

June 13, 1939.

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2,162,318

DRAWER SUSPENSION

Filed Jan. 12, 1937

4 Sheets-Sheet 1

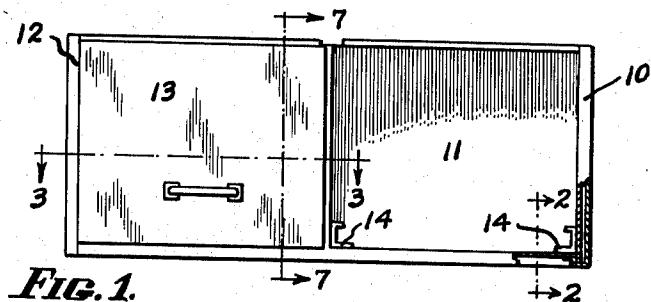


FIG. 1.

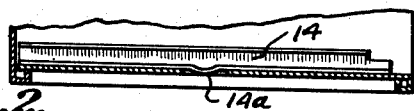


FIG. 2.

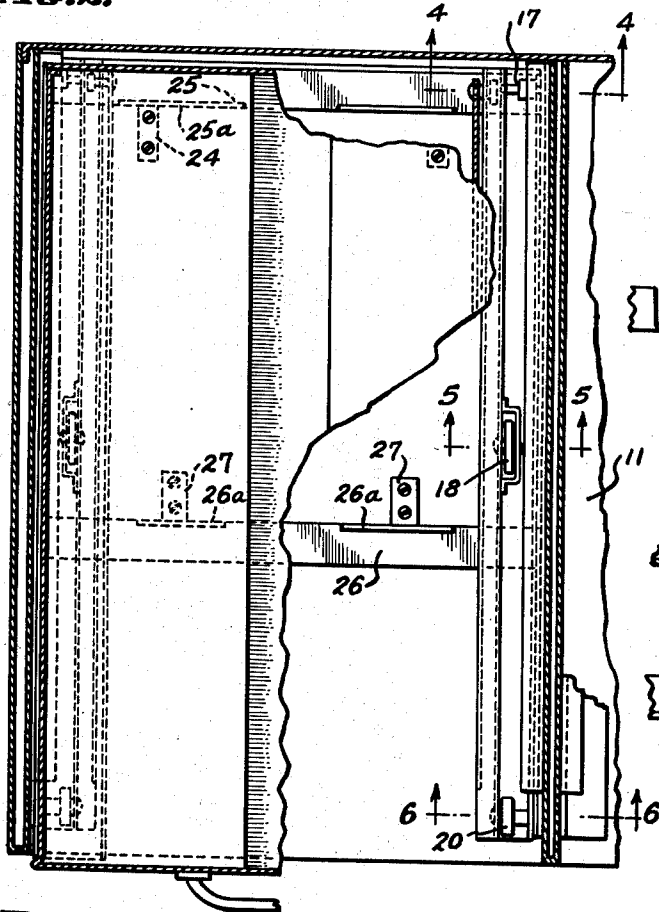


FIG. 3.

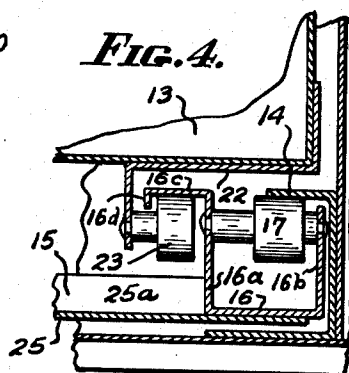


FIG. 4.

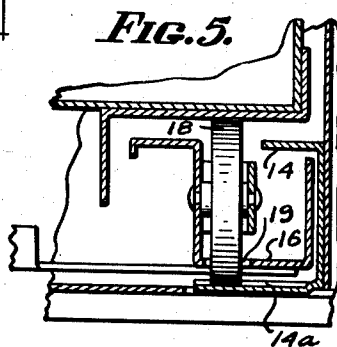


FIG. 5.

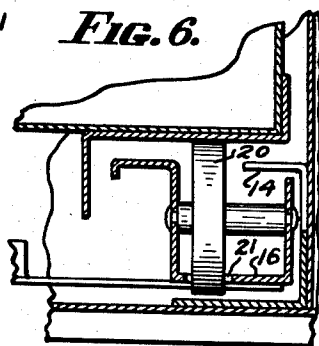


FIG. 6.

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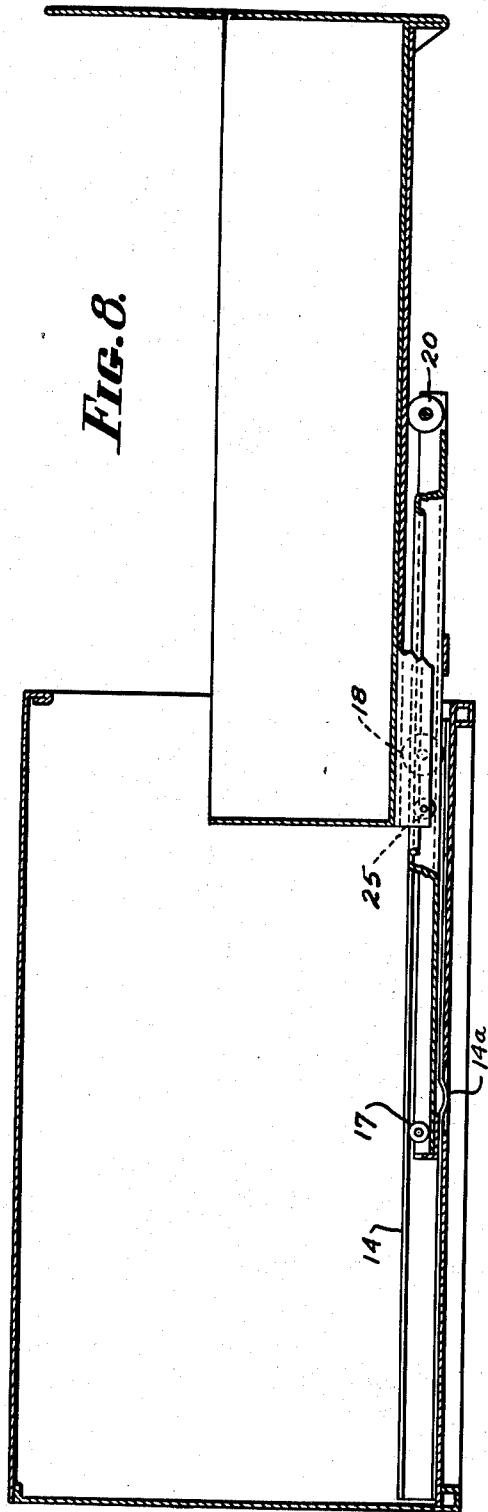
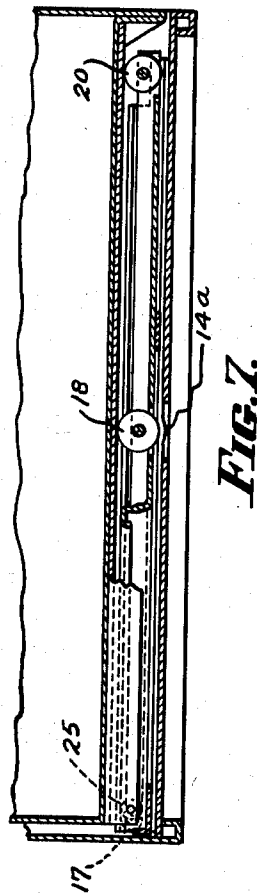
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4 Sheets-Sheet 2



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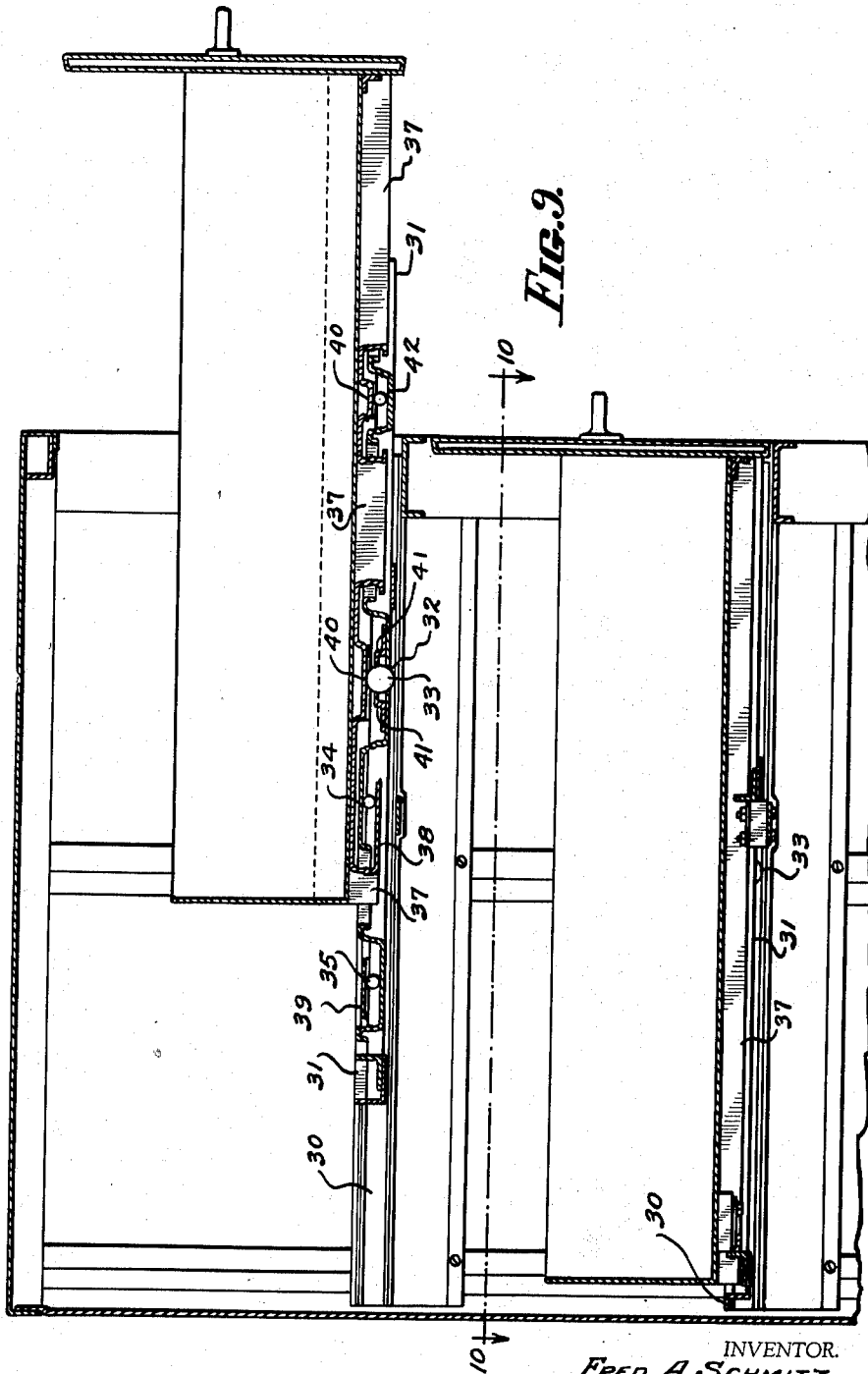
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4 Sheets-Sheet 3



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DRAWER SUSPENSION

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4 Sheets-Sheet 4

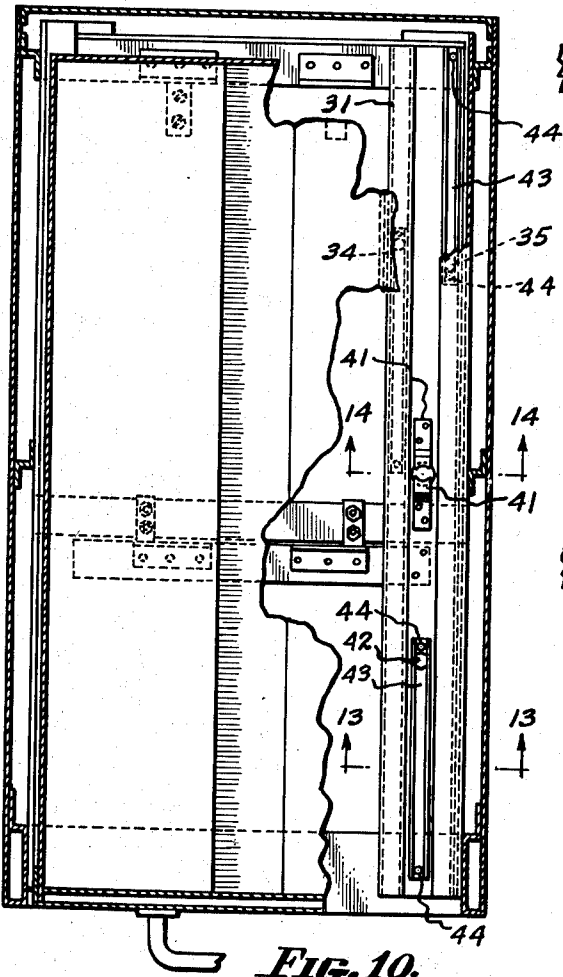


FIG. 10.

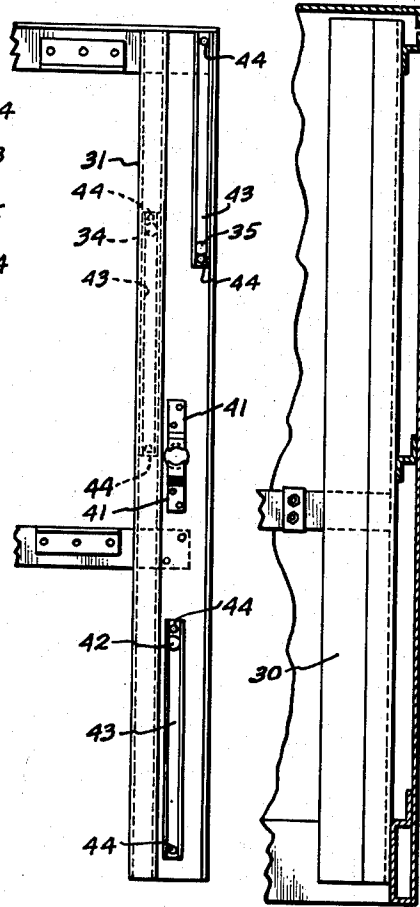


FIG. 11.

FIG. 12.

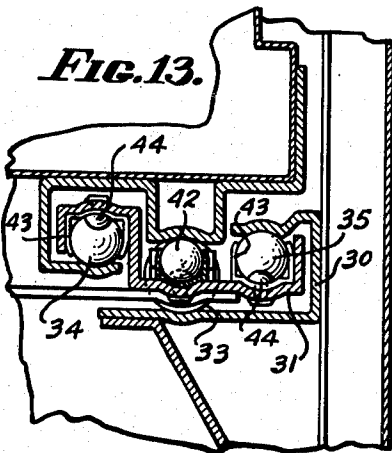


FIG. 13.

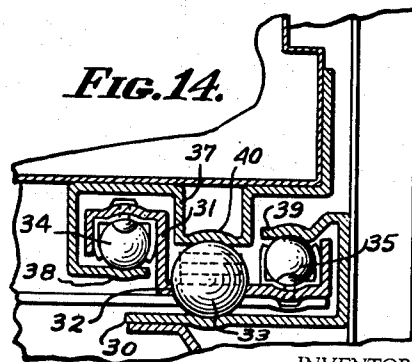


FIG. 14.

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UNITED STATES PATENT OFFICE

2,162,318

DRAWER SUSPENSION

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corporation of Ohio

Application January 12, 1937, Serial No. 120,251

4 Claims. (Cl. 45-77)

This invention relates to suspensions for drawers and more particularly to suspensions of the progressive type for use with drawers in filing cabinets.

5 The suspension of filing cabinet drawers has presented quite a problem in the art. It is desirable that the drawers, when heavily loaded with large files, should be able to slide easily into an opened or closed position. An important development in the art was the progressive suspension in which the drawer was mounted with a runner so that the drawer and runner cooperated during the extension of the drawer. If the drawer was pulled out the suspension would come with it but at half the speed of the drawer and would therefore extend only half the length of the drawer in its outermost position. This not only assisted in the smooth operation of the drawer, but served as a support for the drawer when it was in its full open position.

20 The have been various extensions of this type of suspension in the past, but they have all been connected by the fact that the suspension was mounted on the sides of the drawers, which required the filing cabinets to have unnecessary bulk and which detracted considerably from the appearance of the drawer when in its open position.

30 In view of the above facts, it is an object of my invention to provide a suspension for a drawer, which will operate underneath the drawer rather than at the sides of the drawer and will thus be effective to conserve floor space and to enhance the appearance of the drawer.

35 A further object of my invention is to provide an underneath suspension of the progressive type whereby the above named advantages will be combined with strength and ease of operation.

40 Other objects of my invention include the provision of a suspension as above outlined which will be simple of construction, cheap and durable.

45 These and other objects of my invention which will be pointed out hereinafter or which will be apparent to one skilled in the art upon reading these specifications, I accomplish by that certain construction and arrangement of parts of which I shall now describe an exemplary embodiment.

50 Reference is now made to the drawings which form a part hereof and in which

55 Fig. 1 is a front elevation of a unit comprising a cabinet containing two drawer spaces. Parts are broken away in order to more clearly show the construction.

Fig. 2 is a vertical cross sectional view taken on the line 2-2 of Fig. 1.

Fig. 3 is a horizontal cross sectional view taken on the line 3-3 of Fig. 1 with parts broken away to show the construction.

Figs. 4, 5 and 6 are respectively vertical cross sectional views taken on the lines 4-4, 5-5 and 6-6 of Fig. 3.

Fig. 7 is a partial vertical cross sectional view taken on the line 7-7 of Fig. 1 showing the drawer in its closed position.

Fig. 8 is a cross sectional view similar to Fig. 7, showing the drawer in its opened position.

Fig. 9 is a cross sectional view of a modified form of suspension in which hardened steel balls are used instead of rollers; the sections are taken at various planes in order to best illustrate the construction.

Fig. 10 is a horizontal cross sectional view taken on the line 10-10 of Fig. 9, the drawer being partly broken away to show hidden constructions.

Fig. 11 is a partial plan view of the carrier.

Fig. 12 is a partial plan view of the cabinet and the track upon which the carrier runs.

Fig. 13 is a vertical cross sectional view taken on the line 13-13 of Fig. 10.

Fig. 14 is a vertical cross sectional view taken on the line 14-14 of Fig. 10.

Briefly in the practice of my invention I provide a cabinet in which a drawer is adapted to slide. The cabinet is provided with tracks upon which a suspension unit is adapted to run. Upon the suspension unit I mount a drawer. The drawer and the suspension unit are provided with wheels or rollers, which will be described in more detail hereinafter, so that the suspension unit may run smoothly on the tracks provided in the cabinet and the drawer may run smoothly upon tracks on the suspension unit.

In Fig. 1, I have shown a cabinet indicated generally at 10 having two compartments 11 and 12 respectively, and I have shown a drawer 13 in the left-hand compartment. These compartments are provided with channels 14 which form the tracks upon which the suspension unit runs. These tracks may be provided with central depressions in the lower flange as indicated at 14a, for a purpose which will be mentioned hereinafter. The suspension unit comprises a framework indicated generally at 15 which carries along its lateral edges the S-shaped channels 16. The two vertically disposed arms 16a and 16b of this channel provide bearings for a small roller 17 which may be mounted in any well known

manner. The roller 17 as seen in Fig. 3 is disposed at the rear of the suspension unit. Approximately centrally along the members 16 are mounted the large wheels 18 which are adapted to extend downwardly through the slots 19 in the members 16. The wheels 18 may also be mounted in any desired manner and are preferably provided with ball bearings, not shown. Adjacent the front ends of the members 16 are provided wheels 20 which are adapted to extend downwardly through slots 21 in the members 16. These wheels may likewise be mounted in any desired manner.

As is best seen in Fig. 4 the roller 17 coacts with the upper flange of the rail 14, and prevents the drawer from tilting downwardly when it is extended. The wheel 18 is adapted to ride on the lower flange of the member 14 as may best be seen in Fig. 5. The forward wheel 20 may also ride upon the lower flange of the rail 14 during the initial fraction of the outward movement of the drawer.

The drawer 13 is provided with a pair of Z-shaped channels 22 extending along the lateral lower edges of the drawer. The downwardly extending flanges of the members 22 serve as supports for the small rollers 23 which may be mounted in any desired manner as shown in Fig. 4.

The roller 23 is adapted to ride along the under side of the portion 16c of the member 16 and the member 16c may be provided with a downturned edge 16d to prevent the roller 23 from slipping laterally out of engagement with the portion 16c. The major horizontal portion of the member 22 serves as a rail to cooperate with the large rollers 18 and 20 as shown in Figs. 5 and 6. The aforementioned depression 14a in the rail 14 is provided for the purpose of causing the drawer to settle in a closed position when the wheel 18 enters the portion 14a. Thus if the drawer is slightly open the force of gravity will cause the drawer to come to its fully closed position.

Thus when the drawer is pulled outwardly at the beginning, the major portion of the weight of the drawer is carried by the wheel 18 and the motion of the drawer is thereby transmitted to the suspension unit which begins to travel outwardly with the drawer but at half speed. The drawer in its forward position rests and rides upon the wheels 20 which are carried at the front end of the suspension unit. As the weight is moved forwardly and the drawer would tend to tilt downwardly, the roller 17 of the suspension unit rides along the under edge of the upper flange of the member 14 and likewise the roller 23 on the drawer, rides on the under side of the flange 16c on the drawer suspension so that friction is eliminated at these points.

As shown in Fig. 3 I have provided bumper members 24 fastened on the under side of the drawer. These bumpers are adapted to cooperate with the flanges 25a on the cross rail 25 of the suspension unit, when the drawer is in its closed position. When the drawer is opened the bumpers 24 cooperate with the flanges 26a on the cross rail 26 of the suspension unit. The bumpers 27 which are fastened to the bottom of the casing 10 are adapted to abut the cross rail 25 and prevent the suspension unit from being pulled out beyond its limit of travel.

In Figs. 9 to 14 I have shown a slightly modified construction in which hardened steel balls are used instead of the rollers of Figs. 1-8, in-

clusive. The principle of operation is very much the same with the exception that where the hardened steel balls are used the points of support are movable rather than fixed. Experience has shown, however, that there is very little difference in the ease of operation of the drawer.

Mounted in the cabinet in the lower portion of the drawer compartment are the tracks 30. The carrier or suspension member which I have indicated generally at 31 is provided with an opening 32 through which a large steel bearing 33 projects. The ball 33 projecting through the opening 32 in the member 31 rolls on the track 30. The suspension member 31 is roughly S-shaped in cross section and carries on each of the arms of the S tracks for other balls indicated at 34 and 35. The drawer itself, which is indicated at 36, carries a track member 37 which has an inturned arm 38. By virtue of this construction, the ball 34 rides between the carrier member 31 and the inturned arm 38 of the member 37. The ball 35 rides between the member 31 and the inturned arm 39 of the track member 30. The parts above described are best seen by reference to Figs. 9 and 14. The member 37 also has a track portion 40 which is adapted to ride upon the large ball 33. It will thus be seen that the large ball 33 rides on the cabinet on the track 30, and the drawer, by virtue of the track member 40, rides on the ball 33, while the suspension 31 travels with the ball 33 by virtue of the fact that the ball 33 is confined within the opening 32. The ball 33 is prevented from jumping out of the opening 32 by means of the two arms 41 which are riveted, welded, or otherwise attached to the member 31. The inner ends of these arms are curved to fit the periphery of the ball.

Referring now to Fig. 13, a fourth ball 42 is provided which rides on the suspension member 31 and which also assists in supporting the drawer in the same way as the ball 33. The construction described is duplicated on each side of the drawer and where I have referred to one ball 33, it is to be understood that there is one on each side of the drawer, unless, of course, it is desired to provide a single central suspension member.

The various balls may, of course, run simply in grooves in the various track members. I prefer, however, to provide hardened steel track members which I have indicated at 43 in the various figures. These track members are roughly channel shaped in cross section and are slightly inturned at the ends of the arms in order to confine the respective balls within the tracks. The members 43 are preferably riveted to the carrier as indicated at 44, and by virtue of this construction, the rivets provide means for preventing the balls from rolling out of the ends of the tracks. If it is desired to spot weld the tracks to the carrier member, then, of course, separate confining means must be provided.

The drawer of this construction operates as follows: The carrier member travels backward and forward in accordance with the movement of the big ball 33 which is confined within the opening 32 therein. The drawer rests on the balls 33 and 42, the ball 33 carrying the greater part of the weight, and the ball 42 serving to relieve or reduce friction and provide an additional point of support. The ball 35 coacting with the track 39 fixed to the cabinet serves to prevent the carrier from tilting when the drawer is pulled out and reduces friction at that point. The ball 34 coacting with the track 43 on the carrier and the track 38 on the drawer serves to prevent the

drawer itself from tipping forwardly when it is pulled out and aids in reducing friction between the drawer and the carrier.

It will thus be seen that I have provided a suspension for filing cabinet drawers, which has the advantages of the progressive principle and which eliminates the unwarranted bulk of the side mounted suspension.

It is to be understood that different forms of my preferred embodiment may be made without departing from the spirit of the invention and that I do not intend to limit myself otherwise than as expressed in the claims which follow.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A filing drawer construction comprising a cabinet having a drawer space and a track disposed on the bottom thereof, said track having a portion spaced from the bottom of said space, a track carrying suspension unit having a ball strictly confined substantially centrally thereof, and a drawer of a width to substantially fill said space, and carrying a track on its under side said track having a portion spaced from the underside of said drawer, said ball riding between the track in said cabinet, and the track on said drawer, a second ball riding between the spaced portion of the track in said cabinet and a track on said suspension unit, a third ball riding between the track on said drawer and a track on said suspension unit, and a fourth ball riding between the spaced portion of said track on said drawer and a track on said suspension unit.

2. A filing drawer construction comprising a cabinet having a drawer space and having a track disposed on the bottom of said space, said track having a portion spaced from the bottom of said space, a track carrying suspension unit having a ball strictly confined substantially centrally thereof, said ball riding on said track on the bottom of said space, said suspension unit having three tracks side by side, one of said tracks being

disposed to extend underneath said spaced portion of said first mentioned track, a ball riding between and co-operating with said last mentioned tracks, said suspension unit having a second track aligned with said track on the bottom of said space, and an overhanging track, said drawer having a track on its underside in alignment with said second track, a ball riding between and co-operating with said last mentioned tracks, said second track riding also on said first mentioned ball, and a track spaced from the under side of the drawer, and extending underneath said overhanging track, and a ball riding between said last mentioned tracks and cooperating therewith.

3. In a filing drawer construction, a cabinet having a drawer space and a track on the bottom thereof, and an overhanging track, a drawer having a track on the bottom thereof, and an underhanging track, and a suspension unit having a ball confined substantially centrally thereof, and adapted to ride between the track on the bottom of the space and the track on the bottom of the drawer, said suspension unit having an underhanging track disposed in cooperative relation with said overhanging track on said cabinet, and an overhanging track disposed in cooperative relation with said underhanging track on said drawer, and balls riding between said respective cooperating sets of tracks, and said suspension unit having also a track in cooperative relation with said track on the bottom of said drawer, and a ball riding between said last mentioned tracks and cooperating therewith.

4. In a filing cabinet drawer suspension comprising a casing, a drawer, and a suspension unit, and having a system of balls and tracks cooperating therebetween; a track comprising a channel shaped hardened steel way, the arms of which are slightly inturned, a ball vertically confined in said track thereby, said way being riveted to said track at each end whereby said rivets confine said ball to said way longitudinally.

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