lower face of sides *e* of each drawer D and suitably attached thereto as by screws 26. Each check plate 25 has an upwardly bent portion 25*a* extending beneath the elevated bottom *h* of the drawer and formed with a stop face 25*b* in position to engage rubber bumper 19*a* on stop 19 on each slide 16 when drawer D approaches the end of its forward movement. On its rearward movement sides *e* of the drawer contact the rubber bumper, such as 17*a*, on either or both stops 17 and 18 on slides 16 and force the latter back until they contact stop block *a'* on cabinet A. Forward movement of slides 16 is limited by contact of rubber bumper stops 17 with the rearward ends of bent over portions 21*c* of tracks 21.

When drawer D is in its extreme outermost position it can be removed from cabinet A by tilting the outer end of the drawer upwardly until stops 25*b* on check plates 25 clear stop 19 on slides 16. Drawer D is then withdrawn from slides 16. If desired slides 16 can then be removed from their track 21 by tilting the slides sideways sufficiently to bring the edges of their flanges out of the channels formed by bent over portions 21*c* of tracks 21. Mounting of the slides 16 on their tracks 21 followed by insertion of the drawer is effected by reversing the above steps, but the drawer can be mounted on slides 16 only when both slides are in fully extended position on their tracks 21 with stops 17 in contact with the rearward ends of bent over flange portions 21*c*.

Fig. 8 illustrates a slight modification of the invention shown in Figs. 1–7 in that the tracks 21 are attached to horizontal parts *b* on cabinet A by screws 23 extending through holes in horizontal flanges 21*b*. Flanges 21*a* of the track still remain in vertical position as in Figs. 1, 4 and 7 and the functioning of the parts is identical.

Figs. 9 and 10 show a small two drawer wooden cabinet in all respects identical with that shown in Figs. 1 and 7 and with its parts indicated by the same reference characters. The same guide and supporting apparatus is also provided for drawers D but the mounting of tracks 21 is different in that flanges 21*b* thereof are now vertically disposed and attached to verticals *a* on cabinet A by screws 23 so that when slides 16 are assembled on the tracks it is the edge of horizontal flange 16*b* of the slides which extends with-

in the channel formed by bent over portion 21c of each track 21. The elevated bottom *h* of drawers D provides ample clearance space for bent over portions 21c of tracks 21 and routing or grooving of the side walls *e* is not required. This horizontal arrangement of the retaining channel formed by bent over flange 21c does not change the procedure for removing or remounting drawers D. Moreover since lug 18 (Fig. 11) now becomes the limiting stop to engage the inner edge of bent over flange 21c when slide 16 moves forwardly it is preferable to apply a rubber bumper 18a to it as illustrated. Horizontal mounting of tracks 21 as in Figs. 9–11 will support drawers D against downward tilting but not to the same extent nor with the same rigidity as when tracks 21 are vertically mounted as in Figs. 1–8. Hence while the horizontal mounting of tracks 21 eliminates the necessity of routing or grooving the sides of the drawers, its usefulness is largely confined to short drawers of light construction for light loads.

Engagement of the rear end of the drawer, when fully extended, with a higher drawer or with a frame member of the cabinet is desirable to prevent sagging in case the drawer should be heavily loaded.

Figs. 12–15 show the invention as applied to metal cabinets having drawers with flat bottoms. Cabinet H is of conventional appearance on its exterior and is provided with a plurality of banks of metal drawers M formed with flat sides *n*, bottom *o* and rear wall *p* secured to a front *q* in any suitable manner, as by welding. On its interior cabinet H has vertical stiffening webs *t* attached to its sides and similar webs *j* attached to the back, the latter serving as stop plates or blocks for the rearward movement of drawers M. Between the banks of drawers M are vertical strips *k* in parallel alignment with webs *t* and to these verticals *t* and *k* are secured tracks 21 of the present invention to fix the position of drawers M within cabinet H and to support the same.

For this type of heavy service flanges 21a of tracks 21 are disposed in vertical position and suitably secured to verticals *t* and *k* as by welding. Since drawers such as M are conventionally narrower than their fronts *q*, as indicated in Fig. 13, there is ample clearance for tracks 21 with their bent over flanges 21c and slides 16 for supporting and guiding each drawer M. Slides 16 are fitted into tracks 21 with flanges 16b disposed vertically and extending into the channels provided by bent over flanges 21c (Fig. 15). To the sides *n* of each drawer M at their lower rear corners are attached, as by welding, combined guide and stop members 30 which have several important functions. In the first place members 30 fill the spaces between the sides *n* of drawers M and the vertical flanges 16b of slides 16 prevent side play of the drawers during movement. When a drawer M is pulled out, front ends 30a of members 30 contact stops 19 on slides 16 to move the latter into extended position with the drawer during the latter part of the outward movement of the drawer. Such movement of slides and drawer is halted when stops 18 on slides 16 contact the rear ends of bent over flanges 21c on tracks 21. At this time the rear portions of members 30 are beneath flanges 21c on tracks 21 and the drawer is securely held against downward tipping (see Fig. 12, lower drawer, also Fig. 15). While in this position the drawer can be removed from cabinet H by tilting its forward

end upwardly until stops 30a on members 30 clear stops 19 on slides 16, members 30 being recessed, or cut away at 31 at their lower front corners below and rearwardly of stops 30a as clearly shown in Figs. 12 and 15. On the rearward movement of drawer M the rearward ends 30b of members 30 contact stops 18 to move slides 16 rearwardly with the drawer until stops 18 (or their rubber buffers 18a) contact stop plates *j* on the rear wall of cabinet H. Stops 17 on horizontally disposed flanges 16a of slides 16 may also be engaged by the lower portion of the rear wall *p* of the drawer to effect rearward movement of slides 16. Stop members 30 may be formed as a solid block, or made of sheet metal bent upon itself, as shown, to reduce weight while providing required strength and rigidity.

From the above it will be apparent that the guiding and supporting apparatus of the present invention comprises few parts of simple and inexpensive construction which are readily applied to old as well as new constructions to provide efficient and long wearing support for drawers and other extensible members requiring positive stop for outward movement and strong support against sagging. On new constructions important economies of construction and assembly, as well as saving of space, results from the fact that it is no longer necessary to provide the cabinet with both verticals and horizontals. Tracks 21 of the present invention can be attached to either, thus dispensing with the other and gaining that much additional space within the cabinet, or the cabinet may be made that much smaller without sacrifice of drawer capacity. Mounting of the apparatus in a cabinet is a simple matter, requiring only the attachment of tracks or rails 21 to the framing of the cabinet and of check plates 25 or guide and stop members 30 to the drawers. When the tracks 21 are mounted with flanges 21a disposed vertically, routing or grooving of the sides of the drawers is required to accommodate the bent over flanges 21c. Disposing flanges 21a horizontally when the drawers have elevated bottoms makes such routing or grooving unnecessary. With flat bottomed drawers, either of wood or metal, guide and stop members such as 30 will be utilized.

Slides 16 and tracks 21 are conveniently and inexpensively made by stamping from strip or sheet metal or other suitable material. They have extended bearing and engaging surfaces so that wear is at a minimum. The tracks are interchangeable for either side of the drawer. While right and left slides are required, they are formed with flanges of equal width so that either flange can be utilized to extend into the retaining channel formed by bent over flange 21c on tracks 21. This feature adapts slides 16 to all possible mounting positions of tracks 21 and gives a certain degree of interchangeability in as much as applications of the invention shown in Figs. 1–10 require the mounting of slides 16 with flanges 16b (having stops 18 and 19) horizontally disposed while in the modification shown in Figs. 12–15 flange 16b must be vertically disposed. To effect this change right and left slides 16 are interchanged.

While the present invention has been herein disclosed in what are now believed to be preferred forms, it is to be understood that this invention is not limited to the specific details thereof but covers all changes, modifications, and adaptations within the scope of the appended claims.

I claim:

1. In guiding and supporting apparatus for slidable drawers and the like, the combination comprising: an elongate track having two flanges perpendicular to each other; and a slide also having two flanges perpendicular to each other for mounting the slide for longitudinal sliding movement on the track; said track having an elongate channel at the outer edge of one of its flanges for receiving one edge of a flange of said slide; said slide having its two perpendicular flanges of equal width and of such configuration that it can be mounted on said track with either of its said flanges slidably engaging said one flange of the track and extending within said channel and with the other flange of the slide slidably engaging the other flange of the track; and said slide being provided at its rear end with two stop members projecting from the respective flanges thereof and extending within the angle formed by said flanges and so positioned that, when either flange of the slide is mounted in slidable engagement with said one flange of the track and extending within said channel, the stop member on that flange of the slide is in position to engage the rear end of said channel to limit forward movement of the slide relative to the track.

2. Guiding and supporting apparatus for a slidable drawer or the like comprising: a pair of elongate tracks, each track having continuous flat vertical and horizontal flanges; a pair of slides for receiving a drawer therebetween, each slide having continuous flat vertical and horizontal flanges to be slidably mounted upon one of said tracks; the outer edge portion of one flange of each said track being bent over to form an elongate channel receiving the outer edge of one flange of one of said slides when the latter is mounted on its said track; and means for mounting said tracks interchangeably to support either side of a drawer and with the channel bearing flanges of both tracks in either a vertical or horizontal position; the two flanges of each of said slides being of equal width and of such configuration that said slides may be mounted on the tracks with one of the flanges of each slide slidably engaging the channel bearing flange and channel of the corresponding track, and the other flange of each slide slidably engaging the other flange of the corresponding track, in either position of said channel bearing flanges; and each of said slides being provided at its rear end with two stop members projecting from the respective flanges thereof and extending within the angle formed by said flanges and so positioned that, when the slides are mounted on the tracks with the channel bearing flanges of the tracks in either of said positions, one of said stop members of each slide is in position to engage the rear end of the channel of the corresponding track to limit forward movement of the slides relative to the tracks.

FRANK H. METCALF.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,231,291	Otte	June 26, 1917
1,545,016	Sessions	July 7, 1925
1,844,845	Eustis	Feb. 9, 1932
2,056,407	Metcalf	Oct. 6, 1936
2,215,881	Levensten	Sept. 24, 1940