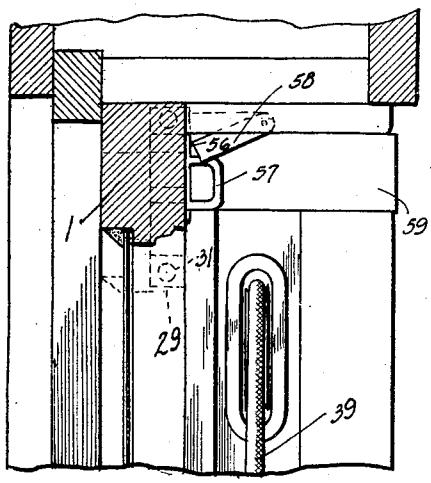
April 15, 1930. F. HAMILTON 1,754,316

WINDOW CONSTRUCTION

Filed Feb. 10, 1928 3 Sheets-Sheet 1



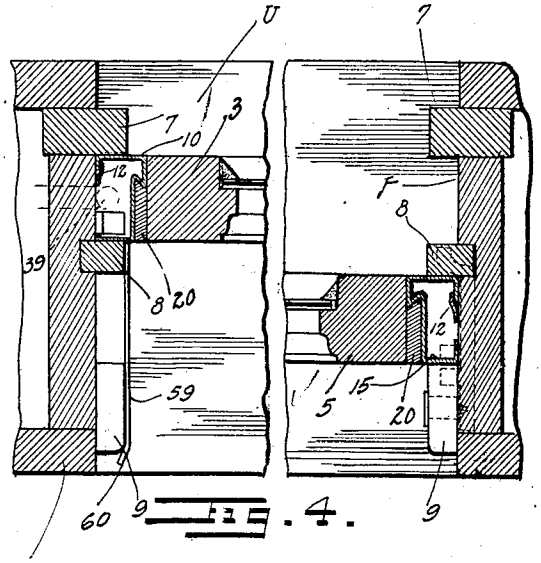
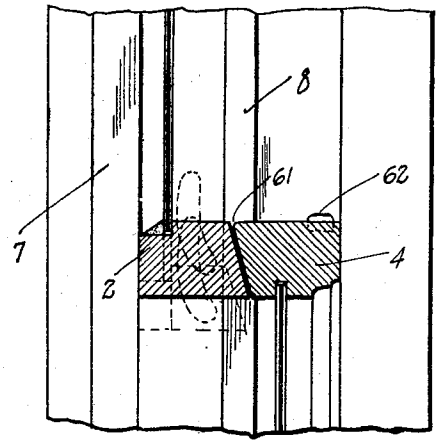


Fig. 4.



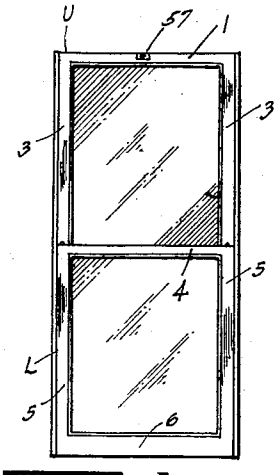


Fig. 1.

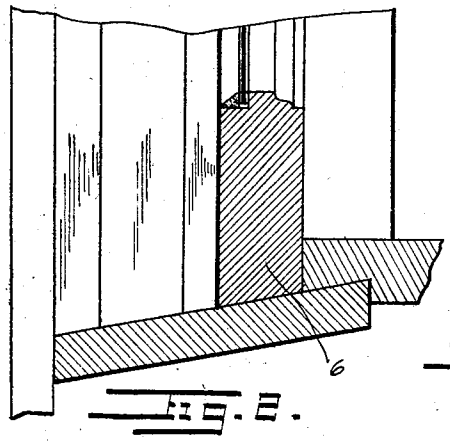


Fig. 2.

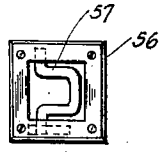


Fig. 3.

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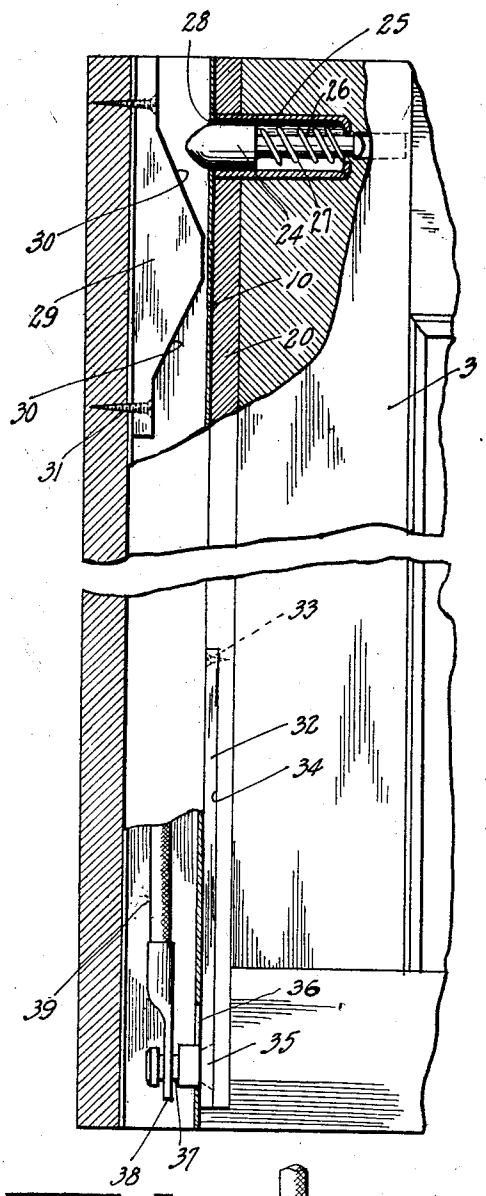

FIG. 5.

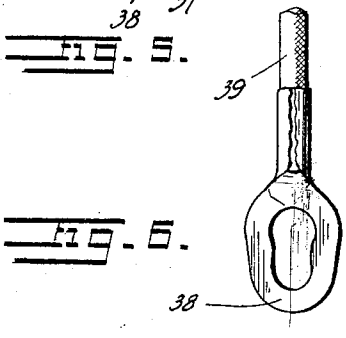

FIG. 6.

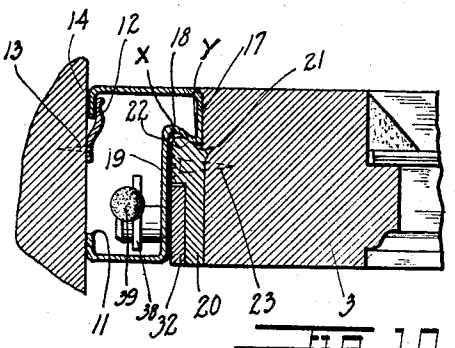

FIG. 10.

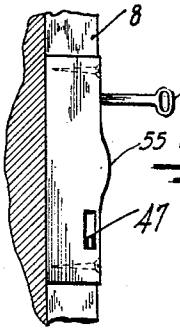

FIG. 9.

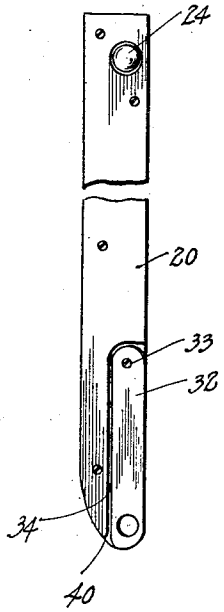

FIG. 7.

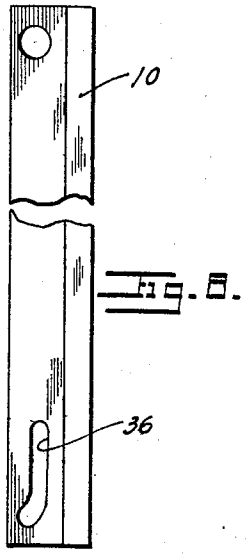

FIG. 8.

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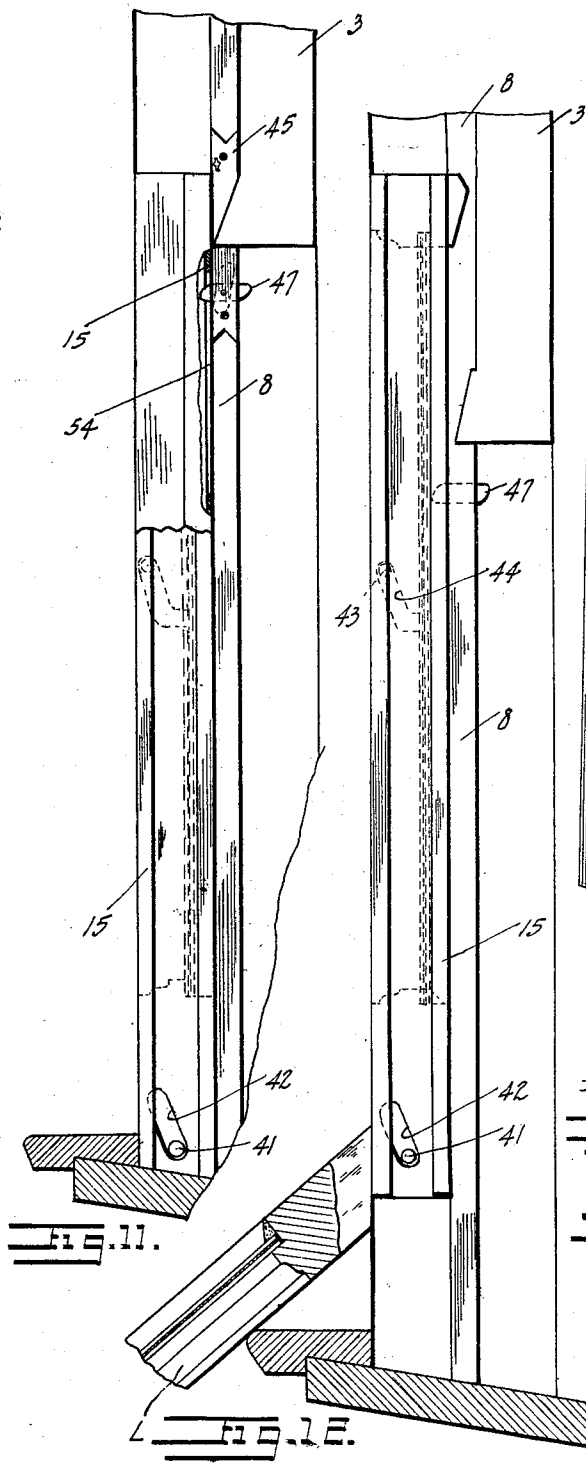
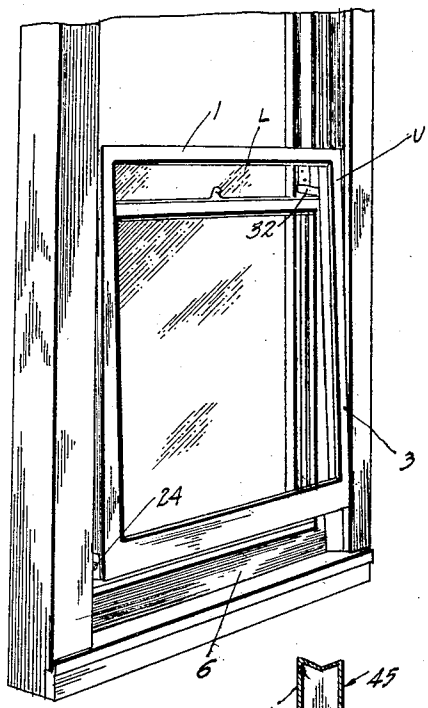


Fig. 11.

Fig. 12.

Fig. 15.



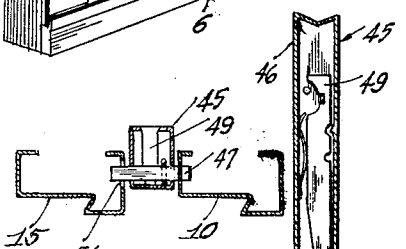


Fig. 14.

Fig. 13.

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UNITED STATES PATENT OFFICE

FRED HAMILTON, OF BEAUMONT, TEXAS

WINDOW CONSTRUCTION

Application filed February 10, 1928. Serial No. 253,400.

My invention relates to improvements in window constructions, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide a window construction in which the upper and lower sashes are of the counterbalanced type in common use, and in which means is provided whereby each sash may be completely reversed into the room for cleaning, re-glazing and other similar purposes without removing outside screens and the like.

A further object is to provide a window construction in which the upper and lower sashes may be reversed into the room, each independently of the other, and in which the means for reversing the sashes may be attached to standard window sashes and frames, thereby dispensing with special constructions.

A further object of my invention is to provide a window construction in which the counterbalance weight may be secured to the sash in such a manner that the weight of the counterbalance may be utilized in the reversing of the sash.

A further object of my invention is to provide a window construction in which the upper and lower sashes may be reversed into the room, and in which novel means is employed for providing a weather-tight joint when the sashes are moved into their normal positions.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which

Figure 1 is a diagrammatic view of an upper and a lower sash,

Figure 2 is a sectional view of a portion of my device,

Figure 3 is a detail view showing the means for moving the upper sash into the room,

Figure 4 is a sectional detail view showing the relation between the upper and the lower sashes, and the manner in which the sashes are mounted in the frames,

Figure 5 is a sectional detail view of a portion of the upper sash,

Figure 6 is a detail view of a portion of the device shown in Figure 5,

Figure 7 is a detail view showing the means for hingedly securing the upper sash in the frame,

Figure 8 is a detail view of the sliding means associated with the upper sash; the sliding means associated with the lower sash is the same as that shown in connection with the upper sash, with the exception of the slot 36 and the opening 38,

Figure 9 is a detail view of the stop mechanism,

Figure 10 is a transverse sectional view of one of the sliding tubular members,

Figure 11 is a sectional detail view showing a portion of the lower sash,

Figure 12 is a sectional detail view showing a portion of the lower sash and the relative position of the sash with respect to the frame when the sash has been reversed into the room,

Figure 13 is a sectional detail view of the stop mechanism,

Figure 14 is a transverse sectional view of the sliding members associated with the upper and lower sashes and showing the manner in which the movement of the upper and lower sashes may be determined by means of the stop mechanism, and

Figure 15 is a perspective view showing the upper sash reversed into the room.

In carrying out my invention, I make use of a window frame F which may be of the type common in the building industry. An upper sash U and a lower sash L are mounted within the frame F to be moved independently of each other in the same manner that the upper and lower sashes may be moved at the present time. The upper sash U comprises a top rail 1, a check rail 2 and the usual side rails 3. The lower sash L comprises a check rail 4, side rails 5 and a bottom rail 6. Suitable guide members 7, 8 and 9 are provided for guiding the sliding movement of the upper and lower sashes in the frame F. A pair of sliding members 10 is operatively connected with the upper sash U and is guided between the guide

members 7 and 8 which are secured to the frame F. The sliding members 10 are preferably formed from suitable sheet metal and are provided with an open side 11. Means for slidably securing the sliding members 10 to the frame F consists of a metal weather strip 12. The weather strip 12 is formed from spring metal, is secured to the frame F by means of nails or screws 13, and is arranged to bear against a flanged portion 14, whereby the sliding members are firmly secured to the frame F and yet may be moved up and down in the frame, and at the same time the weather strip 12 tends to seal the space between the sliding members 10 and the frame in that the sliding members are held snugly against the frame by reason of the tension of the weather strip.

A similar pair of sliding members 15 is operatively connected with the lower sash L. The sliding members 15 are disposed between the guide members 8 and 9 and are so connected with the lower sash, as will be hereinafter explained, that the sash may be moved up and down in the frame in the same manner that the upper sash may be moved down and up. The sliding members 15 are slidably secured to the frame F by means of the weather strips 12.

The sliding members 10 are formed to provide a portion 17 which bears against the side rails 3. A tapered portion 18 is provided. It will now be seen that that portion of the sliding members 10 which is represented at 19 is spaced away from the edges of the rails 3. A member 20 is disposed between the portion 19 and the side rails 3. The member 20 is preferably of metal and is provided with a relatively sharp edge 21 which passes into the side rails 3 and thereby provides a sealing means. One edge of the member 20 is provided with a convex surface 22 which normally bears against the tapered portion 18, thereby providing a weather-tight connection. Since the construction of the sliding members 10 and the sliding members 15 is identical, the description of one will of course apply to both. The members 20 are secured to the side rails 3 and also to the side rails 5 by means of suitable screws 23.

A spring-pressed taper bolt 24 is mounted on each side of the side rails 3 and relatively near the upper end of the upper sash U. The bolt 24 is encased by means of a suitable casing 25, the latter being embedded in the side rails. The bolt 24 is preferably provided with a reduced portion 26 upon which is mounted a coil spring 27, the purpose of which is to yieldingly hold the bolt in engagement with an opening 28 in the sliding members 10. A block 29 having inclined surfaces 30 is firmly secured to each side of the frame F by means of screws 31. Since the blocks 29 are firmly secured to the frame F, it will be seen that any downward movement of the upper sash U will bring the bolt 24 into engagement with one of the inclined surfaces 30.

Referring now to Figure 4, it will be seen that the bolt 24 occupies a position above the block 29. This view shows the relative position of the bolt 24 with respect to the block 29 when the upper sash U is in its normal closed position; that is to say, when the sash is raised to its maximum height in the frame F. It will now be seen that should the sash U be pulled downwardly, the bolt 24 would be moved back and into the casing 25 as the bolt 24 is brought into alignment with the highest portion of the block 29. When in the latter position, it will be seen that the upper end of the sash U may be swung inwardly independently of the frame F. The outer end of each of the bolts 24 is rounded so as to permit the bolts to be moved inwardly against the tension of the spring 27 a distance equal to the thickness of the sliding members 10 when the sash U is pulled into the room. Suitable means is provided for stopping the movement of the upper sash U at a time when the bolts 24 are in contact with the highest portion of the blocks 29, as will be more fully explained later.

A hinge bar 32 is hingedly mounted at 33 relatively near the lower end of each of the members 20 associated with the two side rails 3. The members 20 are recessed as at 34 for receiving the hinge bars 32. A suitable pin 35 is secured to the lower end of the hinge bars 32. The pins 35 pass through a slot 36 in the lower end of the sliding members 10, see Figure 4. The pins 35 are provided with an annular groove 37 for receiving a clip 38 which is secured to a cord 39 associated with the counterbalance weight disposed upon each side of the frame F. The lower end of the members 20 is rounded as at 40 for a purpose which will be hereinafter described.

The members 20 associated with the lower sash L are provided with a pin 41 relatively near the lower end of the members 20. The pins 41 pass through an angularly disposed slot 42 in each of the sliding members 15. A pin 43 is secured to each of the sliding members 15 substantially at a mid point and projects into an angularly disposed slot 44 in each of the members 20 associated with the lower sash L. Normally, that is, when the lower sash L is completely closed, the pins 41 are positioned near the bottom of the slots 42 and the pins 43 are disposed in the upper end of the slots 44.

A lock mechanism 45 is secured to the frame F in the manner shown in Figure 9. The lock mechanism 45 comprises a casing 46 within which a stop member 47 is pivotally mounted at 48. A key-actuated arm 49 is pivotally secured at 50 to the stop member 47. Movement of the arm 49 downwardly as by means of a key 51 will move the stop

member 47 so that each end of the stop member 47 projects through slots 52 and 53 in the casing 46. Movement of the arm 49 in the opposite direction will cause the stop member 47 to pivot so that the ends of the stop 47 do not project out from the casing 46. One of the sliding members 15 is provided with a slot 54 aligned so that when the stop member 47 is moved to project outside of the casing 46, one end of the stop member 47 will project into the slot 54. When the stop member 47 has been moved to project out from the casing 46, as will be seen from Figure 11, the stop member 47 limits the distance which the upper sash may be lowered and also determines the distance that the lower sash may be raised. When the stop member 47 is in the dotted line position shown in Figure 11, both the upper and lower sashes may be moved the full distance the same as window sashes now in common use. The casing 46 is provided with a raised portion 55 which bears against the ends of the check rails 2 and 4 for sealing purposes.

A suitable latch 56 is secured to the upper rail 1 of the sash U on the inner side. The latch 56 is provided with a latch handle 57 which may be closed flush with the latch 56. A safety catch 58 is mounted upon the head of the frame F. Normally the safety catch 58 drops by the force of gravity into the full line position, whereby when the upper sash is lowered sufficiently far to free the bolts 24 from engagement with the sliding members 10, the sash cannot move of its own accord and in fact cannot be swung inwardly into the room until the safety catch 58 has been moved manually or otherwise out of engagement with the sash. A strike plate 59 is disposed upon each side of the frame F and near the top of the frame. The plate 59 is preferably of thin metal and is bent at 60 to permit the sash to be easily moved back into the frame as when the bolts 24 strike the bent portion 60 of the plates 59. The plates 59 also serve as a guiding means for the bolts 24 and hold them in a substantially depressed position so that the upper sash may be easily moved into its proper position within the frame whereupon the bolts 24 will automatically move into the openings 28.

The check rail 4 is rounded at 61 and is provided with a pair of bumpers 62, the latter being made from any suitable yielding material, such as rubber. The purpose of the rounded portion 61 will be described later.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. Normally the stop member 47 is in the dotted line position shown in Figure 11 and when in this position, both the upper and lower sashes may be moved in the same manner as other sashes of standard construction. During the downward movement of the upper sash, the bolts 24 will of course pass the blocks 29, but since the blocks are provided with inclined surfaces 30, the bolts 24 will of course pass the block easily so that very little resistance is offered. Assume now that it is desired to reverse the upper sash. At this time the bottom sash must of course be closed down. The first thing however when reversing either of the sashes is to insert the key 51 for moving the stop member 47 into position so that the latter projects out from the slots 52 and 53. At this time, the upper sash may be moved downwardly until the check rail 2 strikes the stop member 47 and the lower sash may be moved upwardly a distance equal to the length of the slot 54 within which one end of the stop member 47 projects. Let us now reverse the upper sash. The handle 57 of the latch 56 is pulled out to its open position and the handle is pulled down until the bottom of the sash is stopped by the stop member 47. When the upper sash is in its lowered position as determined by the stop member 47, the bolts 24 are in alignment with the highest portion of the blocks 29, at which time the bolts 24 are depressed against the tension of the springs 27 substantially out of engagement with the openings 28. The safety catch 58 is now moved back sufficiently far to clear the top of the sash U. At this time the upper end of the sash may be pulled into the room for reversing. During the reversal of the upper sash, the latter is lifted upwardly a slight distance for moving the pins 35 to the top of the slots 36. During the reversal of the window, the balance weights which are attached to the window cords 39, the latter being secured to the pins 35, will assist in the lifting of the bottom of the sash. When the pins 35 strike the top of the slots 36, the sliding members 10 will be moved upwardly and stopped by striking the head of the frame F. After the upper sash has been swung inwardly substantially into a horizontal position, the face of the side rails 3 strikes the bumpers 62, at which time the hinge bars 32 will permit the sash to be completely reversed.

It will be seen that during the reversal of the upper sash the members 20 which are secured to the side rails 3 will be moved out of engagement with the tapered portion 18 of the sliding members 10. The slots 36 are formed so that when the upper sash is moved back into its normal position, the pins 35 will move the members 20 into close engagement with the sliding members 10 for bringing the convex surface 22 into sealing engagement with the tapered portions 18. When the convex portion 22 of the members 20 is in engagement with the tapered portions 18, it will be seen that air spaces X and Y result. These spaces permit any moisture forming therein to escape. The bolts 24 when moving back into the slightly oval openings 28 will also

tend to move the convex surface 22 into close engagement with the tapered portions 18.

The upper sash is replaced by reversing the action described for the reversal of the same. Should it now be desired to reverse the lower sash, the sash is raised until the stop member 47 strikes the bottom of the slot 54, at which time the lower sash will be stopped from further movement upwardly. At this time a continued lifting of the lower sash will cause the pins 41 to be moved upwardly in the slots 42 and the pins 43 to be moved to the lower ends of the slots 44, whereupon the members 20 which are associated with the rails 5 become disengaged from the tapered portion 18 of the sliding members 15 when the top of the lower sash is swung inwardly and downwardly. During the completion of the reversing of the sash, the latter is permitted to drop slightly so that the pins 41 will drop to the bottom of the slots 42. The lower sash may now be supported by any suitable means in a substantially horizontal position. Merely reversing the operation above described will bring the sash back to its normal position. It will be observed at this time that the slots 42 and 44 are so inclined that when the sash is moved back into its normal position, the members 20 will be moved into close engagement with the sliding members 15, thereby permitting the convex surface 22 of the members 20 to closely engage the tapered portion 18 of the sliding members 15. Thus the lower sash is effectively sealed in the same manner as the upper sash. The key 51 may now be actuated to move the stop member 47 into the dotted line position shown in Figure 5, whereupon either sash may be operated in the usual manner.

From the above description, it will be seen that I have provided a window construction which embodies all of the advantages and operates in the same manner as the ordinary double hung counterbalanced window now in use. In addition to this, either sash may be reversed independently of the other and without interfering with the ordinary screens, shutters, and the like. Furthermore, I have provided a construction which is weather-tight and which may also be used in connection with windows of standard construction.

The rounded portion 61 permits the upper sash to be moved for reversal with greater freedom and at the same time eliminating the possibility of damage to the lower sash by reason of the relative movement between the two. The rounded end 40 of the members 20 permits the sash to be swung into the room without binding against the sliding members 10.

I claim:

1. A window construction comprising a frame, a sash movably mounted within the frame, means connecting the sash with the frame and adapted for reversing the sash, and counterbalance means connected with said means for assisting in the reversal of said sash.

2. A window construction comprising a frame, an upper and a lower sash movably disposed within the frame, stop means arranged for limiting the movement of said sashes, and means operatively connecting each of said sashes with said frame, whereby either of said sashes may be reversed independently of the other when said sashes are brought into contact with said stop means.

3. A window construction comprising a frame, an upper and a lower sash movably disposed within the frame, slidable means disposed between the upper sash and said frame, yielding means carried by the upper sash and engaging the slidable means and actuated by the movement of the upper sash for releasing the upper sash from said slidable means, movable pivotal means connecting the upper sash with said slidable means, whereby the upper sash may be reversed when said yielding means are released, slidable means disposed between the lower sash and said frame, means secured to said slidable means and engaging the lower sash for securing the latter to said slidable means, and movable pivotal means connecting said lower sash with said slidable means, whereby said lower sash may be reversed independently of the upper sash when said lower sash has been moved out of engagement with said last named means.

4. A window construction comprising a frame, an upper and a lower sash movably disposed within the frame, slidable means disposed between the upper sash and said frame, yielding means carried by the upper sash and engaging the slidable means and actuated by the movement of the upper sash for releasing the upper sash from said slidable means, and movable pivotal means connecting the upper sash with said slidable means, whereby the upper sash may be reversed when said yielding means are released.

5. A window construction comprising a frame provided with counterbalance means, an upper and a lower sash movably disposed within the frame, means connecting each of the sashes with the frame for permitting either of said sashes to be reversed, and means associated with the upper sash and adapted for permitting the upper sash to be reversed and dropped into a plane substantially in common with the lower sash, said last named means being operatively connected with said counterbalance means.

6. A window construction comprising a frame provided with counterbalance means, an upper and a lower sash movably disposed within the frame, sliding sealing means positioned between certain of the edges of the sashes and the frame, means carried by each

of the sashes and engaging the sliding sealing means for effecting a weathertight connection, said lower sash being pivotally mounted with respect to certain of the sliding sealing means for permitting the lower sash to be reversed, and hinge bars connecting the upper sash with certain of the sliding sealing means for permitting the upper sash to be swung over and dropped alongside the lower sash, said hinge bars being operatively connected with said counterbalance means.

7. A window construction comprising a frame provided with counterbalance means, an upper and a lower sash movably disposed within the frame, slidable means disposed between the upper sash and the frame, yielding means carried by the upper sash and engaging the slidable means and actuated by the movement of the upper sash for releasing the latter from said slidable means, hinge bars operatively connected with said counterbalance means and arranged for connecting the upper sash with the slidable means, slidable means disposed between the lower sash and the frame, means associated with said last named means and engaging the lower sash for securing the latter to the slidable means associated with the lower sash, and movable pivotal means connecting said lower sash with the slidable means associated therewith, whereby said lower sash may be reversed independently of the upper sash, said hinge bars being arranged for permitting the upper sash to be reversed and dropped alongside the lower sash.

8. A window construction comprising a frame, an upper and a lower sash movably disposed in the frame, means operatively connecting the lower sash with said frame for permitting the lower sash to be reversed, and link means operatively connecting the upper sash with the frame whereby the upper sash may be reversed and dropped into a position alongside the lower sash.

9. A window construction comprising a frame, an upper and a lower sash movably disposed in said frame, sliding means disposed between the sides of said sashes and the frame, means for pivotally connecting the lower sash with the sliding means associated therewith for permitting the lower sash to be reversed, and link means connecting the upper sash with the sliding means associated therewith for permitting the upper sash to be reversed and dropped into a position alongside the lower sash.

Signed at Beaumont in the county of Jefferson and State of Texas, this thirtieth day of January, A. D. nineteen hundred twenty-eight.

FRED HAMILTON.