June 11, 1963 O. W. TURNER 3,093,258

COVER LIFT

Filed June 9, 1960

Fig. 1.

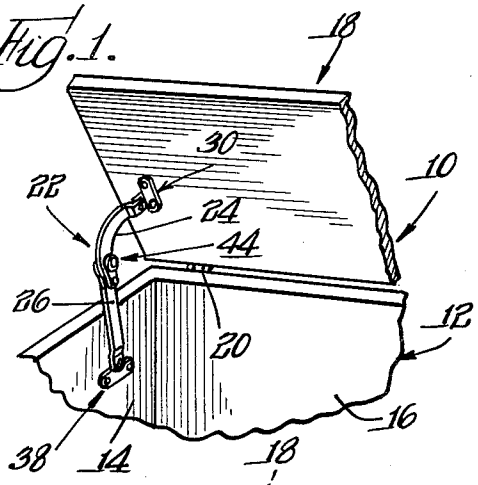
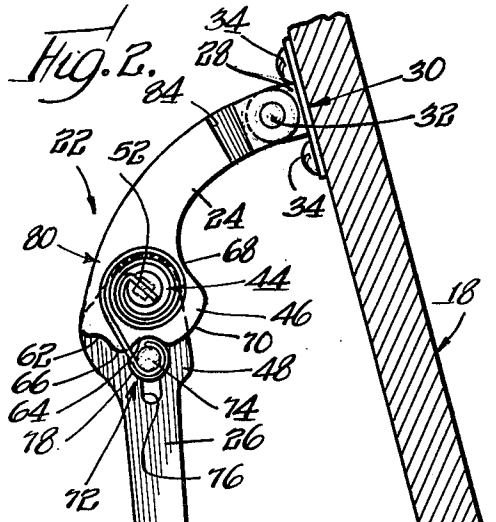


Fig. 2.



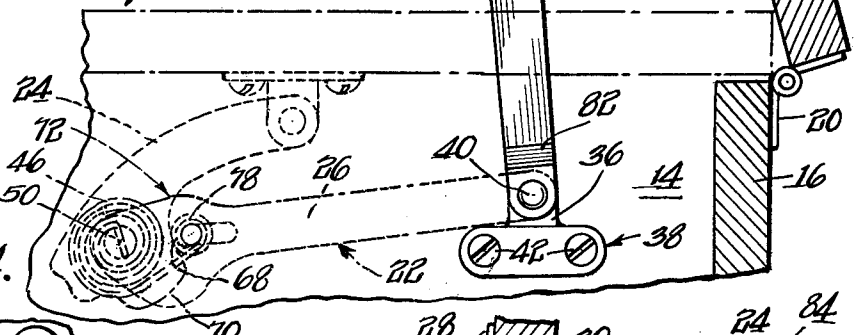


Fig. 4.

Fig. 3.

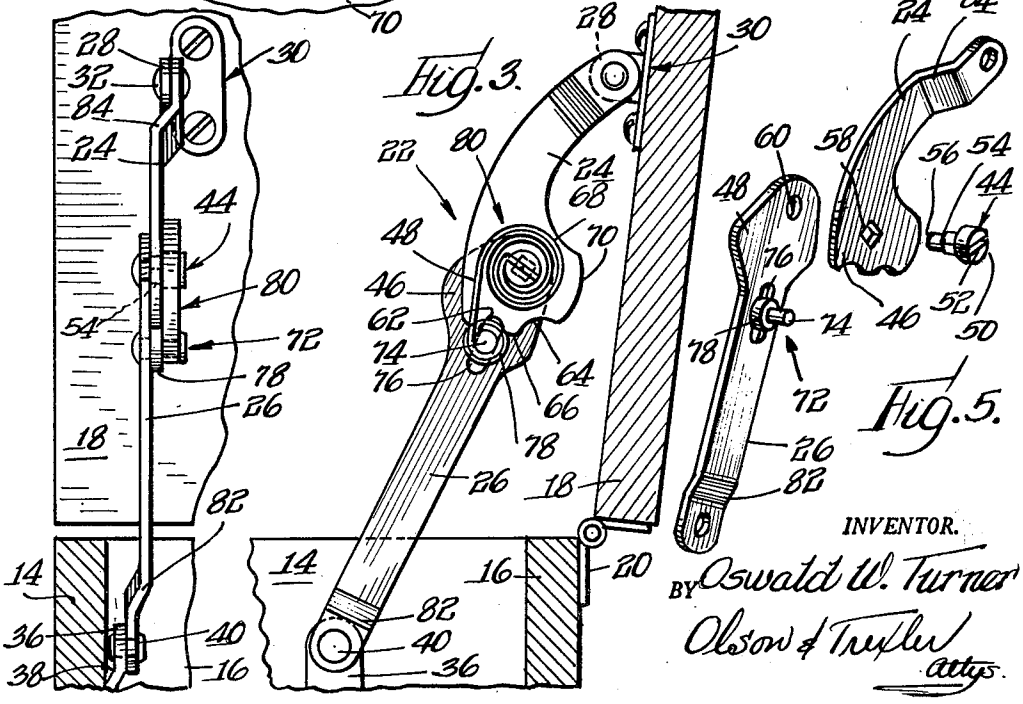


Fig. 5.

INVENTOR.

BY Oswald W. Turner

Olson & Trexler

attys.

United States Patent Office

3,093,258

Patented June 11, 1963

1

3,093,258

COVER LIFT

Oswald W. Turner, Rte. 2, Box 145, Antioch, Ill.

Filed June 9, 1960, Ser. No. 35,086

4 Claims. (Cl. 217—60)

This invention relates generally to cover lifts of a type for use in a cabinet assembly and especially to cover lifts which are adapted to retain the hinged cover of a cabinet assembly in open and closed positions.

Cover lifts are advantageously installed in the cabinet assemblies used to house phonographs and the like; and these cover lifts are commonly arranged to lock the hinged cover in one or more positions. The resultant, positive positioning of the cover prevents its inadvertent operation from damaging delicate electrical and mechanical components of the phonograph, either by shock or by actual physical contact. Positive positioning of the hinged cover, particularly in open positions, is also desirable in order to prevent a sudden closing of the cover from trapping and injuring the fingers of persons operating the phonograph.

Cover lifts of the type described have heretofore commonly comprised an arm pivotally connected to the hinged cover and arranged to cam a coil spring contained within a housing, the housing being joined between the otherwise free end of the arm and some portion of the cabinet. Structures of this nature, while enjoying considerable utility and popularity, have proved expensive to manufacture and, accordingly, have been somewhat restricted in their fields of application.

Therefore, a general object of the present invention is to provide an improved cover lift which overcomes the limitations of the prior art by being simple and inexpensive to manufacture.

A more general object of the invention is to provide a new and improved cover lift which is adapted to retain the hinged cover of a cabinet in open and closed positions.

Another object of the invention is to provide a cover lift which positively locks a hinged cover into open and closed positions.

Yet another object of the invention is to provide a cover lift which positively locks the hinged cover into a special extended position for use during repairs of the phonograph.

A further object of the invention is to provide a cover lift which is easy to install and use.

Other objects and features of the invention pertain to the particular structure and arrangements whereby the above objects are attained.

A structure in accord with the invention includes a first arm pivotally connectable at one end to the lower surface of a hinged cover adjacent one edge thereof and defining a disc cam element at the opposite end; a second arm pivotally connected to an inner face of a sidewall of the cabinet confronting the first arm; stud means pivotally connecting the arms at their otherwise free ends, being fixed with respect to the first arm and rotatable with respect to the second arm; cam follower means slidably mounted on the second arm; and means biasing the follower means into coaction with the cam element, the cam element defining valleys arcuately spaced and associated respectively with the open and closed positions of the hinged cover.

2

In order that the principle of the invention may be readily understood, a single embodiment thereof applied to a phonograph cabinet, but to which the application is not to be restricted, is shown in the accompanying drawing wherein:

FIG. 1 is a perspective view of one corner of a phonograph cabinet showing the hinged cover raised to reveal a cover lift constructed in accordance with the present invention;

FIG. 2 is an enlarged view in side elevation of the arrangement of FIG. 1, one open position of the cover and of the cover lift being shown in solid outline and the closed position of the cover and of the cover lift being shown in broken outline;

FIG. 3 is a somewhat reduced view similar to FIG. 2 but illustrating the cover and the cover lift in the extended position intended for use during repairing of the phonograph;

FIG. 4 is a front-elevational view of the showing of FIG. 3; and

FIG. 5 is an exploded perspective view showing the foldable arms, the stud means and the cam follower means of the invention.

Referring now in detail to the drawing, specifically to FIG. 1, a phonograph cabinet assembly indicated generally by the numeral 10 will be seen to include a cabinet body 12 having a sidewall 14 and a backwall 16. A cover 18 is swingably mounted over the cabinet body 12 by hinges 20, hinges 20 being fastened to adjacently disposed surfaces of cover 18 and backwall 16.

A cover lift shown generally at 22 is affixed between sidewall 14 and cover 18 in order to retain the hinged cover in either of two open positions or in a closed position, as will be described more fully hereinafter. According to the specific showing of FIG. 2, cover lift 22 includes an arm 24 and an arm 26. One end of arm 24 is pivotally connected to an upstanding tab portion 28 of a mounting bracket 30 by means of a rivet 32, bracket 30 being secured to the lower surface of cover 18 adjacent one edge thereof by suitable means such as the wood screws 34.

In somewhat similar manner, one end of the arm 26 is pivotally connected to the offset tab portion 36 of a mounting bracket 38 by means of a rivet 40, bracket 38 being affixed to the inner face of sidewall 14 in alignment generally beneath bracket 30 and arm 24. Wood screws 42 or other suitable fasteners are employed in securing bracket 38 to the sidewall 14.

The otherwise free ends of arms 24 and 26 are pivotally connected by a stud means 44. Adjacent this pivotal connection, arm 24 defines a disc cam element 46 and arm 26 defines an enlarged, heel element 48. As is well shown in FIG. 5, the stud means 44 includes a head 50 incorporating a slot 52, a shank portion 54 of square cross-section and a shank portion 56 of round cross-section. The shank portion 54 is arranged to enter a cooperatively shaped hole 58 in the cam element 46 thereby fixing the stud means 44 with respect to the arm 24. The shank portion 56 is arranged to enter freely a bore 60 in the heel portion 48, journalling arm 26 with respect to the stud means 44.

In compliance with a feature of the invention, the disc cam element 46 is provided with a valley 62 and with a valley 64, valleys 62 and 64 being arcuately spaced apart

by a short elevation 66. The valleys 62 and 64 are also arranged to define respectively the extended open position and the normal open position of cover 18, as will become apparent hereinafter. The disc cam element 46 additionally includes a valley 68 which is arcuately spaced apart from valley 64 by an elongated elevation 70, valley 68 being arranged to define the closed position of cover 18.

Cooperating with the cam element 46 in establishing positive positioning of the hinged cover 18 is a cam follower means indicated generally at 72; and with reference again to FIG. 5, the cam follower means 72 will be seen to include a pin 74 which projects slidably through an elongated slot 76 formed in the arm 26 adjacent the heel portion 48. Cam follower means 72 also includes a wheel 78 which is rotatably mounted on the pin 74 to be disposed coplanarly with the disc cam element 48 in coaction therewith; and in accordance with an important feature of the invention, cam follower means 72 is biased against the disc cam element 46 by a helically wound torsion spring 80.

One end of spring 80 is fixedly situated in the slot 52 of stud means 44 while the other end of spring 80 is secured about the free end of pin 74 confining the wheel 78 therebeneath. It is to be observed that spring 80 is capable of being wound or unwound slightly while maintaining the bias of cam follower means 72 against the cam element 46, this winding and unwinding being associated with reciprocal movement of pin 74 in the slot 76 as the wheel 78 rides over the valleys and elevations of the cam element 46.

In accordance with another feature of the invention, the pivotal connections made respectively between bracket 38 and arm 26, between arm 26 and arm 24 and between arm 24 and bracket 30 are progressively laterally offset from one another; and turning now to FIG. 4, the tab portion 36 will be seen offset slightly from the main body of the bracket 38. Likewise, arm 26 is provided with a lateral step 82 and the arm 24 is provided with a lateral step 84 in order to achieve the progressively laterally offsetting relationship between the several pivotal connections. This arrangement of the cover lift 22 has been found to be permissive of secure fastening of the brackets 30 and 38 sufficiently away from the edges of cover 18 and sidewall 14 to reduce the possibility of tearing the screws 34 and 42 out of those members.

Having thus described one construction of the invention, it is important now to state how the illustrated embodiment operates. When the cover lift 22 is installed between cabinet body 12 and cover 18 as shown and when the cover 18 is disposed in its closed position as is illustrated in broken outline in FIG. 2, the wheel 78 of cam follower means 72 will be situated in the valley 68 of disc cam element 46. So positioned, the curvature of valley 68 will tend to draw the cover 18 closely over the cabinet body 12. Furthermore, the elevation 70 will serve to locate cover 18 positively in this closed position.

When it is desired to gain access to the interior of the cabinet body 12, the cover 18 will be manually lifted to swing about the axis of hinges 20. This raising of the cover 18 will result in an unfolding of the arms 24 and 26. At the same time, the force used in raising the cover 18 will cause wheel 78 to ride out of the valley 68 onto the elevation 70, spring 80 opposing this movement and slot 76 permitting the necessary dislocation of pin 74. As the cover 18 is raised, wheel 78 will ride along the elevation 70 until it encounters the precipice preceding valley 64. Further application of raising force on the cover 18 will allow wheel 78 to enter the valley 64 under the influence of spring 80. This configuration of the cover lift 22 is shown in FIG. 2 in solid outline. It is to be noted with regard to this normal open position that the wheel 78 of cam follower means 72 is positioned positively in valley 64 between the elevations 66 and 70.

Closing of the cover 18 from the normal open position to the closed position described hereinabove will be achieved by reversing the foregoing procedural steps.

Under those circumstances wherein it is desired to have complete and ready access to the interior of cabnet body 12, additional raising force may be applied to the cover 18 from its normal open position whereby to urge wheel 78 up onto the elevation 66 and thence into the valley 62. This latter arrangement of the cover lift 22 is illustrated generally in FIG. 3. As will be recognized, the cover 18 is also positively located in this extended position by virtue of the elevations situated on either side of the valley 62 and by the biasing force of spring 80 tending to hold the wheel 78 within the confines of valley 62. The slidable motion of the pin 74 that is permitted by its arrangement in slot 76, of course, allows the translational movement of cam follower means 72 which is necessary to establishing wheel 78 in valley 62 and to effecting its removal to the adjacent valley 64 upon return of the cover from the extended position.

The specific example herein shown and described is intended to be illustrative only. Various changes in structure will, no doubt, occur to those skilled in the art; and these changes are to be understood as forming a part of this invention insofar as they fall within the spirit and scope of the appended claims.

The invention is claimed as follows:

1. In an assembly including an enclosure and a hinged cover therefor; the provision of a cover support adapted to retain the cover in open and closed positions with respect to the enclosure, and comprising a first arm pivotally connected at one end to the cover, a second arm pivotally connected at one end to the enclosure, the opposite ends of each arm being lapped relative to each other, a pivot stud pivotally interconnecting the lapped ends of the arms, one of said arms having cam means at the lapping end thereof and the other of said arms having a slot extending longitudinally thereof, a cam follower projection and means slidably mounting the same on the said other arm adjacent the said cam means and projecting through said slot for cooperation therewith, spring means connected to said cam follower projection and said pivot stud with the end connected to the cam follower projection being movable in unison with said cam follower projection in said slot and in the direction of sliding movement thereof as the lapped ends of the arms are moved during movement of the cover between open and closed positions, said spring means acting between the pivot stud and the cam follower projection to constantly bias the cam follower projection into cooperative engagement with the cam means for holding the cover in its various positions while permitting the cam follower to ride on said cam means upon the application of force to the cover in a direction to effect opening or closing thereof.

2. In an assembly as claimed in claim 1, wherein the cam follower projection includes a pin slidably projecting through a slot in the said other arm and a wheel rotatably mounted on said pin for cooperation with said cam means.

3. In an assembly as claimed in claim 1, wherein the cam means defines arcuately spaced valleys with which the said cam follower projection cooperates in holding the cover in open and closed positions.

4. In an assembly including an enclosure and a hinged cover therefor; the provision of a cover support adapted to retain the cover in open and closed positions with respect to the enclosure, and comprising a first arm pivotally connected at one end to the cover, a second arm pivotally connected at one end to the enclosure, the opposite ends of each arm being lapped relative to each other, a pivot stud pivotally interconnecting the lapped ends of the arms, one of said arms having cam means at the lapping end thereof, a cam follower and means slidably mounting the same on the said other arm adjacent the said cam means for cooperation therewith, a helical torsion spring having the ends thereof connected respective-

ly to said cam follower and said pivot stud with the end connected to the cam follower being movable in unison with said cam follower and in the direction of sliding movement thereof as the lapped ends of the arms are moved during movement of the cover between open and closed positions, said spring means acting between the pivot stud and the cam follower to constantly bias the cam follower projection into cooperative engagement with the cam means for holding the cover in its various positions while permitting the cam follower to ride on said cam means upon the application of force to the cover in a direction to effect opening or closing thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,779,281	Levine	Oct. 21, 1930
2,205,682	Claud-Mantle	June 25, 1940
2,212,977	De Boer et al.	Aug. 27, 1940
2,992,451	Schonitzer et al.	July 18, 1961

FOREIGN PATENTS

527,160	Great Britain	Oct. 3, 1940