Oct. 6, 1925. 1,555,896

B. C. WEBSTER

SUPPORTING MEANS

Filed June 25, 1923

Fig. 1

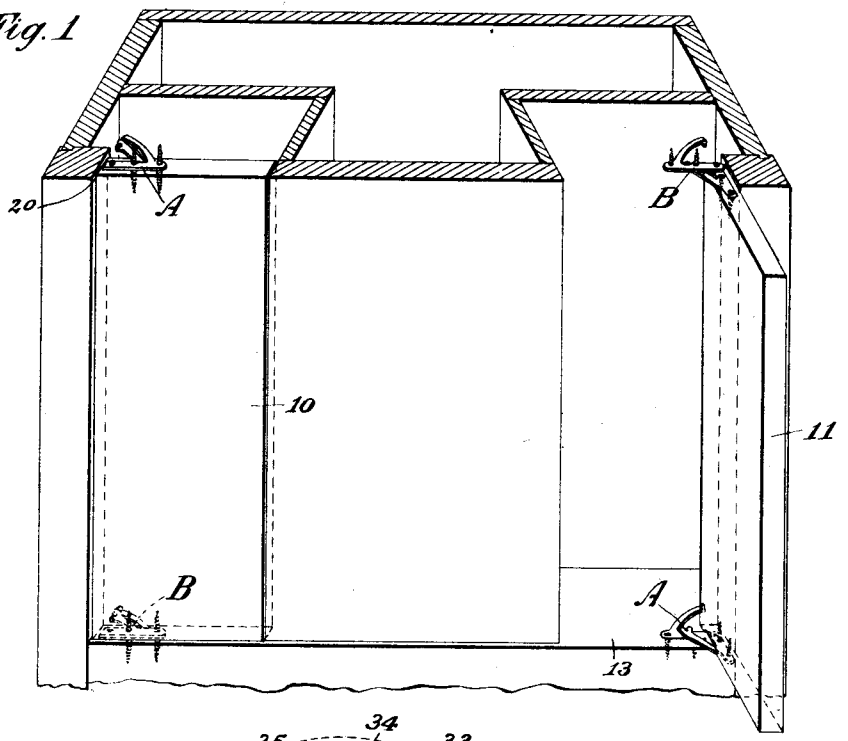


Fig. 6

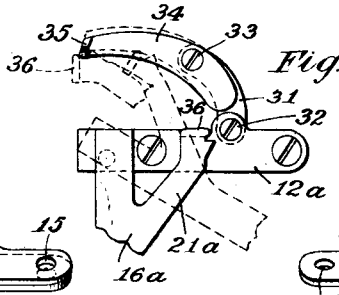


Fig. 2

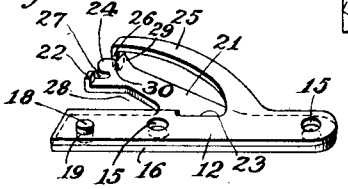


Fig. 3

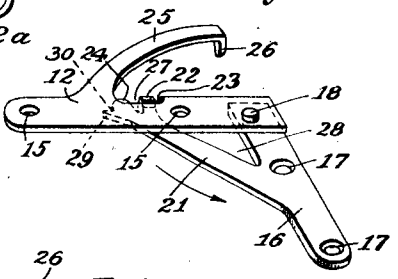


Fig. 4

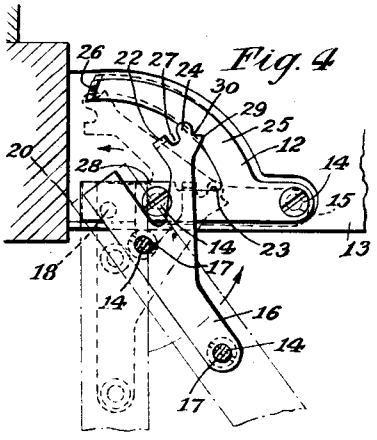
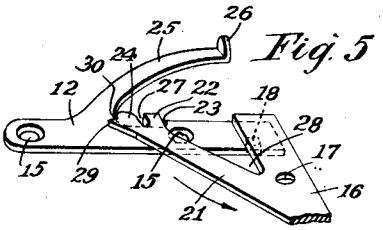


Fig. 5



INVENTOR

Benjamin C. Webster

BY

Ray B. Whitman

ATTORNEY

Patented Oct. 6, 1925. 1,555,896

UNITED STATES PATENT OFFICE.

BENJAMIN C. WEBSTER, OF SOUTHPORT, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO COLUMBIA PHONOGRAPH COMPANY, INC., A CORPORATION OF NEW YORK.

SUPPORTING MEANS.

Application filed June 25, 1923. Serial No. 647,498.

To all whom it may concern:

Be it known that I, BENJAMIN C. WEBSTER, a citizen of the United States, and a resident of Southport, county of Fairfield, and State of Connecticut, have invented certain new and useful Improved Supporting Means, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improved supporting means, and the embodiment disclosed as illustrative of the broad invention, is for phonograph cabinet doors and the like.

An object of the invention is to provide a simple, durable hinge for doors, lids, and other movably supported means.

Another object is to provide for concealing the hinge from view when the movably supported means is closed.

Another object is to provide improved means for holding a movably supported means closed against accidental opening movement.

A further object is to provide an improved means for limiting movements of doors, lids, and the like.

A further object is to provide for checking the closing movements of doors, lids, and the like, to prevent slamming in closing.

A still further object is to provide a hinge and catch formed as a unitary device.

A further object is to provide a hinge and a stop means combined in a single structure.

And a still further object is to provide a single device constituting a hinge, a stop, and a catch.

Another object is to prevent straining and breaking of doors, lids, and the like in closing and opening, by providing stop means for separately limiting the movements of both ends of a door or lid, etc., and further to prevent warping by providing catches for both ends of the door or lid.

And still further objects are to provide methods of absorbing the shock when a door or lid is closed, of limiting the swinging movements of the latter, and of holding the same in closed position.

Other objects will hereinafter appear.

In the accompanying drawings—

Figure 1 is a perspective view of a section of a cabinet, showing the invention as applied thereto;

Fig. 2 is a perspective view of the hinge, shown mounted on the upper part of the door illustrated at the left in Fig. 1, the parts being in "closed" position;

Fig. 3 is a perspective view of the hinge, shown located at the upper part of the door at the right in Fig. 1, the parts being shown in "open" position, and the stop for limiting the outward movement of the door shown in operative position;

Fig. 4 is a plan view of the lower hinge of the door shown at the left in Fig. 1; but, in this case, the door is shown in dot-and-dash lines, several of the positions of the parts of the hinge being shown in dotted lines;

Fig. 5 is a perspective view of the lower hinge of the door shown at the right in Fig. 1; and

Fig. 6 is a plan view of a modified form of hinge.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

The hinges are provided in sets of two, one for the upper and the other for the lower end of the door, or each side of a lid or the like, and each set is adapted for use on either right-side or left-side doors by merely having their positions reversed. This arrangement is shown in Fig. 1, in which the left-side door 10, and the right-side door 11, each have hinges A and B, the latter being like hinges A, but having their parts oppositely disposed.

As shown, each hinge has a stationary or non-moving member 12 (Fig. 4) for attachment to transverse portions of the door-frame 13 by screws 14 passed through holes 15 in the member 12, and a moving member 16 adapted to be secured to a door-end by like screws 14 passing through holes 17 therein. Preferably, the members 12 and 16 are located in cut-out portions or rabbets formed in the door-frame and door-end, respectively, and protruding but slightly, if at all, above the surfaces of these parts of the cabinet, and so being concealed from view when the door is closed. This arrangement is very advantageous, because, being concealed, the hinges need have no special finish, but can be made up in just one style for all doors or lids. Moreover, they can be made extra

thick for strength purposes, a feature not possible in an exposed hinge, because of clumsy appearance. Also, such a hinge can be made of any material, without regard to the style of the door or lid or its finish.

As shown, each member 12 (Fig. 2) is connected to its associated member 16 by a pin 18 on the latter, rotating in a hole or bearing 19 in the member 12. But the pin 18 may, of course, be on either part as desired.

It will be noted from Fig. 4 that, although the member 12 is located about centrally of the door, the pin 18 is offset therefrom forwardly as much as possible without being exposed, being practically on the edge of the member and adjacent the relatively narrow strip of door-material behind which the member is concealed. This is done so that a large, unsightly space need not be left between the door and door-frame, it being necessary, by the above construction, to provide very little clearance to allow the door to swing. For, with this arrangement, the corner 20 of the door, in its movement, travels but slightly toward the side of the door-frame, and moreover, moves away from it immediately after the first part of the movement.

By having the pins 18 vertically above and below the door, and close to their points of attachment, there is the minimum tendency for the screws to be pulled out of their holes with the consequent sagging of the door.

Referring now, particularly to the form of the invention shown in Figs. 1 to 4:

To stop or limit the outward movement of the door, the moving member 16 is provided with an arm 21, having a projection 22 bent toward, and adapted to engage the member 12 when in assembled relation. This member 12 has a cut-out 23 to allow a movement of the door through an angle of at least ninety degrees, as is disclosed in Fig. 4.

The arm 21 is further utilized as one of the elements of a catch or detent for holding the door closed, and for this purpose, it has a rounded abutment 24. The other element of the catch is an arcuate arm 25 extending outwardly from the body of the member 12, and having at its outer end a projection 26 extending into the path of the abutment 24. The arrangement is such that these two elements—the projection 26 and the abutment 24—do not readily permit each other to pass when the door is being opened or closed: but, upon the application of sufficient force, they yield and slip by each other. In the form shown, the arm 25, being of resilient material, yields and moves to the position shown in dotted lines in Fig. 4, when the door is closing or opening, and is made arcuate and relatively long so as to have sufficient resiliency to thus function as a spring. But, it should be noted, that the arm 21 or the arm 25, or any portion of either of them may yield, or they may mutually yield, and that the yielding part or parts may move relatively in any way to permit passage of the projection and abutment.

The abutment 24 and the projection 26 act as a shock-absorber when the door is slammed shut, because they resist the final closing movement of the door, and, in yielding to allow the door to close, take up much of the force and prevent the door from striking hard against its stop.

The abutment 24 and stop 22, both on the member 16, are separated by a notch 27, which allows them to be separately altered or adjusted by hammering or otherwise. The member 16 (Fig. 4), further, has a notch or cutaway-part 28 between the arm 21 and its body, so that the screw-hole 15 in the underlying member 12, will be accessible, when the door is wide-open, to permit the screw to be positioned through the notch 28.

The abutment 24 and the arcuate arm 25, in addition to having the functions above named, also act as guides to maintain the door or lid in correct alignment, and further, to increase the bearing surface and thus reduce wear at the main body portion of the hinge, the abutment 24 riding along the surface of the arm 25 in the swinging movements of the door to accomplish this.

The door has its closing movement limited by a stop-lug 29 (Fig. 2) on the arm 21, engaging the projection 26 of arcuate arm 25 of stationary member 12. The abutment and stop-lug have between them a notch 30 in which the projection 26 is positioned while the door is closed, so that the spring action of the arcuate arm in the notch tends to keep the door tightly closed. It will thus be seen, that the door has both its open and closed positions determined and limited by means located adjacent the hinging point of the door, and that, in fact, the stopping means is provided as a unitary structure with the other parts of the hinge.

Further, it wil be seen that the hinge, the catch, and the shock-absorber are provided as a unitary structure or device. This is an important feature, effecting substantial savings in the cost of manufacture, and also in the assembling of the cabinet, since only a single attaching operation is necessary to provide for the three functions. It is also advantageous in that the parts, being connected, have a predetermined relation in which they are kept, and require no adjustment or alteration relatively after being attached to the door, as would be necessary if the functions were each provided for by separate means.

By having the stop means at both the top and bottom of the door, bending or breaking of the latter is avoided, since the strain, due to the movable members of the hinges striking the stops, is evenly distributed. Also,

by having the catches at the top and bottom of the door, it is held at both ends and will not have so great a tendency to warp.

It will be seen that each of the parts 12 and 16 can be made by stamping from sheet-metal, the projection 22 on the part 16 and the projection on the part 25 being made either during the blanking of the part or during the perforating operation.

Fig. 6 shows a modification of the form of hinge just described and shown in the other figures. It has the above described features and, in addition, provides for applying an adjustable braking force gradually to the door, as it is being closed, to act as a check. This hinge includes members 12^a and 16^a, the latter having an arm 21^a, like the arm 21 shown in Figs. 1 to 4. Instead of the long arcuate arm, however, there is provided a shorter arm 31, pivoted upon a screw 32, threaded thereon and passing through the member 12^a, and having at its other end a screw 33, pivotally supporting a curved arm 34 carrying a projection 35, similar to the projection 26 on the arm 25 shown in Figs. 1 to 4. The arm 21^a, on the movable member 16^a, has a downwardly bent lug 36, adapted to travel in front of the curved arm 34 to engage and pass the projection 35 when the hinge is closing, the arm 31 being resilient so as to allow such movement. The arrangement is such that the lug 36 frictionally engages the adjacent surface of the arm 34 in the movement of the hinge, and this engagement may be varied at will by loosening the screws 32 and 33, and suitably adjusting the parts to change the angular position of the arm 34, and move it to and from the projection 36. For instance, if it is desired merely to increase the friction, or braking action, the screw 32 is loosened, so that the arms 31 and 34 together can be moved closer to the projection 36 on the movable member. This increases friction, or braking action along the entire travel of the projection 36. If, however, it is desired to increase the braking action toward the end of the door's movement, or to reduce it, screw 33 is loosened and the part 34 is angularly adjusted to bring its end, carrying the lug 35, to or from the path of the projection 36. It will, therefore, be seen that by reason of these two adjustments the braking action for the closing movement of the door may be regulated to suit any condition, and may be so as to gradually increase as the closed position is reached, or to be substantially the same throughout the entire closing movement.

The arrangement may be such that the frictional braking action is produced by face-to-face contact of the moving and stationary members, instead of the edge-to-edge contact as shown. For, either the moving or stationary arm, or both, may resiliently extend toward each other to engage under pressure and produce the required friction. And either arm may be adjusted to change their normal relative positions to vary the braking action; or means for increasing or reducing the resiliency may be provided.

It should be understood that the term "door" is intended, throughout the specification and in the annexed claims, to include any movably supported means, and particularly, to embrace such closure means, as lids, covers, windows, gates, hatches, etc., and that they may be large or small,—the parts being, of course, made sufficiently strong to accommodate the weight of the movably supported means depending upon the conditions of use. It should also be understood that the term "door-frame" is intended to include any kind or form of means upon which the door, lid, or the like is hung.

Parts of the improvements may be used without others, and variations and modifications may be made, without departing from the spirit and scope of the invention, as defined in the appended claims.

Having now described the invention, what is claimed as new and for which Letters Patent is desired, is:

1. A hinge including two interconnected, relatively movable members, one having an abutment, an elongated arcuate arm on the other, and means carried by the arcuate arm and adapted to engage with the abutment, the arcuate arm being adapted to yield to allow the abutment and means to pass.

2. A hinge including two parts, projecting means on one part, and cooperating means on the other adapted to limit the relative movement of the parts in one direction, and other cooperating means on the parts adapted to resist relative movement of the parts in the opposite direction.

3. A hinge including two parts, each of which has an angularly disposed arm, said arms extending in substantially the same directions and in the planes of their respective parts, and each of the arms having a bent portion for limiting the relative movement of the parts in two directions.

4. A hinge including a moving member and a stationary member, each of the members having an angularly-disposed arm, said arms extending in substantially the same directions and in the planes of their members, and a means on each of the arms for limiting the movement of the moving member in two directions.

5. In combination, a door, a frame therefor, a combined hinge, stop and catch for the door adapted to be concealed from view when the door is closed, said stop and catch being formed with the members of the hinge, and said catch comprising a pair of laterally-extending resilient arms adapt-

ed to come into sliding frictional contact as the door is moved closed.

6. A means of preventing a door or lid from slamming closed, including a friction brake means operable during the closing movement of the door or lid, said brake means being non-operable when the door or lid is open, said means comprising a pair of laterally-extending resilient arms adapted to come into frictional contact when the door is moved closed, one of the arms being arcuate and offering increasing resistance to the closing movement of the door.

7. In combination, a movably supported means, a support therefor, and an adjustable friction-brake means retarding movements of the movably supported means, said means including a pair of arms arranged to contact as the supporting means is moved, one of the arms being arcuate and resilient.

8. In combination, a door, a frame therefor, and means including a pair of resilient arms at each end of the door for holding it closed, one of said arms at each end being resilient and arcuate and both of them extending in the same general direction.

9. A hinge including two strips of metal pivotally connected for relative movement, an arm projecting from a longitudinal edge of each of the strips, one of the arms being arcuate and resilient, and the other arm having a projection to engage and spring the arcuate arm as the strips are moved to a position where one overlies the other.

10. A hinge including a pair of members pivotally connected for relative movement, an arm projecting from corresponding edges of each of the members, one of the arms being arcuate and resilient, a projection on said arcuate arm, the other of said arms having a projection to engage and spring the arcuate arm as the members of the hinge are moved closed, and said other arm having a stop-lug to engage the projection on the arcuate arm to limit the closing movement of the members.

11. A device as in claim 10, the other arm having an abutment to spring by the projection of the arcuate arm and form therewith a latch.

12. A hinge including a pair of strap members operating in parallel planes, means pivoting the members together, a resilient arcuate arm projecting laterally from one of the members, an inclined arm projecting laterally from the other member and in the same general direction as the arcuate arm, and said arms having portions adapted to engage and pass each other as the strap members are moved to overlapping position.

Signed at Bridgeport, in the county of Fairfield, and State of Connecticut, this 21st day of June, A. D. 1923.

BENJAMIN C. WEBSTER.