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2,606,090

DRAWER SUSPENSION

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FIG. 1.

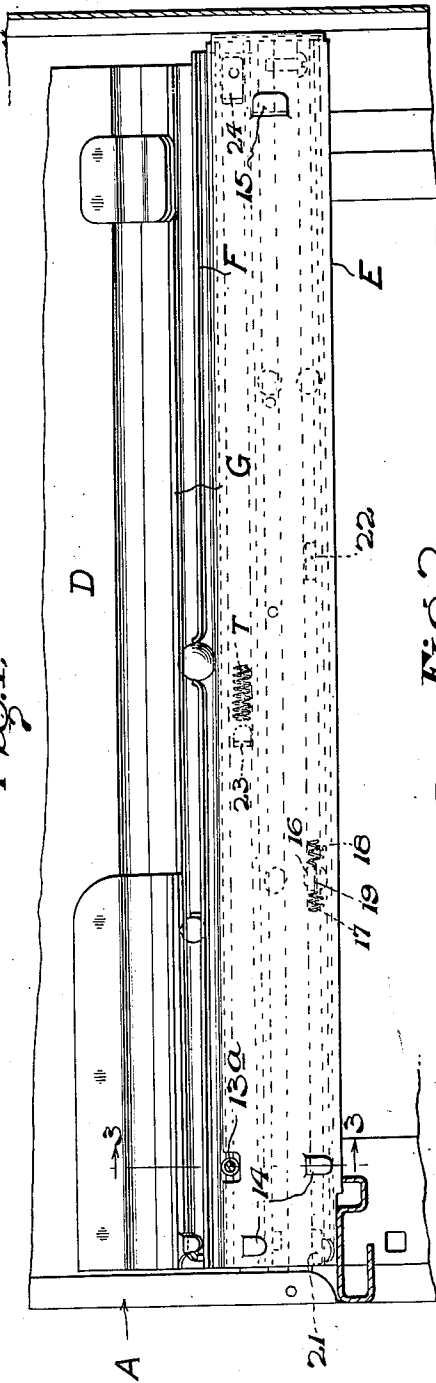


FIG. 2.

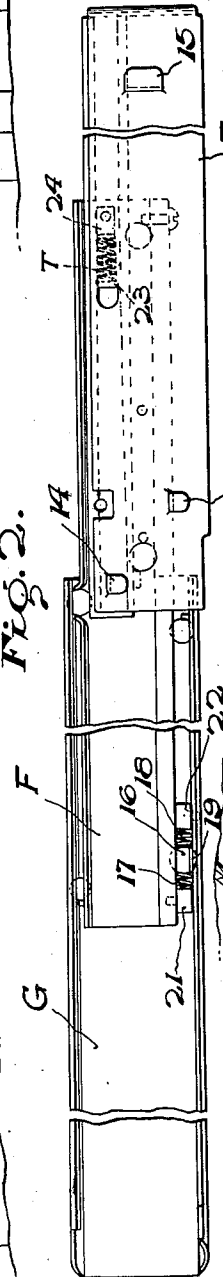


FIG. 3.

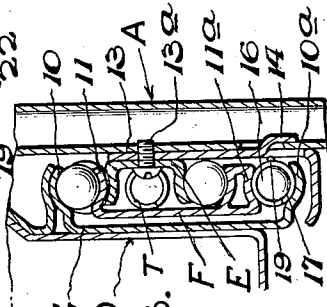


FIG. 4.



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DRAWER SUSPENSION

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2 Claims. (Cl. 312-339)

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This invention relates to an improvement in progressive drawer suspensions of the type, for example, generally illustrated by Patent No. 1,963,220, issued to Alfred H. Anderson on June 19, 1934.

While the primary function of a suspension is to support the drawer when pulled out of the cabinet, nevertheless, an equally important feature is to so mount the various parts that the drawer will slide freely and with little effort on the part of the operator, particularly when loaded. Balls or rollers riding in metal track portions have accomplished this result very efficiently but not without the possibility that when the suspension parts progress to the limit of their inward or outward movement, the impact resulting from stopping such movement produces noise which, because of the inherent resonance of a metal cabinet, is often amplified to the point of being objectionable. The shock or impact due to pushing the drawer inwardly can more readily be taken care of than the shock or impact incident to the movement of the drawer to its full outward position. In other words, the inner end of the case channel secured to the inside face of the case or cabinet wall can be readily provided with a substantial leather or equivalent abutment, as shown in the aforesaid patent, to absorb shock or impact incident to the full inward movement of both the floating intermediate member and the drawer supporting channel, while, on the other hand, when the drawer channel and the intermediate member move outwardly, the limitations as to space and location of such abutments as are necessary reduces them to inadequate size or area. As shown for example in the Anderson patent, the stops or abutments on the intermediate member and drawer channel which determine the outward limit of movement of these parts are provided with a multiplicity of relatively small discs or tips of leather or the like. When this type of cushioning means is new it is satisfactory. However, it soon becomes deformed, compacted or crushed, and loses its cushioning qualities, after which it completely fails in its object or purpose. Replacement, while possible, is impractical because the drawers must be removed from the cabinet and the entire suspension taken apart and reserviced. As a field operation this is impractical because of the time and expense involved, and, as will be readily apparent, it is not feasible to return the cabinets to the factory.

Accordingly, a primary object of the invention

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is to overcome the objections noted, and effectively reduce shock and noise occurring at the end of the full outward movement of the suspension to a substantially inaudible "click" even if the drawer gains momentum as it is pulled out, whether loaded or unloaded. To this end, the invention includes floating metallic coil springs confined within the mating track portions of the channels and cooperating with abutments thereon to absorb shock. That is to say, the invention includes metallic shock absorber units arranged between abutments on the drawer channel and the intermediate channel and also on the intermediate channel and the case channel to absorb shock when the drawer is fully extended. In the first instance there is provided a floating dual spring unit carried by a ball which rides on tracks between facing abutments on the intermediate member and drawer channel in such a manner that the cushioning means is held captive by the ball and floats or travels therewith, immediately to be ready to absorb shock when required; and, in the second instance there is provided a floating coil spring, free of ball connection, which is engaged by opposed abutments on the intermediate member and the case channel. In both instances the floating spring shock absorber units, upon being compressed by approaching abutments, reduce shock and eliminate objectionable noise. Moreover, the present invention eliminates the inadequate non-metallic abutments heretofore used, and further contributes materially to the ease of assembly of the parts of the suspension. In practice the metallic shock absorbing units will last as long as the cabinet itself.

With the above and other objects and advantages in view, which will appear as the nature of the invention is better understood, the invention consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

A preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:

Figure 1 is a sectional view of a portion of a cabinet and a portion of a drawer mounted on a typical suspension, the latter being shown in elevation;

Figure 2 is a side elevation of the drawer suspension as it appears when pulled out to drawer open position, the shock absorbers of the present

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invention being shown between the abutments on the drawer channel and the intermediate member;

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a detail view of the ball carried shock absorbing unit;

Figure 5 is a detail elevation partly broken away to show the floating spring functioning between the rear of the case channel and the intermediate channel.

Before proceeding to a detail description of the general environment of the invention, it may be pointed out that the new floating shock absorbing or cushioning units are designated generally as S and T.

Figure 1 shows a portion of a cabinet generally designated as A, a conventional drawer D, and a drawer suspension comprised of a cabinet fixed case channel or track E, a drawer supporting channel or slide G, and an intermediate member F mounted on ball bearings between the case channel E and the drawer channel G. The case channel E is secured to the side wall 13 of the cabinet A by a screw 13^a and by the tabs 14 and 15. Each longitudinal edge of the channel elements E, F and G are formed with grooved flanges 10—10^a, 11—11^a and 12—12^a, respectively, which cooperate to serve as ball bearing races or runways, as will be seen from Figure 3.

The floating shock absorber unit S is carried by and with one of the lower balls 16. Said unit comprises a spring wire formed into a pair of diametrically spaced apart helices or coils 17 and 18 joined by a ball receiving yoke portion in the form of a substantially U-shaped center part 19 which forms a pocket to receive the ball so that the upper and lower peripheral portions thereof freely roll on their related track surfaces while the entire unit is held captive relative to the migratory ball in its rotary and linear movements. The ball bearing 16, or its equivalent, is mounted, for example, to traverse the runways 10^a and 11^a of the drawer channel G and the intermediate member F, until the coils 17 and 18 are engaged by the abutments 21 and 22 carried respectively by the said channel G and the intermediate member F. Thus, when the suspension is extended as shown in Figure 2, the helices 17 and 18 are pinched between these two abutments and the coils in this manner become compressed to act as yieldable stops to partially relieve the shock of the drawer pull-out operation.

Therefore, the unit S serves as a double acting stop for absorbing that part of the shock between the drawer channel and the intermediate member. The remainder of the shock of impact is simultaneously absorbed by the spring T operating between abutments on the intermediate and case channels as will now appear.

The shock absorbing unit T is a coil spring floatingly confined between the spaced track forming portions x of the case member E and the adjacent wall of the intermediate member F, said unit adapted to be compressed between the abutment 23 carried by the case member and the abutment 24 on the intermediate member when these members reach their outward limit of movement. Thus, when the drawer is pulled fully out of the cabinet and the drawer channel G and intermediate member F are at their outward limits of movement they are cushioned by both of the compression spring shock absorber units S and T. In this way adequate and ample

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shock absorbing means is provided between all three members of the suspension, and the capacity for such absorption is far greater than anything heretofore used for this purpose.

While the shock absorber of the present invention is shown in connection with a type of suspension using ball bearings and grooved track, nevertheless, it will be understood that the invention is equally useful in suspensions using a conventional roller with flat tread portions riding on flat track sections. Also, the floating or traveling shock absorber unit which moves with the ball is shown as being used with only one rolling element of the suspension, but, it should be pointed out that this is merely by way of example, since the unit can be used with any one rolling element and any opposed pairs of abutments.

From the foregoing, it will be seen that the present invention provides a drawer suspension wherein adequate means is provided to arrest the limiting movement of the drawer substantially without shock and a minimum of noise, while at the same time said means is durable and efficient. Since the opposite coils extend to both sides of the ball and are in compressible relation to the ball or rolling element, as well as the abutments, they are not subjected to tensile strains.

Without further description it is thought that the features and advantages of the invention will be apparent to those skilled in the art, and it will, of course, be understood that changes in the form, proportion and minor details of construction may be resorted to without departing from the concept of the invention and the scope of the appended claims.

I claim:

1. In a drawer suspension unit having a longitudinal guide track secured to the drawer housing, a longitudinal drawer channel fixed to the side of the drawer, an intermediate channel between said drawer channel and said track, anti-friction ball bearings between said channels and between the intermediate channel and the guide track, a first abutment member between the forward end of the intermediate channel and the drawer channel, said abutment member being secured to the intermediate channel, a second abutment member disposed between said channel and secured to the drawer channel in longitudinal alignment with the first abutment member, one of said ball bearings being disposed between said abutments, a normally untensioned coil spring between said ball bearing and each abutment, and means connecting the coil springs to each other and to said ball bearing.

2. In a drawer suspension unit having a longitudinal guide track secured to the drawer housing, said track having upper and lower runners spaced apart from each other, a longitudinal drawer channel fixed to the side of the drawer, an intermediate channel between said drawer channel and said track, anti-friction ball bearings between said channels and between the intermediate channel and the guide track, a normally untensioned coil spring longitudinally disposed in the space between said runners, a first abutment carried by said track and a second abutment carried by the intermediate channel, said abutments being adapted to engage the opposite ends of the coil spring when the drawer is in its fully extended position, a third abutment between the forward end of the inter-

mediate channel and the drawer channel, said last mentioned abutment being secured to the intermediate channel, a fourth abutment disposed between said channels and secured to the drawer channel in longitudinal alignment with the third abutment, one of said ball bearings being between said last mentioned abutments, a normally untensioned coil spring between said ball bearing and each of said last mentioned abutments, and means connecting the last mentioned coil springs to each other and to said ball bearing.

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