

March 24, 1970

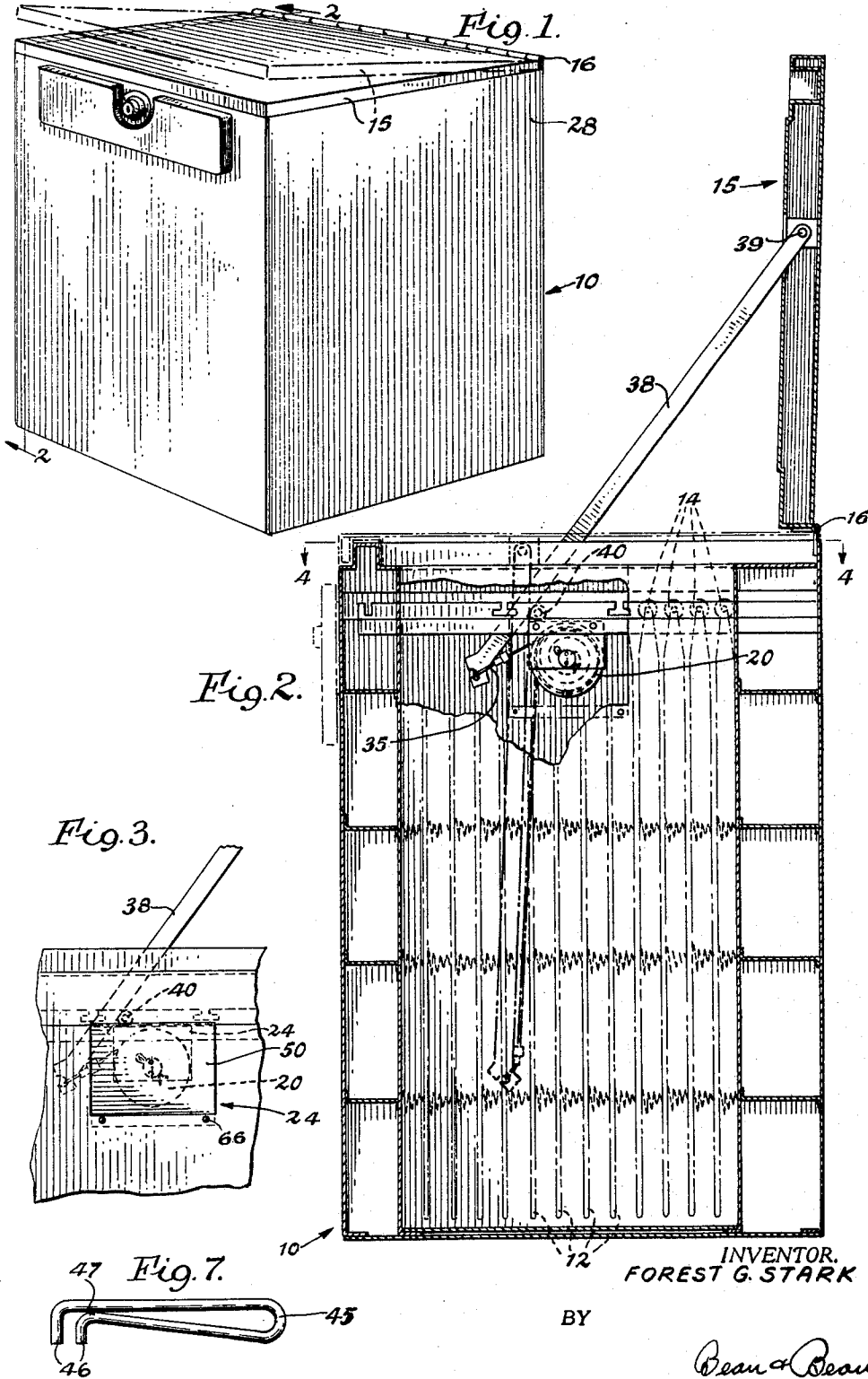
F. G. STARK

3,502,385

VERTICAL FILING CABINET COVER AND CONTROL MECHANISM THEREOF

Filed May 3, 1968

2 Sheets-Sheet 1



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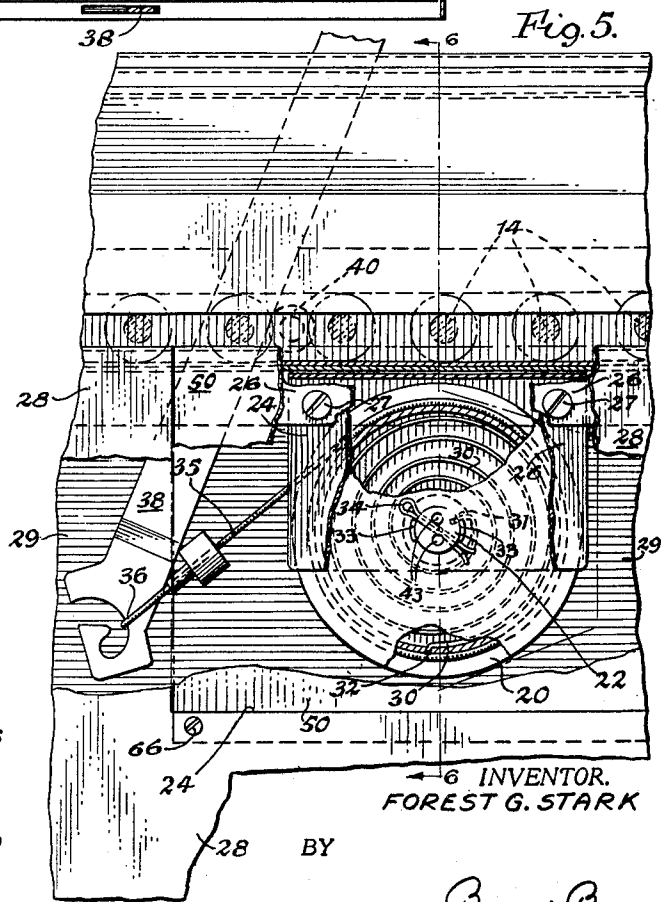
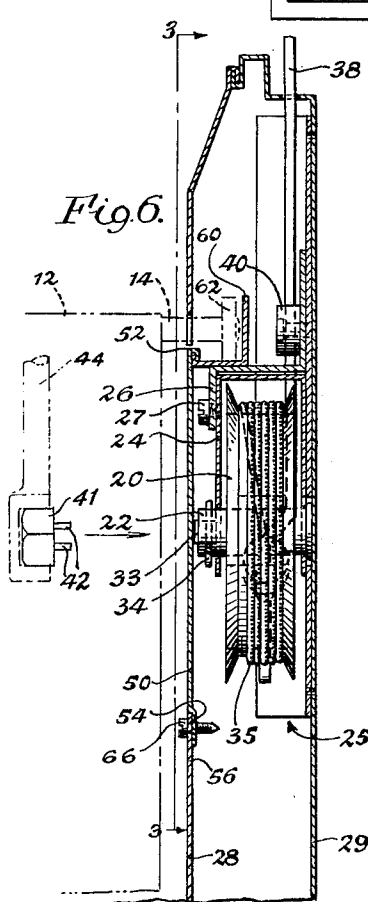
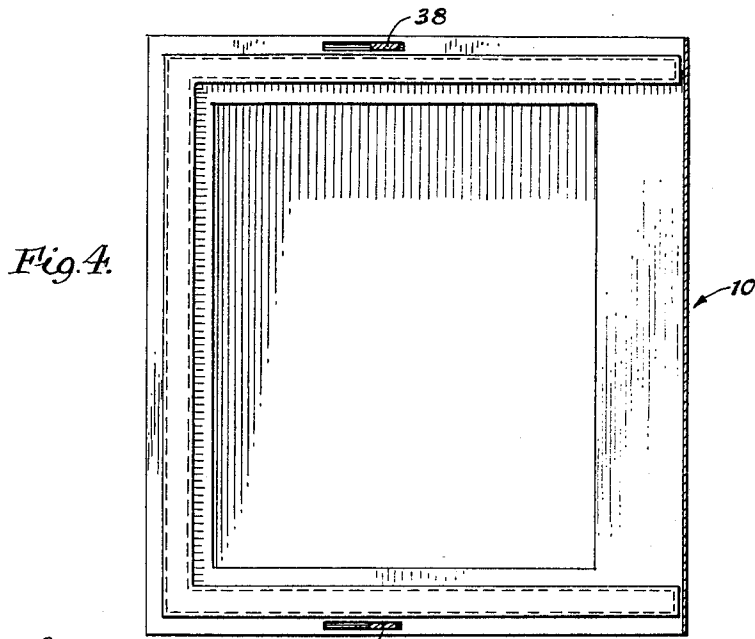
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2 Sheets-Sheet 2



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VERTICAL FILING CABINET COVER AND CONTROL MECHANISM THEREOF

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Filed May 3, 1968, Ser. No. 726,393
Int. Cl. B42f 7/06; A47b 63/00

U.S. Cl. 312-319

4 Claims

ABSTRACT OF THE DISCLOSURE

An improved cover counterbalancing mechanism and novel mounting arrangement thereof in an open top filing cabinet of the type adapted for vertically filing therein maps, blueprints, drawings or the like. Such devices employ relatively heavy covers hingedly mounted thereon for swinging upwardly to vertically standing "open" positions; and the present invention features an improved counterbalance mechanism and a novel mounting arrangement thereof in the cabinet wall structure whereby the counterbalance mechanism is more readily accessible for adjustment, repair, or replacement purposes; without necessitating any disturbances of the cabinet contents or requiring any dismantling of the cabinet structure.

BACKGROUND AND DETAILED DESCRIPTION OF THE INVENTION

The invention relates to improvements in filing cabinet arrangements such as are disclosed for example in co-assigned Patent No. 2,695,113; and provides improvements over the mechanisms thereof with respect to ease of user control of the cabinet cover movements between closed and open positions; adjustments of the counterbalance mechanism operation, and/or access thereto for maintenance and/or replacement purposes.

One of the objects of the present invention is to provide in a filing cabinet or the like as aforesaid, improved means for counterbalancing the weight of the cover as it hingedly swings between its "open" and "closed" positions.

Another object is to provide in a filing cabinet of the type employing a cover which is horizontally disposed when in cabinet-closing position and vertically disposed when in open position, an improved cover weight balancing device which accurately counterbalances the cover throughout its range of swinging movements.

Another object is to provide an improved counterbalance device as aforesaid which tends to carry the cabinet cover upwardly when the latter is first given a manually applied opening impetus; and which also operates to soften both terminal movements of the cover, thereby preventing any slamming thereof.

Another object of the invention is to provide an improved device as aforesaid which is overall dimensionally compact and inexpensive to fabricate; and which is rugged and fool-proof in operation.

Other objects and advantages of the invention will appear from the specification hereinafter, and the accompanying drawing wherein:

THE DRAWING

FIG. 1 is a perspective view of a filing cabinet of the type adopted to embody the present invention, showing by means of solid lines the top cover thereof in its closed position, and by means of broken lines in its open position;

FIG. 2 is a vertical sectional view on enlarged scale of a filing cabinet such as shown in FIG. 1 and embodying a cover control mechanism of the present invention;

the cover member thereof being shown in vertically standing cabinet-open position, and a closure plate device normally covering the control mechanism having been removed;

FIG. 3 is a fragmentary view corresponding to a portion of FIG. 2 but showing the control mechanism closure plate in its normal operative position, taken as suggested by line 3-3 of FIG. 6;

FIG. 4 is a horizontal sectional view taken as suggested by 4-4 of FIG. 2;

FIG. 5 is an enlarged scale fragmentary view corresponding to a portion of FIG. 3, but with parts broken away to illustrate the construction of the spring control mechanism;

FIG. 6 is a fragmentary sectional view taken as indicated by line 6-6 of FIG. 5 and showing in phantom detached relation a spring adjustment device; and

FIG. 7 is a side elevational view of another style of hand tool such as may be used to effect adjustments of the counterbalancing action of the control mechanism.

As shown by way of example in the drawing herewith, the invention is embodied in conjunction with a filing cabinet designated generally at 10 which is of the open top vertical filing or "well" type, such as are typically used for storage of drawings, or blueprints, maps, or the like. Thus as best shown in FIGS. 2, 5, 6, pocket devices 12 made of heavy paper or the like may be suspended therein from roller supported rods 14 extending transversely of the upper interior of the cabinet to provide vertically deep but narrow pockets into which flat articles such as maps, drawings, blueprints or the like may be lowered edgewise for filing purposes. However, it is to be understood that the invention is also applicable to filing cabinets used for other purposes. Thus, the cabinet 10 is formed with an open top, and a cover 15 is hinged to the upper edge of the cabinet rear wall as indicated at 16. Thus, the cover 15 is arranged to swing between horizontal or cabinet-closed position and vertical or cabinet-open positions, as shown in FIGS. 1 and 2.

Cabinets of this type are typically designed and constructed to resist fire damage to their contents; and to such ends the side wall and cover members thereof are usually fabricated to comprise spaced-apart sheet metal panels inter-filled with fire resistant or heat-insulative material. Hence, the cover members of such cabinets are of substantial weights, and therefore difficult to manually control during raising and lowering thereof unless adequately counterbalanced. Prior efforts to counterbalance horizontally closing hinged covers in such type cabinets have involved use of a variety of counterweight and spring devices, but have been less than fully satisfactory for the intended purposes.

As shown in the drawing herewith, the invention employs a cable reel 20 which is rotatable on a shaft 22 mounted within a U-shaped casing designated generally at 24. The casing 24 is supported on a cabinet wall reinforcement plate 25 by means of a bracket 26 and mounting screws 27-27 (FIGS. 5, 6) so as to be disposed inside of a pocket within the side wall structure of the cabinet comprising spaced apart inner and outer sheet metal wall portions 28, 29 respectively. The spaces between the wall portions may of course be otherwise occupied by heat-insulating material or the like if preferred, in order to provide an overall cabinet construction of fire-proof characteristics.

The rotatable reel device 20 includes interiorly thereof a spiral or clock-type spring 30 (FIG. 5) which is keyed to the shaft 22 as indicated at 31; the outer end of the spring 30 being fixed to the reel 20 as indicated at 32 so as to move therewith as the reel rotates. The shaft 22 is journaled in the opposite side legs of the casing 24, and

is maintained therein at rotationally various adjusted positions by means of tabs 33—33 formed integral with the front leg of the casing 24 and a replaceable cotter pin as shown at 34. A pull device in the form of a flexible steel cable as indicated at 35 is partially wrapped about and fixed at one of its ends to the reel 20 and then leads away therefrom into detachable connection as shown at 36 to the lower end of a stiff arm or strut member 38. The upper end of the strut 38 pivotally connects as indicated at 39 to the cover 15 at a position spaced from the hinge 16; and a roller 40 is fixed to extend from the bracket 26 for roller bearing contact with the bottom edge of the strut 38 so as to guide the latter as it moves coincident with movements of the cover 15 between its open and closed positions.

Thus, it will be understood that whenever the cover 15 is moved from its open or solid line position thereof as shown in FIG. 2 toward its lower or cabinet closing position as shown by solid lines in FIG. 1, the strut 38 will operate to draw upon the cable 35 so as to pull it out of the reel device against the action of the spring 30, thus causing the spring 30 to contract into more tightly coiled condition against the elastic force thereof. It will be further understood that with the cover 15 in its raised or cabinet "open" position, the spring 30 within the unit 20 may be initially preset by proper adjustment of the shaft 22 relative to the tabs 33—33 of the casing 24 by means of the cotter pin 34 so as to provide just enough tension in the spring 30 to cause the cable 35 to pull upwardly against the strut 38 so as to insure proper holding of the cover 15 in its upright standing or open position. Then, when the cover 15 is manually displaced about its hinge 16 so as to move downwardly toward cabinet closing position, the operation of the strut 38 will cause the cable 35 to be pulled from the reel so as to cause the latter to draw the spring 30 into a constantly increased tension condition. The spring and lever parts are so selected and dimensioned and arranged that at all positions of the cover 15 the forces exerted by the spring 30 tending to pull upwardly upon the strut 38 will approximately equal the gravity load on the cover about the hinge axis thereof.

It is in fact preferred to arrange the spring tension and the components of the control mechanism so that throughout all phases of the cover movement the spring tension forces tend to slightly overbalance the weight of the cover. Thus, the spring tension may be so adjusted that whenever the cover is stationary in any closed or open position the inertia of the cover and the friction in the moving part connections cooperate to maintain the cover in stationary position; but when ever an opening impetus is given manually to the cover, the inertia and friction forces are thereby overcome and the cover tends to rise to its fully open position with minimum assistance from the operator. Reversely, whenever the cover is standing in open position and manual impetus is given thereto for the purpose of closing the cover, it thereupon proceeds to swing downwardly. However, the slight overbalance effect of the spring 30 operates to gradually damp the downward closing movement of the cover and this eliminates the possibility of dangerous slamming of the cover down into its closed position.

As illustrated in conjunction with FIG. 6, a convenient tool for effecting adjustments of the tension of the counterbalance spring 30 may be provided in the form of a hex-nut 41 having a pair of pins 42—42 extending therefrom and so dimensioned and arranged as to be adapted to be manually slide-fitted into a pair of apertures 43—43 formed in the end of the shaft 22. Hence, it will be understood that the hex-nut 41 may be sidewise "geared" into the shaft 22 and may thereupon be engaged by a standard type "end wrench" or "socket wrench" as indicated at 44 for rotation of the shaft 22 relative to its casing 24. Therefore, when ever it is desired to readjust the counterbalancing effect of the spring 30, the hex-nut and wrench

device 41—41 may be thus engaged upon the shaft 22. The cotter pin 34 may thereupon be withdrawn, and the wrench 44 then operated to provide either increased or decreased tension on the spring 30, as may be required to attain an optimum cabinet-cover counterbalancing operation. The cotter pin is then replaced to lock the device in the desired position of adjustment. As shown in the drawing at FIG. 7, another form of wrench for adjusting the spring action of the control unit may be provided in the form of a bent wire device comprising a handle portion 45 terminating in two spaced apart laterally bent end portions 46—46. The member may be spot welded together as indicated at 47 so as to provide a completely rigid tool device.

As best illustrated at FIGS. 5, 6, it is a particular feature of the present invention that the cabinet cover counterbalance control device is of improved overall compactness and that access to the counterbalancing mechanism for either adjustment or replacement purposes is facilitated by means of a structural arrangement which eliminates any need for disturbance of the filing cabinet contents and/or disassembly of the cabinet structure per se. As is evident from FIG. 6, the entire counterbalance mechanism is enclosed within a dual-wall portion of the cabinet structure; thereby requiring no extra space in the overall assembly. Also, as shown in the drawing herewith, the hanging pocket devices 12 may be constructed and arranged to endwise terminate closely adjacent to the inner wall portion of the cabinet structure; thereby minimizing the requisite overall dimensions of the cabinet structure. This arrangement is feasible in the case of the present invention because of the fact that access to the counterbalance device for tension adjustments and/or replacement purposes is fully available without any inconvenient disturbances of the filing contents.

As illustrated at FIGS. 3, 5, 6, the well portion within the dual wall construction of the cabinet which is occupied by the counterbalance device is normally enclosed by a cover plate 50 which lies flush with the profile of the inner wall 27. At its upper edge the coverplate 50 is hook-shaped as indicated at 52 (FIG. 6) and at its lower edge it is flanged as indicated at 54 so as to lap-fit behind the lower edge portion 56 of the rectangular shaped aperture through the inner wall 28. Thus, it will be seen that the cover plate 50 may be installed by simply first slip-fitting the lower edge thereof over and inwardly behind the aperture edge portion 56 of the wall plate 28, until the upper edge portion 52 of the cover plate hooks downwardly upon an upturned flange portion of the track member 60 in which ride the rollers 62 supporting the filing pocket support shafts 14 (FIG. 6). The track piece 60 is conveniently carried by the bracket 26. When the cover 50 is thus settled into operative position as shown at FIG. 6 it is readily fastened thereat as by means of screws 66.

Thus, it will be understood that subsequent to assembly of the mechanism as illustrated by way of example in the drawing herewith, whenever it is required to adjust the tension of the spring 30 (such as in order to maintain an optimum counter-balancing of the cover 15) the filing pockets 12 in the region of the cover plate 50 may be easily spread apart so as to permit access of a screw driver to the cover plate locking screws 66. Upon removal thereof the cover plate may be vertically lifted out of position, and the apertured end portion of the shaft 22 is thereby exposed for spring adjustment by means of a tool device such as shown either at FIG. 6 or 7, and as explained hereinabove. Similarly, the cover plate 50 may be removed so as to provide easy access to the screws 27—27 which mount the counterbalance until relative to the bracket 26; thus facilitating replacement of the entire counterbalance mechanism without any disturbances of the filing cabinet contents.

It is of course to be understood that whereas only one form of the invention has been illustrated and described

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in detail hereinabove, it will be understood that various changes may be made therein without departing from the spirit of the invention.

What I claim as my invention is:

1. In a filing device of the open top cabinet type adapted for vertically filing therein maps, drawings, blueprints, or the like; said device including, in combination, a well-shaped dual wall cabinet structure having file suspension rods extending transversely across the open top portion of said cabinet and resting at their opposite ends on opposite side wall portions of said cabinet; said cabinet having a top cover hingedly mounted thereon to swing between horizontal and vertically standing positions, and an improved top cover counterbalancing arrangement; said counterbalancing arrangement comprising:

a casing fixedly mounted in a pocket portion of the space between dual wall members of said cabinet structure; said pocket portion being defined by an aperture through an inner wall portion of said structure;

a shaft journaled on said casing, and a cable reel journaled upon said shaft;

a helical spring fixed at its inner end to said shaft and coiling thereabout; and fixed at its outer end to said reel;

a flexible cable terminating at one end in keyed connection with said reel;

a compression strut connected at one of its ends to the other end of said cable and pivotally connected at its other end to said top cover at a position offset from its hinged connection to said cabinet;

and detachable key means normally interengaging said casing and said shaft to prevent rotation of the latter; the inner end of said shaft having means thereon for

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detachable engagement by a hand tool whereby said shaft may be adjustably rotated manually to vary the operative effects of said spring.

2. A filing device as set forth in claim 1 wherein said strut moves within the space between a dual wall portion of said cabinet structure.

3. A filing device as set forth in claim 1 wherein a bracket is mounted on the inside surface of an outer wall portion of said cabinet structure and said casing is detachably mounted on side bracket, and said pocket portion aperture is provided with a cover plate detachably mounted on the inner wall structure to provide for access to said counterbalancing device.

4. A filing device as set forth in claim 3 wherein said file suspension rods are freely movable toward and away from each other so as to permit access to said cover plate and to said tool engaging means on said shaft and to said casing mounting means, thereby permitting adjustments of said shaft and/or replacement of said casing without disturbing the contents of said cabinet.

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JAMES T. McCALL, Primary Examiner

U.S. Cl. X.R.

49—379; 217—60