March 12, 1968 HIDEKI ABE 3,372,965

DEVICE FOR OPENING OR CLOSING TWO DOORS SIMULTANEOUSLY

Filed Feb. 15, 1966

Fig. 1

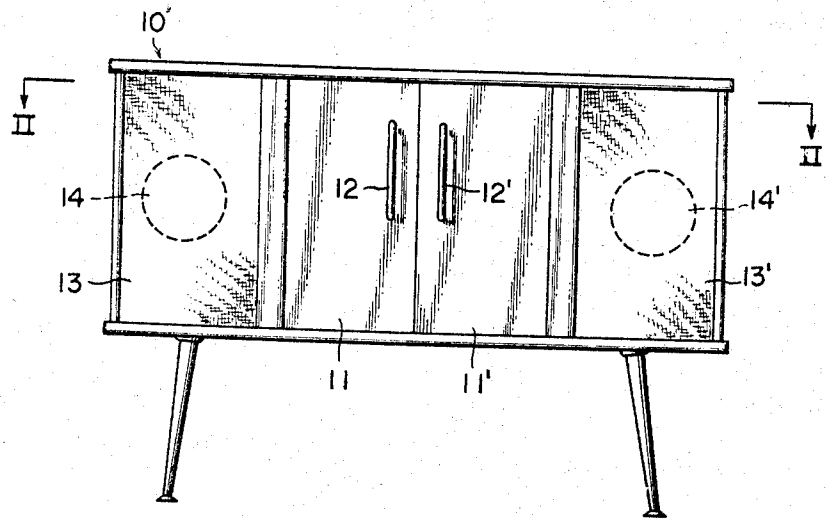


Fig. 2

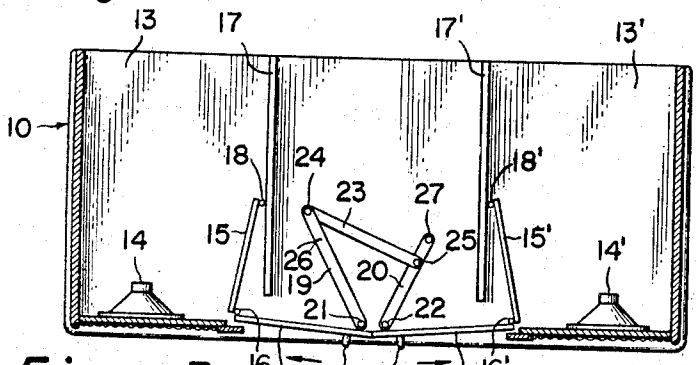
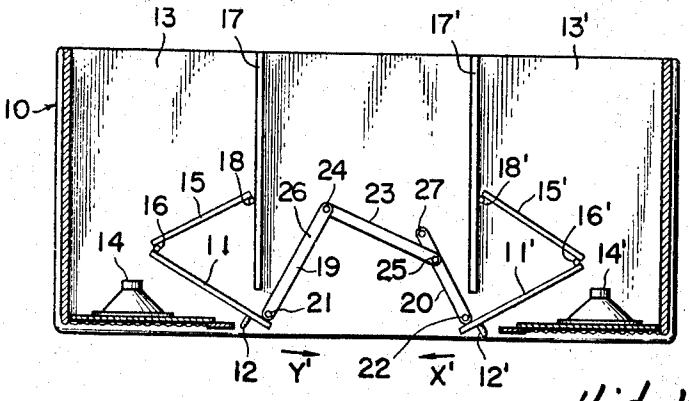


Fig. 3



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3,372,965

Patented Mar. 12, 1968

3,372,965

DEVICE FOR OPENING OR CLOSING TWO DOORS SIMULTANEOUSLY

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Filed Feb. 15, 1966, Ser. No. 527,569
Claims priority, application Japan, Feb. 25, 1965 (utility model), 40/14,298
4 Claims. (Cl. 312—275)

ABSTRACT OF THE DISCLOSURE

A device for simultaneously opening or closing two doors comprising first and second adjacent doors, first and second side plates each having one end pivotally connected to a fixed frame and the other end thereof being pivotally connected to the respective one of said doors for pivotal motion about said frame, first and second levers each of which has one end pivotally connected to the respective one of said doors for swinging motion through an angle about the center of swinging motion of the lever in conjunction with the movement of the door, and means for transmitting the turning force of one of said first and second levers to the other said lever in such a manner that when said one lever swings, the other lever is caused to swing in the direction opposite to the direction in which said one lever swings whereby each of said levers causes one of said first and second doors to move in the direction opposite to the direction in which the other of said doors moves when one door is opened or closed.

The present invention relates to a device for opening or closing two doors simultaneosuly and more particularly to a device for two doors positioned in side-by-side relation with each other in the front of a stereo phonograph cabinet.

In conventional cabinets for stereo phonograph and other equipment, two doors positioned in side-by-side relation with each other have to be separately opened or closed. An additional disadvantage has been that, when the doors are kept open, they stick out of the cabinet, causing no small trouble for persons passing the front of the cabinet. This invention obviates these disadvantages of cabinets of the conventional type.

A principal object of this invention is to provide a novel and useful device for opening or closing two doors which makes it possible to readily open or close two doors, positioned in side-by-side relation with each other, of cabinets of stereo phonographs and other equipment.

Another object of this invention is to provide a device for opening or closing two doors simultaneously by a single action opening or closing one of the two doors, positioned in side-by-side relation with each other, of cabinets of stero phonograph and other equipment which movement automatically opens or closes the other door which is coupled to said one door.

A further object of this invention is to provide a device for opening or closing two doors simultaneously which makes it possible to open or close the two doors, positioned in side-by-side relation with each other, of cabinets of stereo phonographs and other equipment by a single action so that the doors, when opened, may be housed inside the cabinet.

Still other objects and advantages of this invention will become apparent from the following description when considered in conjunction with the accompanying drawings wherein;

FIG. 1 is a front view of a stero phonograph cabinet incorporating the device of this invention;

FIG. 2 is a sectional view taken along the line II—II of the cabinet of FIG. 1, with the two doors thereof being closed; and

FIG. 3 is a sectional view similar to FIG. 2, but with the doors being opened.

Referring to the drawings, **10** is a stereo phonograph cabinet, **11** and **11'** are two doors movably mounted in the front of said cabinet **10** in side-by-side relation with each other. **12** and **12'** are knobs provided on each of said two doors respectively, **13** and **13'** are speaker baffle portions positioned on both sides of the cabinet and provided with speakers **14** and **14'**, respectively, in the front thereof. **15** and **15'** are side plates each of which has one end hinged to the outer end portion of the doors **11** and **11'**, respectively, by hinges **16** and **16'**. The other ends of said side plates are hinged by hinges **18** and **18'** to partition plates **17** and **17'**, respectively, said partition plates **17** and **17'** partitioning off the center portion of the cabinet from said speaker baffle portions **13** and **13'** positioned on the outer ends of the cabinet. Levers **19** and **20** are pivotally connected to the rear surfaces of the doors **11** and **11'**, respectively, at points **21** and **22** which are near the adjacent ends of the two doors and opposite to the ends bearing hinges **16** and **16'**. A connecting rod **23** is pivotally connected at one end to the lever **19** at a point **24** which is on the other end of said lever **19** from the door **11**, and at the other end thereof to the lever **20** at a point **25** on said lever **20**, as is subsequently to be described in explaining the operation of the subject device. The centers of swinging motion are **26** and **27** respectively, each of which constitutes the center of swinging motion of the respective levers **19** and **20**, the point **27** being positioned on the other end of the lever **20**.

The following are examples, by way of illustration only, of preferred modes of operating the invention disclosed herein as applied to a stereo phonograph cabinet comprising a lever **19** which is 180 mm. in length, with a distance of 40 mm. between the center of swinging motion **26** and the other end **24**, a lever **20** which is 140 mm. in length, with a distance of 38 mm. between the center of swinging motion **27** and the point **25** which is connected to a connecting rod **23**, which is 266 mm. in length.

The manner of operation of the device of the construction described hereinabove will now be described. If one grasps the knob **12'** of the right door **11'** and causes said door to move in the direction of arrow X when the doors **11** and **11'** are closed, as shown in FIG. 2, the lever **20**, which is pivotally connected to the door **11'** at point **22**, swings about the center of swinging motion **27** in the anticlockwise direction as seen in FIG. 2. The swinging motion of lever **20** causes the lever **19** to swing about the center of swinging motion **26** in the clockwise direction through the agency of connecting rod **23** which is pivotally supported by levers **19** and **20** at **24** and **25**, respectively. The swinging motion of lever **19** causes, in turn, the left door **11**, which is pivotally supported by said lever **19** at **21**, to move in the direction of arrow Y. It will be appreciated from the foregoing description that the subject device makes it possible to open the left door simultaneously by the single action of operating the right door. It will be apparent that the right door will simultaneously be opened if the left door is operated in the same manner. Since the right and left doors are pivotally connected at the ends thereof to one end of the side plates **15** and **15'**, respectively, which are pivotally connected at the other end to the partition plates **17** and **17'**, respectively, each of the doors and each of the side plates form a sharp angle therebetween when the two doors remain open as shown in FIG. **3**, so that the doors **11** and **11'** are enclosed in the speaker baffle portions **13** and **13'**, respectively, to be housed therein. This

is conductive to the elimination of trouble experienced with cabinets of the conventional type when the doors are kept open.

When it is desired to bring the doors to a closed state, as shown in FIG. 2, after they have been opened, as shown in FIG. 3, the knob 12 or 12' is moved in the direction of arrow Y' or X', a direction opposite to the direction in which the respective knob is moved when the doors are to be opened. This causes the levers 19 and 20, as well as connecting rod 23, to operate in the manner which is reversed to the manner of operation as described hereinabove. It will be appreciated that the subject device makes it possible to simultaneously open one door by operating the other door.

It is to be understood that the embodiment described hereinabove is for illustrative purposes only and that the invention is not limited thereto. Changes may be made therein without departing from the scope and spirit of the invention which is defined in the appended claims. For example, the device of the subject invention may be mounted in the top of a cabinet, instead of in the front thereof.

What I claim is:

1. A device for opening or closing two doors simultaneously comprising a first door, a first side plate pivoted at one end thereof at one point and pivotally connected at the other end thereof to the outer end of said first door for pivotal motion about said pivot, a first lever pivotally supported at one end thereof by the rear surface of said first door for swinging motion through a certain angle about the center of swinging motion of said lever in conjunction with the movement of said door, a second door forming a pair with said first door for opening and closing, a second side plate pivoted at one end thereof at one point and pivotally connected at the other end thereof to the outer end of said second door for pivotal motion about said pivot, a second lever pivotally supported at one end thereof by the rear surface of said second door for swinging motion through a certain angle about the center of swinging motion of said lever in conjunction with the movement of said door, and means for transmitting the turning force of one of said first and second levers to the other in such a manner that when said one lever swings the other lever is caused to swing in the direction opposite to the direction in which said one lever swings, whereby each of said levers causes one of said first and second doors to move in the direction opposite to the direction in which the other of said first and second doors move when said the other door is opened or closed.

2. In a cabinet including a center chamber for housing an equipment for playing records and the like and speaker baffle portions positioned on the opposite sides of said center chamber for mounting speakers therein, a device for opening or closing two doors simultaneously comprising a pair of first and second doors for covering and uncovering the aperture of said center chamber, a first lever pivotally supported at one end thereof by the rear surface of said first door for swinging motion through a certain angle about the center of swinging motion in conjunction with the movement of said first door, a second lever pivotally supported at one end thereof by the rear surface of said second door for swinging motion through a certain angle about the center of swinging motion of said second lever in conjunction with the movement of said second door, and means for transmitting the turning force of one of said first and second levers to the other in such a manner that when said one lever swings the other lever is caused to swing in the direction opposite to the direction in which said one lever swings, each of said doors moving into each of said speaker baffle portions and housed therein when the doors are opened and each of said levers being operable to move one of said doors in the direction opposite to the direction in which the other of said doors move when said the other door is opened or closed.

3. In a cabinet including a center chamber for housing an equipment for playing records and the like and portions for first and second speaker baffle portions positioned on the opposite sides of said center chamber for mounting speakers therein, a device for opening or closing two doors simultaneously comprising a pair of first and second doors for covering and uncovering the aperture of said center chamber, a first side plate pivoted at one end thereof on a partition plate partitioning off said center chamber from said first speaker baffle portion and pivotally connected at the other end thereof to the outer end of said first door for pivotal motion about said pivot in conjunction with the movement of said first door, a first lever pivotally supported at one end thereof by the rear surface of said first door for swinging motion through a certain angle about the center of swinging motion in conjunction with the movement of said first door, a second side plate pivoted at one end thereof on a partition plate partitioning off said center chamber from said second speaker baffle portion and pivotally connected at the other end thereof to the outer end of said second door for pivotal motion about said pivot in conjunction with the movement of said second door, a second lever pivotally supported at one end thereof by the rear surface of said second door for swinging motion through a certain angle about the center of swinging motion of said second lever in conjunction with the movement of said second door, and means for transmitting the turning force of one of said first and second levers to the other in such a manner that when said one lever swings the other lever is caused to swing in the direction opposite to the direction in which said one lever swings, each of said doors moving into each of the speaker baffle portions and housed therein when the doors are opened and each of said levers being operable to move one of said doors in the direction opposite to the direction in which the other of said doors move when said the other door is opened or closed.

4. In a cabinet including a center chamber for housing an equipment for playing records and the like and speaker baffle portions positioned on the opposite sides of said center chamber for mounting speakers therein, a device for opening or closing two doors simultaneously comprising a pair of first and second doors for covering and uncovering the apperture of said center chambers, a first side plate pivoted at one end thereof on a partition plate partitioning off said center chamber from said first speaker baffle portion and pivotally connected at the other end thereof to the outer end of said first door for pivotal motion about said pivot in conjunction with the movement of said first door, a first lever pivotally supported at one end thereof by the rear surface of said first door for swinging motion through a certain angle about the center of swinging motion in conjunction with the movement of said first door, said center of swinging motion of the first lever being positioned on the other end of said first lever, a second side plate pivoted at one end thereof on a partition plate partitioning off said center chamber from said second speaker baffle portion and pivotally connected at the other end thereof to the outer end of said second door for pivotal motion about said pivot in conjunction with the movement of said second door, a second lever pivotally supported at one end thereof by the rear surface of said second door for swinging motion through a certain angle about the center of swinging motion of said second lever in conjunction with the movement of said second door, said center of swinging motion of the second lever being positioned between the other end thereof and said one end at which the second lever is pivotally supported by the second door, and a link member pivotally supported at one end thereof by said first lever at a point positioned between the center of swinging motion of said first lever and the end of said first door

and pivotally supported at the other end thereof by said the other end of the second lever for transmitting the turning force of one of said first and second levers to the other in such a manner that when said one lever swings the other lever is caused to swing in the direction opposite to the direction in which said one lever swings, each of said doors moving into each of said speaker baffle portions and housed therein when the doors are opened and each of said levers being operable to move one of said doors in the direction opposite

to the direction in which the other of said doors move when said the other door is opened or closed.

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