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W. E. CLARK

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WINDOW STRUCTURE

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2 Sheets—Sheet 2

FIG. 4.

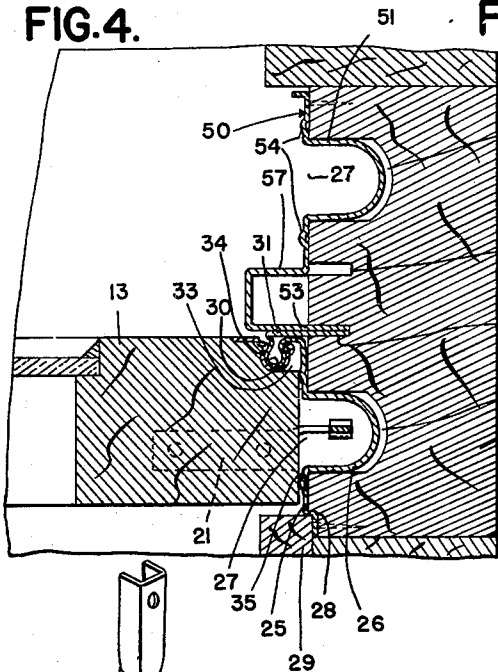


FIG. 5.

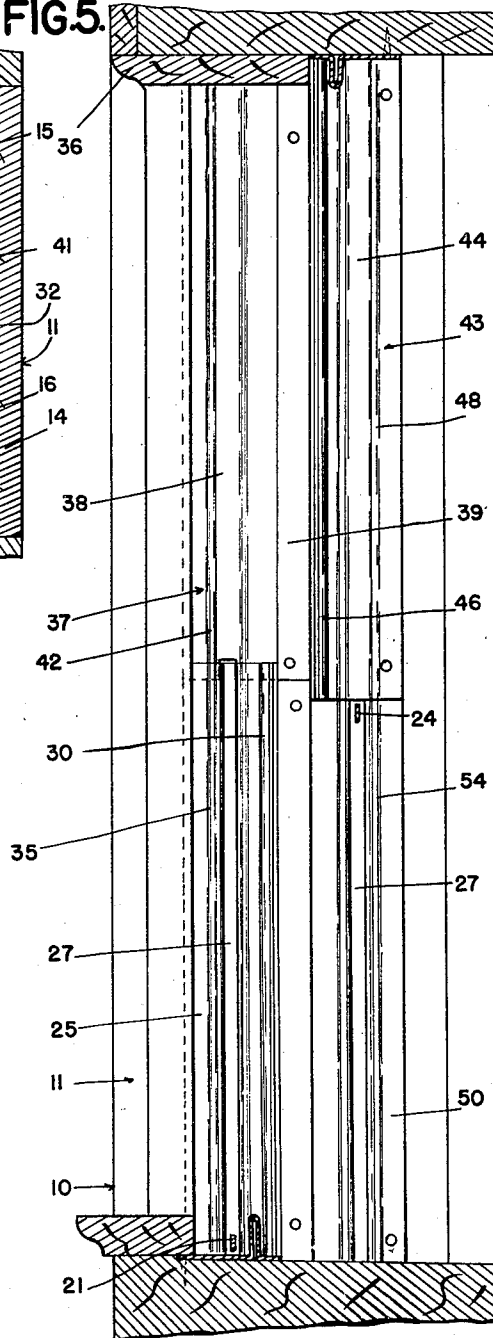
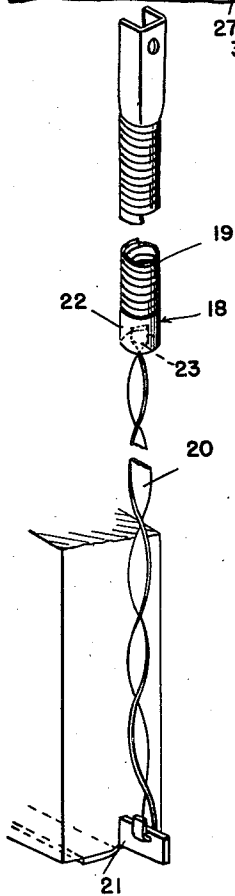


FIG. 6.



INVENTOR

WALDO E. CLARK

BY *Walters, Hulbert, Wittmann & Beckman*
ATTORNEYS

UNITED STATES PATENT OFFICE

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WINDOW STRUCTURE

Waldo E. Clark, Detroit, Mich., assignor to F. M. Sibley Lumber Company, Detroit, Mich., a corporation of Michigan

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14 Claims. (Cl. 20—52)

This invention relates generally to window constructions and refers more particularly to windows equipped with sashes of the spring hung type.

One of the principal objects of the present invention is to simplify, render more efficient and improve generally, windows of the foregoing character by providing a construction having metal strips covering the sides of the jambs and fashioned to conceal or house the sash balancing unit.

Another object of this invention consists in the provision of a window of the double sash type having a sheet metal parting strip between the sashes formed integral with the strips. This feature renders it possible to reduce the amount of wood in the assembly to the minimum and this is desirable in that it not only eliminates the necessity of painting the inner surfaces of the jamb, but also reduces the friction between the jamb and sashes.

A further advantageous feature of this invention resides in the provision of a window construction of the character set forth above having a weatherstrip provided with a housing for the spring balancing units and, if desired, having a section of the parting element formed integral therewith. This assembly provides for reducing the cross sectional area of the window frame to the minimum and this is desirable in that it permits more light with a window of a given dimension.

In addition to the foregoing, the present invention contemplates reducing the effort required to slide the sashes relative to the frame by minimizing the friction offered to movement of the sashes.

The foregoing, as well as other objects, will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings, wherein:

Figure 1 is a side elevational view of a window constructed in accordance with this invention;

Figure 2 is a fragmentary sectional view of the window shown in Figure 1;

Figure 3 is a cross sectional view taken substantially on the plane indicated by the line 3—3 of Figure 1;

Figure 4 is a cross sectional view taken substantially on the plane indicated by the line 4—4 of Figure 1;

Figure 5 is a sectional view taken substantially on the plane indicated by the line 5—5 of Figure 1, showing the sashes removed for the sake of clearness; and

Figure 6 is a detailed view of the sash balancing unit.

Referring now more in detail to the drawings, it will be noted that Figure 1 illustrates a window 10 comprising a frame 11 and upper and lower sashes 12 and 13 respectively. In accordance with conventional practice, the sashes are supported in the frame 10 for sliding movement in parallel planes spaced laterally from each other a sufficient distance to permit the two sashes to slide past each other.

The inner surfaces of the side jambs 14 of the frame 11 are fashioned to provide two pairs of grooves 15 and 16, respectively, located in the planes of the two sashes 12 and 13. In detail, the pair of grooves 15 are arranged in the plane of the upper or outer sash 12 and extend for the full length of the side jambs 14, while the pair of grooves 16 are located in the plane of the lower, or inner sash 13 and also extend for substantially the full length of the side jambs 14. The grooves in the side jambs 14 of the frame are of sufficient cross sectional area to receive the two pairs of sash balancing units 17 and 18. As will be observed from Figure 3, the units 17 are disposed upon opposite sides of the outer, or upper sash 12 in the grooves 15 and serve to balance this sash. The units 18 on the other hand, are disposed on opposite sides of the inner, or lower sash 13 in the grooves 16 and are operatively connected to the lower sash for balancing the latter.

The balancing units are of conventional construction in that they comprise a closed spring element 19 and a spiral rod 20 for actuating the spring element. The lower ends of the spiral rods 20, forming parts of the balancing units 18, are secured to the bottom of the lower sash 13 at opposite sides of the latter by means of suitable brackets 21. The upper ends of the springs 19, associated with the aforesaid spiral rods, are secured to the side jambs 14 of the window frame 11 adjacent the upper ends of the grooves 16. The lower ends of the springs 19 for the units 18 have fittings 22 secured thereto and these fittings are provided with elongated slots 23 in the lower end walls thereof for receiving the upper ends of the associated spiral rods 20. The several elements of the balancing units 18 are shown in Figure 2 in the positions the same assume when the sash 13 is closed and, it is to be understood that in this illustrated position, the springs 19 of the units 18 are under tension so that when the sash is raised, the springs 19 function to balance the weight of the sash 13.

The balancing units 17 for the sash 12 are of similar construction and, as shown in Figure 1, the lower ends of the rods 20 of these units are secured to the bottom of the upper sash 12 by means of brackets 24, and the upper ends of the associated springs 19 are secured to the side jambs 14 of the frame in the grooves 15 adjacent the upper ends of the latter. The lower ends of the aforesaid springs are operatively connected to the spiral operating rods 20 through the medium of fittings identical in construction to the fittings 22 hereinbefore described. However, the elements of the balancing units 17 for the upper sash 12 assume a different position from the one shown in Figure 2 when the sash 12 is in its closed position. In detail, it will be noted from Figure 1 that in the closed position of the sash 12, the spiral rods 20 of the balancing units 17 are located within the springs 19 so that lowering of the sash 12 tensions the springs 19 and this, of course, will assist raising of the sash 12 by balancing the weight of the latter.

In accordance with the present invention, the spring balancing units previously described are concealed and protected from the weather by means of metal strips covering the inner surfaces of the jambs 14. Upon reference to Figure 4, it will be noted that the metal strips located at opposite sides of the lower sash are in the form of weatherstrips 25 fashioned to weatherproof the opposite sides of the lower sash in the closed position of the latter. The weatherstrips 25 are formed of sheet metal and are fashioned intermediate the inner and outer edges thereof with housings 26 of sufficient dimension to extend freely into the grooves 16. The housings 26 receive the spiral operating rods 20 of the balancing units 18 for the lower sash 13 and the adjacent edges of the housings are spaced laterally from each other to provide slots 27 throughout the length of the strips 25. The slots 27 are of sufficient width to freely receive the portions of the brackets 21 extending beyond the sash 13 and permit unrestricted vertical sliding movement of these portions relative to the weatherstrips. It will also be observed from Figure 4 that the inner edge portions of the weatherstrips 25 are rabbeted as at 28 to form a seat for the molding 29 at the inner side of the sash 13. The outer edges of the weatherstrips 25 are bent laterally inwardly and are fashioned to form longitudinally extending beads 30 having the free edges terminating in laterally outwardly extending flanges 31. The free edge portions of the flanges 31 project into longitudinally extending slots 32 formed in the side jambs 14 of the frame 11. The beads 30 are housed within the rabbeted portions 33 of the sash 13 and slidably engage in longitudinal beads 34 secured to the sash. It may be pointed out in this connection that the flanges 31 have a sliding engagement within the slots 32 so as to compensate for shrinking of the sash 13 without destroying the efficiency of the seal.

It has been pointed out above that one of the objects of the invention is to reduce the friction between the sashes and the window frame to the minimum. To this end, the weatherstrips 25 are formed with laterally spaced longitudinally extending beads 35 on opposite sides of the housings 26 for engagement with the adjacent sides of the sash 13. This construction, of course, reduces the area of engagement of the sash 13

with the weatherstrips and consequently, minimizes the friction or resistance offered to movement of the sash 13.

Inasmuch as vertical sliding movement of the brackets 21 is restricted in its upward travel by engagement of the top of the sash 13 with the head jamb 36 of the window frame, it necessarily follows that the housings 26 in the strips 25 may be eliminated in the portions of the strips extending beyond the uppermost position of the brackets 21. In the present instance, the weatherstrips 25 terminate at points adjacent the upper end of the sash 13 and the strips 37, shown in Figure 3, are employed beyond the strips 25. The strips 37 are provided with body portions 38 extending across the grooves 16 to completely conceal the springs 19 of the balancing units 18 and the outer edges of the strips are channeled to provide the parting sections 39 between the two sashes. The outer legs 40 of the channel 39 extend into longitudinally extending slots 41 in the side jambs 14 of the frame 11 and are thereby secured in place. Attention is called to the fact that the body portions 38 of the strips 37 are formed with beads 42 extending in alignment with the beads 35 and cooperating with the latter to reduce friction to the minimum.

The opposite sides of the upper sash 12 are weatherproofed by strips 43 having body portions 44 extending across the portions of the grooves 15 opposite the upper sash when the latter is in its closed position so as to completely conceal the balancing units 17 in the latter position of the sash. The inner edges of the weatherstrips 43 are formed with laterally inwardly extending flanges 45 fashioned to provide longitudinally extending outwardly projecting beads 46 slidably engaging in corresponding longitudinally extending beads secured to the sash and terminating in laterally outwardly extending flanges 47. The flanges 47 are arranged in abutting relation with the legs 40 of the channels 39 and extend into the slots 41. The flanges 47 preferably have a sliding fit within the slots 41 so as to permit the desired shifting movement of the sash 12 in the plane of the window opening without destroying the seal. Attention is also called to the fact that the body portions 44 of the weatherstrips 43 are provided with laterally inwardly extending beads 48 for engagement with the adjacent sides of the sash 12 to reduce the friction to the minimum.

Referring now to Figure 4 of the drawings, it will be noted that the covering strips 50 form continuations of the weatherstrips 43 but differ from the latter in configuration. Inasmuch as the brackets 24 secured to the lower ends of the spiral operating rods 20 of the balancing units 17 are required to travel downwardly in the grooves 15 from their uppermost positions, the strips 50 are formed with housings 51 similar to the housings 26 in purpose and function. The inner edge portions of the strips 50 are formed with laterally inwardly extending channels 52 forming continuations of the channels 40 on the strips 37 to provide the necessary parting strip between the two sashes throughout the length of the window opening. The inner legs 53 of the channels 52 extend into the slots 32 and are thereby secured in position. It will, of course, be understood that the strips 50 are provided with laterally inwardly extending beads 54 on opposite sides of the housings 51 in alignment with the beads 48 to coop-

erate with the latter in reducing the friction to the minimum.

Thus, from the foregoing, it will be apparent that I have provided an improved window construction of the double hung spring sash type wherein metal strips are employed to conceal and protect the spring balancing units. It will also be understood from the foregoing description that I have materially simplified the construction of windows of this character by forming the parting strip between the sashes as a part of the aforesaid strips. In addition, it will be noted that provision is made herein for reducing the friction offered to sliding movement of the sashes to the minimum and this is desirable in that it not only tends to eliminate sticking of the sashes, but appreciably minimizes the effort required to operate the sashes. It will further be understood that the above construction renders it possible to remove or adjust the spring balancers without removing the sash.

What I claim as my invention is:

1. The combination with a window frame having side jambs and having a sash supported in the frame for sliding movement relative thereto, of sash balancing means located in grooves formed in the side jambs of the frame at opposite sides of the sash, weatherstrips secured to the jamb at opposite sides of the sash and having portions extending into the grooves forming housings for the sash balancing means, and strips forming continuations of the weatherstrips and cooperating with the latter to conceal the sash balancing means in the closed position of said sash.

2. The combination with a window frame having side jambs and having a sash supported in the frame for sliding movement relative thereto, of sash balancing means at opposite side edges of the sash, metal strips for the opposite side edges of the sash having portions forming a housing for the balancing means and having other portions forming parting strips, and strips covering the inner surface of the jambs beyond the sash having portions concealing the sash balancing means and having other portions forming continuations of the parting strips aforesaid.

3. The combination with a window frame having side jambs and a sash supported in the frame for sliding movement relative to the jambs, of sash balancing means located in grooves formed in the side jambs of the frame at opposite sides of the sash, and metallic strips secured to the inner surfaces of the jambs and slidably engaged by the adjacent sides of the sash, said strips having portions extending over the grooves in the jambs to conceal the balancing means and having means at one edge thereof slidably engaging cooperating means carried by the sash to effect a weatherproof joint between said sash and jambs in the closed position of the former.

4. The combination with a window frame having side jambs and a sash supported in the frame for sliding movement relative to said jambs, of sash balancing means located in grooves in the side jambs of the frame at opposite sides of the sash, metallic strips covering the inner surfaces of the jambs and slidably engaged by the adjacent sides of the sash, said strips extending across the grooves in the jambs to conceal the sash balancing means and having longitudinally extending beads at one edge thereof, a weatherstrip member secured to the sash at opposite sides thereof and slidably engaging said beads

to provide a weatherproof joint between the sash and jambs in the closed position of the former.

5. The combination with a window frame having side jambs and having a sash supported in the frame for sliding movement relative thereto, of sash balancing means located within the frame at opposite edges of the sash, metallic strips covering portions of the inner surfaces of the jambs adjacent opposite edges of the sash for sliding engagement by said edges, said strips having laterally bowed portions intermediate the longitudinal edges providing a housing for the balancing means and having outwardly opening channel-shaped portions beyond one side of the sash and extending inwardly from the jambs to provide parting strips.

6. The combination with a window frame having side jambs and a sash supported in the frame for sliding movement relative to the side jambs, of sash balancing means in the frame at opposite side edges of the sash, a metallic strip secured to the inner surface of each side jamb for engagement with the side edges of the sash to minimize friction, each strip having a laterally directed portion intermediate the ends forming a housing for receiving the sash balancing means and having one edge terminating in an outwardly directed substantially channel-shaped portion extending inwardly from the jambs to provide parting strips in the frame.

7. The combination with a window frame having side jambs and a sash supported in the frame for sliding movement relative to the jambs, of sash balancing means located in grooves formed in the side jambs of the frame at opposite side edges of the sash, a metallic strip secured to the inner surface of each jamb and slidably engaged by the adjacent side edges of the sash, each strip having a laterally bowed portion intermediate the longitudinal edges extending into the grooves in the jambs to receive the sash balancing means and having an outwardly directed channel-shaped portion at one edge extending inwardly from the jambs to provide parting strips, the flanges of the channel-shaped portions at the edges of the strips being longer than the other flanges of said channel portions and extending into grooves formed in said jambs.

8. The combination with a window frame having side jambs and a sash supported in the frame for sliding movement relative to the side jambs, of sash balancing means located in grooves in the side jambs at opposite side edges of said sash, a metallic strip secured to the inner surface of each of said jambs and slidably engaged by the side edges of the sash, said strips having an intermediate portion extending over the grooves to conceal the sash balancing means and each strip having a longitudinally extending bead at one edge thereof, a weatherstrip secured to the sash and slidably engaging said bead to effect a weatherproof joint between the sash and jambs in the closed position of the former, and metallic strips forming continuations of the strips aforesaid and having portions intermediate the longitudinal edges extending into the grooves in the jambs for receiving the sash balancing means.

9. The combination with a window frame having side jambs and a sash supported in the frame for sliding movement relative to the side jambs, of sash balancing means located in grooves in the side jambs at opposite side edges of said sash, a metallic strip secured to the inner surface of each of said jambs and slidably engaged by

the side edges of the sash, said strips having an intermediate portion extending over the grooves to conceal the sash balancing means and each strip having a longitudinally extending bead at one edge thereof, a weatherstrip secured to the sash and slidably engaging said bead to effect a weatherproof joint between the sash and jambs in the closed position of the former, and metallic strips forming continuations of the strips aforesaid and having laterally bowed portions intermediate the longitudinal edges extending into the grooves in the jambs for receiving the sash balancing means, said second named strips having outwardly opening channel-shaped portions at one of the edges thereof extending into the frame to provide parting strips.

10. The combination with a window frame having side jambs and having sashes mounted therein for sliding movement past each other, of means located on opposite side edges of each of the sashes for balancing the latter, metal strips secured to the inner surfaces of the jambs above the lower sash and having portions cooperating with the jambs to conceal the sash balancing means, said strips having outwardly opening channel-shaped portions located between the sashes, and metallic strips secured to the inner surfaces of the jambs below the upper sash, said second named metal strips having portions intermediate the ends forming housings for the sash balancing means and having outwardly opening channel-shaped portions forming continuations of the channel-shaped portions on the first named strips to provide parting strips between the sashes.

11. The combination with a window frame having side jambs and having a sash supported in the frame for sliding movement relative thereto, of metallic strips arranged in coextensive relation to each other and secured to the inner surface of each jamb for engagement by the adjacent side edges of the sash, one of said strips on each jamb having a length approximating the length of the sash and having an inwardly extending bead at one longitudinal edge thereof, a weatherstrip at each side edge of the sash and extending for substantially the full length of the sash, said weatherstrips shaped to telescopically engage the beads and secured to the opposite side edges of the sash in alignment with said beads, the corresponding longitudinal edges of the other of the strips having a laterally inwardly extending substantially channel-shaped portion forming a stop at one side of the sash.

12. The combination of a window frame having side jambs and having a sash supported in the frame for sliding movement relative thereto, of metallic strips arranged in coextensive relation to each other and secured to the inner surface of each jamb for engagement by the adjacent side edges of the sash, one of said strips on each jamb having a length approximating the length of the sash and having an inwardly extending bead at one longitudinal edge thereof terminating in an outwardly extending flange engaging in a groove in the adjacent jamb, a weatherstrip at each side edge of the sash extending for the full length of said edges and shaped to telescopically engage the beads, said weatherstrips being secured to opposite sides of the sash in positions to telescopically receive the beads, the corresponding longitudinal edges of

the other strips having a laterally inwardly extending outwardly opening substantially channel-shaped portion forming a stop at one side of the sash and the free flanges of said channel shaped portions having extensions engageable in grooves in the jambs.

13. The combination with a window frame having side jambs and having sashes mounted therein for sliding movement past one another, of metallic strips arranged in coextensive relation to each other and secured to the inner surface of each jamb at each side of the outer sash, the upper strip on each jamb having a length approximating the sash and having an inwardly extending bead at one longitudinal edge thereof, the other strip having a laterally inwardly extending substantially channel-shaped portion at the corresponding longitudinal edge thereof, a second pair of metallic strips arranged in coextensive relation to each other and secured to the inner surface of each jamb at opposite side edges of the innermost sash, the lower strip of said second pair having a length approximating the length of the inner sash and having an inwardly extending bead at one longitudinal edge thereof, the other strip of said second pair having a laterally inwardly extending substantially channel-shaped portion cooperating with the channel-shaped portion on the strip aforesaid to form a parting strip between the sashes and weatherstrips on each of the sashes shaped to telescopically engage the beads on said metallic strips.

14. The combination of a window frame having said jambs and having upper and lower sashes mounted therein for sliding movement past each other, of metallic strips arranged in coextensive relation to each other and secured to the inner surface of each jamb at opposite side edges of the upper sash, the upper strip on each jamb having a length approximating the length of the sash and having an inwardly extending bead at one longitudinal edge thereof terminating in an outwardly extending flange engaging in a groove in the adjacent jamb, the corresponding longitudinal edges of the other strips having a laterally inwardly extending substantially outwardly opening channel-shaped portion and having an extension on the free flange engaging in a groove in the adjacent jambs, a pair of metallic strips arranged in coextensive relation to each other and secured to the inner surface of each jamb opposite the side edges of the lower sash, the lower strip of the second pair on each jamb having a length approximating the length of the lower sash and having an inwardly extending bead at one longitudinal edge thereof terminating in a laterally outwardly extending flange engaging in the second named groove in the adjacent jamb, the corresponding longitudinal edges of the other strips of the second pair having a laterally inwardly extending substantially outwardly opening channel-shaped portion cooperating with the channel-shaped portion aforesaid to form a parting strip between the sashes, the free flange of the second channel-shaped portion having an extension engageable in the first named groove in the adjacent jambs, and weatherstrips secured to the opposite side edges of each of the sashes and shaped to telescopically engage said beads.

WALDO E. CLARK.