May 14, 1940. P. ZALKIND 2,200,319

ROLLER CASING

Filed Oct. 19, 1935 3 Sheets-Sheet 1

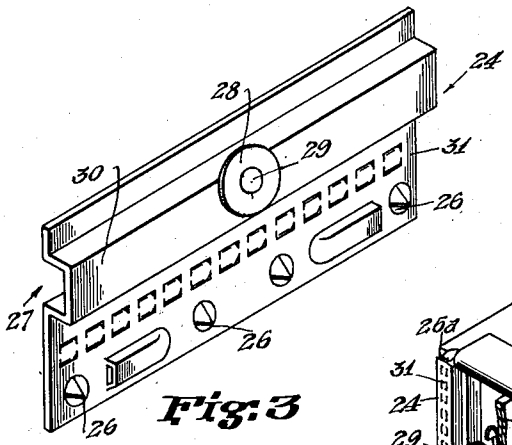


Fig: 3

Fig: 5

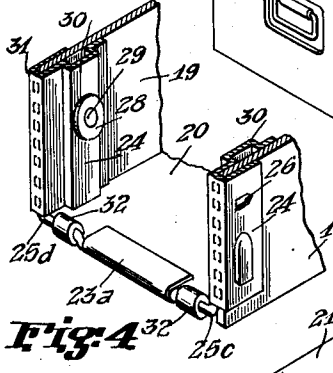


Fig: 4

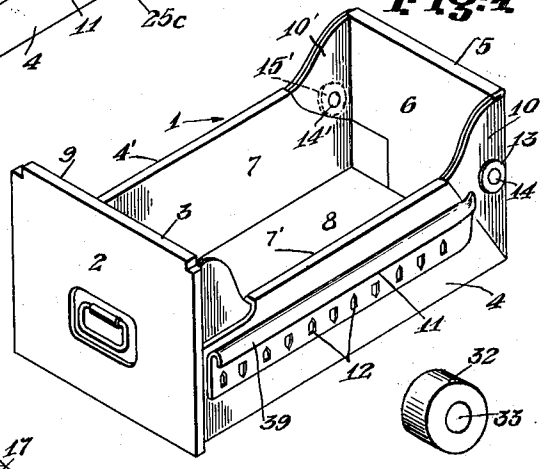


Fig: 4

Fig: 7

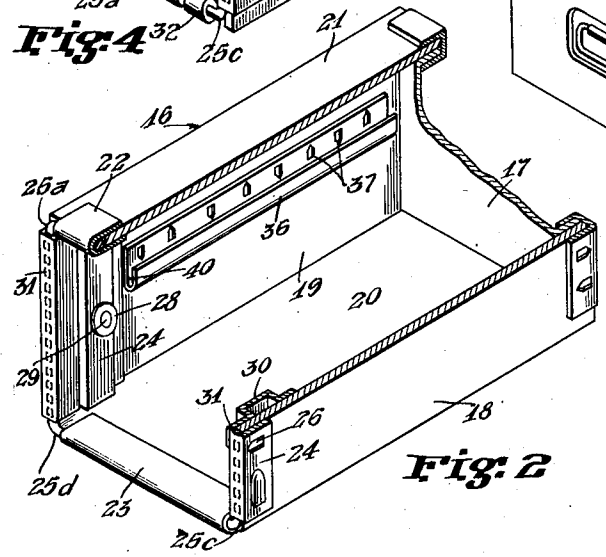


Fig: 2

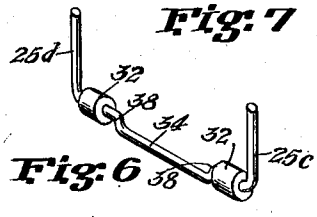


Fig: 6

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May 14, 1940. P. ZALKIND 2,200,319

ROLLER CASING

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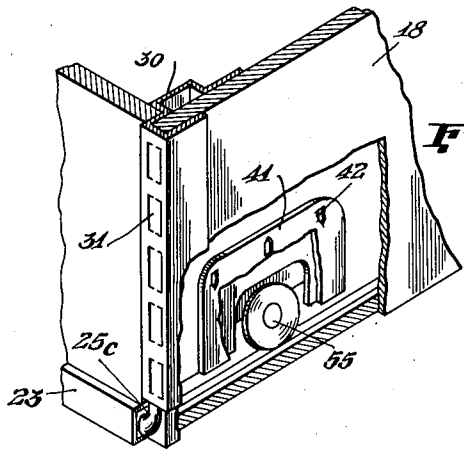


Fig:8

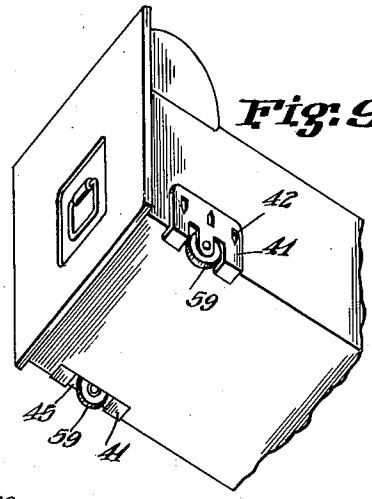


Fig:9

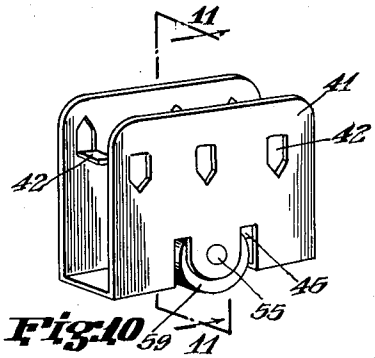


Fig:10

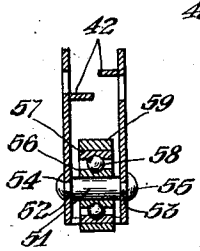


Fig:11

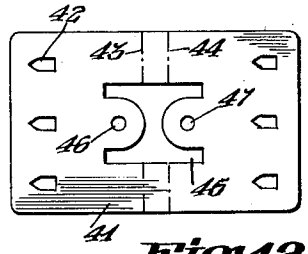


Fig:12

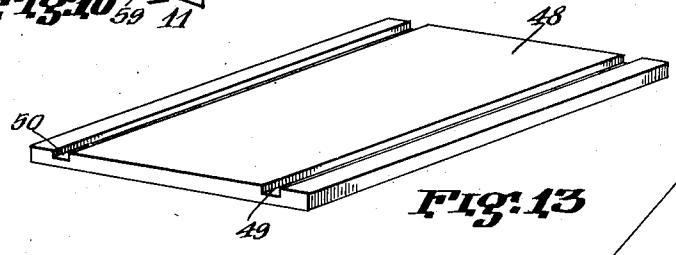


Fig:13

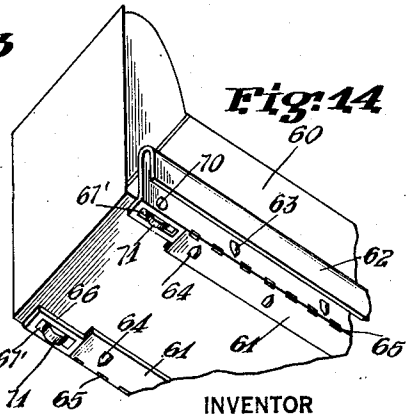


Fig:14

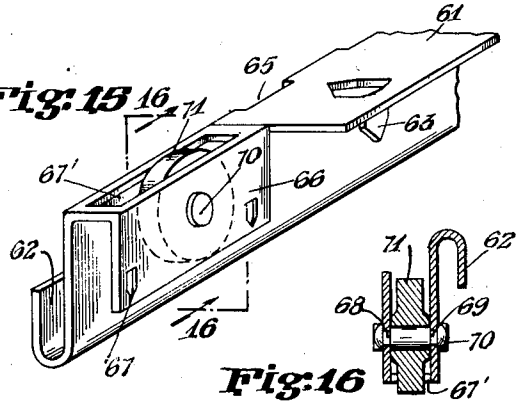


Fig:15

Fig:16

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May 14, 1940. P. ZALKIND 2,200,319

ROLLER CASING

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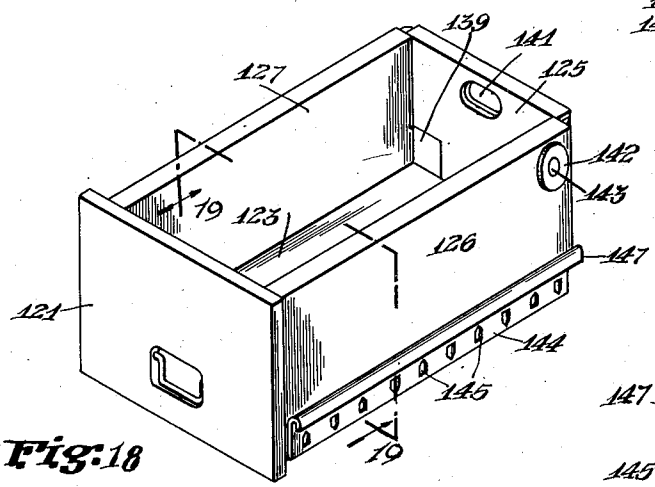


Fig: 18

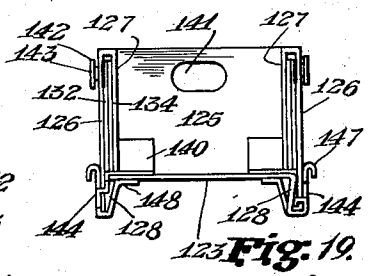


Fig: 19

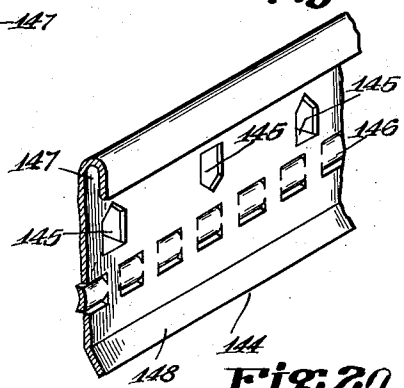


Fig: 20

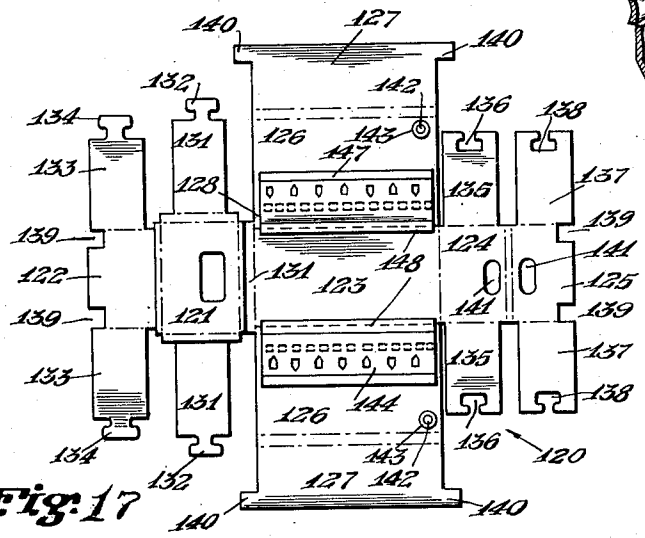


Fig: 17

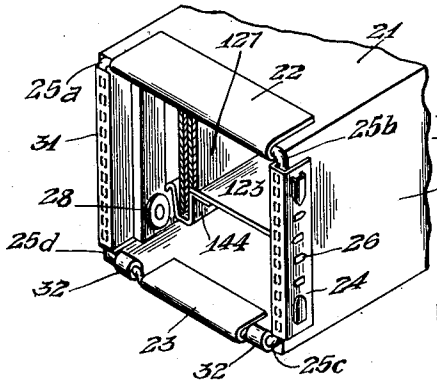


Fig: 21

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Patented May 14, 1940 2,200,319

UNITED STATES PATENT OFFICE

2,200,319

ROLLER CASING

Philip Zalkind, New York, N. Y.

Application October 19, 1935, Serial No. 45,715

6 Claims. (Cl. 45—77)

My invention relates to collapsible and/or folding containers; and more particularly to novel construction of drawers and the like of this class and novel construction of the parts with which said drawers and the like coact to facilitate movement of said drawer relative to said coacting parts.

In the movement of the drawers in and out, of the container in which the drawer is adapted to operate, it is desirable that as much freedom of movement as possible shall be obtained. The present application is a continuation in part of my copending application Serial No. 693,841 filed October 16, 1933, in which I have shown novel construction for facilitating the movement of a drawer in a collapsible casing, and of my copending application Serial No. 739,962 filed August 15, 1934, now Patent No. 2,159,069, in which I have shown novel construction for facilitating the movement of a drawer in a folding or collapsible cabinet.

In the aforesaid applications, I have shown a substantially flat bottom drawer of fibrous sheet material with novel wheel and track construction. This construction is generally very efficacious in reducing the friction between the drawer and the container, but I have found that with certain drawer loadings, the drawer bottom will sag or bow an amount to permit the drawer bottom to make contact with the bottom of the casing unless the wheels and tracks or rails are so mounted as to hold the drawer some distance above the bottom of the subjacent part. If the drawer bottom should sag under loading a sufficient amount to come into contact with the subjacent part, the full benefit of my anti-friction mounting cannot be obtained.

I have found that where, it is expected to load the drawer in such a manner that, without a special construction, the drawer would rub on the subjacent part when loaded, I may provide means in the construction to eliminate such action.

Moreover, I have found that I may combine various parts of the anti-friction member with reinforcing or connecting members and thus obtain an economy of construction through such combination of parts. I have also found, that other economies of construction may be attained through certain novel rearrangement of parts which expedite the manufacture of my novel construction.

Accordingly, objects of my invention are to provide novel apparatus for and methods of moving drawers into and from its container on wheels or rollers; novel apparatus for and methods of mounting collapsible drawers to be moved on wheels or rollers from and into a collapsible container; tracks secured to the container and/or to the drawer and rollers or wheels cooperating with said tracks for providing a maximum freedom of movement of the drawer with respect to its container; novel drawer construction to reduce sagging of the drawer bottom upon the subjacent part; tracks combined with reinforcing and/or connecting members; improved construction as effecting manufacture.

There are other objects of my invention which together with the foregoing, will appear in the detailed description following in connection with the drawings in which:

Figure 1 is a perspective view showing a drawer having wheel and track suspending means.

Figure 2 is a perspective view partly broken away showing a casing for enclosing the drawer of Figure 1, and provided with tracks and wheels for cooperating with coacting parts on the drawer of Figure 1.

Figure 3 is a perspective view showing a method of mounting a drawer supporting wheel upon the vertical open front end reinforcements of the casing.

Figure 4 is a perspective view partly broken away showing a modification of Figure 2 in which wheels are provided in the lower horizontal open front end reinforcement of the casing.

Figure 5 is a perspective view, partly broken away, showing the manner in which the drawer of Figure 1 may be mounted in the casing of Figure 2 or Figure 4.

Figure 6 is a perspective view showing a method for mounting the wheels of Figure 4.

Figure 7 is an enlarged perspective view showing one of the wheels of Figure 6.

Figure 8 is a perspective view, partly broken away, showing the front end of a drawer and casing with wheels mounted on the bottom of the drawer for supporting same.

Figure 9 is a perspective view of the wheels and a portion of the drawer of Figure 8.

Figure 10 is an enlarged perspective view showing one of the wheels of Figure 9.

Figure 11 is a cross section on the line 11—11 of Figure 10.

Figure 12 is a developed blank for the wheel mounting of Figures 8–11.

Figure 13 is a perspective view showing a bottom pad for the casing, having tracks for cooperating with a drawer with wheels similar to those shown in Figures 8-12.

Figure 14 is a perspective view showing the rear end of a drawer having a wheel mounted in a track member.

Figure 15 is an enlarged perspective view showing the wheel mounting of Figure 14.

Figure 16 is a cross section on the plane 16—16 of Figure 15.

Figure 17 is a blank for a drawer having a raised bottom with a track member formed in a manner to secure the bottom flanges in position.

Figure 18 is a perspective view of a drawer formed from the blank of Figure 17.

Figure 19 is a cross sectional view on the plane 19—19 of Figure 18.

Figure 20 is an enlarged perspective view of the track member used in Figures 17 to 19.

Figure 21 is a perspective view, partly broken away, showing the drawer of Figures 17 to 19 inserted in a casing similar to that of Figure 4.

In Figure 1, I have shown a form of folding drawer described in detail in my copending application Serial No. 693,841 which has already been referred to. In this figure, the drawer 1 comprises the front wall 2, the inner front wall 3, the side walls 4 and 4', the rear wall 5, the inner rear wall 6, the side wall flaps 7 and 7' and the bottom panel 8, together with front wall flaps 9, rear wall flaps 10 and 10' and tabs extending from each end of both of the side wall flaps. This drawer may be folded from a single blank of sheet material and after folding, is held in assembled position by means of the various flaps and tabs.

On each of the side walls is mounted the track members 11 (see Fig. 5) of metal or other rigid material formed with the prongs 12 which are pierced into the outer side wall and clinched thereto, which securely fastens the track member to the drawer blank. The wheel 13 is mounted on the flap 10 extending from the rear wall 5, by means of the rivet 14. It will be understood that a similar wheel (not shown) is similarly mounted on the flap 10' and attached by the rivet 14' extending through the washer 15'.

The drawer 1 may be used with the casing 16 as shown in Figure 5, the casing being illustrated in further detail in Figure 2, and in a modified form in Figure 4. The casing as shown is of a type disclosed in my copending application Serial No. 693,841, but my invention is not limited to any particular form of casing. This casing comprises the rear wall 17, the side walls 18 and 19, the bottom wall 20, and the top wall 21. The open front end of the casing is provided with the horizontal reinforcing channels 22 and 23, and the vertical reinforcing members 24, one of the latter being shown in greater detail in Figure 3. At each corner of the open front end is a right angle bent member illustrated at 25*a*, 25*b*, 25*c*, and 25*d*, connecting the vertical and horizontal reinforcing members.

The casing 16 is of the collapsible type and in its collapsed position, the vertical reinforcing members, which are attached to the outside of the open front end in any suitable manner, as for instance by the prongs 26, are in the substantially flat position illustrated in Figure 3. In this position that portion of the vertical reinforcing member indicated at 27 projects out from the open front edge. This projecting portion includes the wheel 28 mounted on the reinforcing member by means of the axle rivet 29, as well as the rabbet 30. Member 24 is provided with the band line 31, which is preferably of a type as disclosed in my copending application entitled Predetermined bend line, Ser. No. 45,710, and filed coincidentally with this application. Also in the collapsed position of the casing the angle members 25*a* and 25*b* which are held within the top horizontal channel 22 are turned outwardly to be substantially in the plane of the top panel 21; and the angle members 25*c* and 25*d* which are held within the bottom horizontal channel 23 are turned outwardly to be substantially in the plane of the bottom member.

In setting up the casing to its assembled position, the collapsed form is first turned on its bend lines until the open front assumes a rectangular position; the angle members 25 are then turned on their pivot to abut the front edges of the side walls; and the vertical reinforcing members 24 are turned on their score lines 31 to envelop the exposed legs of the angle members 24 and the vertical front edges of the side walls 18 and 19. In this position, the wheels 28 extend within the casing in a position to cooperate with the tracks 11 and 11' of the drawer. It will be understood that the tracks may be placed at any height on the drawer sides, provided the wheels 28 are properly positioned on the casing; but the wheels 28 should be placed in such a position on the casing 16 that when the drawer is hung within the casing by the tracks 11 and 11' coacting with the wheels 28, the bottom 8 of the drawer will not be in contact with the bottom 20 of the casing.

Mounted on the inside of the side wall 19 of the casing 16 may be a rail member 36 attached to the wall by any suitable means, such as the prongs 37. A similar rail, not shown, may be attached to the side wall 18 in a similar manner. The rails 36 are placed at a height within the casing to cooperate with the wheels 13 mounted on the drawer. The relative position of the wheels 13 and the rails 36 is such that when the wheels 13 are supported by the rails 36, the drawer will be free to move within the casing without the drawer bottom 8 coming in contact with the casing bottom 20.

As shown in Figure 4 and in further detail in Figure 6, the bottom corner angles 25*c* and 25*d* may be provided with wheels 32. The angles 25*c* and 25*d* may be united with each other in a uniting structure through the rod 34 which is preferably connected with the angle members through the offsets 38. The angle members are then joined to the casing bottom by means of the rod 34 secured in place by the bottom reinforcing member 23*a*.

The offsets 38 serve a double purpose in connection with the wheels 33. When the casing is in a collapsed position and the angle members 25*c* and 25*d* lie substantially in the plane of the bottom member 20, the offsets serve to bring the wheels 33 outside of the casing and into a position where they do not interfere with collapsibility. When the casing is assembled, the offsets serve to raise the wheels 33 relative to the casing bottom 20. By proper proportioning the wheels and the offsets, the bottom of the wheels can be raised a sufficient amount, that they will lie slightly above the casing bottom and will not interfere with the casings being laid upon a substantially flat surface or being piled one upon the other. In this position the wheels 33 will cooperate with the bottom of the drawer when the drawer is inserted into the casing, or they may be cooperated with suitably flanged reinforcements on the drawer bottom as will be more fully described later.

As has been described, I have shown three sets

of cooperating means for reducing the friction of the drawer in the casing. These means are:

1. Wheels on casing coacting with tracks on the drawer member.

2. Wheels on the drawer coacting with rails on the casing member.

3. Wheels on the open front end coacting with a portion of the drawer bottom.

It will readily be understood that, while these three sets of means may cooperate with each other in the manner that will shortly be described, any one of the sets or a combination of any two of the sets will greatly reduce the friction of the drawer in the casing and depending upon the particular application I may apply one or another of the friction reducing means, without the application of the other groups. Moreover, with properly positioning of the tracks 11 and 11' and the rails 36, it may in certain instances be desirable to entirely eliminate the wheels 13, 28, and 32 and mount the drawer in the casing by hanging the drawer in the casing through the medium of the tracks 11 and the rails 36, the downwardly depending leg 39 of the track 11 being supported within the channel 40 of the rail 36. This will raise the bottom of the drawer above the bottom of the casing and will greatly reduce the friction of the drawer in the casing.

Where all three sets of wheels and their coacting members, which have been described, are provided, these three sets cooperate with each other as follows: The principal supporting and anti-friction means comprises the wheels 28 coacting with the tracks 11 and 11'. The wheels and their axles act as pivots about which the drawer is free to rotate. Thus, when the drawer is first inserted into the casing, the weight of the drawer is largely on the outside of the casing, so that the center of gravity of the drawer will lie outside of the pivots 29 as clearly shown in Figure 5. This would cause the forward end of the drawer to move downwardly about the wheels 28 so that the bottom of the drawer will come in contact with the bottom edge of the open front end of the casing, unless the front end of the drawer is manually supported. Such manual support may require a considerable effort when the drawer is heavily loaded, and it becomes largely unnecessary where the wheels 32 are provided, as these wheels then take the lead off the front end of the drawer, but do not cause an increase in friction as would be occasioned by the drawer bottom rubbing over the bottom open end of the casing.

As the drawer is pushed into the casing the center of gravity of the drawer continuously moves closer to the pivots 29, until such a position is reached that the center of gravity of the drawer lies in a vertical plane through the pivots 29. Any further movement of the drawer then causes the center of gravity of the drawer to pass into the casing beyond the pivots, which in turn acts to cause the rear end of the drawer to drop relative to the casing, and if the drawer were not otherwise supported, the rear bottom edge of the drawer would rub on the inside bottom of the casing. If wheels 13 and tracks 36 are not provided, this rubbing may be disposed of by manually supporting the drawer by pulling lown on the front of the drawer, but if wheel 13 and 13' and tracks 36 are provided, these means will prevent the drawer bottom from coming into contact with the casing and will provide antifriction support for the rear end of the drawer.

In Figures 8 to 13, I have shown a further feature which may be applied to my drawers, comprising wheels secured to the base or floor member thereof for riding on a track in the casing. As shown in Figure 12, a flat member 41 preferably made of metal may be provided with prongs stamped therefrom in a manner already described and may be scored to form a predetermined bending line at 43 and 44. At 45, the metal is punched out, forming a pin support at the openings 46 and 47 for a roller when the metal is turned along the scorings 43 and 44 into the form shown in Figure 10.

A pin 51 having its ends 52 and 53 of reduced diameter protruding through the openings 46 and 47 and provided with the caps 54 and 55 carries the ring 56. Between the rollers 56 and 57, the roller ball bearings 58 are supported for permitting a free rotation of the caster 59. The member 41, after being formed into the shape in Figure 10 is secured to the inner and outer side wall by its prongs as shown in Figure 9, the side of member 41 coming opposite the inner side wall being admitted therein through a suitable slot formed in the side wall.

Secured to the base of the casing is a member 48 having the dimensions substantially equal to the inner dimensions of the bottom of the casing and having the tracks 49 and 50 formed therein at positions at which the rollers 59 will ride in the tracks. In a further form of my invention these tracks may be constructed as an inherent part of the base or bottom sections of the casing, as will be described in further detail.

In a further modification the wheel members similar to those shown in Figures 8 to 13 may be combined with the track members on the drawer, and at the same time the track members may be used to reinforce the bottom drawer corners. Such modification is illustrated in Figures 14 to 16.

As shown in Figure 14, the drawer 60, is provided with the track members 61, provided with the track 62 adapted to coact with a wheel mounted upon the inside of a casing. The track member 61 has the prongs 63 and 64 by which it may be attached to the drawer blank, the prongs 63 being applied to the side wall panel and the prongs 64 being applied to the bottom panel of the drawer blank. The track member 61 is thus adapted to fit partly over the side wall of the drawer and partly over the bottom of the drawer. As applied to the drawer blank the side wall and bottom wall portion are in the same plane, but when the drawer blank is folded into assembled position, the track member 61 is bent on the bending line 65 and forms an angle reinforcement for the drawer.

As shown in Figure 14 and in greater detail in Figure 15, a portion of the track member may be bent to form a channel having the flange 66 adapted to pass through a slot in the bottom of the drawer and to be fastened to the inside of the side wall of the drawer, as for instance by prongs 67.

At this channel shaped portion the track member 61 has the punched out portions 67', 68, and 69 the latter two openings being shaped to support the axle 70, and the hole 67 being shaped to permit the wheel 71 mounted within the channel portion to extend through the member 61 in order to cooperate with a suitable track, such for instance as that shown in Figure 13 which has already been described.

While in Figure 16, I have shown a wheel with

plain bearings, it will be readily understood that a wheel having roller ball bearings as in Figure 11 may be used in connection with the track member of Figures 14 and 15, or that a plain bearing may be used in Figures 8, 9, and 10 in place of the roller bearing shown in Figure 11.

As I have pointed out, a flat bottom drawer may in some cases become so loaded that the bottom may sag a sufficient amount to come in contact with the bottom of the casing, even though the drawer be supported on wheels or rollers when it is less heavily loaded. In such cases the partial support given by the wheels will cause freer movement of the drawer in the casing than if the entire weight were carried on the bottom, but a greater force is required to move the drawer than if the bottom of the drawer were supported entirely free from the bottom of the casing. In drawers expected to carry heavy loads, I thus make provision for supporting the drawer in a manner, that even when the drawer is loaded, its bottom will not contact the casing with sliding friction when the drawer is moved. This result may be accomplished by raising the supports of the drawer so that the drawer when empty is a sufficient distance from the casing bottom that even when loaded the drawer bottom will not scrape, or by providing a drawer with a bottom so constructed that it will not sag down to meet the casing bottom.

One form of a drawer so constructed is shown in Figures 17 to 21, in which Figure 17 shows a developed blank. In this figure blank shown generally as 120, comprises the front panel 121, the panel extension 122, the bottom panel 123, the rear wall panel 124, the rear wall extension 125, the side walls 126, and the side wall extensions 127. Between the bottom panel 123 and the side panel 126 is a narrow panel 128 which forms a flange portion on the bottom of assembled drawer. The front panel has the extended wings 131 with the locking tabs 132; and the front extension has similar extensions 133 with tabs 134. The rear panel has the wings 135 with notches 136, and the rear panel extension has similar wings 137 with similar notches 138. The notches 136 and 138 are made to fit the tabs 132 and 134. A narrow panel 131 connects the bottom panel 123 with the front panel 121 and forms a bottom flange on the drawer front when the blank is folded into position. The front panel 121 is somewhat larger than the front panel extension 122 to provide flanges around the drawer front as is fully described in my copending application Serial No. 693,841 previously referred to. The front and rear panel extensions are provided with cut out notches 139 for cooperating with the flaps 140 on the side wall extensions. The rear wall and the rear wall extension are provided with the holes 141 which when the blank is folded form a handle in the rear wall. Suitable score lines are provided on which the blank may be folded to form a drawer.

Attached to the side panel 126 is a wheel 142 secured on the axle 143. Also secured on the side panel is the metallic member 144, shown in greater detail in Figure 20. Member 144 is provided with prong 145 for securing the member to the drawer blank. Member 144 is provided with a grid bending line 146 which is preferably of a construction similar to that disclosed in my copending application entitled Predetermined band line, Serial No. 45,710, and filed coincidently with the application. One edge of the member 144 may be turned into a U shape to form a track 147 and the other edge may be bent up to form a lip as at 148.

When the rear wall extension is turned on its score lines, the panels 125 and 124, and the wings 137 and 135 overlap in face to face relation, and the handle openings 141 will register with each other. Similarly, when the front wall extension is turned on its score lines, the panel 122 will overlap panel 121 in face to face relation; and then when the side flanges are formed on panel 121 by bending the blank on the score lines on the sides of panel 121, the wings 131 and 133 will overlap in face to face relationship. Both the front and rear panels may be so bent before shipment, and the overlapping parts adhesively united with each other.

In assembling the drawer, the front and rear walls are bent on their score lines at right angles to the base 123, and the front and rear wall wings are then bent on their score lines at right angles to the front and rear walls. The wings may be locked together through the tabs 132 and 134 entering the notches 135 and 136. The side walls are then bent into position with the side wall 126 and the side wall extension 127 enveloping the front and rear wall wings 131, 132, 135, and 137. In this operation the flange member 128 is formed on the bottom of the drawer and the metallic members 144 are bent on their score lines 146, thereby locking the flange in position. At the same time, the extension 148 of member 144 aids in supporting the bottom of the drawer. Moreover, the member 144 may, as shown, be provided with a track 147 for supporting the drawer in a casing.

Where the drawer is used with a casing having wheels or rollers for coacting with the drawer flanges, such for instance as the form of casing of Figure 4, which is illustrated also in Figure 21 having inserted therein the drawer (partly broken away) formed from the blank of Figure 17, I prefer that the grid bending line be one of the covered forms shown in my copending application entitled Predetermined bend line, Serial No. 45,710, and previously referred to. In this manner, a smooth metallic surface will be presented to the wheels or rollers; and there will be no interference with free movement of the drawer due to any uneven surface on the bottom of the flanges or the drawer bottom.

In the particular drawer illustrated, I have shown a form in which the side walls are of the same height as the rear wall and substantially the same height as the front wall. It will be realized, however, that I may equally well provide bottom flanges and a raised bottom on a drawer in which the sides are of a different height than the rear wall.

I have further found that I can extend the use of flanges on the drawer bottom; and by the added strength of bottom so obtained, I may secure greater assurance of the drawer maintaining its position supported on the anti-friction means. Thus in addition to the two side flanges which I have shown in the drawer which I have just described, I may provide additional flanges on the bottom, running either longitudinally or transversely of the drawer.

It will be understood that various features of my copending applications filed coincidently with the application and entitled: Drawer, Serial No. 45,711, now Patent No. 2,152,676; Three sided casing, Serial No. 45,714; Container fastening means, Serial No. 46,316; Predetermined bend line, Serial No. 45,710; End fold casing, Serial No.

45,713, now Patent No. 2,088,315; may be used in conjunction with the present invention, and that certain features of the present application may be used in conjunction with the above named applications.

Now having described my invention so that it may be understood by one skilled in the art,

I claim:

1. A collapsible drawer having score lines along the edges thereof along which the walls of said drawer are collapsible into a substantially flat unit; a track member comprising a metallic angle member secured along the bottom edges of said drawer; a predetermined bend line formed in said angle member coinciding with the score lines of said drawer to permit collapse of said drawer.

2. A collapsible drawer having score lines along the edges thereof along which the walls of said drawer are collapsible into a substantially flat unit; a track member comprising a metallic angle member secured along the bottom edges of said drawer extending longitudinally along the bottom and side of said drawer to form a reinforcing edge therefor; a predetermined bend line formed in said angle member coinciding with the score lines of said drawer to permit collapse of said drawer.

3. A collapsible drawer having score lines along the edges thereof along which the walls of said drawer are collapsible into a substantially flat unit; a track member comprising a metallic angle member secured along the bottom edges of said drawer; a predetermined bend line formed in said angle member coinciding with the score lines of said drawer to permit collapse of said drawer; and prongs formed in said metallic member and engaging the drawer.

4. A collapsible drawer adapted to be slidably supported in a casing; said drawer having score lines along which the walls of said drawer are collapsible into a substantially flat unit; said drawer having a bottom wall; means for locking said bottom wall in a position elevated above the lower edges of the side walls for preventing contact of said bottom wall with the bottom of its casing; said means comprising a flange member and metallic members secured to said flange for locking said flange in position, said metallic members being constructed and arranged to permit collapse of said drawer into a substantially flat unit.

5. A collapsible drawer adapted to be slidably supported in a casing; said drawer having score lines along which the walls of said drawer are collapsible into a substantially flat unit; said drawer having a bottom wall; means for locking said bottom wall in a position elevated above the lower edges of the side walls for preventing contact of said bottom wall with the bottom of its casing; said means comprising a flange member and metallic members secured to said flange for locking said flange in position; said metallic member forming a track member adapted to rest upon a roller member for suspending said drawer in said casing; said metallic members being constructed and arranged to permit collapse of said drawer into a substantially flat unit.

6. A collapsible drawer adapted to be slidably supported in a casing; said drawer having score lines along which the walls of said drawer are collapsible into a substantially flat unit; said drawer having a bottom wall; means for locking said bottom wall in a position elevated above the lower edges of the side walls for preventing contact of said bottom wall with the bottom of its casing; said means comprising a flange member and metallic members secured to said flange for locking said flange in position; said metallic member forming a track member adapted to rest upon a roller member for suspending said drawer in said casing; said metallic members being constructed and arranged to permit collapse of said drawer into a substantially flat unit; and wheels secured to the rear of said drawer adapted to engage with the track of the drawer casing for providing a further suspension of said drawer in its casing.

PHILIP ZALKIND.