

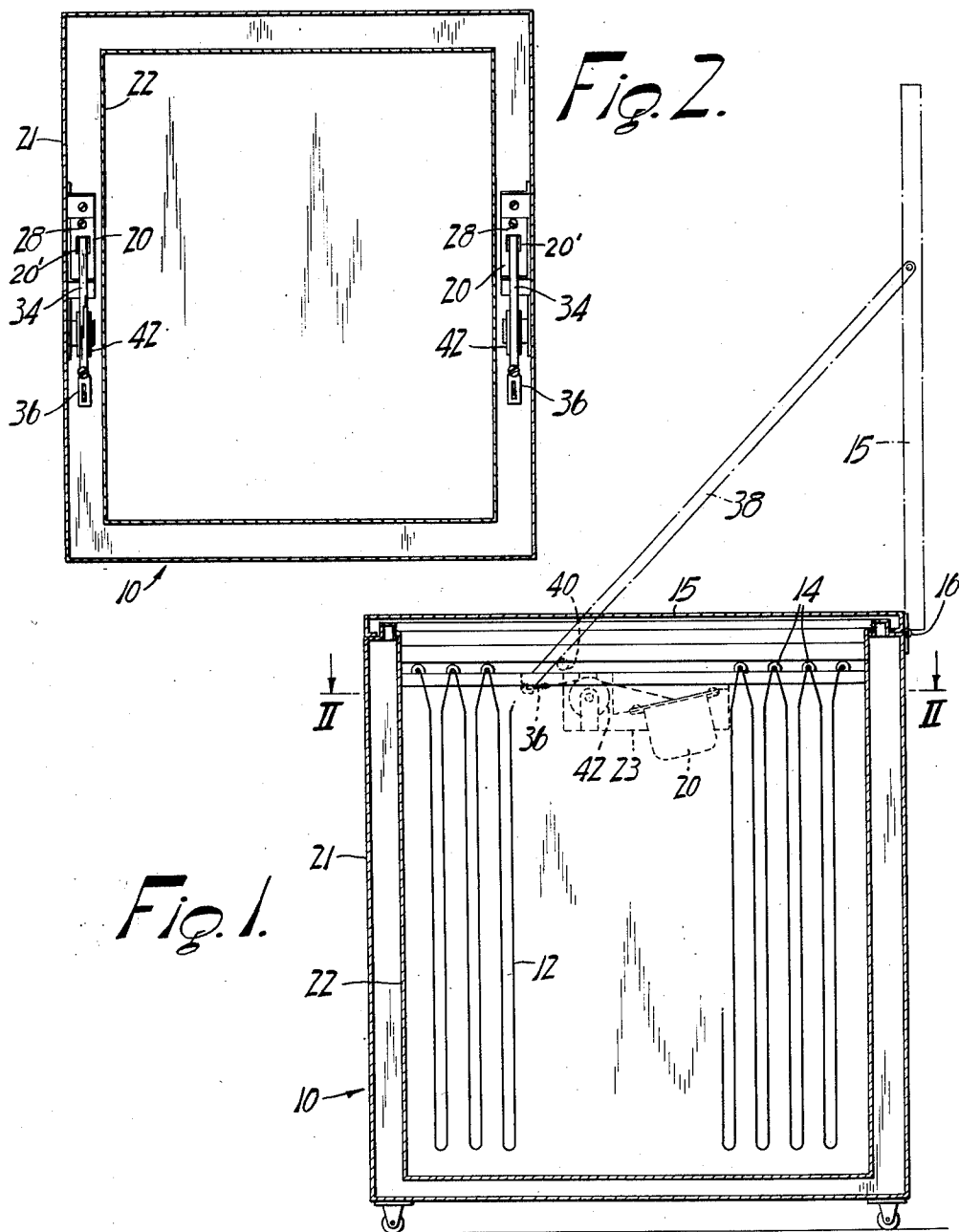
Nov. 23, 1954

J. R. JONES ET AL
CABINET COVER CONTROL

2,695,113

Filed Jan. 10, 1951

3 Sheets-Sheet 1



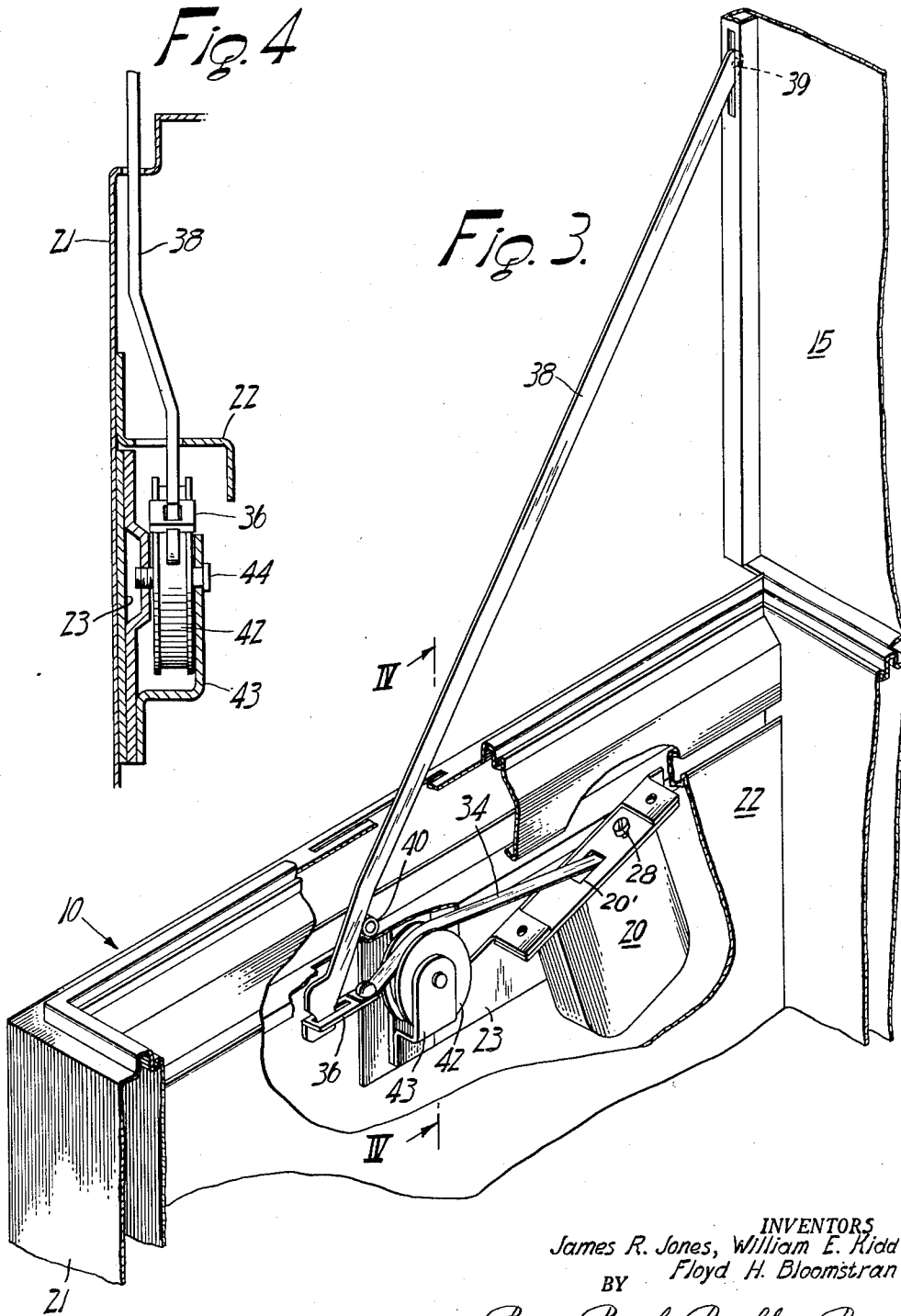
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CABINET COVER CONTROL

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Application January 10, 1951, Serial No. 205,256

2 Claims. (Cl. 217—60)

This invention relates to office filing cabinets having hinged top covers or doors, and more particularly to provision of means in such cabinets for counterbalancing in improved manner the weight of the cover as it is moved between open and closed positions.

One of the objects of the invention is to provide in a filing cabinet or the like of the type having a hinged cover disposed substantially horizontally when in cabinet closing position and vertically when in open position, improved means for counterbalancing the weight of the cover throughout swinging movements thereof between open and closed positions.

Another object of the invention 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 balance device which provides equal cover counterbalance effects throughout the range of swinging movements of the cover between open and closed positions thereof.

Another object of the invention is to provide an improved cover balance arrangement as aforesaid such as is particularly adapted to be incorporated in double wall type filing cabinets or the like.

Another object of the invention is to provide a device as aforesaid which tends automatically to lift the weight of the cabinet cover when given an opening impetus, and which tends to damp or soften slamming movements of the cover.

Another object of the invention is to provide a balance device as aforesaid which inherently operates to compensate for the gravity load variances thereon about its hinge axis due to swinging of the cover between horizontal or closed and vertical or open attitudes.

Another object of the invention is to provide a device as aforesaid which is relatively 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.

In the drawing:

Fig. 1 is a vertical section through an office filing cabinet equipped with a hinged cover counter balance mechanism of the invention;

Fig. 2 is a horizontal section taken along line II—II of Fig. 1;

Fig. 3 is a fragmentary interior perspective view of the cabinet with portions broken away, showing the cover and cover balance mechanism of the invention when the cover is in its vertical or "open" position;

Fig. 4 is a fragmentary section, taken along line IV—IV of Fig. 3; and

Fig. 5 is a fragmentary side elevation of the cabinet, with portions broken away to show the interior; showing the cover control mechanism at different positions of operation.

In the drawing the invention is illustrated by way of example in conjunction with a filing cabinet 10 which is of the vertical filing or "well" style presently used for storage of drawings or blue prints or the like. Thus as shown in Fig. 1, pockets may be suspended therein as indicated at 12 from rods 14 extending transversely of the upper interior of the cabinet to provide pockets into which flat articles 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. As shown, the cabinet 10 is formed

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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 position as shown in Figs. 1 and 5.

Cabinets of this type are often designed and constructed for example to resist fire damage to their contents, and to such ends the wall and cover members are usually fabricated to comprise double sheet metal panels filled with fire resistant or insulative material. Hence, the cover members of such cabinets are often of substantial weight and therefore difficult to control during raising and lowering thereof unless adequately counterbalanced. Prior efforts to counterbalance horizontally closing hinged covers in "well" type cabinets or the like have involved various applications of counterweight and spring devices, but they have not contemplated sufficiently simple and compact and otherwise satisfactory arrangements whereby the gravity load variances due to swinging of the cover about its hinge axis between horizontal and vertical attitudes may be automatically compensated for in the inherent operation of a spring balance device. Thus, the present invention contemplates employment of a compact spiral spring device arranged in a novel combination with a tension transmitting member and a compression strut member connected to the cabinet cover; the parts being so arranged that when the cover is in the region of its upright position whereby the gravity loads thereon about its hinge axis are relatively light, the device transmits to the cover relatively light biasing forces; while when the cover is in the region of a horizontal attitude whereby the gravity loads thereof about its hinge axis are relatively great, the device transmits to the cover relatively strong biasing forces.

For example as illustrated in the drawing herewith, one specific form of the invention may be constructed to employ a spiral spring balance device of the type such as is enclosed within a housing 20. This housing which is stationarily mounted within the cabinet as for example between the double sheet metal wall elements 21—22 comprising the side wall construction of the cabinet. It will of course be understood that one or more of the spring balance devices may be employed as desired, and that a practical arrangement may include paired units at opposite sides of the container as shown in Fig. 2. In Figs. 3 and 5 the spring housing 20 is shown as being mounted within the cabinet side wall structure as by means of a bracket 23, and as shown in more detail in Fig. 5, the spring unit includes within the housing 20 a rotatable reel device comprising a central hub 24 and side flanges 26 consisting of disks rigidly mounted upon the hub and spaced transversely from each other. This reel device is rotatable within the housing 20 to adjusted position while being at the same time positionally lockable therein as by means of a screw 28, the thread portion of which meshes with a toothed peripheral portion of one of the flange members 26. Thus, the reel device is rotatably adjustable within the housing 20 for purposes which will be explained hereinafter.

A spiral or clock-type spring 30 is disposed about the hub 24, and the inner end of the spring 30 is fixed to the hub 24 so as to move therewith in response to adjustments of the screw 28. The other end of the spring 30 is fixed to a collar 32 which encloses the spring 30 and spans the space between the flanges 26—26 of the reel device, but the collar is dimensioned so as to rotate freely between the reel flanges. A tension device in the form of a metal tape or strap as indicated at 34 is partially wrapped about and fixed at one of its ends to the sleeve 32 and then leads away from the reel through an opening 29' in the upper end wall of the housing 20 and carries an eyelet 36 which in turn detachably hooks upon 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 cabinet side wall structure for roller bearing contact with the bottom edge of the strut 38 so as to guide the latter to move between the solid and broken line positions thereof as illustrated in Fig. 5 coincident with movements of the cover 15 from its open and closed po-

sitions. A pulley 42 is also mounted upon the cabinet side wall structure, as by means of a bracket 43 and pin 44, for the strap 34 to train about incidental to movements of the cover 15 between closed and open 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. 5 toward its lowered or cabinet closing position as shown in broken lines in Fig. 5, the strut 38 will operate to draw upon the tape 34 so as to pull it over the pulley 42 and out of the reel device of the spring unit 20, thus causing the sleeve 32 of the spring device to rotate inside of the reel and to thereby draw the spring 30 into more tightly coiled condition against the elastic forces thereof. Thus, 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 screw 23 so as to provide just enough tension in the spring 30 to cause the tape 34 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 tape 34 to be pulled from the reel so as to cause the latter to draw the spring 30 into a constantly increased tension condition; and the spring and lever parts are so selected and dimensioned and arranged that at all positions of the cover 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.

More specifically, it is 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 tends 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 whenever an opening impetus is given manually to the cover, the inertia and friction forces are thereby overcome and the cover tends to rise to 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, but the slight overbalance effect of the spring 30 operates gradually to damp the downward closing movement of the cover. This eliminates possibility of falling or slamming of the cover down into closed position such as might otherwise injure the operator.

Thus, it will be appreciated that the invention provides a novel and advantageous cover movement control arrangement such as is particularly useful in connection with "well" type filing cabinets, or the like, and wherever the problem is to provide a control mechanism for a rela-

tively heavy cover device which will operate automatically to compensate for swinging of the cover at various angles about its hinge axis so as to at all times properly counterbalance the cover and facilitate manual opening and closing of the cover while at the same time protecting the operator against cover slamming hazards or the like. Thus, it will be also appreciated that whereas only one form of the invention has been described and illustrated in detail, it will be apparent to those skilled in the art that the invention is not so limited but that various changes may be made therein without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. A filing cabinet including a container open at its top, a cover for said cabinet hinged for vertical movement from a closed position upwardly to an opened position, an arm pivoted to said cover and extending downwardly into the container, and mechanism for counterbalancing opening and closing movements of said cover comprising a housing mounted upright adjacent a side wall of the cabinet and having a top wall provided with an opening, a reel in said housing having a horizontally disposed rotatably mounted hub and disks rigidly carried by said hub and spaced transversely from each other, a circular collar surrounding said hub and free from the hub and the disks, a coiled spring about said hub surrounded by said collar and secured at one end to the hub and at its other end to the collar, a tape wound about said collar and having one end secured to the collar, said tape extending outwardly through the opening in the top wall of the housing and connected with the lower end of said arm, said arm exerting pull upon the tape to turn the collar and tighten the coiled spring when the cover is swung downwardly to its closed position, and means mounted on said housing and engaging one of the disks of the reel to move the reel in a direction to adjust tension of the spring.

2. A filing cabinet as set forth in claim 1, wherein the means comprises a screw mounted in the housing, the screw having gear teeth on the shank thereof, and one of the disks having gear teeth on its periphery which are engaged and driven by the gear teeth on the shank when the screw is turned in either direction whereby the tension of the spring is adjusted.

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