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SLIDING WINDOW OF THE BALANCED TYPE

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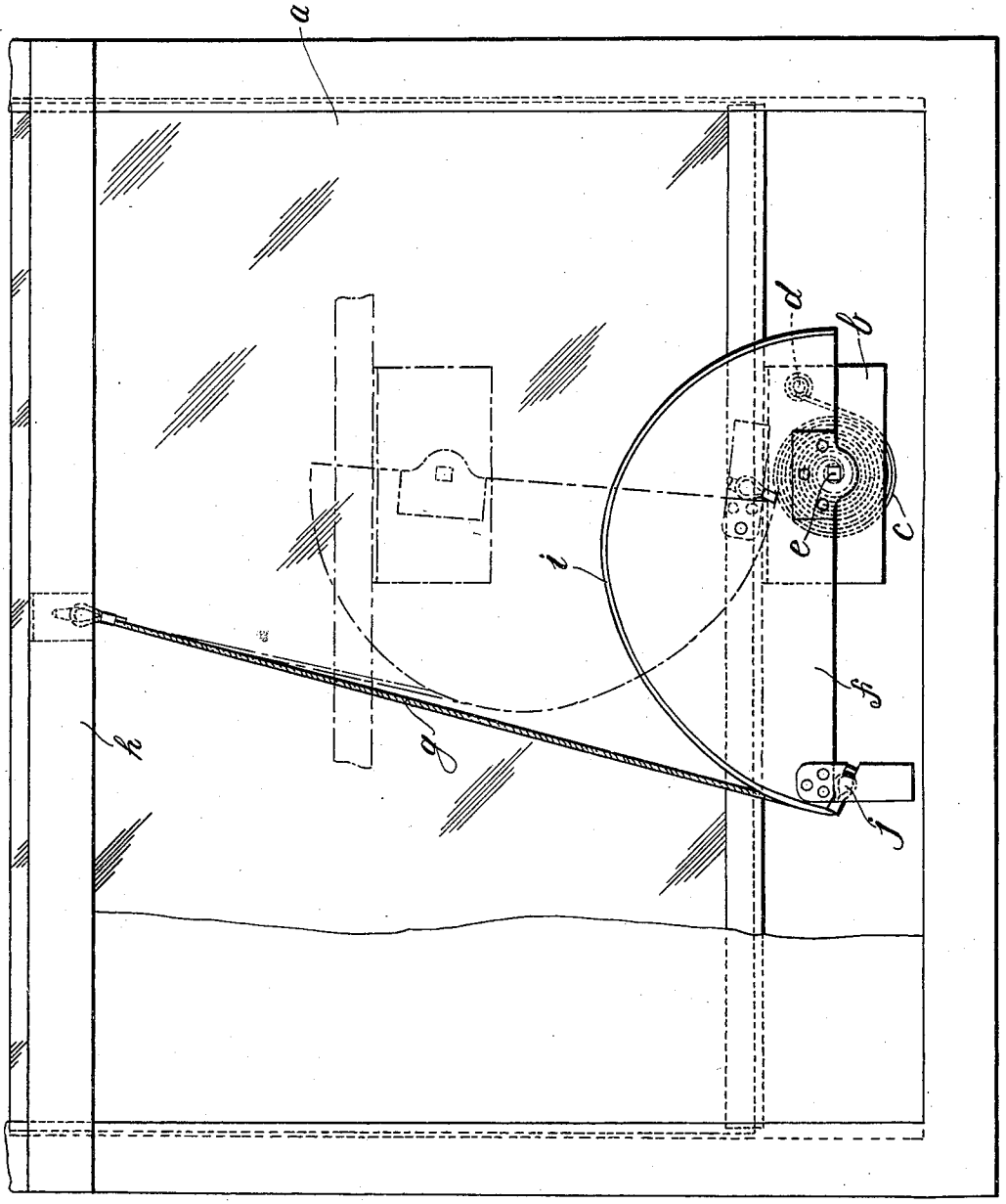

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SLIDING WINDOW OF THE BALANCED TYPE

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This invention relates to slidable windows of the spring balanced type and has for its object to provide a new or improved spring balanced device for controlling the movements of such windows in such a manner that the window will be substantially balanced in any position to which it may be adjusted.

The invention employs spring balanced mechanism of the known type in which the variation of leverage necessary to enable the spring to balance the weight of the window in all positions of the latter is obtained by means of a rotatable cam plate so shaped that the rotation of the cam plate varies the leverage upon a coil or chain which is fixed at one end to the cam plate and is wound on to the cam plate as the latter rotates.

According to the invention the window is suspended directly by a cord or chain and cam plate controlled by a spiral spring acting directly on the cam plate.

In the preferred construction the cam plate, which is mounted on the sliding window in a plane parallel thereto, is of substantially semi-circular form and is so arranged that when the window is fully raised the plate turns to a position with its straight edge uppermost so that no part of the cam plate will project above the garnish rail when the window is raised. This construction permits a cam plate and coil spring of substantial dimensions to be accommodated with the window in a housing of ordinary dimensions.

Reference will now be made to the accompanying drawing which illustrates by way of example an elevation partly in section showing the application of the invention to a vertically slidable window.

In the form illustrated there is mounted at or near the lower edge of a window *a* a bracket *b* shaped to constitute a housing for a spiral spring *c* the outer end of which is fixed to the bracket at *d* while the inner end of the spring is fixed to a spindle *e* rotatably mounted in the bracket, this spindle also carrying a cam plate *f* movable therewith but having its cam face eccentric thereto. The plate *f* is preferably, but not essentially of semi-circular form as shown, one of its ends being flexibly connected by a cable *g* or the like to the garnish rail *h* or other fixed part of the housing of the slidable window. The curved edge *i* of the plate *f* which may be of involute instead of semi-circular form is grooved peripherally so as to accommodate the cable *g* during the operation of the device as hereinafter described.

When the window *a* is in its lowermost position as shown in the drawing, the flexible cable *g* is out of engagement with the pivoted plate *f* except at the point of connection *j* and the plate is in the position shown in which its lower edge is horizontal, the spring *c* being wound to its fullest extent. As the window is raised the cable *g* is slackened and the spindle *e* is also raised thus freeing the spring to unwind and partially rotate the spindle *e* and plate *f* in an anti-clockwise direction so that the cable *g* becomes wrapped partially around the cam plate resting in its peripheral groove, as shown in the broken line position in the drawing. This movement is such as partially to unwind the spring but owing to the eccentric mounting of the plate *f* the higher the window is raised the less becomes the distance between the point at which the cable *g* engages the periphery of the plate *f* and the point about which the plate is rotating with the result that the leverage is decreased as the tension of the spring is relaxed, thus giving an even tension on the window throughout its upward movement.

When the window is depressed the spring becomes tensioned and the pivoted plate returns to its normal position in which it is out of contact with the cable *g* except at the point of connection *j*.

The arrangement above described may be employed in conjunction with any suitable arrangement for engaging the edge or edges of a window and locking in any one of a series of adjusted positions.

I claim:—

1. Means for balancing a vertically slidable window in its frame, said means comprising a plate rotatively mounted on the lower portion of such window and having one of its edges curved, the axis of rotation of said plate being nearer one end of said curved edge than the other end of same and said

curved edge being uppermost when such window is in lowered position, flexible means extending between a part of the frame and the curved edge of the plate adjacent the end of the latter remote from the axis of rotation of the plate, and yieldable means associated with said plate and tending to rotate said plate and elevate the window.

2. Means for balancing a vertically slidable window in its frame, said means comprising a plate rotatively mounted on the lower part of such window, said plate having an arcuate edge eccentric to its axis of rotation and said arcuate edge being uppermost when said window is in lowered position, a flexible member having its upper and lower ends connected, respectively, to a part of the window frame and to the arcuate edge of said plate adjacent the end of the latter remote from the axis of rotation of said plate, and yieldable means tending to rotate said plate and elevate the window.

3. The combination set forth in claim 1 wherein the yieldable means which tends to rotate the plate and elevate the window comprises a scroll spring surrounding the axis of rotation of the plate and having its ends connected, respectively, to the plate and to the lower portion of the window.

4. The combination set forth in claim 2 wherein the yieldable means tending to rotate the plate and elevate the window comprises a scroll spring surrounding the axis of rotation of the plate and having its ends connected, respectively to the plate and to the lower part of the window.

5. A mechanism for balancing the vertical sliding movement of a window in a frame, said mechanism comprising a bracket for attachment to the lower part of a window, a plate rotatively mounted on said bracket and having one of its edges curved eccentrically to the axis of rotation of said plate, a flexible member having one of its ends connected to the curved edge of said plate adjacent that end of the plate which is at the greater distance from the axis of rotation of the plate and having at its other end means for attachment to a part of the frame.

In testimony whereof I have hereunto set my hand.

SYDNEY EDWARD THOMAS.