CELLAR WINDOW CONSTRUCTION

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This invention relates to improvements in cellar window constructions.

Windows of this type are located in basements and the like, and are generally of small dimensions, being located in the ground floor of the house and may be the cellar area; as a result, the available dimensions above the external ground surface may be small, and in some cases a special area may be provided in order that the window may open on to the outside of the house. Such windows are designed more particularly for ventilation, although they permit of the entrance of small amounts of light. Because of the low location the openings are generally screened in order to prevent the entrance of mice or the like through the opened window.

Of late years windows of this type have generally been of the metallic type, since the casement and the window can be readily fashioned, and provide for long-life service. Such metallic window structures are generally arranged to permit being swung inward—with the axis generally at the bottom of the window; suitable latching means are provided at the top capable of being readily disengaged with a suitable operator by means of which the window can be released and swung inward—with the movement limited by a suitable foldable stay—or can be readily swung to the closed and latched positions; the operator may be a lengthy link carried permanently by the latch structure, thus compensating for the position of the window relative to the interior of the room, the window being generally located at an elevated point.

In localities which face severe wintry conditions, it has been found desirable to employ a storm window structure as an aid to meeting the severe conditions; this is especially desirable where the window is of the metallic type. While the addition of a storm window under these conditions has been contemplated, there are a number of problems involved and which must be met. For instance, the storm window should also permit of being opened for ventilation; the particular location of the window may be a determining factor as to the manner in which the storm window is mounted—whether it is to be swung inward or outward when being opened. Again, if swung inward, it must be capable of being manipulated without material difficulty; if swung outward—the location of the window close to the ground surface would permit ready opening from the outside—it should swing in such a way as not to open up the window to rain or snow-flurries, etc. Again, the location of the mesh will be of importance, depending on the inward or outward opening of the storm sash—if the latter opens inward, the mesh must be located outside, and if opening outward, the mesh must be located internal, since the movement of the mesh must not be impeded by the meshed structure.

It is in presence of problems of this type that the present invention has been developed. Since the metallic window structures are of standard sizes, it can be understood that the storm window sash can also be made of standard size; but the complications set up by the direction of opening of the storm sash tend to set up the need for separate storm window structures to meet the two conditions, thus entailing the need for separate casements and sash to make it possible to meet the particular installation conditions. To meet this situation, the present invention has been developed in a form such that the same storm sash and casement can be utilized under either condition, it being necessary only to add certain hinges if the sash is to swing outward—otherwise, the casement and sash are standard, as is the meshed screen. As a result, the parts can be initially assembled to meet either of the conditions to be encountered at the time of installation.

In addition, the storm window assembly is of simple and inexpensive construction, readily installed, and efficient in operation.

To these and other ends, the present invention, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the improved construction and combination of parts, hereinafter more particularly described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the views, Figure 1 is an external view of a cellar window of the type described, the meshed screen being located on the outer side. Figure 2 is a vertical sectional view taken on line 2—2 of Figure 1, the parts being shown in closed position in full lines, and in open position in dotted lines. Figure 3 is a vertical sectional view taken on line 3—3 of Figure 2. Figure 4 is a detail sectional view taken on line 4—4 of Figure 3. Figure 5 is a view similar to Figure 2, but having the storm window arranged to be swung outward, the parts being shown in closed position in full lines, and in open position in dotted lines.
Figure 6 is a perspective view showing the storm sash. In illustrating the present invention, the normal cellar window and its casement are shown as the metallic type, the casement A being shown as rectangular in contour with the walls of standard cross-section, this being properly seated within the building opening B in the usual manner. The window C is of standard metallic form, the lower side c of the latter having a flange c' which lies outside of the casement, while the remaining sides are adapted to lie against the inner face of casement flanges, the arrangement permitting the window to swing inward, as shown in dotted lines in Figures 3 and 5; a latching element D having a lengthy operator e enables the window to be latched in its closed position or released to swing pivotally, a suitable collapsible brace F serving to limit the swinging movement.

While the normal window is shown as of standard metallic structure, it will be understood that the invention is not limited to service with such particular arrangement but is usable with any preferred form of window structure as long as the swinging movement of the window is on a horizontal axis located at the bottom of the window so as to provide the generally open relationships shown in Figures 2 and 5. It is apparent that the casement and window are located at the inner portion of the wall opening B; the latter may be located above the level of the external ground surface, or may be depressed with respect to such surface—in which case a suitable depression is made outside of the opening to afford access to the opening. Advantage is taken of the thickness of the wall for the addition of the storm window assembly within the wall opening B but outside of the normal window and casement. For this purpose, the lower wall or all of the opening is shown as formed with a step b—provided as an aid in positioning the casement A—with the step extending to the outer limits of the opening. A suitable lining element—shown as of angular formation b' extends across the top of opening B, and may also extend down the sides of the opening; this is generally used with the metallic casement A and, for the purpose of the present invention, extends forward and outward a distance sufficient to include the area occupied by the storm window assembly.

As pointed out above, one of the peculiar conditions found in meeting the conditions of installing storm windows to cellar windows of this type, is the varied preferences of the customers in the matter of the direction of opening of the storm window; in some instances, a particular direction is mandatory, but where either can be used the individual preferences vary, some preferring that the window open inwardly, and others that it open outwardly; in the former case, the opening is from the inside of the house while, with the latter case, it is necessary to pass outside of the house in order to open the window. While the need for external opening appears more troublesome under general conditions, it is apparent that where the cellar window is located high or near the ceiling level of the cellar, inward opening of the storm window would be more troublesome than the need for external opening, leaving the latter preferable. Hence, one of the problems of the installation of a storm window assembly is brought about by both the necessities as well as the individual preferences of the user—the decision as to inward or outward opening of the storm window.

This condition is complicated in two respects. One of these is the fact that if the window opens inwardly, the swinging should be on a lower horizontal axis—conforming to the swinging of the normal window C, since it would not be possible to swing the storm window from an upper horizontal axis, and the latter necessarily being opposite the swinging of the window C; where the storm window is to swing outward, the swinging must be on an upper horizontal axis so that in its opened position, it will protect against rain, etc.—if swing on a lower horizontal axis, the inclination would be such as to produce the effect of a catch basin. Hence, the direction of swinging will determine whether or not the hinging action is to be taken from the bottom or the top of the storm window.

A second consideration is the fact that because the window is close to the surface of the ground, there is need for protection against the entrance of rodents such as rats and mice through the gap between the glass. This is practiced by the use of screens, it being the practice to screen the opening protected by the storm window. Obviously, the location of the screen must depend upon the direction in which the swinging storm sash will open—if the sash swings inward, the screen should be on the outside of the sash casement, but if the sash swings outward, the screen must be located on the inner side of the sash casement; in other words, the location of the screen must be on the side opposite the direction of swing of the storm window.

From this can be gathered some of the problems confronting the workman when called upon to provide an installation—generally under conditions where the normal cellar window is in position, and the storm window is to be added. And it is to meet this condition that the present invention has been developed. While the prevailing practice is to provide the metallic form of normal cellar window, and that these are generally of standard sizes, different sizes may be utilized, but being standard, it would be possible to predetermine the dimensions of the casement and storm window, and to provide these in corresponding sizes, with the screen structures properly dimensioned. But these facts still leave the problems above indicated relative to installation—the direction of swing of the storm sash which generally is determined at the time of installation. Normally, these problems would require the workman to take with him a casement and window, for each direction of swinging, and make his choice on the ground; it being assumed that the dimensions are known in advance.

The present invention is designed to avoid this latter condition—and to make possible the use of a single casement and single storm window regardless of which direction the window is to swing. The only material carried by the workman which may not be used, are the latch for the inward-swinging window and the hinges used with the outwardly swinging window, the selection being made at the point of installation; the casement and storm window are used regardless of which opening direction of the window is employed. The result is obtained by a particular formation employed in the casement and storm window cooperating faces.
To provide the closure effect, these opposing faces are made more or less sinuous by the use of a simple rabbet formation—two surfaces extending on approximately parallel planes and joined by a face substantially perpendicular to the planes—each of the meeting edges of the two elements forming the casing. However, for the purpose of the present invention the two parallel surfaces differ as to width, the variation being as desired, the drawings indicating an approximate two-to-one variation. In addition, the relative arrangement carries another particular characteristic—one of the edges has the variation reversed with respect to the remaining edges.

For instance, the casement for the storm window, which fits within opening B, is of rectangular contour and formed with side and top and bottom rails f, f', and f2, respectively. As shown in Figures 2 and 4, these rails have their inner edges shaped to provide a rabbeting element, with the longer width on the inner side of the casement so far as the side rails f and the top rail f', as shown in Figure 4; this distinction exists between the bottom rail f2, however, as has the longer width of the rabbeting element. This rail may be located on the outside; in other words, the top rail and side rails have similar edge cross-sections, while the bottom rail edge cross-section is exactly reversed in this respect.

The storm window G, dimensioned to fit within the casement, is formed with side rails g, top rail g', and bottom rail g2, and is provided with one or more window panes g3. The outer edge faces of the rails of window G are formed with rabbeting configurations supplemental to those of the casement, thus providing the greater width plane as located on the inner side of the window with respect to the sides g and top g', but located on the outer side with respect to the bottom rail g2. As indicated in Figure 2, this places the greater width plane of the sash as of the male characteristic with respect to similar planes of the casement, but with the distinct that this characteristic is present on the inner side of the window and casement with respect to the sides and top, but on the outer side with respect to the bottom rail, and is in conformity with the particular configuration effect of the window as shown in the bottom zone of Figure 6, the outer face of the bottom rail g2 omitting the cut-away portions of the remaining rails, this cut-away portion being shown as on the inner face of the lower edge of the bottom rail g2; the casement is of complementary arrangement.

This description of the window and casement is based on the showing of the Figure 2 position of the storm window, in which the top and bottom rails are shown as having this relationship. As will be seen, this arrangement permits the window to be swung inward—as shown by dotted lines in Figure 2, with the swinging movement on a horizontal axis located at the bottom of the rail g2 and permitted by the particular form of the rabbet configuration which permits such swinging action; the swinging is not of a true hinge, as is apparent, but is similarly effective. When the casement and window are to be installed with this direction of swing, a latin H is secured to the inner face of the top rail of the casement and which has immovable member h adapted to be swung down over the inner face of the upper rail of the window as shown in full lines in Figure 2 to retain the window in closed position. When the normal window C has been swung open, as in dotted lines in Figure 2, any suitable manipulating element may be used to push the member h upward to release the storm window, after which the latter can be moved inward by grasping the handle J carried by the upper rail g' to swing the window to the open position shown by dotted lines in Figure 2; manipulator d may be used for the various operations. Since the latch H is not needed if the window opens outward, as presently explained, this, together with the hinges presently referred to are taken to the point of installation for use if needed.

As indicated in Figure 2, the casement F has its outer side provided with the frame k of a protective screen K, the mesh portion k' of which overlies the opening of the casement F, and serves to prevent the entrance of rodents such as rats or mice when window G is opened.

As shown, casement F contacts the walls of the window opening—or the lining thereof—after which g rout M is applied around the outer edges, thus preventing passage of air exterior of the casing; hence, all possibilities of leakage of air through the closed assembly must take place through opposing faces of the window G and casement F. And since the relative configurations of these faces set forth a sinuous path at all points—due to the rabbeting formations—the arrangement sets up an efficient sealing characteristic.

This latter result is due to several conditions, and brought about by the specific formations of the rabbeting formations. As is apparent when the window is swung on an axis located at its inner bottom edge, the upper edge swings on arcs; if the rabbeting conformation conform to such arcs, it would be possible to provide a fixed axis and a close fitting upper edge—a structure which would be expensive to produce. Obviously, the simpler and less expensive joint arrangement is with plane surfaces rather than curvatures, a condition which sets up the need for providing dimensions of the opposing faces such that the top of the window can be swung out of its closed position—dimensions such as will require the presence of a space between opposing parts of the rabbeting formation of the edge being swung—top edge in Figure 2; the bottom edge does not require such space, since the window edge face moves away from (instead of across) the opposing casement face. Since it is apparent that as the width of a planar face increases it is necessary to increase the width of the space to accommodate for the swing. Hence, in order to retain the width of the space that is open to the exterior as small as practicable, the width of this planar face of the outer zone of the window is made small—shown as about one-third of the width of the window; with this planar face as the bottom plane of the upper rabbet, the vertical face which connects the two planar faces of the rabbet, extends upwardly from this outer plane face. As a result, it is apparent that while a space opening to the exterior is present, the vertical face—which closely fits the opposing face of the casement—presents a definite barrier against the passage of air, and since this face extends vertically upward from the lower plane, any moisture which might enter the space could not readily pass due to the need for flowing upward. While the second planar face is of greater width, and would thus require a wider space to permit the swing, such wide
space is immaterial since it lies inside of the vertical face which forms the barrier.

No material spacing of the opposing edges is required at the side edges of the window since the swing of the window has the side edges moving in opposite directions. Hence, the narrow planar face arrangement of the rabbit shown at the top in Figure 2 thus placing the two sides and the top (in Figure 2) as of similar rabbitting configuration; in Figure 6 the top referred to becomes the bottom, so that in the latter arrangement the two sides and the bottom have this similar configuration.

However, the bottom joint (Fig. 2) is a direct reversal to that of the top; the narrow width planar face is on the inner side of the window (it is on the outer side at the top) with the wider plane face as extending to the outer face of the window. In the reversal, the narrow width plane remains as the bottom of the female portion of the rabbit configuration of the window; as a result, to this the vertical elements of the inner and outer faces of the window are similar—in contrast to these dimensions considered horizontally of the window and in which the distance between the two narrow planar faces at the opposite sides of the window is materially less than the distance between the wider planar faces.

As is apparent, in Fig. 2, the opposing edge face of window and casement, at the bottom, are in contact when the window is closed, since there is no physical fixed connection between window and casement in this particular arrangement so that the window support is then provided by these opposing edges; this contact is not detrimental on this edge since the swinging movement is in a direction to move the window edge away from the casement edge when swinging the window to open position.

One of the advantages in this connection, so far as Figure 2 is concerned, is the fact that the absence of a fixed connection enables the walls of the narrow width recess to move over the opposing faces of the male portion of the casement rabbit configuration, tending to set up a variable pivotal action with a consequent change in the arc of swing of the window top, a condition such as can tend to reduce the width of the space at the top; this can be understood from the showing of the dotted line position of Figure 2.

As pointed out above, the storm window assembly is designed in such manner as to permit the same construction to be employed regardless of which direction of swing is desired, thus making it possible to withhold selection of direction of swing until the time of installation. A comparison of Figure 5 with Figure 2 indicates the conditions which permit such selection of direction of swing in the same manner as for Figure 2. In Figure 5 the casement and window are positioned in the wall opening in reversed position as compared with Figure 2—the top of the assembly of Figure 2 becomes the bottom of the assembly of Figure 5 with the screen on the inner side instead of the outer side; after being located in the opening, the grout M is added to anchor the casement, and the hinges N placed in position at the top joint, and, if desired, a suitable pivotally mounted latch P applied to the casement at the bottom and adapted to swing over the edge of window. A suitable support Q may be employed to hold the window in open position. The latch construction H is not utilized in this position, its service being provided by latch P.

As will be understood, this reversal does not affect the rabbiting configuration nor materially change the efficiency of the apparatus. While the space conditions are now set up at the bottom instead of the top, with the wider space now located on the inner side, the vertical face of the rabbit still provides the barrier effect, and the greater width of the plane face that is present tends to aid in this respect. The same barrier effect against the passage of moisture is present in the Figure 2 position—since the outer wall leads upward from the plane of the space open to the outside—brought about by the particular arrangement of the rabbit formation at the bottom in Figure 2, which, in effect, duplicates that shown at the top, but in reverse. Hence, the same conditions will be present at top and bottom regardless of which position is the basis of installation, with the exception of the location of the outer space, and the fact that in Figure 5 the window is supported at the top (as in Figure 2) whereas in Figure 2 it would be possible, of course, to arrange the hinging so as to provide the spacing at the top as in Figure 2 when installing in the Figure 5 position, but in such case it would be necessary to bevel the narrower edges of the window to permit freedom of swing; the latter is avoided when the hinge mounting is as in Figure 5.

As will be understood, the ability to use the storm window assembly elements for swinging of the window in either an inward or outward direction, is of definite advantage. There is no need for carrying assemblies individual to the direction of swing, so that a single standard form can be utilized. There is no need for selection of the direction of swing until the time for installation—the same elements are used for either direction of swing, these being carried to the point of installation, it being necessary only to carry all of the appurtenant elements which may be required in both directions of swing, the workman using the ones actually needed after the selection of direction has been made, those not being used being returned to stock. As a result the supply stock of the dealer for completing the installation is of minimum requirement, an advantageous status under present-day conditions; standard sizes may be provided for many types of cellar window structures, but inasmuch as the latter are generally standardized, no real difficulty is present—a single stock assembly of a particular size will provide for all installations of such size regardless of direction of swing.

Due to the presence of the intermediate face perpendicular to the planar faces of the rabbit configuration, the assembly provides for efficient protection against wintry blasts, and yet permits any "breathing" to and from the space between the normal plane of the rabbit for normal pressure conditions within the space will be avoided, since high pressures due to expansion of the space air or low pressures due to air contraction can be automatically compensated through the joints of rabbit configuration. And, due to the fact that the top and bottom—regardless of direction of swing—extend upwardly from the planar face which extends from the outer side of the assembly, ensures that moisture, etc., which may enter through the joints cannot reach the interior. Hence, the assembly provides for highly efficient service without the need of costly insulation or other sealing means, thus retaining the installation cost at a minimum, doing this with-
out sacrifice of the ability to manipulate the formation in service in simple manner and efficiently.

While I have disclosed one general form in which the invention may be provided, it will be readily understood that changes or modifications therein may be required or found desirable in meeting the varied installation conditions and customer desires, and I desire to be understood as reserving the right to make any and all such changes or modifications as may be found essential or desirable, insofar as the same may fall within the spirit and scope of the invention as expressed in the accompanying claims, when broadly construed.

I claim:

1. In cellar window assemblages, the combination with a normal cellar window and its casement, wherein the window and its casement are mounted in a wall opening for swinging movement into the cellar between closed and open positions with the general axis of swinging movement extending horizontally within a horizontal edge zone of the window opening, of a storm window assembly mounted within the wall opening external of the normal cellar window and casement, said storm window assembly including a casement independent of the normal window casement, and a sash structure mounted within the storm window casement, the storm sash having its peripheral edges formed with a cross-sectional contour presenting a pair of substantially parallel plane faces joined by a face perpendicular thereto with the parallel faces differing in width dimension and combinedly presenting the edge width of the storm sash, the edges of the storm window casement being substantially complementary to the edges of the storm sash, the joint therebetween being of a rabbet configuration, the storm sash being swingable between closed and open positions about a horizontal axis located in one of the edge zones of the storm casement, the storm sash being selectively mountable for swinging either inwardly or outwardly relative to its casement and for swinging in the selected direction when installed for service, releasable means being provided for retaining the window in its closed position.

2. An assemblage as in claim 1 wherein the swing axis of the storm window is selectively located in the bottom zone of the wall opening when the window is to be swung inward and in the upper zone of such opening when the window swing is outward.

3. An assemblage as in claim 1 wherein the storm window casement carries a screen overlying the window opening, said screen being located on the side of the casement opposite that on which the window is pivoted for swinging.

4. An assemblage as in claim 1 wherein the opposing perpendicular faces of three of the four joints limit the travel of the storm window in one direction to closed position and extend in a common plane, the perpendicular faces of the joint of the fourth edge extending on a plane parallel to said common plane, the opposite side faces of such window in one direction having vertical dimensions of equal length, the parallel face at the inner side of the perpendicular face of the three edges of the window being of less width than the parallel face at the outer side of such perpendicular face.

5. An assemblage as in claim 1 wherein the opposing perpendicular faces of three of the four joints limit the travel of the storm window in one direction to closed position and extend in a common plane, the perpendicular faces of the joint of the fourth edge extending on a plane parallel to said common plane, the opposite side faces of the window in one direction having vertical dimensions of equal length, the parallel face at the inner side of the perpendicular face of the three edges of the window being of less width than the parallel face at the outer side of such perpendicular face.

6. An assemblage as in claim 1 wherein the opposing perpendicular faces of three of the four joints limit the travel of the storm window in one direction to closed position and extend in a common plane, the perpendicular faces of the joint of the fourth edge extending on a plane parallel to said common plane, the opposite side faces of the window in one direction having vertical dimensions of equal length, the parallel face at the inner side of the perpendicular face of the three edges of the window being of less width than the parallel face at the outer side of such perpendicular face.

7. An assemblage as in claim 1 wherein the storm window is hinged connected at its top to its casement to provide the axis of swing when the window installation is for outward swinging, the hingeless rabbet configurations at the bottom of the window presenting the axis of swing when the installation is for inward swinging of the window.

8. An assemblage as in claim 1 wherein the rabbet configurations at the top and bottom of the window present the parallel face relative widths as similar in both configurations, the narrower width of one configuration leading from one face side of the window and the similar width face of the other configuration leading from the opposite face of the window, whereby a reversal of the window and casement to move the configuration of one of such window edges to the position of the other will maintain the same configuration contours at the top and bottom of the window regardless of the direction of window swing.

9. An assemblage as in claim 1 wherein the rabbet configurations at the top and bottom of the window present the parallel face relative width as similar in both configurations, the narrower width of one configuration leading from one face side of the window and the similar width face of the other configuration leading from the opposite face of the window, whereby a reversal of the window and casement to move the configuration of one of such window edges to the position of the other will maintain the same configuration contours at the top and bottom of the window regardless of the direction of window swing, the rabbet configuration of the vertical side edges having the narrower planar face of a configuration shifted from one side face to the other of the window when the window and casement are thus relatively reversed.

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