Aug. 7, 1928. 1,680,092

H. DIXSON

ROLLING WINDOW SCREEN CONSTRUCTION

Filed May 13, 1925 3 Sheets-Sheet 1

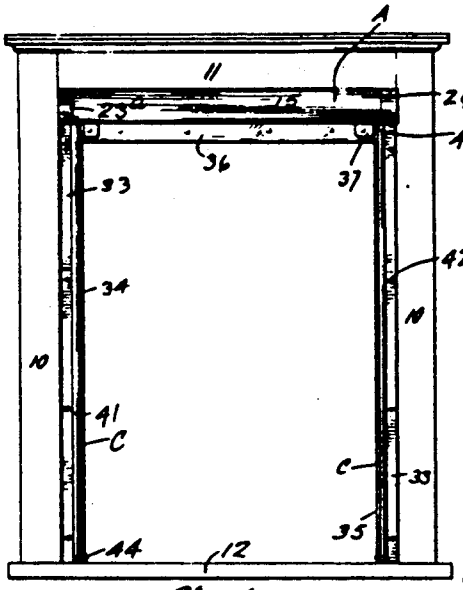


Fig. 1.

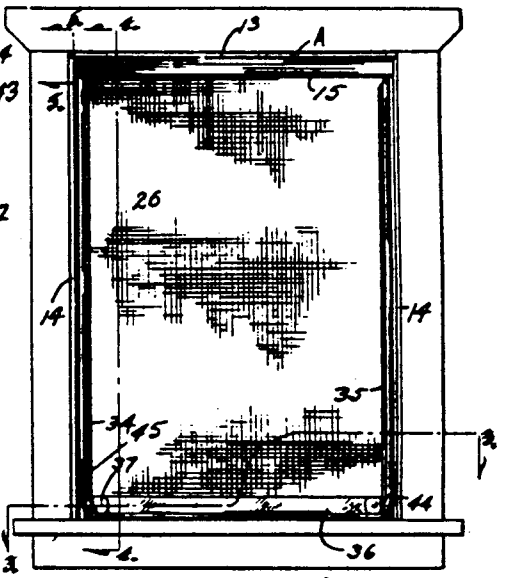


Fig. 2.

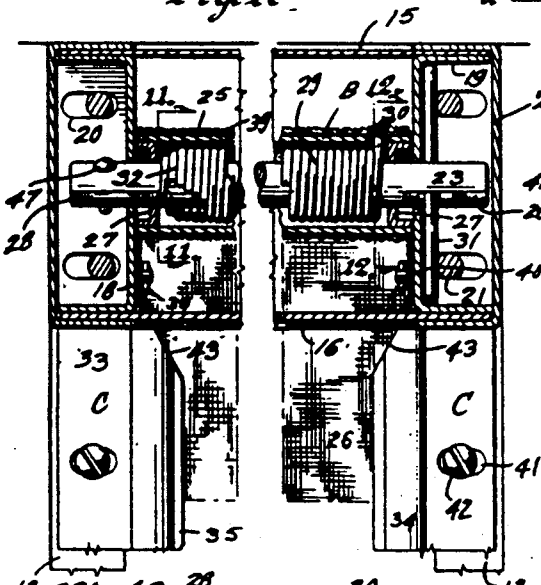


Fig. 10.



Fig. 11.



Fig. 12.

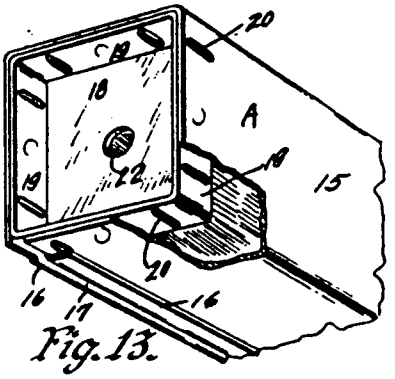


Fig. 13.

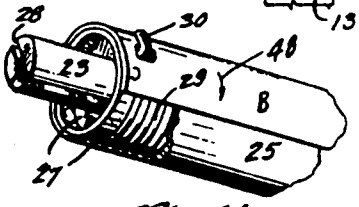


Fig. 14.

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ROLLING WINDOW SCREEN CONSTRUCTION

Filed May 13, 1925 3 Sheets-Sheet 2

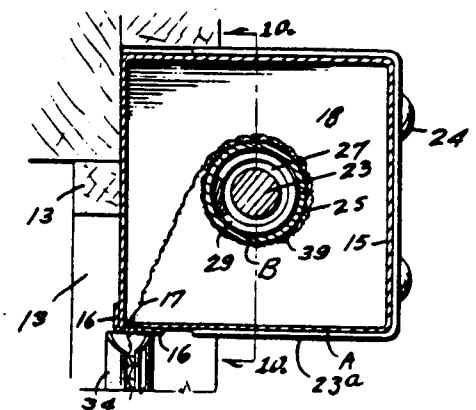


Fig. 4.

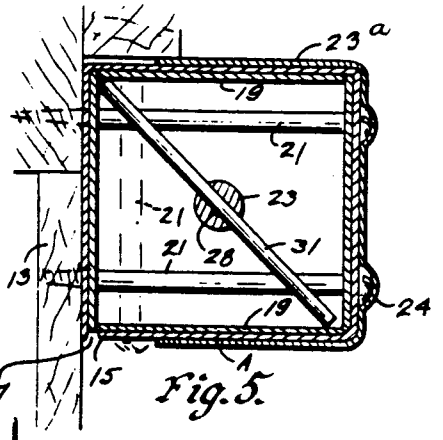
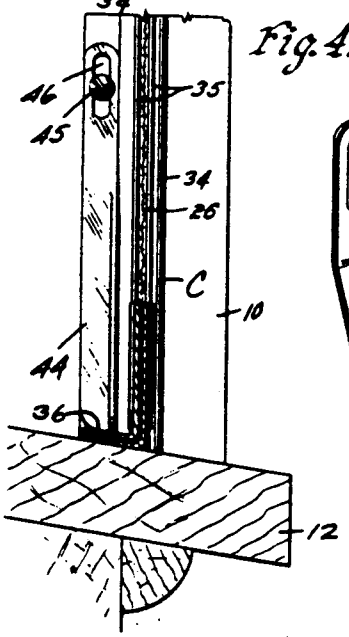


Fig. 5.



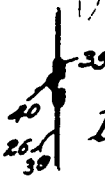


Fig. 7.



Fig. 8.

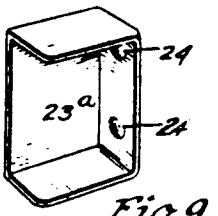


Fig. 9.

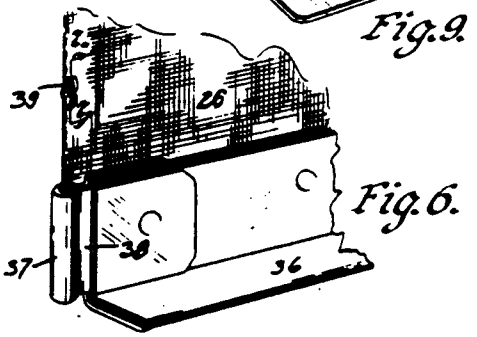


Fig. 6.

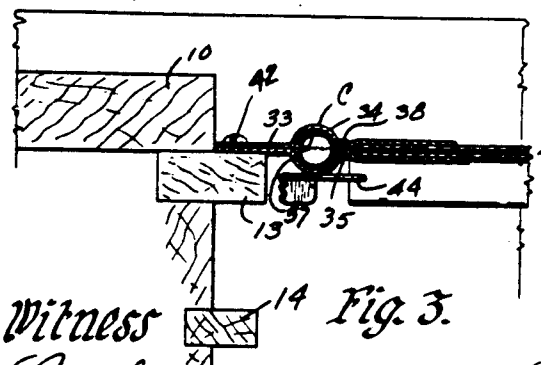
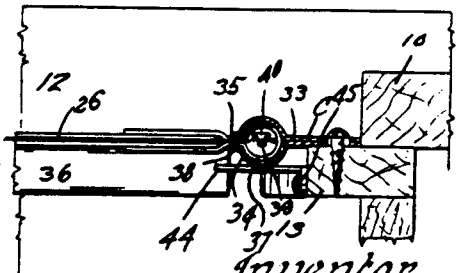


Fig. 3.



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ROLLING WINDOW SCREEN CONSTRUCTION

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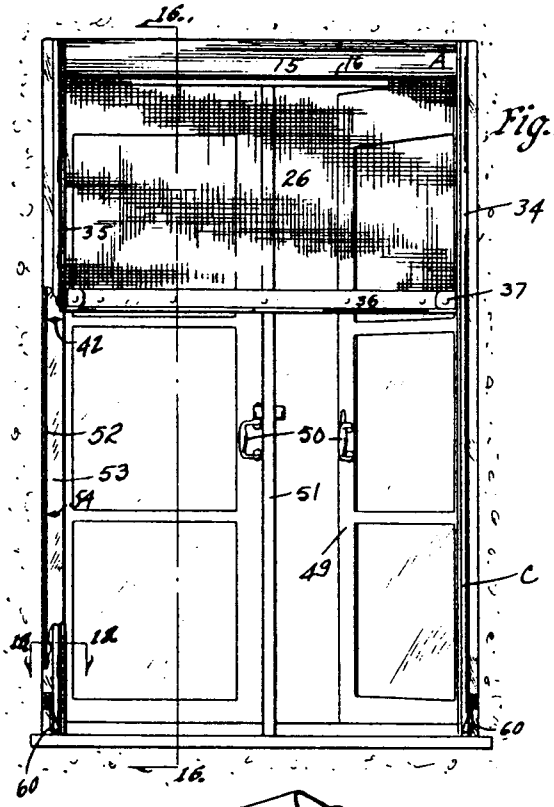


Fig. 15.

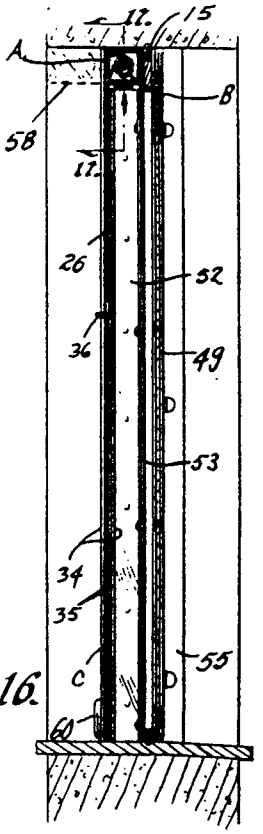


Fig. 16.

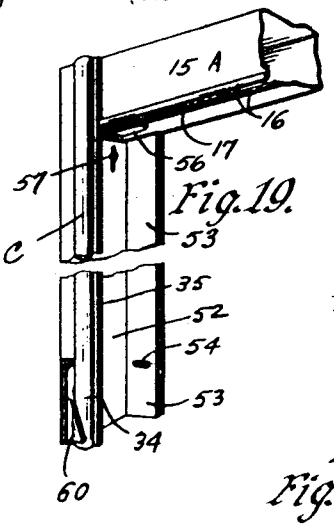


Fig. 19.

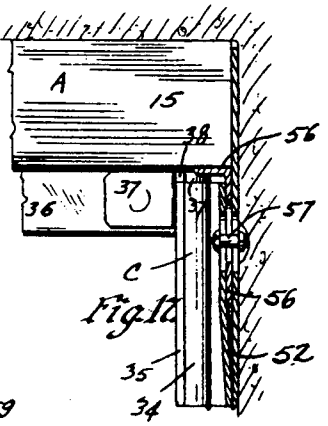


Fig. 17.

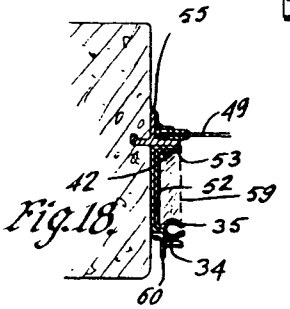


Fig. 18.

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Patented Aug. 7, 1928. 1,680,092

UNITED STATES PATENT OFFICE.

HARRY DIXSON, OF DES MOINES, IOWA, ASSIGNOR TO ROLSCREEN COMPANY.

ROLLING-WINDOW-SCREEN CONSTRUCTION.

Application filed May 13, 1925. Serial No. 29,960.

The object of my invention is to provide a rolling window screen of simple, durable and comparatively inexpensive construction.

More particularly, my invention relates to a rolling window screen adapted, when in inoperative position, to be tightly wound around a shaft and encased in a casing, and when in use, to cover the window opening and be held comparatively taut from side to side and from the bottom to the top of the window casing.

Still a further object is to provide a spring roller construction upon which the window screen may be wound, which spring roller construction can be easily and conveniently assembled for reducing the expense of the window screen construction.

Still a further object is to provide a spring having one end slightly contracted so as to snugly fit around the shaft or rod, upon which it is mounted, and the major portion of the spring to be free from the rod, that is, greater in inside diameter than the diameter of the rod upon which it is mounted.

Still a further object is to provide a casing for the screen when in rolled position, which casing has formed thereon, end members which serve to strengthen and reinforce the casing, as well as to serve as a bearing for the rolling window screen.

Still a further object is to provide a pair of spaced guides in which the edges of the screen are permitted to travel, the edges having clips stapled therein at spaced intervals for maintaining the screen in position against accidental withdrawal from the guides.

Still a further object is to provide a rolling window screen wherein the retaining means for normally holding the side edges of the screen within guides may be automatically returned to the guides in the event they are pulled from the guides by undue pressure being applied against the screen, the return being accomplished by providing sufficient spaces above the guides or below the screen casing adjacent the guides so that the retaining means may pass through said open spaces and into proper alignment with the guides when the screen is rolled up.

Still a further object is to provide a guide block of slightly greater diameter than the inside diameter of the guides for traveling therein, and causing them to slightly expand when the guide block is moved up and down, the guide block frictionally engaging within the guide for serving as a stop or retarding means against the action of the spring forming a part of the rolling window screen construction and at the same time to so mount the guides that they are capable of adjustment towards or from each other whereby the binder strip tends to automatically adjust the guides as the screen is rolled up or pulled down.

Still a further object is to provide a pair of spaced, flat flanges at the opening in the guides for preventing any binding or otherwise interfering with the free up and down movement of the screen proper when operated.

Still a further object is a provide a rolling window screen construction for use in connection with the so-called "casement windows", the window screen in the casement window being mounted on the inside of the window.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a window frame with my improved rolling window screen construction mounted thereon.

Figure 2 is a similar view, looking at the inside of the window frame with the rolling screen in down position.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2, showing the lower binding edge of the screen as well as the guide block and vertical guides therefor.

Figure 4 is a vertical, sectional view taken on line 4—4 of Figure 2, parts being broken away to better illustrate the construction.

Figure 5 is a detail, sectional view taken on the line 5—5 of Figure 2 showing the means of mounting the rolling window screen construction on a window frame.

Figure 6 is a detail, perspective view showing a portion of the lower binder for the screen as well as a guide block.

Figure 7 is a detail, sectional view taken on the line 7—7 of Figure 6, showing one of the clips positioned along the edge of the screen.

Figure 8 is a detail, perspective view of one of the locking clips positioned near the lower edge of the window frame.

Figure 9 is a perspective view of one of the end closure caps for the casing in which the screen is contained when in inoperative position.

Figure 10 is a detail, sectional view taken on line 10—10 of Figure 4, parts being broken away to better illustrate the construction.

Figure 11 is a detail, sectional view taken on line 11—11 of Figure 10 showing the spring roller construction.

Figure 12 is a detail, sectional view taken on line 12—12 of Figure 10, showing the opposite end of the spring roller construction from that shown in Figure 11.

Figure 13 is a detail, perspective view, parts being broken away illustrating the bearing cap and casing construction.

Figure 14 is a detail, perspective view of one end of the spring roller construction.

Figure 15 shows the mounting of my rolling window screen construction upon a casement window.

Figure 16 is a vertical, sectional view taken on line 16—16 of Figure 15.

Figure 17 is a detail, sectional view taken on line 17—17 of Figure 16 showing the mounting of the screen casing when used in connection with a casement window.

Figure 18 is a detail, horizontal, sectional view taken on line 18—18 of Figure 15; and

Figure 19 is a detail, perspective view showing the mounting of the casing relative to the guides when used in connection with a casement window.

In the accompanying drawings, I have used the reference character A to indicate generally a window frame which includes the upright members 10, a top cross member 11 and a sill 12.

The window frame includes the ordinary guide strips 13 and divider strips 14, between which the upper and lower window sashes are permitted to slide as in the ordinary window frame construction.

My improved rolling screen construction includes a casing 15, which is substantially rectangular in cross section, as clearly shown in Figure 4 of the drawings, although casings of any suitable shape may be employed.

The casing 15 is formed of a single blank of material folded along three lines so as to form the four sides of the casing.

The edges of the casing 15 are doubled upon themselves, as at 16, and are slightly spaced apart so as to form a screen opening 17.

End bearing caps 18 are inserted in the casing 15, and are spot welded or otherwise secured to the four walls of the main body portion of the casing 15.

The bearing caps 18 are formed with four outturned flanges 19 so as to make the bearing caps 18 substantially like an open receptacle.

The outturned flanges 19 serve as a means for fastening the bearing caps 18 to the remainder of the casing 15.

The outturned flanges 19 and the casing 15 are formed with registering slots 20 through which may be extended screws 21, as will hereinafter be more fully explained for the purpose of fastening the casing 15 on to a window frame A.

A bearing cap 18 is placed in each end of the casing 15, and each bearing cap 18 is formed with a central opening 22, through which is extended the ends of a rod 23.

Cover caps 23^a substantially as shown in Figure 9 of the drawings are used for covering the two outer ends of the casing 15.

The cover cap 23^a is formed of spring material and may be sprung sufficiently for permitting it to frictionally engage the casing 15 when in installed position.

One flange of the cover caps 23^a is formed with a pair of outstruck portions 24, which are of sufficient size to accommodate the heads of the screws 21, as clearly shown in Figure 5 of the drawings.

The casing 15 is set against the window frame between the two upright members 10, and against the guide strips 13 thereof and just below the top cross piece 11.

The screws 21 are extended through the slots 20, and extend into guide strips 13 as well as the upper frame work of the window frame A for properly anchoring the entire casing on to the frame A.

The provision of slots in all four sides of the casing 15 permits the use of screws 21 in either vertical direction or in a horizontal direction, whereby the casing may be properly anchored.

Ordinarily, however, the screws 21 are arranged in horizontal position due to the fact that there is no overhanging part of the frame A above the casing 15.

Mounted within the casing 15 and between the bearing caps 18 is a spring roller construction B including a tubular shaped member 25 to which a sheet of window screen 26 may be fastened in any suitable manner.

The tubular member 25 has a pair of caps 27 placed in its ends, which caps have openings therein of sufficient diameter to receive the rod 23, all as clearly shown in Figure 10 of the drawings in section.

The rod 23 is slotted in each of its ends, as at 28.

The slotted ends will be hereinafter more fully explained.

A coil spring 29 of greater diameter than the rod 23 is received within the tubular member 25, and has one end extended through one slot 28 in the rod 23, and has its other end, as at 30, extended through the tubular member 25, thus anchoring one end of the coil spring 29 relative to the other.

In order to prevent rotation of the rod 23, I insert a pin 31 in the slot 28 opposite the end of the coil spring 30 that connects with the rod 23.

The pin 31 is arranged diagonally in the casing 15 so that when inserted, will positively retain the rod 23 against any possible rotation.

The coil spring 29 at the end which connects to the rod 23 is contracted, as at 32, so as to fit rather snugly against the rod 23, leaving the remainder of the coil spring 29 free from the rod 23.

The purpose of making one end of the coil spring 29 tight around the rod 23, and the remainder loose is to allow the coil spring to tighten when the screen is withdrawn without causing any undue binding of the spring relative to the rod 23.

Fixed to the actual surfaces of the guide strips 13 are screen guides C. The screen guides C are preferably formed of two similar members, each having a flat portion 33 and a substantially semi-circular portion 34.

The two similar members of the screen guide C are placed against each other with the semi-circular portions 34 facing each other so as to form a substantially complete tube in which the edges of the screen 26 are permitted to travel.

The free edges of the semi-circular portions 34 are extended away from such portions to form parallel flanges, as at 35, and are spaced a slight distance apart so as to permit the screen 26 to travel therebetween, as clearly shown in Figure 3 of the drawings.

The lower edge of the screen 26 is formed with a binder strip 36, which is formed of a flat sheet of metal bent upon itself so as to form two thicknesses between which is received the screen 26.

The binder strip 36 is then bent between its top and bottom edges for forming a substantially L-shaped strip in cross section.

The two sides of the binder strip 36 are spot-welded together and also spot welded to the screen itself.

Guide blocks 37 extend over the side edges of the binder strip 36 and are adapted to travel in the screen guides formed by the two semi-circular portions 34.

The guide blocks 37 include a pair of flat parts 38, which travel between the two flat portions 35 of the screen guides C.

The guide blocks also extend around the binder strip 36 and are spot welded thereto.

The edges of the screen 26 are stapled with clips 39 which are formed with a central hump 40 for insuring the screen 26 to remain within the screen guides C.

The clips 39 are spaced at various intervals along the marginal edges of the screen 26 and thereby do not interfere with the screen when in rolled position.

The guide block 37 is of such diameter that when inserted in the semi-circular portions 34, it will cause them to be slightly expanded, thus causing the two parts of the screen guide C to frictionally engage the guide block 37.

The screen 26 passes out of the casing 15 through the screen opening 17.

The rolled edges 16 of the casing 15 prevents any sharp edges from coming in contact with the screen itself.

The screen guides C are formed with a number of slots 41 through which are extended screws 42 whereby the screen guide C may be slightly adjusted toward or from each other for taking care of any slight variation in the width of the window frame A.

The upper edges of the screen guide C rest against the underside of the casing 15 and the opening in the upper ends of the guides C are in substantial register with the screen opening 17.

The upper ends of the semi-circular portions 34 of the guides C are cut at an angle or beveled as at 43, for permitting the easy insertion of the guide block 37 into the semi-circular portions 34.

The beveled edges 43 also permit the screen 26 to pass in between the two flat portions 35 without any danger of the clips 39 being caught or binding.

Along each side of the guide strips 13 near the lower edge thereof, I place spring locking bars 44, which are adapted to spring over the lower portion of the binder strip 36 and engage it for retaining the screen in its lowered position against the tension of the spring 29.

Each locking bar 44 is fastened to the guide strip 13 by means of a screw 45 extending through a slot 46.

The slot 46 permits slight adjustment of the locking bar 44.

In this connection it may be mentioned that in the use of the rolling window screens manufactured on a commercial basis, it is necessary to provide for adjustment of the parts in order to take care of any variations in wood frame construction used in building art.

The tension of the spring 29 may be varied by removing the pin 31 and then rotating the rod 23 against action of the spring.

A locking pin 47 may be inserted through one end of the rod 23 for preventing the removal of the rod 23 when the parts are being assembled.

In Figures 11 and 12, I have shown an arrow 48 to indicate the direction of the tubular member 25 when the screen 26 is withdrawn or moved to its operative position where it covers the window opening.

In Figures 15 to 19 inclusive, I have shown my rolling window screen construc-

tion applicable to casement windows. Casement windows ordinarily open outwardly, and it is therefore necessary to mount the screen on the inside of the house or building. It is also necessary in view of the handle and other hardware upon the casement windows to mount the screen a sufficient distance inward of the casement window so as to clear any such hardware, and in the drawings I have used the reference numeral 49 to indicate an ordinary casement window of either wood or steel construction.

Locking handles 50 are provided on the casement windows 49, and engage the upright dividing bar 51.

In some casement windows the bar 51 is omitted and the two casement windows simply fasten to each other. In this form of construction, the screen guides C are formed with an extension 52 arranged at right angles to the line of the screen 26, and this portion 52 terminates in a second portion 53 arranged at right angles to the portion 52.

The portion 53 is formed with slots 54 whereby screws may be extended therethrough for securing the screen guides C to the casement window frame 55, which may be of either steel or wood.

The portion 52 causes the position of the screen to be a sufficient distance forward of the casement windows 49 so as to prevent any interference with the screen by the hardware upon the casement window.

The portion 52 of the screen guides C rests against the plaster or against the actual frame of the building in which the casement window frame 55 is mounted.

The screen guide C shown in Figure 18 of the drawing is formed of two pieces similar to the one shown in Figure 3 of the drawings, and in this case the inner one terminates somewhat short of the outer one so as to receive the casing 15 thereon, as clearly shown in Figure 19 of the drawings.

The outer part of the screen guide C serves as an end cover plate for the casing 15.

In order to provide additional supporting means for the casing 15, I provide a slidable bracket 56 positioned between the inner and outer members of the screen guide C and adjustable thereto by the slot and bolt connections 57.

The casing 15 may be built right in the plaster work of the house or building, and when so built in, the plaster will come down to position substantially as shown by the dotted line 58 in Figure 16 of the drawings.

The space between the semi-circular portions 34 and the portions 53 of the screen guides C may be filled in by the use of a filler block 59, thereby practically concealing the portions 52 and 53 of the screen guides C.

The locking bar 44 is formed with an offset flange 60 permitting it to be properly secured to the screen guide C where it will properly coact with the binder strip on the lower edge of the screen.

It will be seen that I have provided a very efficient rolling window screen construction adapted to be used either in combination with a wooden window frame wherein the windows slide, or either in connection with a casement window where the windows swing outwardly.

When the rolling window screen construction is used with a casement window, it may be built in with the house, and practically unnoticeable, and will not in any way interefere with the beauty of the walls adjacent the windows.

Some changes may be made in the construction and arrangement of the various parts of my invention, without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a structure of the class described, the combination of a screen mounted to be rolled and unrolled having enlarged portions at its side edges, and having a stiff binder strip provided with enlarged end portions, guides receiving the side edges of the screen including the enlarged portions thereof and the enlarged end portions of the binder strip when the screen is unrolled each guide comprising a pair of resilient semi-cylindrical members opening toward each other and resiliently frictionally gripping the binder strip end portion, and having at one side parallel relatively long adjacent flanges formed on the respective semi-cylindrical members and adapted to be sprung apart for portions of their lengths to facilitate the spreading and contracting action of the guide when the binder strip is slid therein.

2. In a structure of the class described, the combination of a screen mounted to be rolled and unrolled having enlarged portions at its side edges and having a stiff binder strip at its free edge provided with enlarged portions at its ends, guides to receive the side edges of the screen including the enlarged portions thereof and the enlarged portions of the binder strip when the screen is unrolled, each guide having a slotted tubular portion, and means for mounting the guides for permitting their slidable adjustment toward and from each other whereby the sliding movement of the binder strip in rolling or unrolling the screen automatically adjusts the positions of the guides.

3. In a structure of the class described, a guide for the edge of a rolling screen comprising a pair of resilient, semi-cylindrical

members opening toward each other having at one side spaced flanged edges and at the other side projecting parallel flanges whereby the guide may be supported, provided with slots elongated transversely of the guide.

4. In a structure of the class described, a screen mounted to be rolled and unrolled having enlarged portions at its side edges, guides to receive the side edges of the screen including the enlarged portions when the screen is extended, each guide comprising a resilient tubular device having a longitudinal slot, the slotted side of each guide terminating short of the screen mounting a sufficient distance to permit any of such enlarged portions which may have been pulled out of the guides to travel into the proper position to be rolled up and when the screen is again unrolled, to enter the guides.

5. In a structure of the class described, a slotted casing, a screen mounted therein to be rolled or unrolled having enlarged portions at its side edges, guides extending downwardly from the casing to receive the side edges of the screen, including the enlarged portions thereof when the screen is extended, each guide comprising a resilient tubular device having a longitudinal slot, the slotted sides of the guides terminating sufficiently short of the casing to permit any enlarged portions of the screen edge, which may have been withdrawn from the guides, to ride over the guide into proper line.

6. The combination with a window frame of a casing mounted at one end of said frame, a roller journaled in said casing, a flexible screen adapted to be wound upon said roller, said casing being formed with a slot through which said screen is extended, a pair of slightly expandable track members mounted on the side margins of said window frame and formed with slots opening toward the median line of the frame, the side margins of the screen being arranged for travel in said track members, retaining means on the side margins of said screen adapted for normal travel in the track members and also adapted to be withdrawn through said slots when undue pressure is applied to the screen. said track members being formed on inclined lines at their upper ends to permit said retaining members to pass back to their normal positions when the screen is retracted within the casing.

7. The combination with a window frame of a casing mounted at one end of said frame, a roller journaled in said casing, a flexible screen adapted to be wound upon said roller and to be extended outside of said casing, a pair of slightly expandable track members mounted on the side margins of said window frame. each of said track members being formed with a track substantially circular in cross-section and also formed with a slot opening toward the median line of the frame, the side margins of the screen being arranged for travel in said circular tracks, retaining means on the side margins of said screen adapted for normal travel in the circular tracks and also adapted to be withdrawn through said slots when undue pressure is applied to the screen, the inner portions of said track members being cut away at their upper ends to permit said retaining members to pass back to their normal positions when the screen is retracted within the casing.

8. The combination with a window frame of a casing mounted at one end of said frame, a roller journaled in said casing, a flexible screen adapted to be wound upon said roller and to be extended outside of said casing, a pair of slightly expandable track members mounted on the side margins of said window frame, each of said track members being formed with a track substantially tubular in form and also formed with a slot opening toward the median line of the frame, the side margins of the screen being arranged for travel in said tubular tracks, retaining means on the side margins of said screen adapted for normal travel in the tubular tracks and also adapted to be withdrawn through said slots when undue pressure is applied to the screen, the inner portions of said track members being cut away at their upper ends to permit said retaining members to pass back to their normal positions when the screen is retracted within the casing, and rigid friction blocks carried by the lower portion of said screen and arranged for frictional contact with said sliding movement in said tubular tracks.

9. The combination with a window frame of a roller journaled at one end of said frame, a flexible screen adapted to be wound upon said roller, a pair of track members mounted on the side margins of said window frame, each of said track members being formed with a flat attaching flange and with a substantially tubular track, each of said tracks being formed with a longitudinal slot opening toward the median line of the window frame, the side margins of the screen being arranged for travel in said tubular tracks, retaining members mounted on the side margins of said screen and adapted for normal travel in the tubular tracks and for retaining the side margins of the screen therein, said track members being capable of expansion to permit the retaining members to be withdrawn through said slots at times, whereby the side margins of the screen may be withdrawn from the tracks when undue force is applied to said screen, thus preventing damage to the screen, retaining members and track members.

10. The combination with a window frame

of a casing mounted at one end of said frame, a roller journaled in said casing, a flexible screen adapted to be wound upon said roller and to be extended outside of said casing, a pair of track members mounted on the side margins of said window frame, each of said track members being formed with a flat attaching flange and with a track having a longitudinal slot opening toward the median line of the window frame, the side margins of the screen being arranged for travel in said tracks, friction blocks carried by and extending laterally from the lower portion of said screen and adapted for travel in said tracks, the attaching flanges of said track members being formed with a plurality of transverse slots and fastening means passing through said slots and loosely seated in the window frame whereby said track members have a limited lateral movement to automatically adjust themselves to the spacing apart of said friction blocks.

11. In a structure of the class described, a casing having an opening, a screen mounted therein to be rolled or unrolled, guides extending at right angles to the casing to receive the side edges of the screen, each guide having a longitudinal slot, the slotted sides of the guide being spaced a sufficient distance away from portions of the casing to provide open spaces to allow the edge of the screen which may have been withdrawn from the guides to pass through said open spaces and into proper alignment with the guides.

12. In a structure of the class described, a casing having an opening, a screen mounted therein to be rolled or unrolled, resilient guides extending at right angles to the casing, each guide having a longitudinal slot, retaining means on the side margins of said screen adapted for normal travel in said guide and also adapted to be withdrawn through said slots when undue pressure is applied to the screen, the slotted sides of the guide being spaced a sufficient distance away from portions of the casing to provide open spaces to allow the retaining means which may have been withdrawn from the guides to pass through said open spaces and into proper alignment with the guides.

13. In a structure of the class described, the combination of a screen mounted to be rolled and unrolled, having a stiff binder strip at its free edge provided with enlarged portions at its ends, guides to receive the side edges of the screen and the enlarged portions of the binder strip when the screen is unrolled, each guide having a slotted tubular portion and means for mounting the guides for permitting their slidable adjustment toward and from each other whereby the sliding movement of the binder strip in rolling or unrolling the screen, automatically adjusts the position of the guides.

14. In a structure of the class described, a casing, a screen mounted therein to be rolled and unrolled, having a stiff binder at its free edge provided with enlarged portions at its ends, guides extending at right angles to the casing, each guide having a longitudinal slot, retaining means on the side margins of said screen adapted for travel in said guides, said guides also receiving the enlarged portions at the ends of said binder strip and means for mounting the guides for permitting their slidable adjustment toward and from each other whereby the sliding movement of the binder strip in rolling or unrolling the screen, automatically adjusts the position of the guides.

15. In a structure of the class described, a casing, a screen mounted therein to be rolled and unrolled, having a stiff binder at its free edge provided with enlarged portions at its ends, guides extending at right angles to the casing, each guide having a longitudinal slot, retaining means on the side margins of said screen adapted for normal travel in said guides, said guides also receiving the enlarged portions at the ends of said binder strip and means for mounting the guides for permitting their slidable adjustment toward and from each other whereby the sliding movement of the binder strip in rolling or unrolling the screen, automatically adjusts the position of the guides and means whereby said retaining means which may have been pulled out of the guides, travel into the proper position relative to said guides when rolled up and again unrolled to enter the guides.

16. In a structure of the class described, the combination of a screen mounted to be rolled and unrolled having a stiff binder strip at its free end provided with end portions, guides receiving the side edges of the screen and the end portions of the binder strip when the screen is unrolled, each guide comprising a pair of resilient members opening toward each other, resiliently frictionally gripping the binder strip end portion, said resilient members forming therebetween a slot of normally less width than the thickness of said end portion whereby said members are sprung apart for portions of their length to facilitate sliding movement of the binder strip end portion therein as the screen is rolled and unrolled.

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HARRY DIXSON.