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WINDOW ASSEMBLY

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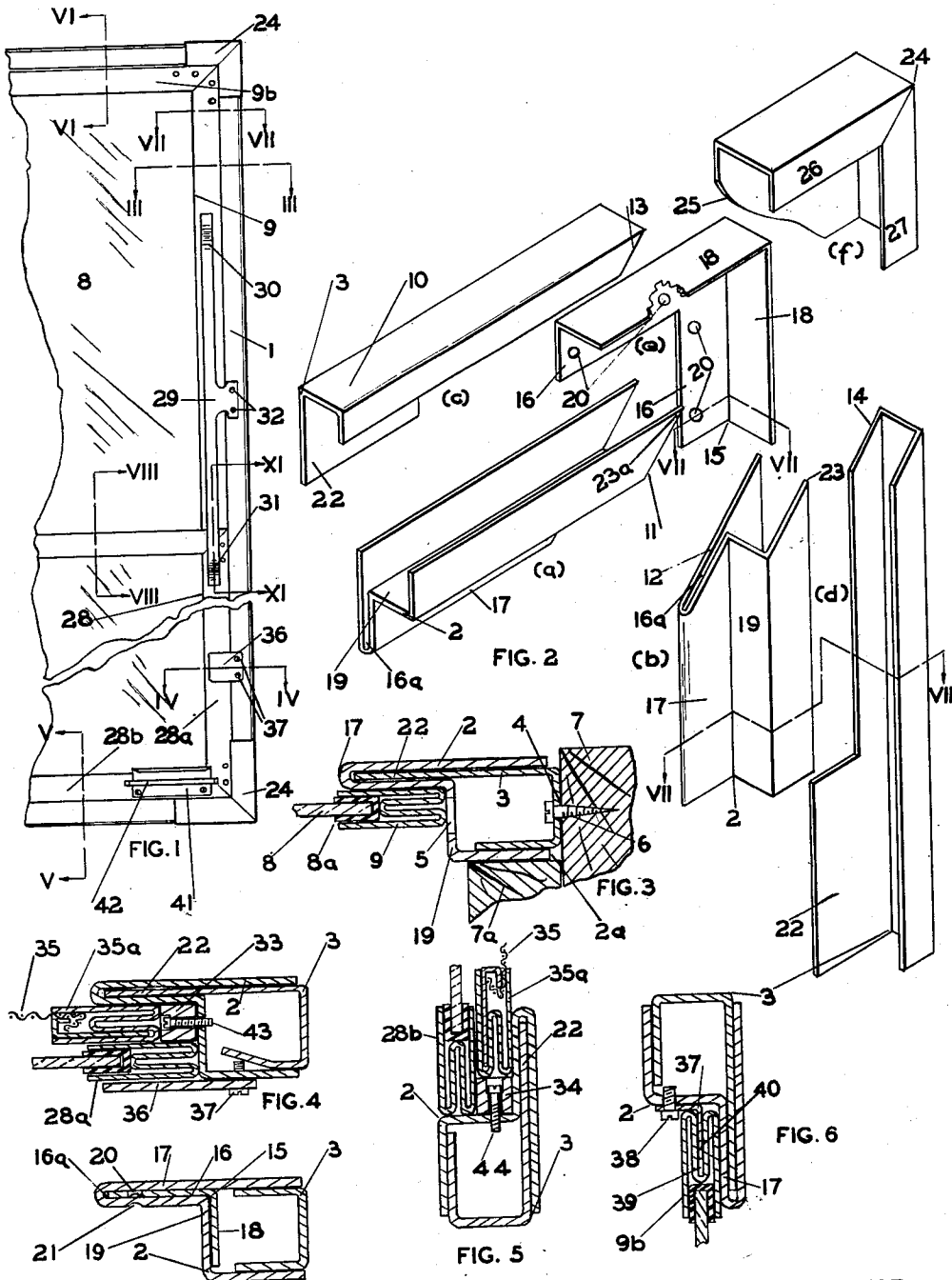


FIG. 7

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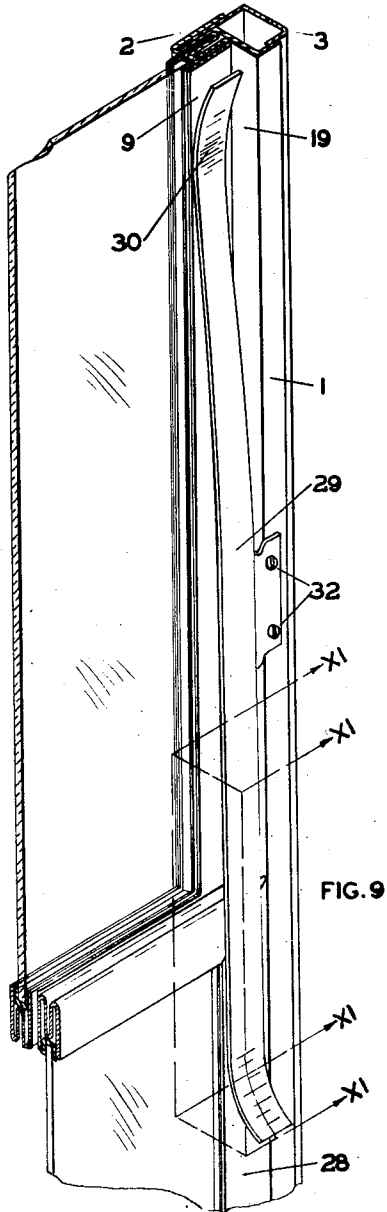
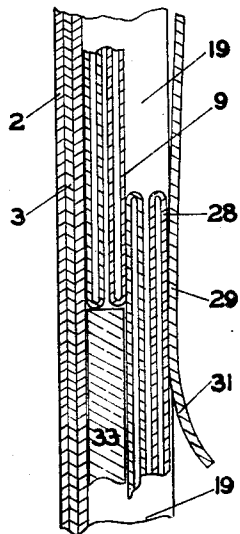
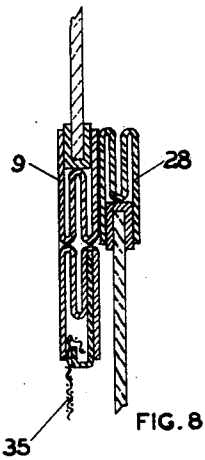
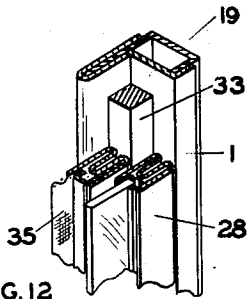
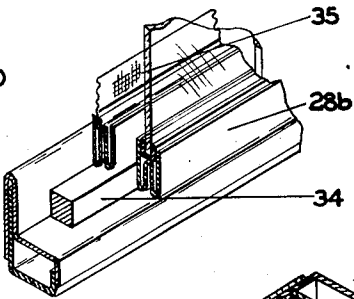
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2 Sheets-Sheet 2



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WINDOW ASSEMBLY

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Application November 15, 1940, Serial No. 365,735

5 Claims. (Cl. 189—64)

This invention relates to storm windows and screens, and especially to the type thereof which contemplates an all-metal frame and easy removability by an operator who is inside of the building. It is a continuation in part of my application Serial No. 322,793 of the Series of 1935 which relates to similar constructions and wherein is disclosed and claimed portions of the incidental disclosure herein.

The principal object of the invention is to provide a construction of the class indicated which is adaptable to mass-production methods yet requiring only simple machinery, and which is accordingly inexpensive to construct and install and yet efficient in operation and having certain definite advantages in manipulation.

A further object of the invention is to provide a construction of the storm window class which will fit tightly against the window frame and provide within itself means for compensating for the ordinary variations from the rectangular which frequently appear in a wooden window frame.

A further object of the invention is to provide a form for a channel for a metallic frame which is readily manufactured by rolling, which is strong and durable and which may be available for various different types of use.

A further object of the invention is to provide means for bonding the corners of a metallic window frame in a manner that will be rapid of application, strong in operation and smooth in appearance.

A further object of the invention is to provide a storm window which will be simple to install, easy to remove by a simple operation from the interior of the house in spring-time, and operable with a minimum of mechanical manipulation.

A further object of the invention is to provide a frame construction adaptable for supporting double hung storm windows and a screen at the same time, which will support said windows in a weather tight manner and which will eliminate complex means for holding the upper sash in position.

Other purposes and advantages of the herein disclosed invention will be apparent to those skilled in the art upon examination of the following specification in the light of the accompanying drawings.

In the drawings, wherein like numerals refer to like parts:

Figure 1 represents a broken view of a portion of a window as seen from the interior of the building. The side not shown is constructed identically with the side shown.

Figure 2 shows an exploded view of the corner construction of the window frame together with

the cap enclosing the same and the various portions of this figure are separately identified.

Figure 3 shows a section taken on the line III—III of Fig. 1, together with a portion of the wooden window frame of the building.

Figure 4 shows a section taken on the line IV—IV of Fig. 1.

Figure 5 shows a section taken on the line V—V of Fig. 1.

Figure 6 shows a section taken on the line VI—VI of Fig. 1.

Figure 7 shows a section taken on the lines VII—VII of Figs. 1 and 2.

Figure 8 shows a section taken on the line VIII—VIII of Fig. 1.

Figure 9 shows a broken perspective view of the middle portion of the window in the region of the retaining spring.

Figure 10 shows a broken perspective view of the lower portion of the window in the region of the frame to show the arrangement of parts thereon.

Figure 11 is a section view taken on the section indicated by the lines XI—XI in Figures 1 and 9.

Figure 12 is a broken perspective view of a portion of the side of the window below the meeting rails to show the arrangement of parts therein.

There are now on the market or otherwise available many forms of metallic frame storm window and such, by itself, is far from new. However, all of the presently available forms have various disadvantages which in varying degrees have kept them from being widely accepted by the public. Some are expensive, some are complicated to operate, some are difficult to install and remove, some are noisy by reason of the window rattling in the frame when the wind blows, some have an awkward appearance, few are adjustable to fit the average wooden window frame well, and most have various combinations of these named disadvantages together with others not named. By the herein disclosed window, the applicant has succeeded in solving these various difficulties and for the first time presents to the public a storm window assembly which includes also a screen and which is inexpensive to manufacture and install. It is easy to operate, easy to remove and re-install, non-rattling, smooth in appearance, sturdily constructed, easily adjustable to compensate for any ordinary mis-construction of the average wooden window frame into which this is to be fitted, and which is of the double hung type so that it may be used, by proper adjustment, to control ventilation.

Referring now in detail to the drawings, the numeral 1 represents the metallic window frame which holds the storm window and screen and which is placed within the wooden frame 7 of

the building window outside of but resting against the blind stop 1a thereof. The frame is made of a channel of substantially chair shape as at 2 (Fig. 3) into which is fitted channel 3. The distance from points 2a on part 2 to part 19 should be slightly greater than the thickness of the normal blind stop found in the average window. I have found one-half inch to be satisfactory for this purpose. The length of member 19 of channel 2 should be sufficient to accommodate both window sashes (Figs. 4 and 5) but should not be greater than the distance from the outer extremity of the blind stop to the outer part of the frame in the average wooden window in order to preserve a smooth appearance from the outside. I have found three-fourths of an inch to be satisfactory for this purpose. The sections of Figs. 3, 4, 5, and 6 show that this form of channel is used all of the way around the window frame. An opening at 4 accommodates screw 6 which fastens the metallic frame to the wooden frame 7 of the main window frame. When the window 8 with its sash 9 is removed, a screwdriver may be inserted through opening 5 to tighten screw 6. Any convenient number of these screws may be used according to the size of the window frame.

It will be noted that expansion channel 3 will slide outward of channel 2 to fit tightly against the window frame 7 and still provide a weather tight seal between channels 2 and 3. Hence, merely by tightening the various screws, of which 6 is one, the channel 3 will be caused to fit tightly against the wooden window frame 7 and the metallic frame 1 will accommodate itself to ordinary irregularities in the construction of the wooden window frame. Thus all but negligible leakage of air and water is prevented.

The corner construction of frame 1 is shown in Fig. 2. Here the channels 2 are mitered at 11 and 12, as shown, and the channels 3 are mitered at 13 and 14 as shown. Angle 15 is constructed to provide the connecting piece between the adjacent legs of the frame. Of angle 15, legs 16 will fit into opening 16a of flange 17 as shown in Fig. 7. Leg 18 of angle 15 will lie flat against part 19 of channels 2. Portions of flange 17 are indented into openings 20 of angle 15 to bond the parts firmly together, as shown at 21 of Fig. 7.

Inasmuch as flanges 22 of the expansion channels 3 also extend into space 16a of channels 2, it is obvious that it becomes necessary to cut out a portion of flanges 22 near the corners of the frame 1, as shown in Fig. 2 at parts c and d thereof, so that the cross-section of the assembled parts shows expansion channel 3 as in Fig. 7 instead of its normal appearance as in Fig. 3.

Since the adjacent channels 2 are not welded to each other, the tips 23 and 23a sometimes tend to work out of perfect alignment with each other to cause leakage of air and an unsightly appearance. Also when expansion channels 3 which have been mitered at 14 and 13 for exact fit, are moved outward to compensate for imperfect rectangularity of the wooden window frame, it is obvious that they will not meet exactly at the corners. Hence, to hold all parts together and to cover an unsightly appearance, cap 24 is provided to fit snugly over the corner. This cap is preferably made from a single piece of stamped sheet metal which is folded to the form shown in Fig. 2 at part f thereof. This slides with respect to the channels 2 and 3, sufficiently to permit any ordinary adjustment of expansion channel 3 with respect to channel 2, but hides unsightly

openings between the ends of the respective channels 3 and provides sufficient sealing surface between its flanges 25, 26 and 27 and the respectively contacting portions of channels 2 and 3 to constitute a weather seal against wind and water.

A little above the meeting rails of the window sashes 9 and 28, there is affixed a spring 29 having one end 30 bearing against sash 9 to hold the same tightly against flange 17 of frame 1, as shown in Figs. 8, 9 and 11. Spring 29 may be fastened to frame 1 by any convenient method, as by screwing as shown at 32.

The upper sash 9 is held against falling by a member 33 affixed vertically in position as shown in Figs. 4, 11 and 12 which is directly below said sash 9. Member 33 is affixed to channel 2 in any convenient manner, such as by a countersunk screw 43 as shown in Fig. 4. This member 33 provides support for the upper sash 9 (Fig. 11), as above mentioned, provides one face of a recess for the accommodation of a screen 35 (Figs. 4 and 12) and provides a sealing face against which the adjacent rail of sash 28 lies in weather sealing relationship (Fig. 12). This bar member then, assumes great importance in this assembly by eliminating complex means for supporting the upper sash and by eliminating complex means for weather sealing the lower sash.

The lower part of the lower sash is held in place by means of a plate 36 which is fastened in any convenient manner, as by screws 37 as shown, near the lower portion of the lower sash 28. By simple manual bending of this plate inward, it may readily be made to bear against the adjacent rail 28a of sash 28 with a slight pressure to hold the lower end of the same tightly against the bar member 33.

While the foregoing description has shown and described a spring 29, retaining plate 36 and bar 33 on only one side of the window, namely, the right hand side as viewed from the interior of the building and shown in the various figures, it is apparent that the left hand side of the said window is constructed similarly to the right hand side and that each of these articles together with their associated structures are duplicated on the said left hand side of the window.

The bottom rail 28b of sash 28 bears against a filler member 34, as shown in Figs. 5 and 10, which provides a weather seal for the same, and which may be fastened to channel 2 by screws of which screw 44 is one. The frame 35a of screen 35 rests upon bar 34 and between the bottom rail of sash 28 and the flange 17 of channel 2 and shown in Fig. 5.

The top rail (Fig. 6) 9b of sash 9 is further held tightly against flange 17 of channel 2 by strip 37 which is screwed, or otherwise fastened, at 38 to the adjacent face of channel 2 and which has a portion 40 extending into the opening 39 of the sash rail. This portion 40 may be bent slightly to exert pressure against the contacting portion of rail 9b to urge the same tightly against flange 17. Obviously member 37 also serves as a weather sealing strip.

It has previously been noted that screen 35, mounted in any convenient frame 35a of width equal to the width of the rails of sash 9, bar 33 and bar 34, all of which are of mutually equal width, is mounted tightly and neatly within the recess defined peripherally by the bottom part of the bottom rail of sash 9 (Fig. 8) for the top thereof, by bar 33 on the one side and its mate (not shown) on the other side and by bar 34 on

the bottom, defined outwardly by flange 17 of channel 2 and defined inwardly by the rails of sash 28. It will be noted also that if sash 28 be removed, the lower end 31 of spring 29 will bear against the frame of screen 35 to hold the same in position.

The windows are mounted in any convenient manner within rails of any convenient style or shape provided only that they are of sufficiently small transverse dimension that both of them will go onto the channel as illustrated, all of which must fit into the usually narrow space (about 1¼ inches) between the blind stop and the outer extremity of the ordinary wooden window frame. The W-shaped form shown in the drawings (Fig. 3 and others) has been found convenient for this purpose. It is made of sheet metal, is easily rolled and cut to size and is strong. The glass is set into the same by setting it into a cushion of resilient material 8a (Fig. 3) in any convenient manner. It is desirable, however, to have a recess 39 (Fig. 6) in at least the top rail 9b for the reception of part 40, for, although parts 37 and 40 may be omitted without failure of the window, their presence is helpful in maintaining a tight fit.

The operation of the windows may be best understood by reference to Figs. 1, 9 and 11.

The channels 2 and 3 are assembled as shown and the corners bonded as explained above. The frame is then set into the wooden window frame in front of but tightly against the blind stop with flange 17 outwardly and spring 29 inwardly of the building. The screw 6, together with others like it, is tightened down by a screwdriver inserted through opening 5, by which operation the frame is fixed tightly in place and the channels 3 caused to fit tightly against the window frame 7. It will be noted that the cap 24 will adjust itself as the expansion channels 3 move outwardly but will always remain tight.

With the frame tightly in place the top rail 9b of the upper sash 9 is placed from the inside of the building against the rod 33 (and its counterpart on the other side of the window) and under the lower end 31 of the spring 29. The sash is then pushed upward into place, in which position part 40 has been received into slot 39, spring 29 by its end 30 is pressing the upper end of sash 9 against flange 17 in effective weather sealing relationship and the entire sash is resting at its bottom upon the tops of member 33 and its said counterpart. Next the screen may be placed into its above-described recess if desired but it may be omitted if desired. Next the lower sash is placed against upper sash supporting member 33 (and its counterpart on the other side of the window) and against the bottom 31 of spring 29 (and its mate on the other side of the window) and pushed upwardly under said spring until the bottom of said sash comes above the retaining plate 36. The bottom part of the sash is then swung inwardly against the bar 33 and the screen sash (if the latter has been inserted) and slid down into place, in which position its top portion is held by spring 29 tightly against the bottom rail of upper sash 9 and both held against flange 17 (Figs. 9 and 11), its bottom portion held by the retaining plates against the upper sash supporting bars (Fig. 4 and 12) by which its outer face is held in effective weather sealing relationship against said bars.

The manipulation of the lower sash may be facilitated by use of handles, such as shown at 41, and it may be held in any raised position by

any convenient form of sliding catch, such as shown at 42 which is intended to slide sideways by manual manipulation and hook against convenient supports affixed the blind stop 7a of the window frame.

The removal of the windows and screen is obviously affected by reversing the process outlined above for inserting them.

It will be observed that the herein disclosed window construction provides means for economical construction and ready utilization in a wide variety of situations. Costly molding or extruding of complicated shapes is eliminated and the channels used can all be readily made by rolling. Costly welding is reduced to a minimum by being needed only on the corner bonding angles. As mentioned above, the expansible feature of the frame channels permits ready fitting even where the wooden window frame is not quite rectangular.

It will be also noted that in operation the herein disclosed window has many advantages. The metallic frame is small and may be left on the building throughout the year even if it should be desired to remove entirely the screen and windows. The screen and windows are easily installed and removed from the interior of the house by a simple manipulation and there are no screws, hooks or catches to get out of order or to confuse the person using the window.

It will be noted further that the window fits tightly and is effectively sealed against weather at all points. Holding by spring tension also has a further advantage in preventing rattling.

Obviously there are many modifications of the herein disclosed window which may occur to those skilled in the art, many of which may even be improvements thereon, but which all will be within the scope of this invention and its equivalents. Such variations, by way of example only and without any thought of inclusive designation, might be found in variations in size and shape to accommodate factory, hotel and apartment windows, as well as house windows, variations in type of sashes used within the general assembly, substitution of other resilient means for the retaining spring or even use of bayonet slotted brackets or other retaining plates in place of the spring and substitution of differently shaped expansion means in the frame channel. These and many other variations will occur in the use of this disclosure, but such variations, except where specifically limited by the claims, will fall within the scope of this invention.

It is apparent that the screen and glass are mounted in identical frames and that accordingly sashes fitted with screen may be substituted for the sashes herein shown as fitted with glass and vice versa. Hence the claims should be so construed unless expressly limited otherwise. It has also been observed when it is desired to omit the simultaneously used screen from the arrangement herein disclosed, it is desirable to make the members 33 and 34 extend the full adjacent extent of the flange 17 (without, however, increasing their thickness in the direction perpendicular to the plane of the window), for otherwise a rain and sleet gathering recess will appear above member 34 between the flange 17 and the bottom rail of the lower sash.

Having thus fully described my invention, what I claim as new is:

1. Storm window and screen construction comprising in combination: a metal frame including an L-shaped cross-section, located within

a window frame and entirely outwardly of the blind stop of said frame wherein a flange of said frame is positioned outwardly of the building to which said frame is attached; a pair of oppositely arranged upper sash supporting members fitted into the inside angles of the opposite lower perpendicular members of said frame and each being of thickness in a direction perpendicular to the plane of said window frame equal to the thickness of the hereinafter mentioned upper sash in the same direction and each being of length sufficient to support said upper sash in manner hereinafter specified; a filler member fitted into the inside angle of the bottom horizontal member of said frame and of thickness in a direction perpendicular to the plane of said window frame equal to the thickness of said upper sash supporting members in the same direction and of length sufficient to fill the space between the two said upper sash supporting members; a sash occupying the upper portion of said frame and resting at the outer side thereof against the flange of said frame, on the bottom thereof upon the said upper sash supporting members and being on the inward side held by a spring hereinafter mentioned; a lower sash occupying the lower portion of said frame and being retained on the outward side of its upper rail by the bottom rail of the said upper sash, on its side rails by said upper sash supporting members and on its bottom rail by said filler member; a spring affixed near its middle part to the said frame and arranged to rest at one end against the inward side of a side rail of the upper sash and resting at its other end against the inward side of a side rail of the lower sash; a retaining plate affixed to the said frame near the lower part thereof and arranged to bear against the inward side of the lower part of a side rail of the lower sash; and means for fastening said frame to the window frame of a building; whereby said windows will provide tight sealing against the entry of wind and rain and may be inserted and removed by a simple manipulation which excludes separate manipulation of fastening devices.

2. Storm window and screen mounting comprising in combination: a frame structure including a pair of parallel side members and a pair of parallel end members each having an L-shaped cross-section and each positioned to have its inside angle facing inwardly of the frame and of a building to which said frame is attached; a pair of oppositely positioned upper sash supporting members each affixed in the inside angle of one of said L-sections of said frame side members and presenting a flat side inwardly of the window and being of length sufficient to support the upper sash in position as hereinafter specified; a filler member affixed in the inside angle of said L-section on the bottom part of said frame and presenting a flat side inwardly and being a thickness equal to said upper sash supporting members; a sash occupying the upper portion of said frame and resting tightly against the outward flange of the said L-section of the frame side members and resting on its bottom upon the ends of said upper sash supporting members; a sash occupying the lower portion of said frame and having its upper rail resting on the outward side thereof against the bottom rail of the said upper sash, its side rails resting on the outward

sides thereof against the said flat sides of the upper sash supporting members and its bottom rail resting on the outward side thereof against the said flat side of the said filler member; a spring affixed to the inward side of the said frame and arranged to press at one point thereon against a side rail of the upper sash and to press at another point thereon against a side rail of the lower sash; a retaining member affixed to said frame on its inward side and arranged to bear against a side rail of the lower sash; and means for fastening said frame to the window frame of a building; whereby said windows will provide tight sealing against the weather and may be inserted and removed by a simple manipulation which excludes separate manipulation of fastening devices.

3. Storm window construction which includes: a frame structure presenting an L-section opening to the inward side of the window opening; an upper sash supporting member fitted into the inside angle of the lower part of said frame and arranged longitudinally of said frame to support an upper sash; a sash occupying the upper portion of said frame, retained outwardly by the flange of said frame and resting at its bottom upon said upper sash supporting member; means holding said sash in position; a sash occupying the lower portion of said frame and resting outwardly partly against a portion of the upper sash and partly against the inner portion of the upper sash supporting member; resilient means bearing against a side rail of the lower sash at a point longitudinally in close proximity to a point of contact of said lower sash with said upper sash to hold it tightly against the same; means bearing against the lower part of a side rail of said lower sash to retain the same in weather sealing contact against the inner part of the upper sash supporting member; and means to fasten said frame to a window frame in a building.

4. Window construction including a frame presenting an L-section wherein a flange thereof is parallel to the plane of said window frame and extends toward the center thereof; a long and relatively narrow member affixed in the inside angle of said L-section but of less transverse extent than the respective legs of the corresponding extent of the said L-section; a sash located in said frame in contact by a rail thereof with said member; whereby there is defined a recess for a rail of a screen by the flange on the one side, the sash on the other side and the abovementioned long and relatively narrow member on the periphery.

5. Window construction, including a frame presenting an L-section wherein a flange therein is parallel to the plane of said window frame and extends center-wise thereof; a member of rectangular section affixed in the inside angle of said L-section but being of less transverse extent than either of the respective portions of corresponding extent of said L-section; a sash located in said frame and having a rail thereof contacting a surface of said member which is of rectangular section; whereby there is defined a recess for a rail of a screen by the said flange on the outward side, the sash rail on the inward side, and the said member of rectangular section on the periphery; means for holding said sash rail against said member of rectangular section.

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