United States Patent [19]

Anderson

[11] **3,881,793**

[45] **May 6, 1975**

[54] **ANTI-TILT MECHANISM**

[75] Inventor: **Kenneth M. Anderson,** Jamestown, N.Y.

[73] Assignee: **AVM Corporation,** Jamestown, N.Y.

[22] Filed: **Jan. 2, 1974**

[21] Appl. No.: **429,750**

[52] **U.S. Cl.** **312/217;** 312/276

[51] **Int. Cl.** . **E05b 65/46;** E05c 15/04; A47b 81/00

[58] **Field of Search** 312/217, 218, 219, 216

[56] **References Cited**

UNITED STATES PATENTS

3,371,974	3/1968	Vermeersch	312/218
3,404,929	10/1968	Wright et al.	312/216
3,454,320	7/1969	Olree	312/217
3,560,068	2/1971	Ostrom	312/217
3,622,216	11/1971	Havnost	312/219

Primary Examiner—Paul R. Gilliam
Assistant Examiner—Andrew M. Calvert
Attorney, Agent, or Firm—Bean & Bean

[57] **ABSTRACT**

In a filing cabinet having a plurality of aligned drawers supported for horizontal movement between closed and open positions, the improvement of an anti-tilt mechanism for preventing the opening of other of such drawers after a first drawer has been opened.

15 Claims, 8 Drawing Figures

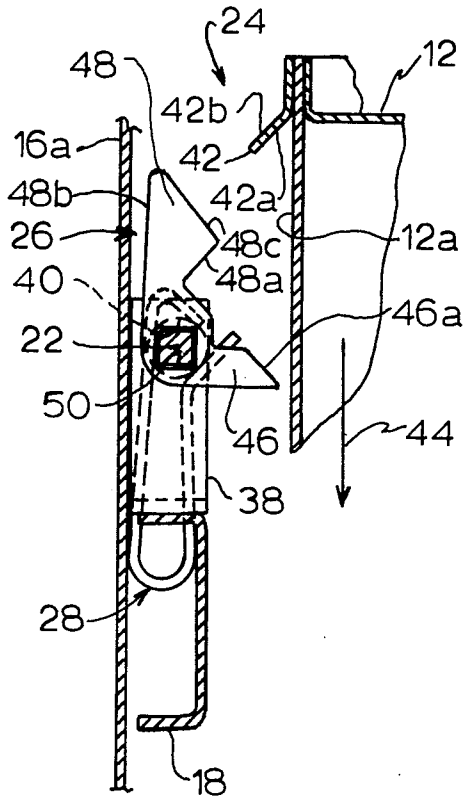


FIG. 1

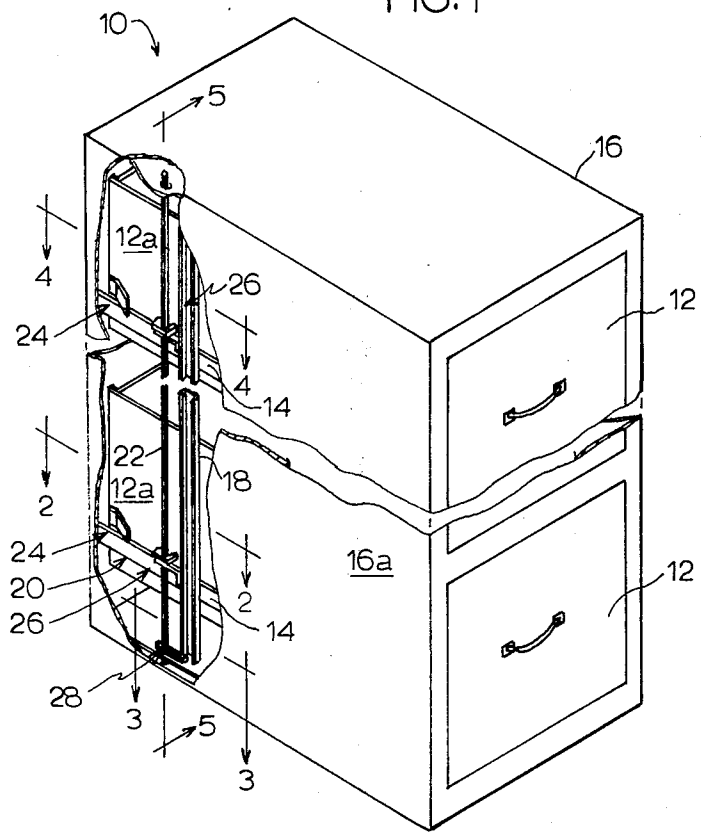


FIG. 2a

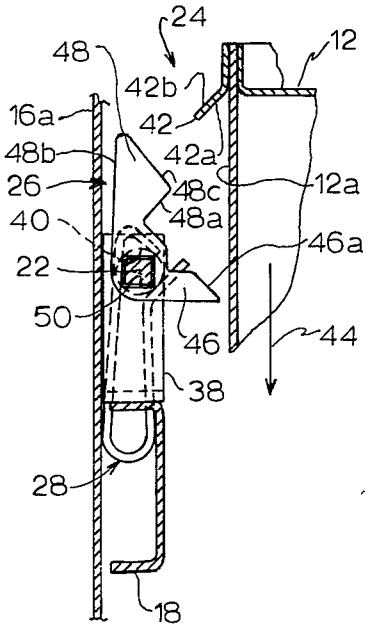


FIG. 2b

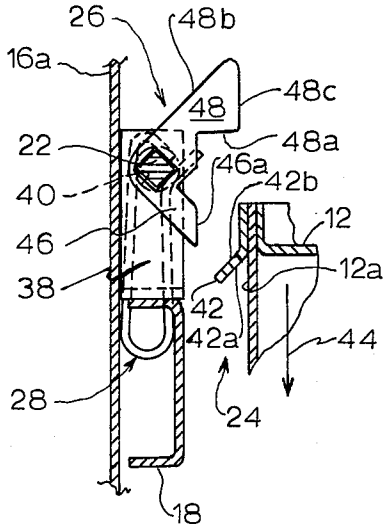


FIG. 3a

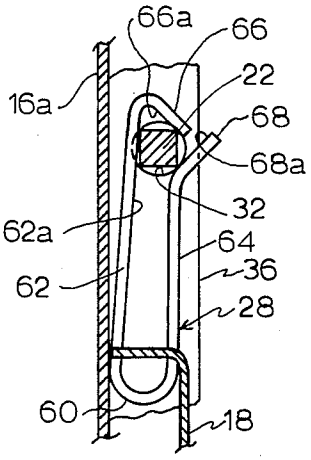


FIG. 3b

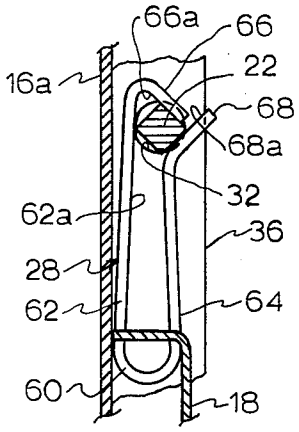


FIG. 4

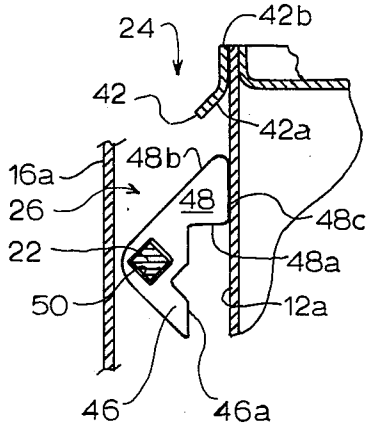


FIG. 5

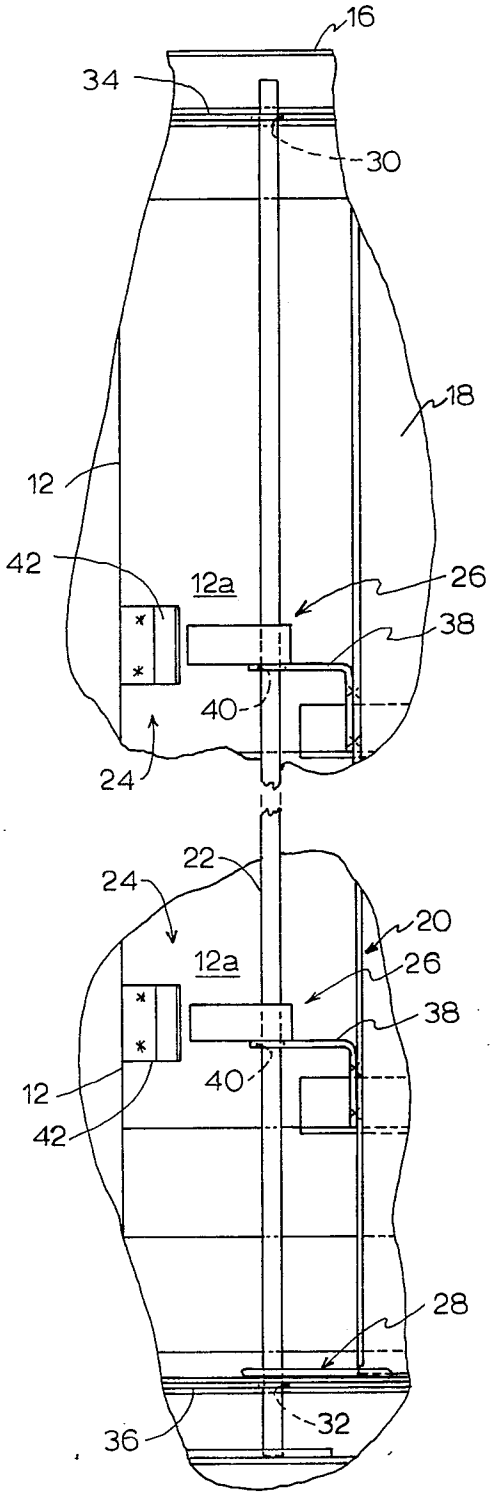
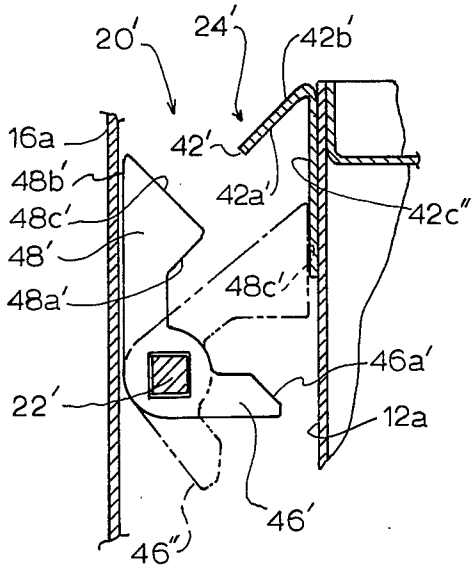

16
34
30
18
12
42
12a
26
38
40
24
22
24
20
12a
26
38
40
12
42
28
36
32

FIG. 6


20'
24'
42b'
16a
42'
48b'
42a'
42c''
48c'
48'
48c'
48a'
46a'
22'
12a
46'
46''

ANTI-TILT MECHANISM

BACKGROUND OF THE INVENTION

This invention relates to filing cabinets of the type having a plurality of drawers arranged in linear alignment with one another and more particularly to an anti-tilt mechanism for interlocking the drawers within such cabinet so that once any given drawer has been opened, the other drawers are prevented from being extended in order to prevent the filing cabinet from becoming unbalanced.

More particularly, the present invention is directed towards an improvement in anit-tilt mechanisms of the general type disclosed in U.S. Pat. No. 3,454,320. In this prior mechanism, a plurality of cam members are fixed for simultaneous rotation with a rod and spaced therealong one in association with each of a plurality of abutments carried one by each drawer. Each cam member is formed with two finger elements, which successively cooperate with leading and trailing surfaces of the abutment carried by the first drawer to be opened for initially moving all of the cam members into a drawer latched condition as the first drawer is opened and then returning such cam members to drawer unlatched condition as such first drawer is closed. When the cam members are in their drawer latched condition, engagement of the leading surfaces of the abutments of the other drawers with their associated cam members serves to prevent opening of such other drawers.

It is believed that an undesirable feature of this general type of construction is the manner in which the latched and unlatched conditions of the cam members are defined. Specifically, the latched and unlatched conditions are defined by resiliently driving the finger elements alternately into engagement with a side wall of the cabinet. Thus, this construction will produce noise each time a drawer is moved either in or out and repeated striking of the finger elements against the cabinet side wall may cause the formation thereof, particularly when formed of a thin gauge metal.

SUMMARY OF THE INVENTION

The present invention is directed towards an improved anti-tilt mechanism for interlocking the drawers of a cabinet, so that once any given drawer has been opened, the other drawers are prevented from being extended in order to prevent unbalancing of the cabinet.

DRAWINGS

FIG. **1** is a perspective view of a drawer file cabinet with portions thereof broken away to show the anti-tilt mechanism of the present invention;

FIG. **2***a* is a sectional view taken generally along the line **2—2** in FIG. **1** and showing a cam member of the mechanism arranged in drawer unlatched condition adjacent its associated drawer;

FIG. **2***b* is a view similar to FIG. **2**a, but showing the drawer moved into open position and the resultant drawer latched condition of its associated cam member;

FIg. **3***a* is a sectional view taken generally along the line **3—3** in FIG. **1**, and showing the condition of the spring device when all drawers are in closed position;

FIG. **3***b* is a view similar to FIG. **3***a*, but showing the condition of the spring when a drawer has been moved into open position;

FIG. **4** is a sectional view taken generally along the line **4—4** in FIG. **1** and showing a cam member when in drawer latched condition in association with a closed drawer;

FIG. **5** is a sectional view taken generally along the line **5—5** in FIG. **1**; and

FIG. **6** is a view similar to FIG. **2***a*, but showing an alternate form of the present invention.

DETAILED DESCRIPTION

The present invention possesses utility in cabinets of the general type having two or more linearly aligned drawers, wherein it is desired to prevent opening of other drawers after a first drawer has been opened in order to prevent unbalancing of the cabinet. A preferred form of the invention will now be described with initial reference to FIG. **1**, wherein a typical vertical file cabinet is generally designated as **10** and shown as including a plurality of file drawers **12** mounted in a spaced, vertically aligned relationship for horizontal movements between closed and open positions by rail structures **14**, which are in turn suitably supported within the cabinet casing or frame **16**, as by vertically disposed U-shaped, support channels **18**. It will be understood that drawers **12**, rail structures **14** and cabinet casing **16** may be of any conventional construction, other than that illustrated in the drawings and thus the invention to be hereinafter described is not to be considered as being limited thereto.

Interlocking of drawers **12** for the purpose of preventing other drawers from being opened after a first drawer has been opened, is effected by the anti-tilt mechanism of the present invention, which is generally designated as **20** in FIGS. **1** and **5**. Mechanism **20** includes an elongated rod **22**; a plurality of latch devices **24**, which are arranged one in association with each of, that is, carried one by each of drawers **12**; a plurality of cam members or devices **26**, which are spaced lengthwise of rod **22** one in operative association with each of latch devices **24**; and a spring device **28**. It will be understood that the term "plurality" as used herein is meant to include two or more, and that therefore the term "other drawers" is meant to include one or more additional file cabinet drawers.

With particular reference to FIGS. **1**, **2**a and **5**, it will be understood that in a preferred form of the present invention, rod **22** is mounted in and by casing **16** to extend perpendicular to and immediately adjacent drawers **12**, as by being end journaled within circular cutouts **30** and **32** formed in upper and lower casing structural parts **34** and **36**, respectively. Sidewise movement or deflection of rod **22** intermediate its ends may be prevented by angle brackets **38**, which are formed with rod receiving or journaling circular openings **40** and fixed to one of support channels **18**. Preferably, rod **22** is of a non-round, such as square, cross-sectional configuration in order to facilitate mounting of the cam members **26** in the manner to be described.

Each of latch devices **24** may be considered as including an abutment and a stop. In the preferred form of the invention best shown in FIGS. **2***a*–**5**, each stop is defined by the outwardly facing surface of a side wall **12***a* of its associated drawer; and each abutment is defined by a flange **42**, which is fixed to a rear end poriton

of its associated drawer side wall **12***a*, as by welding, and arranged to extend forwardly in a diverging relationship relative to such outwardly facing surface. Flange **42** may be considered as having leading and trailing surfaces **42***a* and **42***b*, respectively, relative to its path of travel as its associated drawer is moved towards open position in the direction indicated by arrow **44** in FIG. **2***a* and **2***b*.

Cam members **26** are shaped to define an operator finger **46** and an interlock-return finger **48,** which are arranged in an essentially right angular relationship and extend horizontally and radially of the rotational or lengthwise extending axes of rod **22.** Operator finger **46** may be considered as having an operator or rearwardly disposed edge surface **46***a*, where interlock-return finger **48** may be considered as haivng a return or forwardly disposed edge surface **48***a*, an interlock or rearwardly disposed edge surface **48***b* and a stop or intermediate edge surface **48***c*.

Cam members **26** may be fixed for simultaneous rotation with rod **22** in any suitable manner. However, they are preferably coupled for conjunctive rotation by forming each cam member with an aperture **50,** which extends vertically therethrough and has a non-round configuration corresponding to that of rod **22.** Apertures **50** are dimensioned to permit cam members **26** to be freely slid onto rod **22** in order to facilitate assembly of mechanism **20**; the cam members being thereafter constrained against movement downwardly along the rod surface engagement with angle brackets **38.**

It will be understood that cam members **26** alternately assume first drawer unlocked and second drawer latched conditions, shown in FIGS. 2a and 2b, respectively. When the cam members **26** are in their first condition, which they assume when all drawers are closed, their operator fingers **46** are arranged in operative alignment with the path of travel of their associated abutment **24** and their interlock-return fingers **48** are removed from such alignment. On the other hand, when the cam members are in their second condition, which they assume when any one of drawers **12** has been opened, their interlock-return fingers are disposed in operative alignment with their associated abutments and their operator fingers are removed form such alignment. Cam members **26** are moved or rotated through about 45° from their first condition into their second condition upon movement of a first of drawers **12** into open position by driving surface engagement of leading surface **42***a* of its abutment **42** with operator edge surface **46***a* of its operatively associated operator finger **46.** Thereafter, the other drawers are prevented from being opened by engagement of leading surface **42***a* of their associated abutments **42** with interlock edge surfaces **48***b* of their operatively associated interlock-return fingers **48,** which are in turn prevented from movement from their second condition in a direction away from their first condition by surface engagement of stop edge surfaces **48***c* with side walls **12***a* of the other drawers, as shown in FIG. **4.** In effect, the other drawers are prevented from opening by wedging engagement of their associated abutments and stops with their associated interlock-return fingers.

As a practical matter, engagement of stop edge surfaces **48**c with the side walls of the non-opened drawers may be relied upon to positively establish the second condition of the cam members, as indicated in FIG. **4.** However, if manufacturing tolerances permit, it would be preferable from the standpoint of operating noise reduction to employ spring device **28** to establish the second condition of the cam members, so as to permit a slight spacing to exist between the stop edge surfaces and the side walls. Thereafter, whenever an attempt would be made to open another drawer, engagement of its abutment with operatively associated interlock-return finger would merely cause the latter to swing into engagement with the side wall of the drawer; the extent of such swinging movement being of course insufficient to remove the interlock-return finger from operative alignment with its associated abutment, i.e. over-center relative to rod **22.**

The cam members are automatically returned to their first condition when the first drawer to be opened is closed by driving engagement of trailing surface **42***b* of its abutment or flange **42** with the return edge surface **48***a* of its operatively associated interlock-return finger.

Spring device **28** is best shown in FIGS. **3***a*, **3***b* and **5,** as being of generally U-shaped configuration and as resting on casing structural part **36** with its base portion **60** constrained from movement or positionally oriented relative to rod **22** by cooperation of the lower end of support channel **18,** the upper surface of part **36** and casing side wall **16***a*. Extending from spring base portion **60** are a pair of leg portions **62** and **64,** which have their free ends bent to define rod engaging parts **66** and **68,** respectively. Leg portion **62** and parts **66** and **68** have facing surfaces **62***a*, **66***a* and **68***a*, which are adapted to engage planer surfaces of the rod and junctures of such planer surfaces in order to releasably retain the rod alternately in first and second rotatable positions thereof, shown in FIGS. **3***a* and **3***b*, respectively, which correspond to the first and second conditions of cam members **26.** During movement of rod **22** between its first and second positions, spring device **28** is resiliently deformed and subject to slight displacements in a direction extending lengthwise of leg portions **62** and **64.**

Reference is now made to FIG. **6,** wherein like parts of an alternative form of the present anti-tilt mechanism are designated by primed numbers. This form of the invention differs primarily from that previously described in the design of latch device **24'**. Specifically, latch device **24'** includes a flange member **42'**, which is shaped to define both an abutment portion having leading and trailing surfaces **42***a'* and **42***b'* and a stop portion **42***c'*, which is adapted to be engaged by interlock-return finger stop edge surface **48***c'*, as indicated in phantom line.

I claim:

1. In a file cabinet of the type having a plurality of drawers supported by said cabinet in linear alignment with each other for horizontal movements between closed and open positions and an anti-tilt mechanism for preventing opening of other drawers after a first drawer has been opened, the improvement wherein said anti-tilt mechanism comprises:

a plurality of latch means carried one on each of said drawers, each said latch means including abutment means and stop means, each said abutment means having leading and trailing surfaces relative to its path of travel as its associated drawer is moved towards open position;

an elongated rod mounted in and by said cabinet to extend perpendicular to an immediately adjacent

said drawers for rotary movements about its own longitudinal axis; and

a plurality of cam members fixed for simultaneous rotation with said rod and spaced therealong one in operative association with each of said latch means, each said cam member having an operator finger and an interlock-return finger, said cam members having a first drawer unlatched condition when all of said drawers are closed wherein their operator fingers are disposed in operative alignment with said path of travel of said abutment means of said latch means with which said cam members are operatively associated and their interlock-return fingers are removed from such alignment and a second drawer latched condition wherein their interlock-return fingers are disposed in operative alignment with said path of travel of said abutment means of said latch means with which said cam members are operatively associated and their operator fingers are removed from such alignment, said cam members being movable from said first condition into said second condition upon movement of said first drawer into open position by driving surface engagement of said leading surface of its associated abutment means with its operatively aligned operator finger, said cam members being returned to said first condition from said second condition upon return movement of said first drawer to closed condition by driving surface engagement of said trailing surface of its associated abutment means with its operatively aligned interlock-return finger, said other drawers being prevented from being opened while said first drawer is in open position due to surface engagement of said leading surface of their associated abutment means with their operatively aligned interlock-return fingers and said interlock-return fingers of said cam members operatively associated with said latch means carried by said other drawers surface engaging with said stop means of said other drawers to prevent movement of said interlock-return fingers from operative alignment with said abutment means in a direction away from said first condition.

2. The improvement according to claim **1,** wherein said cam members when in said first and second conditions are angularly spaced through about 45° of rotation of said rod, and said fingers of each of said cam members are arranged in an essentially right angular relationship.

3. The improvement according to claim **2,** wherein said anti-tilt mechanism includes resiliently deformable means for releasably retaining said cam members alternately in said first and second conditions, said resiliently deformable means being of generally U-shaped configuration and having a base portion positionally oriented relative to said rod by said cabinet and having leg portions formed with facing surfaces disposed in engagement with surfaces of a square cross-sectioned portion of said rod, said resiliently deformable means being deformable upon rotation of said rod to move said cam members between said condition thereof.

4. The improvement according to claim **1,** wherein said stop means associated with each said drawer comprises an outwardly facing surface of a side wall of said drawer and said abutment means associated with each said drawer comprises a flange fixed to said side wall adjacent a rear end portion thereof to extend forwardly in a diverging relationship relative to said outwardly facing surface.

5. The improvement according to claim **4,** wherein said rod is of square cross-sectional configuration and said anti-tilt mechanism includes resiliently deformable means for releasably retaining said cam members alternately in said first and second conditions, said resiliently deformable means being a generally U-shaped spring device having a base portion positionally oriented relative to said rod by said cabinet and a pair of leg portions, said leg portions having facing surfaces thereof arranged to alternately engage planar surfaces and junctures of adjacent planar surfaces of said rod when said cam members are in said first and second conditions, said spring device being deformable during rotation of said rod to move said cam members into said first and second conditions.

6. The improvement according to claim **1,** each of said latch means comprises a flange member fixed to its associated drawer and formed to define said stop means and said abutment means.

7. The improvement according to claim **6,** wherein each said flange member is fixed to a side wall of its associated drawer and includes a flange portion disposed parallel to said side wall for defining said stop means and another flange portion joined to a rearwardly disposed edge of said flange portion and extending forwardly and in a diverging relationship relative thereto to define said abutment means.

8. The improvement according to claim **7,** wherein said rod is of square cross-sectional configuration and said cam members are releasably retained alternately in said first and second condition by resiliently deformable means, said resiliently deformable means being a generally U-shaped spring device having a base portion positionally oriented relative to said rod by said cabinet and a pair of leg portions, said leg portions having facing surfaces thereof arranged to alternately engage planar surfaces and junctures of adjacent planar surfaces of said rod when said cam members are in said first and second conditions, said spring device being deformable during rotation of said rod to move said cam members into said first and second conditions.

9. In a file cabinet of the type having a plurality of drawers supported by said cabinet in linear alignment with each other for horizontal movement between closed and open positions and an anti-tilt mechanism for preventing opening of other drawers after a first drawer has been opened, the improvement wherein said anti-tilt mechanism comprises:

a plurality of latch means carried one on each of said drawers, each of said latch means including abutment means and stop means, each said abutment means having leading and trailing surfaces relative to its path of travel as its associated drawer is moved towards open position;

an elongated rod mounted in and by said cabinet to extend perpendicular to and immediately adjacent said drawers for rotary movement about its own longitudinal axis;

a plurality of cam members fixed for simultaneous rotation with said rod and spaced therealong one in operative association with each of said latch means, each of said cam members having an operator finger and an interlock-return finger, said cam members having a first drawer unlatched condition and a second drawer latched condition, said cam

members when in said first condition having their operator fingers disposed in operative alignment with said path of travel of said abutment means of said latch means with which said cam members are operatively associated and their interlock-return fingers removed from such alignment and when in said second condition having their interlock-return fingers disposed in operative alignment with said path of travel of said abutment means of said latch means with which said cam members are operatively associated and their operator fingers removed from such alignment, said cam members being movable from said first condition into said second condition upon movement of said first drawer into open position by driving surface engagement of said leading surface of its associated abutment means with its operatively aligned operator finger, said cam members being returnable to said first condition from said second condition upon return movement of said first drawer to closed position by driving surface engagement of said trailing surface of its associated abutment means with its operatively aligned interlock-return finger, and movement of said other drawers into open position when said first drawer is open being prevented by wedging surface engagement of their associated abutment means and stop means with operatively aligned interlock-return fingers of said cam members with which said latch means of said other drawers are operatively associated.

10. A file cabinet comprising in combination:

a cabinet frame;

a plurality of file drawers;

means for supporting said drawers on said frame in vertical alignment and for horizontal movements between open and closed positions; and

an anti-tilt mechanism for preventing opening of other of said drawers after a first of said drawers has been opened, said mechanism including an elongated rod supported within and by said cabinet frame to extend vertically and immediately adjacent a side wall of each of said drawers and for rotary movements about its own longitudinal axis, a plurality of latch means carried one on each of said drawers, each said latch means including an abutment means and stop means, each of said abutment means having leading and trailing surfaces relative to its path of travel as its associated drawer is moved horizontally towards open position, and a plurality of cam members fixed for simultaneous rotation with said rod and spaced vertically therealong one in operative association with each of said latch means, each said cam member having an operator finger and an interlock-return finger, said cam members having a first drawer unlatched condition when all of said drawers are closed wherein their operator fingers are disposed in alignment with said path of travel of said abutment means of said latch means with which said cam members are operatively associated and their interlock-return fingers are removed from such alignment and a second drawer latched condition wherein their interlock-return fingers are disposed in alignment with said path of travel of said abutment means of said latch means with which said cam members are operatively associated and their operator fingers are removed from such alignment, said cam members being movable from said first condition into said second condition upon movement of said first drawer into open position by driving surface engagement of said leading surface of its associated abutment means with its operatively aligned operator finger, said cam members being returned to said first condition from said second condition upon return movement of said first drawer to closed position by driving surface engagement of said trailing surface of its associated abutment means with its operatively aligned interlock-return finger, said other drawers being prevented from being opened while said first drawer is in open position due to surface engagement of said leading surface of their associated abutment means with their operatively aligned interlock-return fingers, and said interlock-return fingers of said cam members operatively associated with said latch means carried by said other drawers surface engaging with said stop means of said other drawers to prevent movement of said interlock-return fingers from operative alignment with said abutment means in a direction away from said first condition.

11. A file cabinet according to claim **10,** wherein said rod is of non-round cross-sectional configuration, each said cam member is formed with an aperture extending vertically therethrough, said aperture having a configuration corresponding to said rod configuration for slidably receiving said rod while constraining its cam member for rotation with said rod, and means are fixed to said frame for constraining said cam members from vertical movement downwardly along said rod.

12. A file cabinet according to claim **11,** where the last said means are apertured to rotatably receive said rod and constrain horizontal deflection thereof intermediate upper and lower ends of said rod.

13. A file cabinet according to claim **12,** wherein said rod is of square cross-sectional configuration and said cam members are releasably retained alternately in said first and second conditions by resiliently deformable means, said resiliently deformable means being a generally U-shaped spring device having a base portion positionally oriented relative to said rod by said cabinet and a pair of leg portions, said leg portions having facing surfaces thereof arranged to alternately engage planar surfaces and junctures of adjacent planar surfaces of said rod when said cam members are in said first and second conditions, said spring device being deformable during rotation of said rod to move said cam members into said first and second conditions.

14. A file cabinet according to claim **13,** wherein said stop means associated with each said drawer comprises an outwardly facing surface of the side wall of said drawer, and said abutment means associated with each said drawer comprises a flange fixed to its side wall adjacent a rear end portion thereof to extend forwardly in a diverging relationship relative to said outwardly facing surface.

15. A file cabinet according to claim **13,** wherein each said latch means is defined by a flange member, said flange member being fixed to the side wall of its associated drawer and including a flange portion disposed parallel to said side wall for defining said stop means and another flange portion joined to a rearwardly disposed edge of said flange portion and extending forwardly and in a diverging relationship relative thereto to define said abutment means.

* * * * *