April 1, 1958 H. E. HUTZELMAN 2,828,505

CABINET DOOR CONTROL MECHANISM

Filed Sept. 9, 1954 2 Sheets-Sheet 1

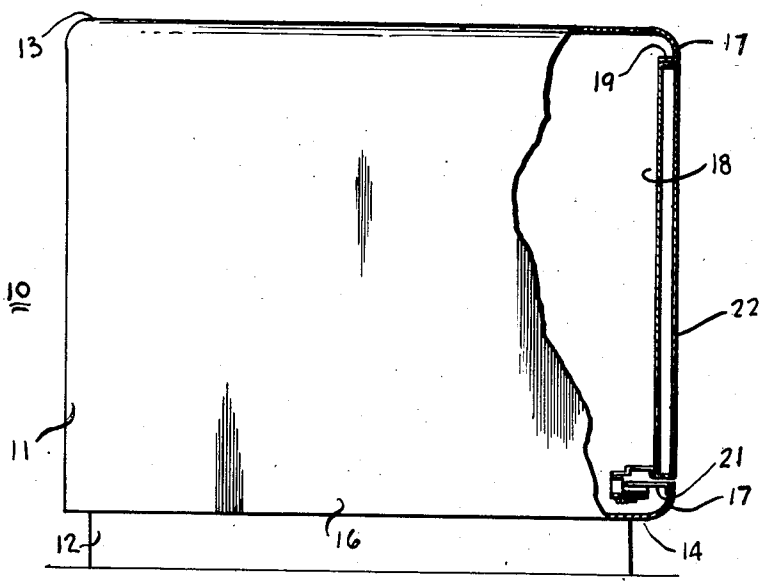


Fig. 1

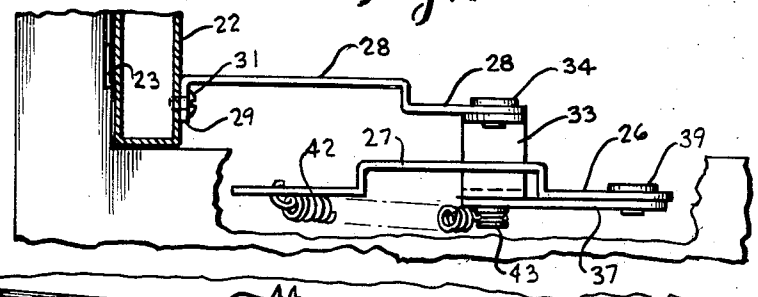


Fig. 2

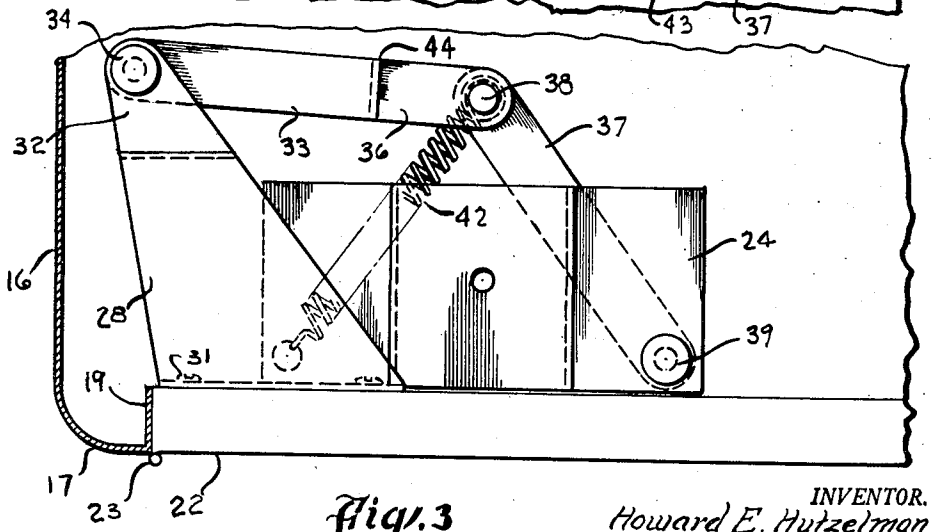


Fig. 3

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CABINET DOOR CONTROL MECHANISM

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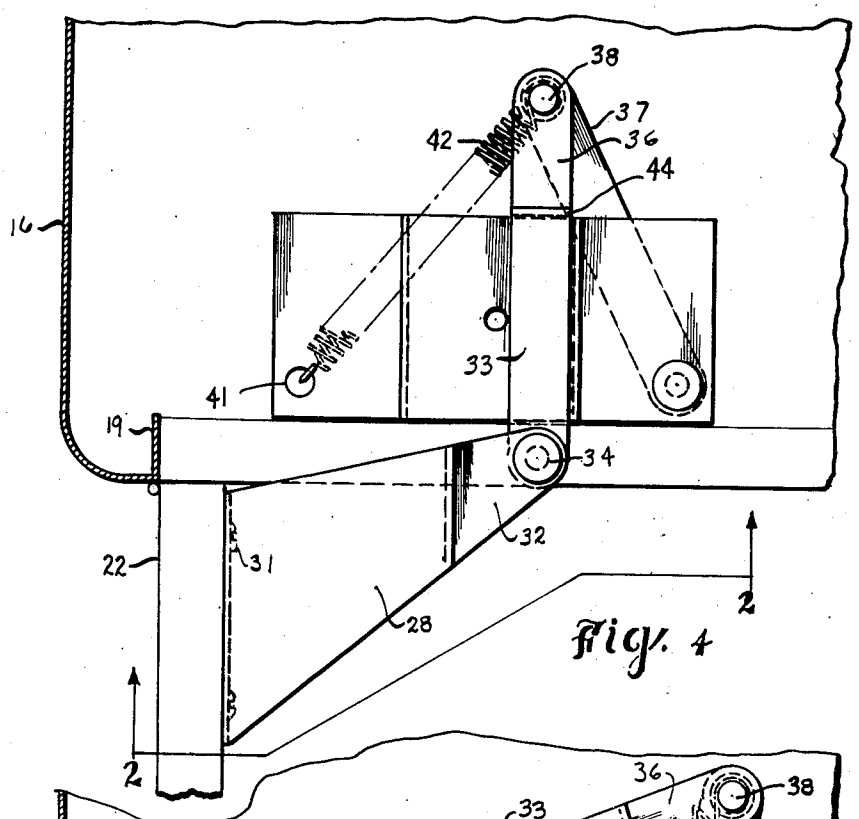


Fig. 4

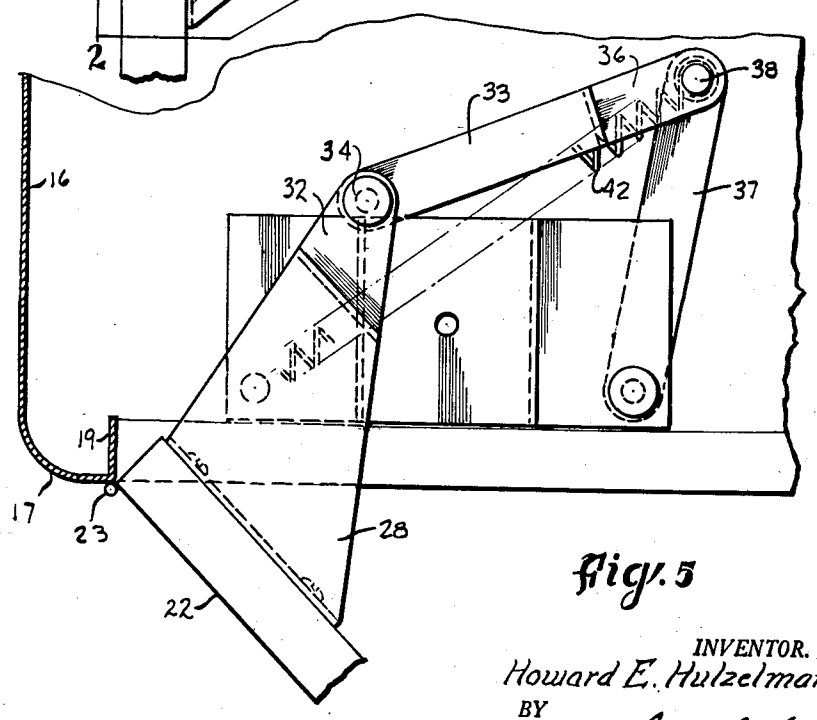


Fig. 5

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CABINET DOOR CONTROL MECHANISM

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Application September 9, 1954, Serial No. 455,004

2 Claims. (Cl. 16—80)

This invention relates to cabinet structures and more particularly to an improved mechanism by which the doors of such structures may be yieldingly urged into fully opened or fully closed position.

The present invention is found to be well suited for use in controlling the positioning of doors of cabinets, cupboards, files, etc., wherein it is desired or necessary to eliminate conventional latches or other operative parts usually provided to secure a door in closed position. Also, the present invention is well suited for use in holding a door in open position. Although many devices, such as bullet catches or springs, have been heretofore utilized as means for holding a cabinet door in opened or closed position, it is basically necessary to go beyond the mere holding of the door in a given position. That is, it has been found necessary to provide means by which the door, when moved one way or the other, past a half open position, will be urged into either fully opened or fully closed position. A mechanism of this nature eliminates the possibility of an operator failing to fully open or close the door and subsequently banging against it in such an ajar position.

In its present form, the invention is applied to, and serves as the control mechanism for movement of, a door that serves to close a cabinet-like opening in one of the pedestals of a conventional two-pedestal desk. The invention serves solely as a means for urging a door into opened or closed position and yieldingly holding the door in such position until the door has been manually moved.

It is therefore a principal object of the invention to provide a control mechanism for urging the door of a cabinet or the like selectively into opened or closed position.

Another object of the invention lies in the provision of a mechanism that will urge a door into, and yieldingly hold it in, fully opened or closed position regardless of any jarring or vibration to which the door may be subjected.

Another and important object of the invention lies in the provision of a door control mechanism that is so proportioned as to leave full, clear, and unobstructed access to the interior of the cabinet through the door opening.

A still further object of the invention lies in the provision of a simple and inexpensive control mechanism for the door of a cabinet and the like.

Other objects and advantages of the invention will be more fully disclosed and understood from a consideration of the following specification, taken in conjunction with the accompanying drawings; in which

Fig. 1 is an end view of a cabinet-like desk pedestal, partly in section, and discloses one application of use of the invention;

Fig. 2 is a greatly enlarged fragmentary front view, partly in section, of the control mechanism, being taken substantially as suggested by the line 2—2 of Fig. 4;

Fig. 3 is a fragmentary top plan view of the mechanism, showing the position of the operative parts when the door is in closed position with the door sill omitted;

Fig. 4 is a view similar to Fig. 3, showing the position of the operative parts of the mechanism when holding the door in fully opened position; and

Fig. 5 is a further view similar to Fig. 3, showing the position of the operative parts of the mechanism when the door is intermediate its closed or opened position.

Referring more particularly to the drawings, the reference numeral **10** is employed to generally designate a cabinet having a door, the operation of which is controlled by a mechanism embodying the invention. In the present application of the invention, the cabinet **10** takes the form of one of two end pedestals **11** of a conventional desk. The pedestal, as presently shown, is supported on a base **12** and includes a top **13**, bottom **14**, and side walls **16**. The top and bottom walls **13** and **14** are rolled downwardly and upwardly, respectively, as at **17**, at their forward ends. Similarly, side walls **16** are rolled inwardly. These rolled portions frame an opening **18** to the interior of the cabinet **10**. The curved portions of the top and side walls terminate in inturned flanges **19**. The curved portion **17** of the bottom **14** is provided with a sill **21** which is of importance only to the extent of providing a suitable mounting location for the control mechanism of the invention, and may be varied as found necessary in mounting the invention on cabinets of types other than the one shown in the drawings. A door **22** is provided as a closure for the opening **18** and this door is shown to be supported by conventional hinges **23**, carried by the flange **19** of one of the side walls **16** of the cabinet.

Attention is now particularly directed to the door control mechanism. This mechanism includes a plate **24** that is secured in any suitable manner, as by rivets, to the under face of the sill **21**. As clearly shown in the drawings, this plate includes end flanges **26** and an upwardly stepped, central, horizontal portion **27**. For the purpose of the invention, the portion **27** serves as a stop for one position of the operative parts, as will hereinafter be described. A bracket **28**, of generally triangular outline, is attached to the door **22** along its end flange **29**, in any suitable manner, as by screws **31**. The tapered or narrow, free end **32** of the bracket **28** is downwardly offset from the body of the bracket to a slight extent and serves not only to rigidify this bracket, but also provides a stepped end for convenience in connecting the linkage with the plate **28**. The end **32** provides connection with one end of a link **33** through a pivot pin **34**. The other end of this link is downwardly offset, as at **36**, and is connected with another link **37** through a pivot pin **38**. The other end of link **37** is joined through a pin **39** to one end of the plate **24**. An opening **41** is provided in the plate **24** at a corner remote from the pin **39**. This opening receives one end of a spring **42**. The other end of this spring is engaged with a downwardly extending porton **43** of the pivot pin **38**.

Having described the structural parts of the invention, a clearer understanding of its use and applicability is briefly set out as follows: Referring particularly to Fig. 3, it will be noted that the door **22** occupies a position to close the opening **18** of the cabinet. In this position of the door, the bracket **28** extends inwardly along one of the side walls **16** of the cabinet, link **33** being approximately parallel with the door **22**, and link **37** at a wide angle to link **33**. With the parts in this position, the spring **42** is under sufficient tension to apply a force to the pin **38** in a direction tending to straighten the links **33** and **37**. Of course, force applied in this direction urges bracket **28** toward wall **16** and, consequently, holds the door **22** in fully closed position.

Attention is now directed to Fig. 5 of the drawings wherein the operative parts are shown as they appear when the door has been only partially swung to open position. With the door in this position, it will be noted

that the bracket 28, which moves with the door and about the hinge 23, has forced the links 33 and 37 into a somewhat jack-knifed position and in so doing has moved the pivot pin 38 in a direction to considerably stretch the spring 42. Thus, if the door, in this position, was released, it would quickly swing back into closed position as shown in Fig. 3. Continued movement of the door toward opened position brings the straight edge of bracket 28 into alignment with the link 33 and also with spring 42. In this position, the operative parts of the mechanism may be said to be on dead-center. In other words, the door, when moved slightly past the position of Fig. 5, will have no urgency to move into either opened or closed position. However, since the door, when the mechanism is on dead-center, is insufficiently open to give access to the interior of the cabinet, an operator would never leave it in this position but would continue manual movement of it in one direction or the other.

Assuming the door to be moving toward opened position from that shown in Fig. 5, attention is now directed to Fig. 4. As the door is swung further open, the links 33 and 37 further jack-knife to move the bracket and link 33 beyond the dead center mentioned above. When this point has been passed, the spring now again urges the pivot 38 toward the side of the cabinet. Thus link 37 again swings toward the cabinet side wall and moves link 33 outwardly of the cabinet to a point where the stop or shoulder 44 abuts an edge of the central portion 27 of the plate 24. When this occurs, the door 22 will occupy a position ninety degrees to the line of the opening of the cabinet.

From the foregoing it will be evident that whether the door is in opened or closed position, the spring 42 continually exerts a force at the pivotal connection of the links 33 and 37 in a direction to hold the door fully opened or fully closed. It will, of course, be understood that the proportions of the plate 24 and bracket 28, as well as the length and steps of the links, may be varied in adapting the mechanism to the control of a door other than the one shown, and it will therefore be understood that any such variations in the structure are contemplated as being within the spirit and scope of the invention insofar as they are encompassed by the 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 door hinged to one of the walls forming the cabinet opening, a mechanism for urging said door into opened or closed position comprising a plate fixed to said cabinet beneath said opening, a bracket attached to said door adjacent the lower portion of the hinged edge thereof and movable into said cabinet through said opening when said door is closed, a downwardly stepped portion terminating in and providing a free end on said bracket, a link pivotally joined at one end to the free end of said bracket, a downwardly stepped portion on the other end of said link, a second link having one end pivotally joined to the stepped portion of the first link, the stepped portions of said bracket and said first mentioned link enabling pivotally connecting said second link with said plate from beneath and abutment of the stepped portion of the first link with the plate during opening of the door to limit the extent of opening of the door, said links and said bracket being of such related length as to cause said links and the free end of said bracket to lie within said cabinet in all positions of said door between its closed position and a predetermined opened position, and a spring engaged under tension with said plate and the pivotal connection between the links, said spring exerting a continuous force on said second link whereby to urge the first link and said bracket into either of two relative positions.

2. In a cabinet having a door hinged to one of the walls forming the cabinet opening, a mechanism for selectively urging said door into opened or closed position comprising a plate fixed to said cabinet adjacent the door opening, a bracket having an end attached to said door adjacent the hinged edge thereof, a pair of strap-like links, a pivot pin joining said links, one of said links being pivotally joined to the other or free end of the bracket and the other link being pivotally joined to the plate, said links and said bracket being of such related length as to cause said links and the free end of said bracket to lie within said cabinet in all positions of said door as it moves from closed position to a predetermined open position, a spring having one end engaged with said pin and the other end with said plate at a point remote from the pivotal joining of one of said links with said plate, the link connected to the bracket being approximately parallel to the door at its closed position and movable into alignment with the bracket when the door is opened and the other link being approximately parallel to the bracket when the door is closed, said spring being effective to extend or constrict said links when said bracket and its connected link are moved out of alignment in either direction.

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