May 10, 1932. W. L. CLARK 1,857,623

BALANCE SUPPORT

Filed March 12, 1930

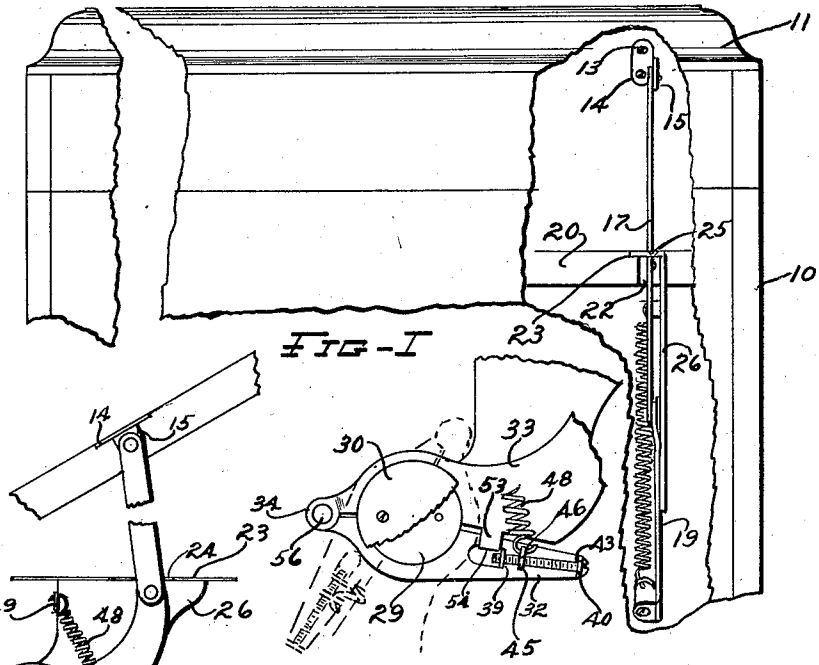


FIG-1

FIG-2

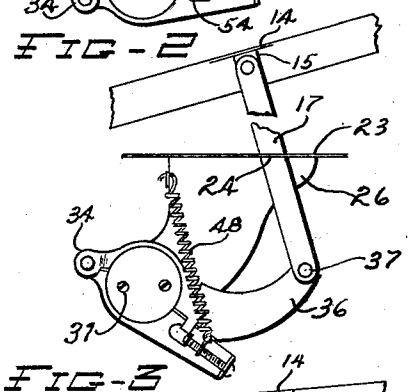


FIG-3

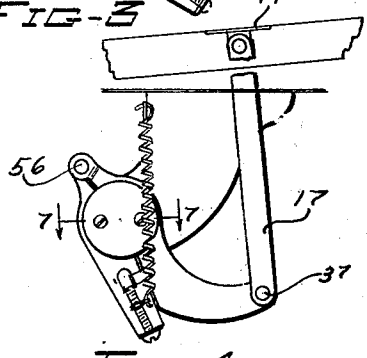


FIG-4

FIG-6

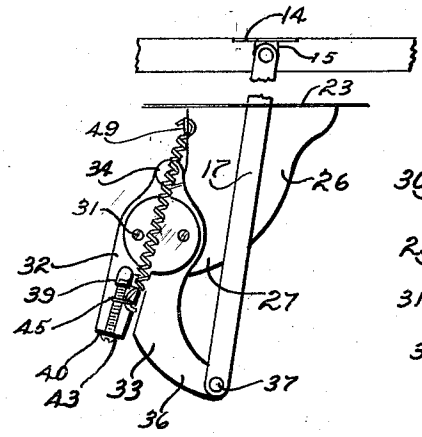


FIG-5

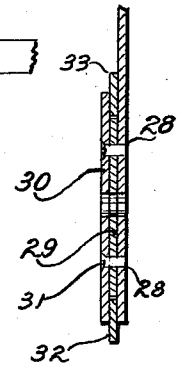


FIG-7

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Patented May 10, 1932 1,857,623

UNITED STATES PATENT OFFICE

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BALANCE SUPPORT

Application filed March 12, 1930. Serial No. 435,138.

This invention relates to an improvement in balance supports for cabinet lids or tops.

Prior to this invention in devices of this character, the practise has been to provide lid or top supports, the action of which was controlled by increased or decreased tension of a spring, attached to an arm which in turn was linked with said top. Various methods have also been employed by which to increase or decrease the initial spring tension to adapt the support for use with tops of varying weight. In practice it has been found that any one type of spring could not be successfully adjusted to control the raising and lowering of varying weights and it was therefore necessary, before installation, to ascertain with what weight top the device was to be used in order to provide a spring of appropriate initial tension.

In its preferred embodiment, this invention discloses a balance support, the control of which is had through a brake mechanism, the action of which is directly proportional to the increased or decreased weight of the cabinet top with which it is joined.

The principal object of this invention is to provide a balance support capable of controlling the raising and lowering of cabinet lids of practically all sizes and weights.

Another object is to produce a device of this class having braking means capable of automatically increasing with the increase in weight of the cabinet top with which it is connected.

A further object is to produce a device of this class having an adjustable tension spring controlling the action of a brake arm linked with a cabinet top.

Other and further objects of this invention will appear from a consideration of the following specification which is taken in conjunction with the accompanying drawings, and in which

Fig. 1 is a fragmentary front elevation of a cabinet showing one modification of this invention in position of use;

Fig. 2 is a side elevation of the balance support showing the cabinet lid in open position;

Figs. 3 and 4 show different positions of the cabinet top and balance support therefor;

Fig. 5 shows the top completely closed with the balance mechanism moved past center to hold the top in this position;

Fig. 6 is an enlarged partially broken away view of the balance support, showing the brake structure in engaged position and (dotted line) released position; and

Fig. 7 is a sectional view taken substantially on the line 7—7 of Figure 4.

Referring to the drawings, this invention is shown mounted for use in a cabinet generally indicated by the reference numeral 10. A lid or top 11 is hingedly joined to the cabinet and has secured thereto, by screws 13, a bracket 14 having a depending flange 15. Pivotally connected with the flange 15 is a link 17 which, at its lower end, is pivotally joined to a balance support generally designated by the numeral 19.

In the cabinet 10 is located a horizontal rail 20 through which an elongated vertical slot 22 is cut. The balance support 19, by means of the horizontal flange 23, is secured to the walls of the slot 22 by screws 25. A slot 24 is formed in the flange 23, the purpose of which is to permit vertical movement therethrough of the link 17. Extending downwardly from the flange 23, and providing a mounting for the movable elements, is an arm 26 which at its lower end, and for the convenient location of said movable elements, is formed with a laterally projecting portion 27. Two diametrically opposite drilled and tapped openings 28 are made in the portion 27 and mounted centrally thereof is an annular disc 29. A cover 30, concentrically mounted on the disc 29, is anchored through said disc to the portion 27 by means of screws 31 which engage the threaded openings 28.

Two brake elements 32 and 33, the inner edges of which, adjacent their pivotal jointure 34, are arcuately formed, encircle the disc 29. The brake element 33 terminates at its free end in a curved portion 36 on which is mounted a pivotal pin 37. The link 17 is connected at its lower end with the pin 37. The brake element 32, adjacent its free end, is formed with two spaced upstanding flanges 39 and

40. Aligned openings 41 are formed in the flanges 39 and 40 through which an adjusting screw 43 is passed. Between the flanges 39 and 40, and in threaded engagement with the screw 43, is a plate 45 having an opening 46 adjacent the threaded opening. A spring 48 is connected at one end to the plate 45 through the opening 46 and at the other end to a notched lug 49 formed on one edge of the arm 26. When the spring 48 is thus mounted, the tension thereof tends to draw the plate 45 and screw 43 toward the flange 39, this movement being limited by contact of the head of the screw with the flange 40.

Attention is directed to the fact that the flange 39 is struck up from the center of the brake element 32, thus creating an opening 51 in said element. Adjacent this opening and projecting outwardly from the brake element 33 is a finger 53, the end 54 of which is bent at right angles to enter and engage the wall of the opening 51. Subsequent to joining the brake elements 32 and 33 by means of the pivot 56, the finger 53 is engaged with the brake element 32 through the opening 51, thus limiting the relative pivotal movement of said brake elements.

To assemble and install a device of this type, the following steps are to be observed. The disc 29 and cover 30 are secured to the portion 27 of the arm 26 by means of screws 31. The brake elements 32 and 33 are joined at their pivoted ends 34 by means of the pivot pin 56. These elements may then be brought into engagement with and made to encircle the disc 29, being partially covered on one face by the portion 27 and on the other by the cover 30. The finger 53 of the brake element 33 may now be snapped into engagement with the element 32, thus preventing disengagement of said elements from the arm 26. The spring 48 is connected with the plate 45 and lug 49, as a result of which, portion 36 of the brake element 33 is moved to a position substantially as shown in Figure 2 of the drawings. The link 17 is engaged with the pin 37, the other end being passed through the slot 24 in the flange 23. The device is now ready to be installed in the cabinet 10. The opening or slot 22 in the rail 20 permits the securing of the support thereto with the entire structure extending beneath said rail. The link 17, at its upper end, is connected with the bracket 14 which is suitably located in the lid or top 11.

The balance support 19, as shown in Figure 2, is in released position, the lid 11 being raised. As the lid is lowered (see Figures 3 and 4), the link 17 causes the free ends of the brake element 32 and 33 to move downwardly and the whole of said brake structure to rotate about the disc 29. Since the brake element 32 is connected with the spring 48, downward movement thereof elongates the spring 48 greatly increasing its tension. It is pointed out that downward movement of the lid 11 exerts a downward pressure on the brake element 33, whereas at the same time, an upward pull is exerted by the spring 48 upon the brake element 32. The application of oppositely directed forces on the brake elements cause said elements to closely engage the disc 29. It will be understood that the downward movement of the brake element 33 is not checked through the action of the spring 48 but by reason of the fact that the opposed forces applied to said elements create a clamp-like grip on the disc 29. When the lid has been lowered to within approximately one half inch of its closed position, the spring 48 lies directly over the center of the disc 29 and in this position releases the clamping action of the brake elements upon said disc. Further downward movement of the lid causes the brake element 32 to travel past center and the spring 48 now exerts an upward pull on said element and a downward pull on the element 33. The lid 11 is thus drawn into and remains in closed position under tension of the elongated spring.

Inasmuch as the spring 48 controls the clamping action of the brake elements, increasing said spring tension causes a corresponding increase in clamping force applied to the disc 29 by the brake elements. To increase the initial spring tension, the screw 43 is rotated in a clock-wise direction causing the plate 45, with which one end of the spring is connected, to be elongated.

Applicant, in the foregoing, has disclosed a balance support for cabinet lids or tops which at all times and under all conditions prevents violent or improper manipulation of the cabinet lid and although but one modification of this device is shown and described, it is not intended that he be limited in the scope thereof other than as set forth in the hereunto annexed claims.

Having thus set forth my invention what I claim as new and for which I desire protection by Letters Patent is:

1. In a cabinet having a hinged lid therefor, a balance support comprising a member fixed to said cabinet, pivotally joined rotatable elements mounted on said member, a link connecting one of said elements with said lid, tension means connecting the other of said elements with said member and friction means adapted to resist the action of said tension means according to the position of said lid relative to said cabinet.

2. In a cabinet having a hinged lid therefor, a balance support comprising a member fixed to said cabinet, pivotally joined rotatable elements mounted on said member, a spring connecting one of said elements with said member, a link connecting the other of said elements with said lid, adjustable means controlling the initial tension of said spring and friction means adapted to resist the ac-

tion of said spring according to the position of said lid relative to said cabinet.

3. In a balance support for a hinged cabinet lid, a supported member, a disc on said member, a pair of elements having curved inner edges frictionally engageable with said disc, means limiting the relative movement of said elements and tension means connected with one of said elements, and said member, said tension means being adapted, when said elements are rotated about said disc, to vary the pressure of said elements on said disc.

4. In a balance support for a hinged cabinet lid, a pair of pivotally joined movable elements, means limiting the pivotal relative movement of said elements, and a disc engaged with varying force by said elements during rotation thereabout.

5. In a balance support, a supporting member, a disc secured to said member, relatively movable means rotatably engaged with the peripheral edge of said disc and spring means adapted to vary the pressure engagement of said movable means as applied to said disc when said means is rotated relative thereto.

6. A balance support for a cabinet lid comprising a supporting member, pivotally joined brake elements mounted on said member, a spring connecting one of said elements with said member, a link connecting the other of said elements with said lid and means permitting limited relative movement of said elements.

7. A balance support for a cabinet lid comprising a supporting member, pivotally joined brake elements, a disc secured to said member and pivotally supporting said brake elements, a spring connecting one of said elements with said member and adapted to vary the pivotal freedom of said elements relative to said supporting member, and means connecting the other of said elements with said lid whereby said lid is at all times in balance.

8. A balance support for a hinged cabinet lid comprising a stationary member, eccentric means frictionally engaged with said member and a spring connecting remote portions of said member and said means, said means, during rotation, being adapted to vary its frictional engagement with said member.

9. A balance support for a hinged cabinet lid comprising a stationary member, rotatable means mounted on and having variable frictional engagement with said member, a spring connecting remote portions of said member with said means, and further means for adjusting the initial tension of said spring whereby to alter the variable frictional engagement of said rotatable means with said member during rotation.

10. In a balance support for a hinged cabinet lid, a pair of pivotally connected brake elements, means frictionally engaging and supporting said elements, tension means connecting one of said elements, a link engaged with said lid and connected to the other of said elements, said elements being adapted to increase their frictional engagement on said means when said lid moves or tends to move downwardly to closed position.

In testimony whereof I have affixed my signature.

WYCLIFFE L. CLARK.