CLAIMS

1. A torsion spring counter balancing mechanism for a stacking panel shutter door, wherein

   a) one end of the or each torsion spring is fixable to a drive transmission shaft of the stacking panel shutter door, the drive transmission shaft being adapted to raise and lower the or each shutter of the stacking panel shutter door; and
   b) the other end of the or each torsion spring is fixable to a separate rotatable member of the stacking panel shutter door;

and whereby the mechanism is provided with means adapted to enable both the drive transmission shaft and the rotatable member to rotate in tandem in the same direction, during opening and closing of the stacking panel shutter door, in such a manner as to cause respective ends of the or each torsion spring to travel at different speeds during the opening and closing sequence.

~~2. The mechanism as claimed in claim 1, wherein the respective ends of the torsion spring are located at radii of different lengths measured from the centre of the drive transmission shaft.~~

2~~3~~. The mechanism as claimed in claim 1 ~~or claim 2~~, wherein the drive transmission shaft and the rotatable member rotate at different rates during opening and closing of the stacking panel shutter door.

~~4. The mechanism as claimed in any one of the preceding claims, wherein the separate rotatable member is concentric with the drive transmission shaft.~~

3~~5~~. The mechanism as claimed in claim 1 or claim 2 ~~any one of the preceding claims~~, wherein the separate rotatable member is circular in shape.

4~~6~~. The mechanism as claimed in claim 3~~5~~, wherein the radius of the drive transmission shaft and the separate rotatable member are different.

5~~7~~. The mechanism as claimed in any one of the preceding claims, wherein the separate rotatable member is a drive transmission barrel which surrounds the drive transmission shaft.

6~~8~~. The mechanism as claimed in any one of the preceding claims, wherein the mechanism further comprises:

a first sprocket operatively connected to the drive transmission shaft;

a second sprocket operatively connected to the rotatable member;

wherein the first and second sprockets are operatively linked in a sequence (train).

7~~9~~. The mechanism as claimed in claim 6~~8~~, wherein the first sprocket is of a different size to the second sprocket.

8~~10~~. The mechanism as claimed in claim 6~~8~~ or claim 7~~9~~, wherein the sprockets are so sized and shaped as to enable the drive transmission shaft to make half or a fraction of the number of turns relative to the drive transmission barrel when the stacking panel shutter door is in operation.

9~~11~~. The mechanism as claimed in any one of the preceding claims, wherein the drive transmission shaft and the separate rotatable member may be independently operable.

10~~12~~. A stacking panel shutter door incorporating a torsion spring counter balancing mechanism as claimed in any one of the preceding claims.

11~~13~~. A building incorporating a stacking panel shutter door as claimed in claim 10~~12~~.

CLAIMS

1. A torsion spring counter balancing mechanism for a stacking panel shutter door, wherein

a) one end of the or each torsion spring is fixable to a drive transmission shaft of the stacking panel shutter door, the drive transmission shaft being adapted to raise and lower the or each shutter of the stacking panel shutter door; and
b) the other end of the or each torsion spring is fixable to a separate rotatable member of the stacking panel shutter door;

and whereby the mechanism is provided with means adapted to enable both the drive transmission shaft and the rotatable member to rotate in tandem in the same direction, during opening and closing of the stacking panel shutter door, in such a manner as to cause respective ends of the or each torsion spring to travel at different speeds during the opening and closing sequence.

2. The mechanism as claimed in claim 1, wherein the drive transmission shaft and the rotatable member rotate at different rates during opening and closing of the stacking panel shutter door.

3. The mechanism as claimed in claim 1 or claim 2, wherein the separate rotatable member is circular in shape.

4. The mechanism as claimed in claim 3, wherein the radius of the drive transmission shaft and the separate rotatable member are different.

5. The mechanism as claimed in any one of the preceding claims, wherein the separate rotatable member is a drive transmission barrel which surrounds the drive transmission shaft.

6. The mechanism as claimed in any one of the preceding claims, wherein the mechanism further comprises:

a first sprocket operatively connected to the drive transmission shaft;

a second sprocket operatively connected to the rotatable member;

wherein the first and second sprockets are operatively linked in a sequence (train).

7. The mechanism as claimed in claim 6, wherein the first sprocket is of a different size to the second sprocket.

8. The mechanism as claimed in claim 6 or claim 7, wherein the sprockets are so sized and shaped as to enable the drive transmission shaft to make half or a fraction of the number of turns relative to the drive transmission barrel when the stacking panel shutter door is in operation.

9. The mechanism as claimed in any one of the preceding claims, wherein the drive trans-mission shaft and the separate rotatable member may be independently operable.

10. A stacking panel shutter door incorporating a torsion spring counter balancing mechanism as claimed in any one of the preceding claims.

11. A building incorporating a stacking panel shutter door as claimed in claim 10.