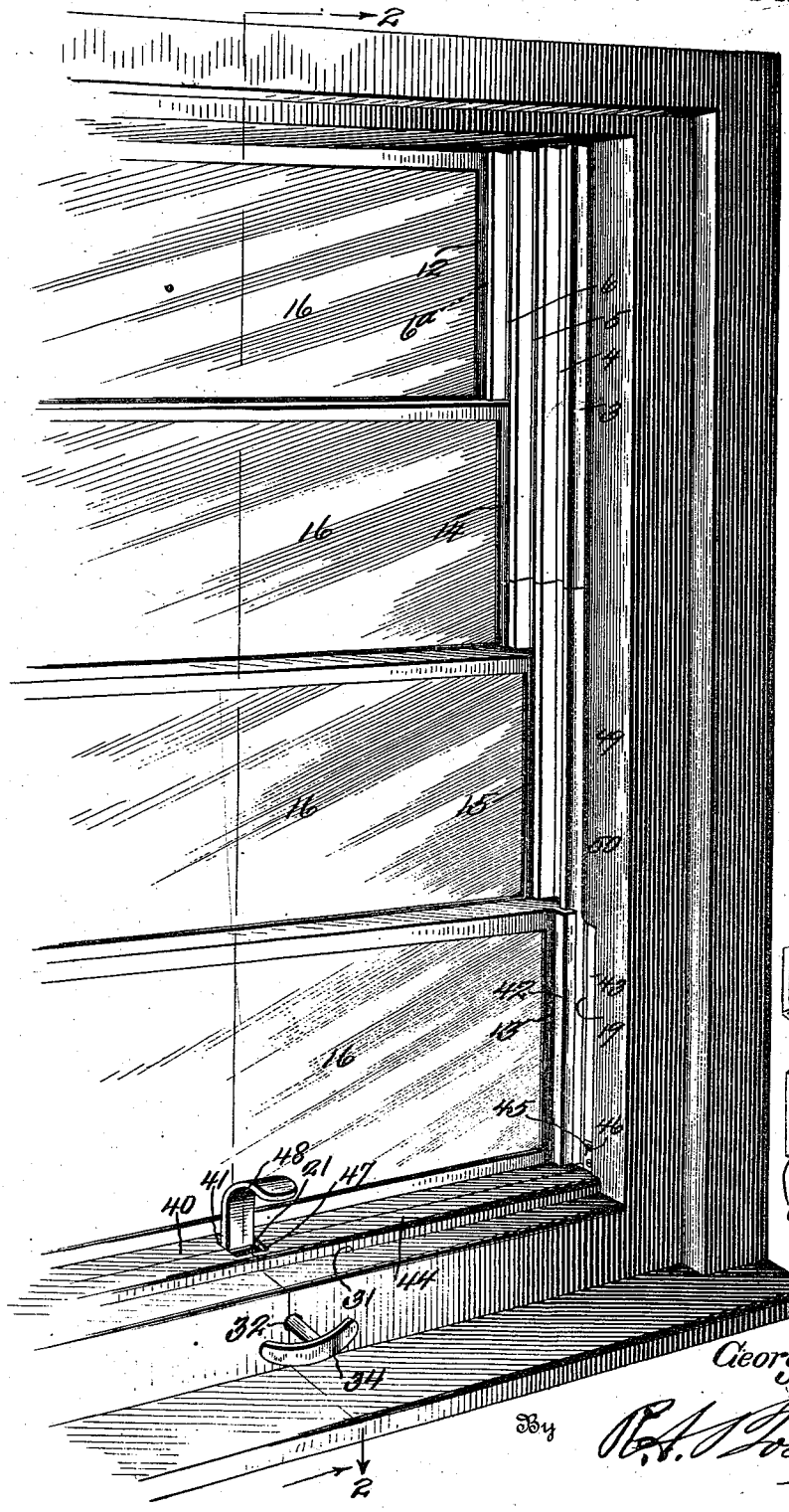
July 24, 1923. 1,462,646

G. W. LANCASTER

PLURALITY OF COUNTERBALANCING SASHES FOR WINDOWS

Filed March 19, 1921 2 Sheets-Sheet 1



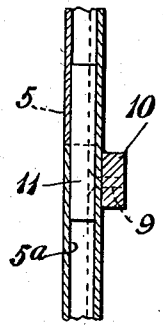
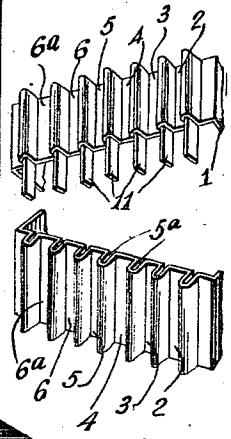


Fig. 5.

Fig. 1.

Fig. 6.



Inventor

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PLURALITY OF COUNTERBALANCING SASHES FOR WINDOWS

Filed March 19, 1921 2 Sheets-Sheet 2

Fig. 3.

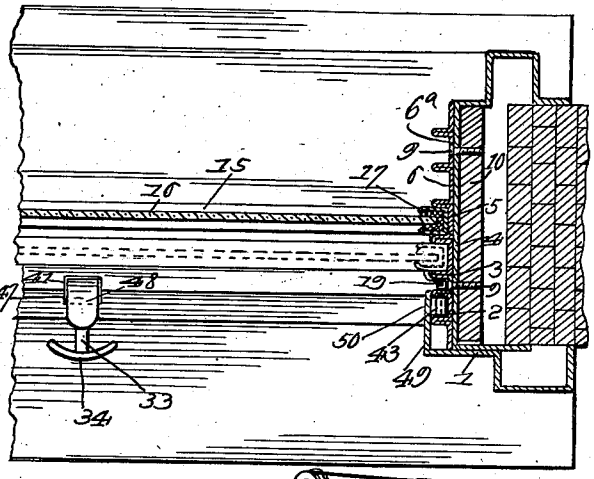


Fig. 4.

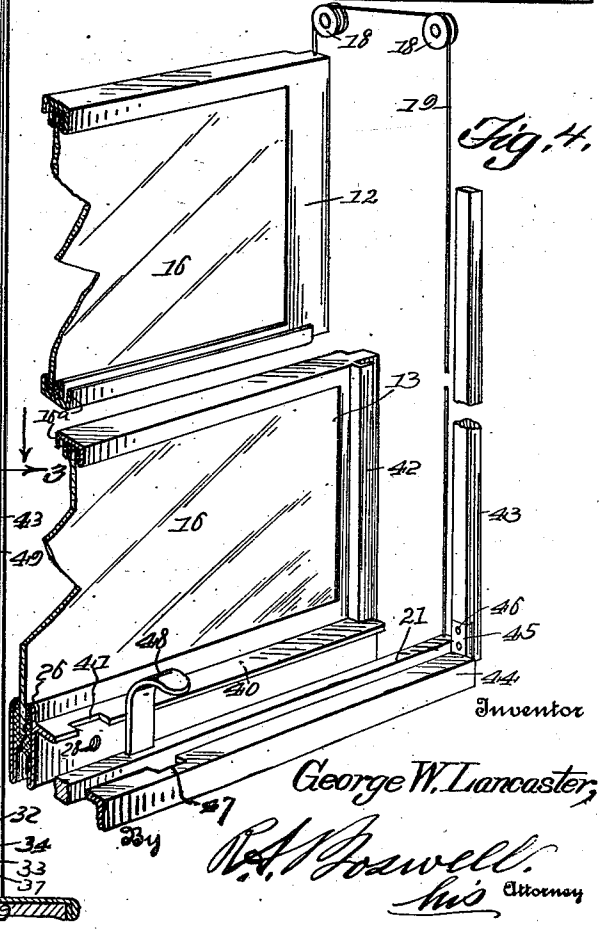
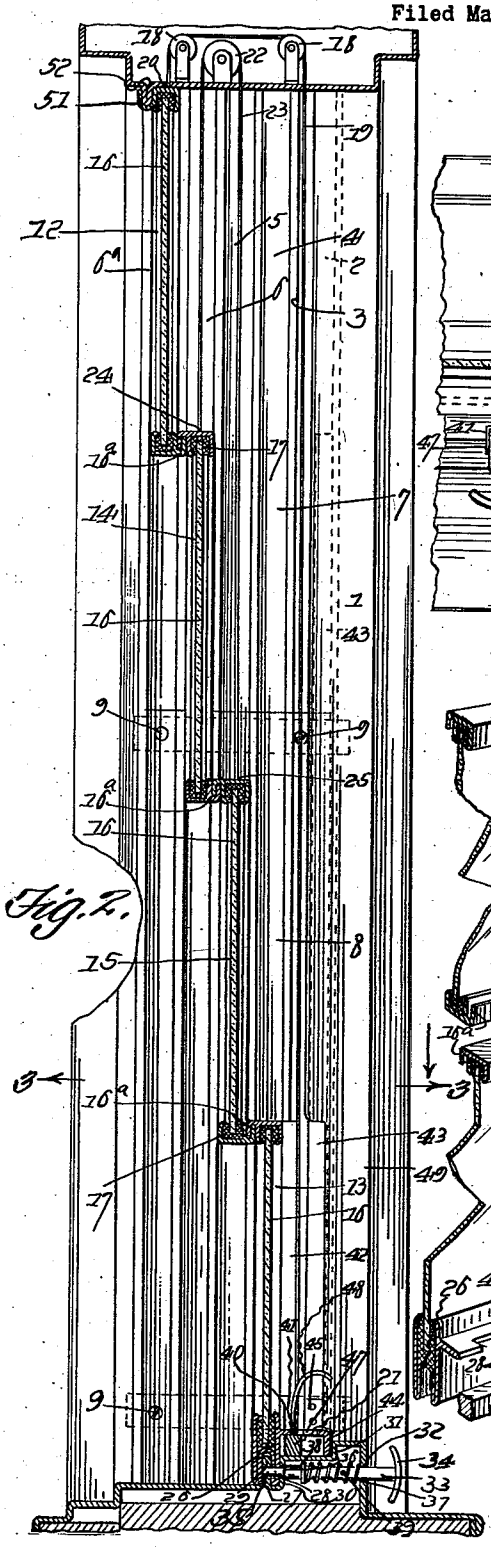


Fig. 2.



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Patented July 24, 1923. 1,462,646

UNITED STATES PATENT OFFICE.

GEORGE W. LANCASTER, OF RICHMOND, VIRGINIA, ASSIGNOR TO PERFECTED WINDOW COMPANY, OF RICHMOND, VIRGINIA, A CORPORATION OF VIRGINIA.

PLURALITY OF COUNTERBALANCING SASHES FOR WINDOWS.

Application filed March 19, 1921. Serial No. 453,592.

To all whom it may concern:

Be it known that GEORGE W. LANCASTER, a citizen of the United States of America, residing at Richmond, county of Henrico, State of Virginia, has invented a new and useful Plurality of Counterbalancing Sashes for Windows, of which the following is a specification.,

The purpose of the present invention involves a general principle of counterbalancing sashes, as in the patent issued to George W. Lancaster December 7, 1920, Patent No. 1,361,163, and the applications filed respectively February 20, 1920, Serial No. 360,151; January 5, 1921, Serial No. 435,233; and January 5, 1921, Serial No. 435,234, and in addition thereto the invention involves the provision of means, whereby the upper outermost sash and the lower innermost sash may balance each other the full height of the casement, or the upper outermost sash may be moved and counterbalanced separately for a distance equal to its own height, without in any way disturbing the lower innermost sash, or the intermediate sashes.

Another purpose is the provision of means for locking the lower innermost sash of the casement, to prevent opening any of the sashes from the exterior.

A still further purpose involves the provision of a sash moving rod or member connected to the upper outermost sash, and adapted to be coupled either to the lower innermost sash or to a counterbalancing device movable in guides of the casement, whereby the upper outermost sash and the lower innermost sash may be moved while in balancing relation to each other the full height of the casement, or the upper outermost sash may be counterbalanced independently of the lower innermost sash during its movement for a distance equal to its own height.

A further purpose is the provision of a lock, the construction and arrangement of which are such that the lower innermost sash may be locked, and since there is a provision of means for coupling the upper outermost sash moving bar to the lower innermost sash, the entire plurality of sashes may be locked against movement from the exterior.

A still further purpose involves a counterbalancing device, with which the upper outermost sash moving bar may be connected, whereby the upper outermost sash, while independently counterbalanced may be moved a distance equal to its own height.

It is to be understood that the particulars herein given are in no way limitative and that while still keeping within the scope of the invention, any desired modifications of detail and desired proportions may be made in the apparatus according to circumstances.

The invention comprises further features and combination of parts, as will be hereinafter set forth, shown in the drawings and claimed.

In the drawings:—

Figure 1 is a view in perspective of a window showing a stationary casement, and disclosing the plurality of counterbalancing sashes constructed in accordance with the invention.

Figure 2 is a vertical sectional view on line 2—2 of Figure 1.

Figure 3 is a transverse sectional view on line 3—3 of Figure 2.

Figure 4 is a perspective view showing the upper outermost sash, and the lower innermost sash, and the sash moving bar and the connections between the bar and the upper outermost sash, and the counterbalancing device, so as to disclose the general principle of the invention.

Figure 5 is a vertical sectional view through the adjacent ends of the upper and lower sections of one of the sides of the casement, showing how the upper and lower sections of the guides are united;

Figure 6 discloses views of the adjacent ends of the upper and lower guides of the casement, showing how the adjacent ends unite when in place.

Referring to the drawings, 1 designates a casement, which may be stationary, or hingedly mounted, and if the latter, an extra casement (not shown) for the window opening of the building is necessary, in which the first casement may be pivotally arranged.

In any instance, however, each jamb is provided with vertical channel guides 2, 3, 4, 5, 6 and 6ª which extend the full height of the casement on each side thereof. These channel guides may be constructed in any suitable manner, either hand made or rolled, preferably the latter.

Each jamb consists of upper and lower sections 7 and 8, the upper section being fixed or made fast with the casement, either by brazing or spot welding, preferably the latter. The lower section 8 is removably mounted on the side of the casement, by means of screws 9. The casement is provided with heavy backing strips 10 transversely arranged of the casement, for the reception of the screws 9, as the wall of the casement is made of such relatively thin metal, that the threads would not be sufficient to hold the screws. On an inspection of the drawings, it will be obvious that in the lower ends of the flanges forming the walls of the upper channel guides are inserted tongues 11, which enter between the walls of the flanges of the lower guides, thereby holding the flanges in alignment. It will be noted that the flanges forming the guides are bent upon themselves as shown, so that the tongues may enter between the walls. In Fig. 3 the walls, however, are shown close together, but in actual practice the upper ends of the walls of the flanges of the lower guides may be spread apart slightly, as shown at 5^a (in Fig. 6). Furthermore the tongues are made of relatively thin sheet metal, so as not to take up very much space between the walls of the flanges of the lower guides, so that where the tongues enter between the walls, the metal of the flanges of the guides will not bulge. Furthermore the walls may be pressed closely together, so as to insure unobstructed surfaces, for guiding the sashes.

Mounted in the guides are upper outermost and lower innermost sashes 12 and 13, and also upper outermost and lower innermost intermediate sashes 14 and 15. These sashes are constructed of sheet metal, channeled, made by hand work, or by a rolling process, preferably the latter, and the glass panes 16 are mounted in the channels of the sashes, there being asbestos packing 17, not only to insure a tight fit, but also precluding the weather. The sashes have interlocking connections 16^a, as set forth in the aforesaid patent and applications, and it will be noted that when the lower innermost sash is locked, and the sash moving bar engaged or coupled with the lower innermost sash, all the sashes are locked against movement from the exterior. It will also be noted that when the sash moving bar is disconnected from the lower innermost sash, and coupled with the counterbalancing device, the upper outermost sash may be moved a distance equal to its own length, without disturbing the locked positions of the other sashes. It will be further noted that when the lower sash is locked, regardless of whether the upper outermost sash is locked or not, it is impossible to move either one of the intermediate sashes. The interlocking connections may, or may not have asbestos filling, in order to insure a tight fit between the parts and preclude the weather.

Mounted in the upper part of the casement in any suitable manner are pulleys 18, over each of which a suitable sash cord, cable, chain or the like 19 passes. One end of the sash cord, cable, chain or the like 19 is connected in any suitable manner as at 20 to the upper outermost sash, and its other end is coupled in any suitable manner to the upper outermost sash moving bar 21. While only one side of the window is disclosed, it is to be noted that both sides of the window are constructed alike, therefore it is obvious that the upper outermost sash will move uniformly, and consequently will not bind in its guides.

Mounted in any suitable manner in the upper part of the casement is a pulley 22, over which the flexible member 23, whether it be a cord, cable, chain or rope or the like passes. It is obvious that this should be duplicated on the other side of the window, and furthermore the sash cord has its opposite ends connected in any suitable manner as at 24 and 25 to the upper edges of the intermediate sashes 14 and 15, so that the movement of one causes the movement of the other.

The lower innermost sash has its lower rail constructed with a channel 26, in order to straddle a flange 27 formed in the sill of the casement. This channel 26 may be formed in any suitable manner, and one wall of the channel has an opening 28, while the upstanding flange of the sill of the casement has an opening 29. The sill of the casement has shoulders 30 and 31, and the wall of the shoulder 30 and the interior wall of the sill are provided with guide openings 32, in which a spring tensioned lock pin 33 is mounted. This lock pin has a head 34 and an inner reduced extension 35, which penetrates through the openings 28 and 29, that is when the lower innermost sash is closed, thereby locking the same. Where the reduced extension 35 is formed, the lock pin has a shoulder 36, which engages the inner surface of the wall of the shoulder 30, thereby limiting the pin in its locking position. An expansion coiled spring 37 is mounted upon the locking pin between the inner wall of the sill and a collar 38 (which extends transversely of the locking pin) and is in surrounding relation to the pin. By means of this spring the locking pin is held in engagement with the registering openings of the lower rail of the lower innermost sash and the upstanding flange of the sill of the casement. The lock pin 33 has a transverse abutment pin 39, which limits the pin in its movement, when the reduced extension 35 is being withdrawn from the registering openings.

The lower rail of the lower innermost

sash has an inwardly extending lateral flange 40, extending the width of the sash, and the central portion has a notch 41. The dividing flange between the guides 2 and 3, below the normal position of the upper edge of the lower innermost sash is cut away as shown.

The side rails of the lower innermost sash are provided with lateral overhanging guide flanges 42, which overlie and engage the guide flanges between the guides 3 and 4, thereby insuring guiding the sash in its movement, there being only one flange 42 shown.

Mounted in the guide 2 is a counterbalancing bar 43, it being obvious that the corresponding guide on the opposite side of the casement is to be provided with a similar member. Connected to the lower end of the counterbalancing bar 43 and to a corresponding bar 43 (not shown) on the opposite side of the casement is a bar 44. This bar 44 obviously moves with the bars 43, all of which constitute a balancing element as its ears or lugs 45 are secured by screws 46 to the bars 43. The bars 43 are of lengths substantially equal to three of the sashes, though it is obvious that they may be any other suitable length, either the length of two of the lowermost sashes, or slightly longer than three of the lowermost sashes, so as to determine the movement of the upper outermost sash. The bar 44 is angular in form, and its upper flange at its central portion is provided with a notch 47, which registers with the notch 41. When the bar 44 is in its lowermost position, it engages the shoulder 31, so as to insure a substantial fit. Suitable packing (not shown) may be used at a point between the shoulder 31 and the bar 44. Also it will be noted that the bar 44 is so arranged that its upper flange registers with the flange 40 of the lower rail of the lower innermost sash, whereby the notches 41 and 47 correspondingly register. The sash moving bar 21 has an upstanding hand piece 48, which has its upper portion curved inwardly, to substantially conform to the finger of a hand, whereby the sash moving bar or element 21 may be manipulated manually. Obviously the bar 21 may be moved under the flange 40, or under the upper flange of the bar 44. When engaged under the flange 40 of the lower rail of the innermost sash, the upstanding hand piece 48 engages the notch 41. When the sash moving bar 21 is under the upper flange of the bar 44, the upstanding hand piece 48 engages the notch 47.

When the sash moving bar 21 is engaged under the flange 40, it is obvious that the lower innermost sash may be moved the full height of the casement, and counterbalance the upper outermost sash correspondingly. When the sash moving bar 21 is engaged under the upper flange of the bar 44, it is obvious that the upper outermost sash may be moved and counterbalanced, a distance equal to its own height, or equal to one-third of the height of the bars 43, without disturbing any one of the other sashes. Obviously when the bar 21 is engaged with the flange 40, and is moving the upper outermost and lower innermost sashes, the lower innermost sash must be unlocked. This may be accomplished by operating the lock pin inwardly of the room, so as to disengage the reduced extension of the lock pin from the registering openings 28 and 29. Also when the upper outermost and lower innermost sashes are unlocked, the innermost sash may be moved, but as long as the upper outermost and lower innermost sashes remain locked, the intermediate sashes are correspondingly locked. In order to retain the bars 43 in their guides 2 of the casement, the casement is provided with a trim 49, which is preferably constructed of sheet metal, and is engaged and fastened to the casement in any suitable manner (not shown), and has a flange 50, which overlies the flanges forming the guide 2. It will be noted that the flange 50 retains the bar 43 in its guide.

The upper outermost sash has on its top rail an overhanging flange 51 to underlie and engage the flange 52 on the lintel of the casement, and due to asbestos, which may be arranged in the channel of the flange 51, the weather may be precluded.

The invention having been set forth, what is claimed as being useful is:

1. In a window, a casement having guides, upper outermost and lower innermost sashes mounted in certain of the guides, counterbalancing means in certain others of the guides, and means operatively connected to the upper outermost sash and adapted to operatively couple with the lower innermost sash or with the counterbalancing means, whereby the two sashes may balance each other throughout the full height of the casement, or the upper outermost sash may be counterbalanced independently of the lower innermost sash.

2. In a window, the combination with a casement having guides, of upper outermost and lower innermost sashes mounted in certain of the guides, a counterbalancing device in certain others of the guides, and means operatively connected to the upper outermost sash and adapted to couple operatively with the lower innermost sash or the counterbalancing device, whereby the two sashes, while in balancing relation to each other, may be moved the full height of the casement, or the upper outermost sash may be moved while counterbalanced independently of the lower innermost sash, the arrangement and construction of the counterbalancing device being such as to limit the upper outermost

sash in the last mentioned movement to a travel substantially equal to its own height.

3. In a window, the combination with a casement having guides, of upper outermost and lower innermost sashes mounted in certain of the guides, a counterbalancing device in certain others of the guides, and means operatively connected to the upper outermost sash and adapted to couple operatively with the lower innermost sash or the counterbalancing device, whereby the two sashes, while in balancing relation to each other, may be moved the full height of the casement, or the upper outermost sash may be moved while counterbalanced independently of the lower innermost sash, a pair of upper and lower intermediate sashes, operative connections therebetween, interlocking connections between all of the meeting rails of the sashes, and a locking device for locking the lower innermost sash, and thereby through said interlocking connections locking said pair of intermediate sashes.

4. In a window, the combination with a casement having guides, of upper outermost and lower innermost sashes mounted in certain of the guides, a counterbalacing device in certain others of the guides, and means operatively connected to the upper outermost sash and adapted to couple operatively with the lower innermost sash or the counterbalancing device, whereby the two sashes, while in balancing relation to each other, may be moved the full length of the casement, or the upper outermost sash may be moved while counterbalanced independently of the lower innermost sash, a pair of upper and lower intermediate sashes, operative connections therebetween, interlocking connections between all of the meeting rails of the sashes, said sash moving means being clear of the lower innermost sash when engaged with the counterbalancing device, whereby the upper outermost sash may travel a distance equal to the movement of the counterbalancing device, thus unlocking the intermediate sashes to permit them to travel a corresponding distance.

5. In a window, the combination with a casement having guides, of upper outermost and lower innermost sashes mounted in certain of the guides, a counterbalancing device in certain others of the guides, and means operatively connected to the upper outermost sash and adapted to couple operatively with the lower innermost sash or the counterbalancing device, whereby the two sashes, while in balancing relation to each other, may be moved the full height of the casement, or the upper outermost sash may be moved while counterbalanced independently of the lower innermost sash, the arrangement and construction of the counterbalancing device being such as to limit the upper outermost sash in its last mentioned movement a distance substantially equal to its own height, a pair of upper and lower intermediate sashes, operative connections therebetween, interlocking connections between all of the meeting rails of the sashes, and a locking device adapted for locking the lower innermost sash and thus locking the intermediate sashes through the medium of their interlocking connections.

6. In a window, the combination with a casement having guides, of upper outermost and lower innermost sashes mounted in certain of the guides, a counterbalancing device in certain others of the guides, and means operatively connected to the upper outermost sash and adapted to couple operatively with the lower innermost sash or the counterbalancing device, whereby the two sashes, while in balancing relation to each other, may be moved the full height of the casement, or the upper outermost sash may be moved while counterbalanced independently of the lower innermost sash, the arrangement and construction of the counterbalancing device being such as to limit the upper outermost sash in the last mentioned movement to a travel substantially equal to its own height, said sash moving means being clear of the lower innermost sash when engaged with the counterbalancing device, whereby the upper outermost sash may travel a distance equal to the movement of the counterbalancing device, thus unlocking the intermediate sashes to permit them to travel a corresponding distance.

7. In a window, a casement having guides, upper outermost and lower innermost sashes, mounted in certain of said guides, the latter sash having a coupling flange, a counterbalancing device movable in certain others of said guides and provided with a coupling flange, a sash moving bar operatively connected to the upper outermost sash and adapted for engagement with either coupling flange, whereby the two sashes may counterbalance, or upper outermost sash may travel independently a distance substantially equal to its own height.

8. In a window, a casement having guides, upper outermost and lower innermost sashes, mounted in certain of said guides, the latter sash having a coupling flange, a counterbalancing device movable in certain others of said guides and provided with a coupling flange, a sash moving bar operatively connected to the upper outermost sash and adapted for engagement with either coupling flange, whereby the two sashes may counterbalance, or upper outermost sash may travel independently a distance substantially equal to its own height, intermediate counterbalancing sashes operatively connected for counterbalancing movements, interlocking connections between all of the meeting rails of the sashes, and means for

locking the lower innermost sash, thereby locking all of the sashes through their interlocking connections.

9. In a window, a casement having guides, upper outermost and lower innermost sashes, mounted in certain of said guides, the latter sash having a coupling flange, a counterbalancing device movable in certain others of said guides and provided with a coupling flange, a sash moving bar operatively connected to the upper outermost sash and adapted for engagement with the first mentioned coupling flange, whereby the two sashes may counterbalance, or upper outermost sash may travel independently a distance substantially equal to its own height, the construction and arrangement of the counterbalancing device being such that it may contact with the lintel of the casement to limit the upper outermost sash in the last mentioned travel.

10. In a window, a casement having guides, upper outermost and lower innermost sashes, mounted in certain of said guides, the latter sash having a coupling flange, a counterbalancing device movable in certain others of said guides and provided with a coupling flange, a sash moving bar operatively connected to the upper outermost sash and adapted for engagement with either coupling flange, whereby the two sashes may counterbalance, or the upper outermost sash may travel independently a distance substantially equal to its own height, the construction and arrangement of the counterbalancing device being such that it may contact with the lintel of the casement to limit the upper outermost sash in the last mentioned travel, intermediate counterbalancing sashes operatively connected for counterbalancing movements, interlocking connections between all of the meeting rails of the sashes, and means for locking the lower innermost sash, thereby locking all of the sashes through their interlocking connections.

11. In a window, a casement having guides, upper outermost and lower innermost sashes mounted in certain of the guides, counterbalancing means in certain others of the guides, means connected to the upper outermost sash and adapted to operatively couple with the lower innermost sash, or with the counterbalancing means, whereby the two sashes may balance each other throughout the full height of the casement, or the upper outermost sash may counterbalance independently of the lower innermost sash, and means for locking the lower innermost sash.

In witness whereof, in the presence of two witnesses, the inventor's signature is hereunto affixed.

GEORGE W. LANCASTER.

Witnesses:
G. J. McKee,
E. L. Ward.