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(54) Sash balancing

(57) A torque-reducing connection for connecting a spring of a window or door sash-balance to a shoe or block adapted to slide in a fixed frame member is in the form of a shackle-collar, 5-7, arrangement wherein two or more limbs 5a, b of the shackle are engaged with grooves 4 in the block.

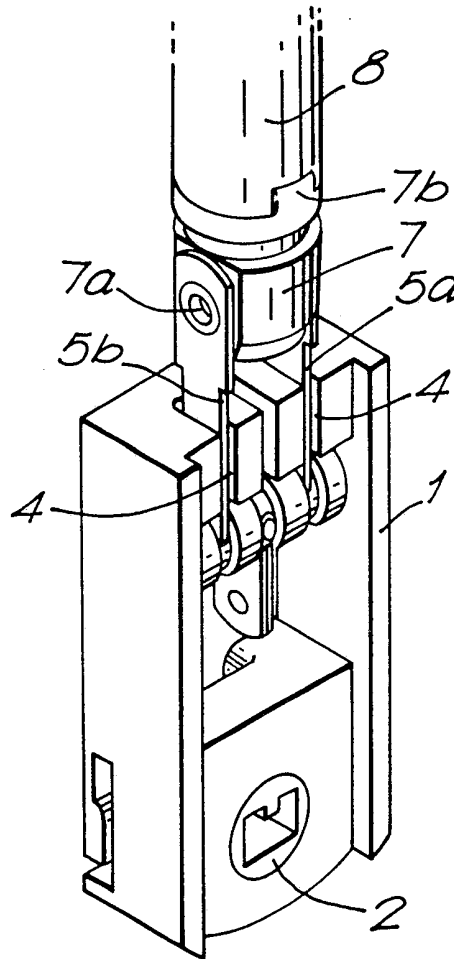


FIG. 4.

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FIG.1.

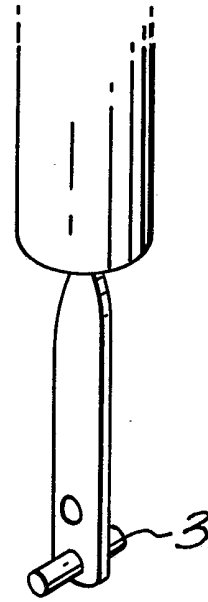


FIG.2.

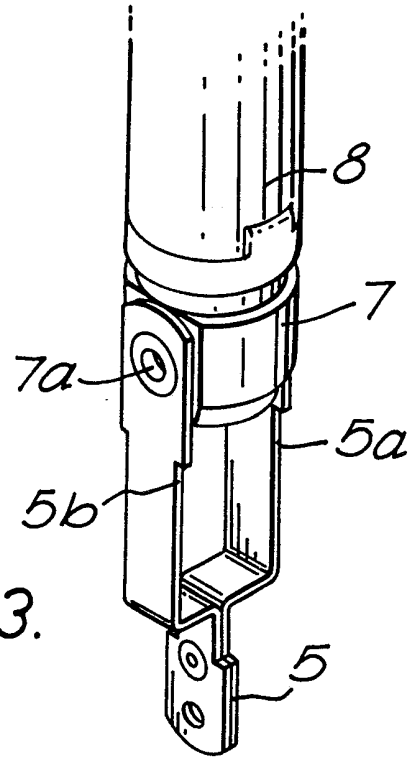
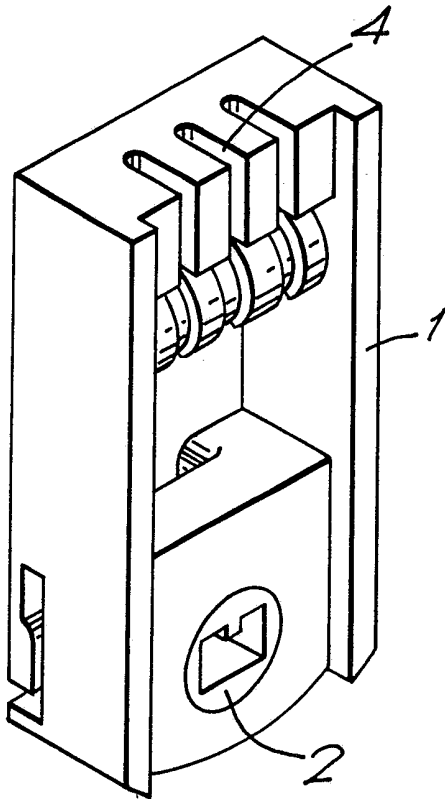


FIG.3.

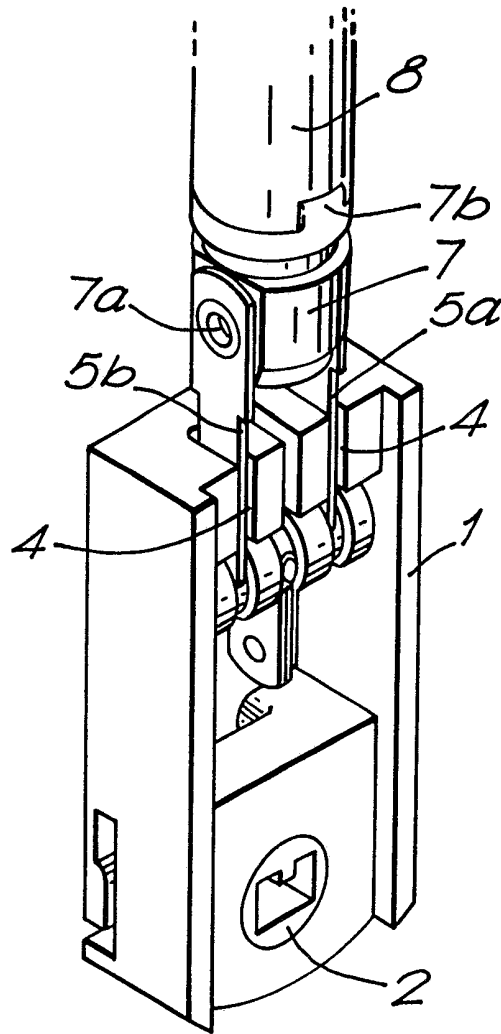


FIG. 4.

SPECIFICATION

Improvements in or relating to sash balances

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This invention relates to sash-balances of the type in which a torsion and/or tension spring is enclosed within a tube which is adapted to be accommodated within a vertical fixed frame member of a door or window and the force of the spring is used to counter-balance the weight of the sash.

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Various types of sash balances are known which incorporate torsion-springs or tension springs or both. Typical are those manufactured by CATNIC COMPONENTS (GARADOR DIVISION), YEOVIL, SOMERSET under the trade-name "UNIQUE" (Registered Trade Mark).

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The top of the spring is normally fixed to a fixed vertical frame member while the bottom or "foot" of the spring is normally attached to a sliding plastic block or "shoe" which slides within a channel in the fixed frame and is attached to the bottom of the sash being balanced.

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The shoe slides in a channel in the fixed side frame member of the door or window and is attached to the bottom of the sash by means of a metal bar inserted into the shoe. A prior art arrangement is shown in Figs. 1 and 2 which illustrate a known spring-end connection and a sash balance tilt-shoe respectively.

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With reference to Figs. 1 and 2, the prior art arrangement is to attach the balance-spring end to the tilt shoe by slotting the end of a spiral rod attached to the spring (3) into a groove (4) in tilt shoe (1) which has further provided therein a cam (2) which is adapted to receive a metal bar for attachment to the bottom of the sash (not shown).

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In operation such an arrangement leads to a torque action which is transmitted, from the torsion spring, via the spiral rod (3) to the shoe which results in a tendency for the shoe to twist in the channel and leads to undesirable frictional forces between shoe and channel surfaces.

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We have now devised a connection between the end of the torsion spring and the tilt shoe which allows such frictional forces to be largely overcome.

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This invention consists in a sash-balance for a door or window, wherein torsion and tension springs are contained within a tube adapted to be mounted in a fixed vertical frame-member and the foot of the spring is connected to a block or shoe adapted to slide in said frame-member and to be attached to the bottom of a sash, characterized in that the connection between the foot of the spring and the shoe is at two or more horizontally-separated locations, whereby the torque

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shoe is reduced.

Preferably the spring is connected to the shoe by means of a collar and shackle arrangement, wherein a shackle is attached to a collar at the foot of the spring and the shackle has at least two parallel limbs which engage with grooves in the shoe.

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Preferably the collar carries a projection which is adapted to lock into a recess in the tube enclosing the spring, so as to resist rotation of the collar with the spring and to enable pre-tensioning of the spring.

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The invention will now be further illustrated with reference to Figs. 3 and 4 of the accompanying drawings, which illustrate a connection arrangement according to the invention.

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With reference to Fig. 3, the connector is in the form of a bifurcated shackle, designated 5 which has parallel limbs 5a and 5b which are pivotably attached to a collar 7 by means of swivel-pins designated 7a.

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With reference to Fig. 4, the limbs 5a and 5b of the shackle 5 are inserted into grooves 6 which are cut into shoe 1 as shown in the drawing. In this way the torque effect of the spiral spring acting on the shoe is reduced or eliminated.

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The collar 7 has a projection 7b adapted to fit into a recess in tube 8 and to lock the collar against rotation. In this way the torsion spring can be pre-tensioned by rotation before the collar is locked into the tube.

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CLAIMS

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1. A sash-balance for a door or window, wherein torsion and tension springs are contained within a tube adapted to be mounted in a fixed vertical frame-member and the foot of the spring is connected to a block or shoe adapted to slide in said frame-member and to be attached to the bottom of a sash, characterized in that the connection between the foot of the spring and the shoe is at two or more horizontally-separated locations, whereby the torque transmitted from the torsion spring to the shoe is reduced.

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2. A sash-balance as claimed in claim 1 wherein the spring is connected to the shoe by means of a collar and shackle arrangement, wherein a shackle is attached to a collar at the foot of the spring and the shackle has at least two parallel limbs which engage with grooves in the shoe.

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3. A sash-balance as claimed in claims 1 or 2, wherein the collar carries a projection which is adapted to lock into a recess in the tube enclosing the spring, so as to resist rotation of the collar with the spring and to enable the spring to be pre-tensioned.

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4. A sash-balance for a door or window substantially as hereinbefore described with reference to Fig. 3 or Fig. 4 of the accompanying drawings.

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