July 27, 1965 R. M. WHITTOM 3,196,480

COUNTER-BALANCING MECHANISM FOR STEREO SETS

Filed Dec. 14, 1962 2 Sheets-Sheet 1

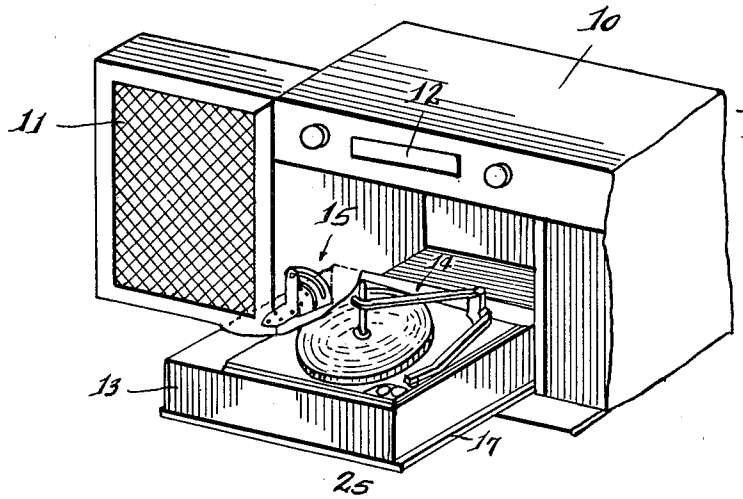


Fig. 1.

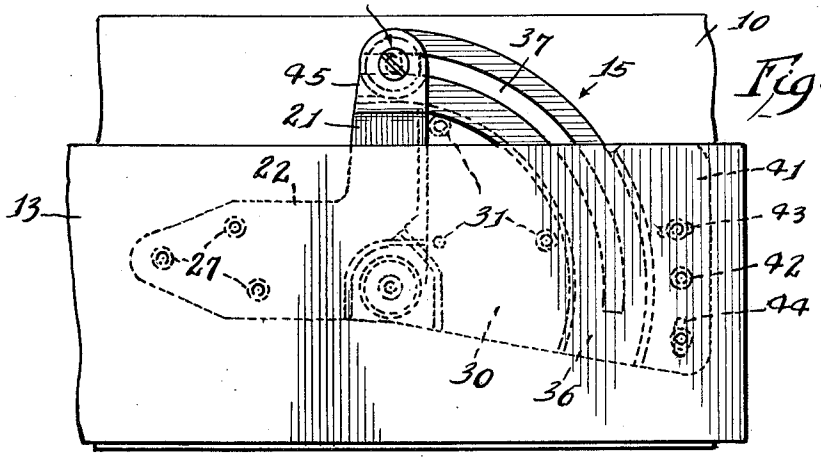


Fig. 2.

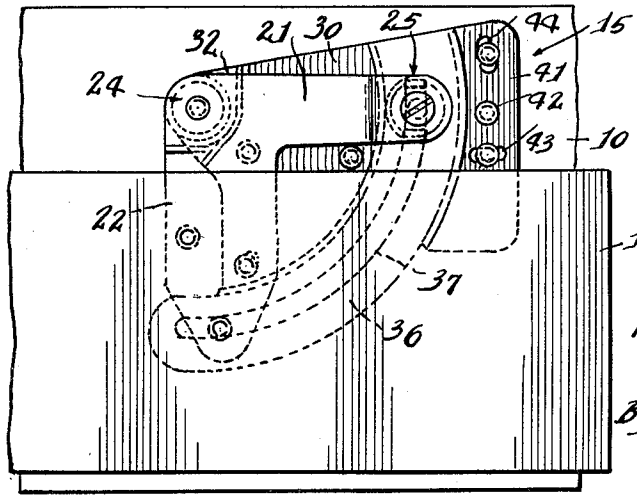


Fig. 3.

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COUNTER-BALANCING MECHANISM FOR STEREO SETS

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Fig. 4.

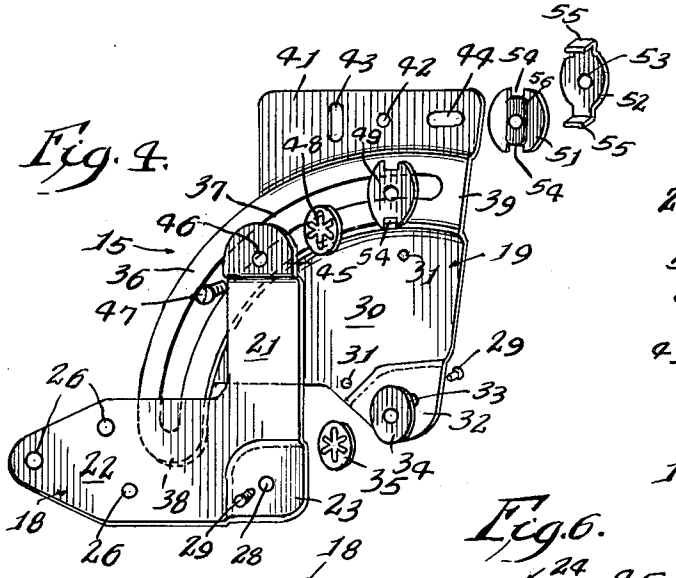


Fig. 5.

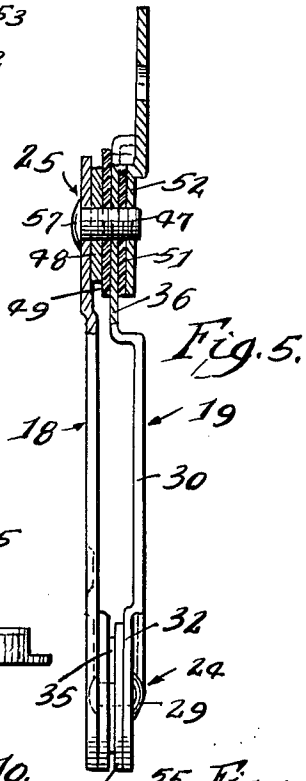


Fig. 6.

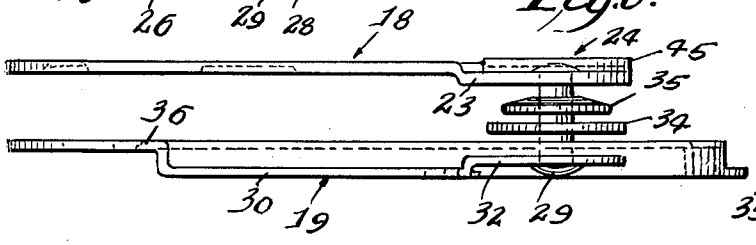


Fig. 8.

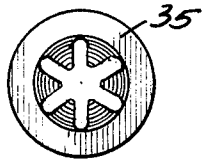


Fig. 9.

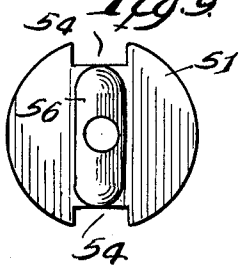


Fig. 10.

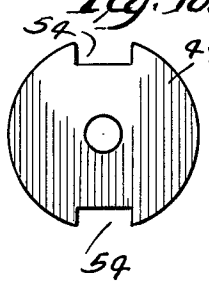


Fig. 11.

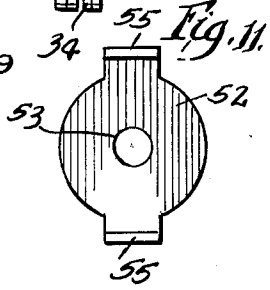
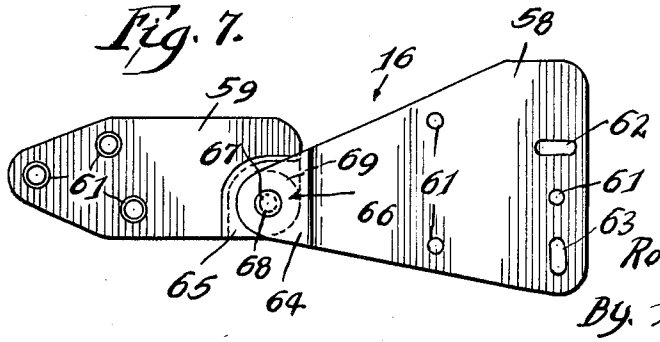


Fig. 7.



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COUNTER-BALANCING MECHANISM FOR STEREO SETS

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Filed Dec. 14, 1962, Ser. No. 244,763
3 Claims. (Cl. 16—141)

The present invention relates to a counter-balancing mechanism for high fidelity and stereophonic sets and more particularly to a tilting hinge support for the record changer or turntable of a wall-hung or table top stereophonic phonograph or radio-phonograph combination.

In the recent trend to wall-hung shelves or pole or frame supported wall units; desks, book shelves and cabinets are being provided in a more compact form for use in such wall units to decrease the weight and space requirements. Likewise, stereophonic phonographs or stereo radio-phonograph combinations are being designed to be hung on the wall or fit in a bookcase or on a table top.

An illustrative stereophonic unit presents a compact appearance when closed having swing-out speakers forming doors for the cabinet to enclose the stereo components in the housing; which speakers are pivoted open for operation and may be removed from their hinges to provide greater sound separation. The pre-amplifier and amplifier, and the radio where desired, are mounted in the housing with the control knobs and dials exposed and the changer or turntable is mounted in a base which pivots or flips down from a vertical position exposing only the wood panel or door on the bottom of the base to a horizontal position to allow playing of records.

An important object of the present invention is the provision of a novel counter-balancing pivot mechanism for a flip-down or pivoted record changer or turntable in a compact stereo console which will create a holding factor or friction that will prevent the base and changer or turntable from falling free when the door on the base is opened. As the changer or turntable has a considerable amount of delicate mechanism and the turntable generally is of substantial weight, the holding force in the hinge mechanism must have positive effectiveness throughout the arc of travel of the base.

Another object of the present invention is the provision of a counter-balancing hinge or pivot mechanism which positively limits the arc of travel of the base in opening or closing movement. The mechanism includes a cabinet bracket having an arcuate slot of approximately 90° and a changer or turntable base bracket having an arm with a slide pivot moving in said slot.

A further object of the present invention is the provision of a counter-balancing pivot mechanism having an adjustable friction support to accommodate any variation in the weight of the changer or turntable assembly, and for convenience and ease of opening or closing the changer base in the cabinet. The slide pivot moving in the arcuate slot includes suitable friction washers to obtain maximum frictional contact and an adjusting screw acting in cooperation with a screw plate can adjust the degree of frictional contact of the washers contacting the cabinet bracket.

The present invention also comprehends the provision of a counter-balancing pivot mechanism which can be installed on the cabinet to provide either an external or an internal pivot for the changer base.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

In the drawings:

FIGURE 1 is a perspective view of a stereo console having a changer or turntable base pivotally mounted in the cabinet with the counter-balancing pivot of the present invention.

FIG. 2 is an enlarged partial side elevational view of the changer base in the cabinet with an internal pivot for the counter-balancing mechanism.

FIG. 3 is a view similar to FIG. 2 except that the changer base is mounted with an external pivot.

FIG. 4 is an exploded perspective view of the counter-balancing pivot mechanism.

FIG. 5 is a side elevational view, partially in cross section, of the pivot mechanism showing the cooperation between the various elements.

FIG. 6 is an exploded side view of the pivotal connection of the counter-balancing mechanism.

FIG. 7 is a front elevational view of the pivotal connection on the changer base opposite to the mechanism of FIGS. 2 to 6.

FIG. 8 is a front elevational view of a spring washer.

FIG. 9 is a front elevational view of a suitable molded friction washer.

FIG. 10 is a front elevational view of a suitable friction washer.

FIG. 11 is a front elevational view of a screw plate used in the slide pivot.

Referring more particularly to the drawings wherein is shown an illustrative embodiment of the present invention, FIG. 1 shows a portion of a stereo cabinet **10** having swingout stereo speaker **11**, an FM or AM-FM tuner or radio **12** and a pivotal or tiltable base **13** for a record changer **14**. It is understood that a turntable and tone arm could be substituted for the changer assembly. The amplifier and controls therefor as well as a second speaker are housed in the portion of the cabinet **10** not shown in FIG. 1.

A counter-balancing frictional pivot mechanism **15** is mounted on one side of the base **13** and a pivotal bracket **16** (FIG. 7) is mounted on the opposite side of the changer base so that the base **13** and the changer **14** tilt or pivot about a horizontal axis from the position shown in FIG. 1 to a second position where the base is completely enclosed in the cabinet **10** with only the bottom of the base exposed providing a door panel **17** for the cabinet.

This counter-balancing pivot mechanism **15** is more clearly shown in FIGS. 4 and 5 includes a changer base bracket **18** and a cabinet bracket **19**. The changer base bracket has two arms **21** and **22** formed at right angles to each other with an offset portion **23** at the corner of the junction of the arms for a rivet or pivot pin **24**. The arm **21** is attached to a slide pivot **25** to be later described and the arm **22** contains spaced openings **26** adapted to receive suitable securing means **27** to secure this bracket to the changer base **13**. The offset portion **23** has an opening **28** adapted to receive a rivet **29** to act as the pivot for the changer base.

The cabinet bracket **19** includes a central portion **30** with openings **31** for suitable securing means and having an offset area **32** at one corner thereof with an opening **33** to receive the rivet **29**. A suitable friction washer **34** and a spring washer **35** are mounted on the rivet **29** and sandwiched between the offset portions **23** and **32** of the brackets **18** and **19**, respectively, with the rivet **29** tightly secured to provide maximum friction. The friction washer may be formed of any suitable material such as a plastic as nylon.

Opposite the offset portion **32** is an arcuate offset portion **36** extending over an arc of more than 90° about a radius having the rivet **29** as the center. This offset portion **36** has an arcuate slot **37** centrally located therein

and extending to adjacent the ends 38 and 39 thereof. Beyond this offset portion 36 is a generally rectangular area 41 lying in the same plane as the portion 30 and includes an opening 42, a horizontally arranged elongated opening or slot 43, and a vertically arranged elongated opening or slot 44 for receiving suitable securing means; the openings 43 and 44 providing limited horizontal and vertical adjustment of the bracket 19 in the cabinet 10.

The arm 21 has a slightly offset end 45 containing an opening 46 to receive the adjusting screw 47 of the pivotal slide. Although an adjusting screw 47 is shown in the drawings, it is also contemplated that a rivet might be utilized to form a permanent connection. Between the offset end 45 and the arcuate offset portion 36 of the cabinet bracket 19 are disposed a spring washer 48 and a friction washer 49. On the opposite side of the bracket 19 are a molded friction washer 51 and a screw plate 52 having a tapped opening 53. Both the friction washer 49 and the molded friction washer 51 are preferably formed of nylon and have oppositely disposed peripheral notches 54 to receive the laterally projecting arms 55 of the screw plate 52; said arms extending through the arcuate slot 37. Further, the molded washer 51 has a raised elongated area or embossment 56 extending between the notches 54 and adapted to be received within the slot 37 to aid in the frictional forces holding the base 13 in a fixed position.

The adjusting screw 47 has a slotted head 57 to be engaged by a suitable driver blade and the screw is rotated relative to the screw plate 52 to tighten or loosen the slide pivot and thus adjust the applied friction; rotation of the screw plate 52 being prevented by the arms 55 extending through the slot 37.

FIGS. 2 and 3 show the manner in which this pivot mechanism 15 may be attached to the changer base 13 and to the cabinet 10. FIG. 2 relates to the counter-balancing mechanism with an internal pivot where the pivot 24 is positioned between the base 13 and the cabinet wall 10 and is not exposed in either open or closed position. FIG. 3, on the other hand, shows the pivot 24 to be an external pivot which is not concealed by the changer base 13 in either open or closed position. The bracket as shown in FIG. 3, however, is a mirror image of FIG. 2 and mounted in substantially the same manner on the cabinet and changer base.

A pivotal bracket 16 which does not provide for any frictional adjustment is mounted on the opposite side of the changer base 13 and includes a cabinet bracket plate 58 and a changer base plate 59, each having openings 61 for suitable securing means. The plate 58 also has a horizontal slot 62 and a vertical slot 63 similar to the slots 43 and 44 of the bracket 19 for purposes of limited adjustment. The plates 58 and 59 and adjacent offset portions 64 and 65, respectively, for a pivot 66 with openings 67 in the portions 64 and 65 adapted to receive a rivet 68. A suitable friction washer 69 is sandwiched between the offset portions 64 and 65 to provide frictional forces resisting relative movement between the plates.

While the improvement has been shown and described as being advantageously applicable to the tilting changer base of a stereo set, it is not my intent or desire to unnecessarily limit the scope or the utility of the improved features by virtue of this illustrative embodiment.

Having thus disclosed the invention, I claim:

1. A counter-balancing mechanism for supporting one member for pivotal movement relative to a second member, comprising a stationary bracket having a plate secured to the second member, an outwardly offset arcuate portion on the plate having an arcuate slot formed therein, an outwardly offset corner of the plate generally opposite the offset portion having an opening therein providing the center of curvature for said arcuate slot, a movable bracket secured to the first member including two arms in a common plane and disposed at approximate right angles to each other, an offset portion at the junction of the two arms and having an opening aligned with the opening in the corner of the stationary bracket, pivotal means extending through the aligned openings joining the brackets together, a friction washer positioned between the offset portions and on the pivotal means to resist rotation between the brackets, one of said arms being secured to the first member, the second arm terminating in a free end having an opening aligned with the arcuate slot, and a slide pivot secured to the second arm and the offset arcuate portion on the stationary bracket including a friction washer sandwiched between the second arm and the offset arcuate portion and having a central opening aligned with said opening in the second arm and the slot, a second friction washer having a central opening aligned with the slot, said second washer being positioned behind the arcuate portion of the stationary bracket, a screw plate having a threaded opening aligned with the arcuate slot, said screw plate abutting said second friction washer, and an adjusting screw extending through the opening in said second arm, first friction washer, arcuate slot and second friction washer and threadingly engaging the opening in said screw plate to adjust the frictional resistance retarding movement of the slide pivot.

2. A counter-balancing mechanism as set forth in claim 1, in which said slide pivot moves in said arcuate slot as the movable bracket rotates about said pivot means, said first friction washer having a pair of oppositely disposed peripheral notches therein aligned with said arcuate slot, said second friction washer having an elongated embossment and a pair of oppositely disposed peripheral notches at the ends of the embossment, said embossment received within and said notches aligned with said arcuate slot, and said screw plate having a pair of oppositely disposed laterally projecting legs on the periphery of the plate, said legs extending through said peripheral notches on the second friction washer, said arcuate slot and the notches in the first friction washer to provide a generally unitary assembly.

3. A counter-balancing mechanism as set forth in claim 1, in which said offset portion at the junction of the two arms is offset toward said stationary bracket, and said arm cooperating with the slide pivot has the outer end offset outwardly away from the stationary bracket.

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