Jan. 8, 1935. L. L. BREDIN 1,987,140

FRAMELESS WINDOW SCREEN

Filed Jan. 19, 1933 2 Sheets-Sheet 1

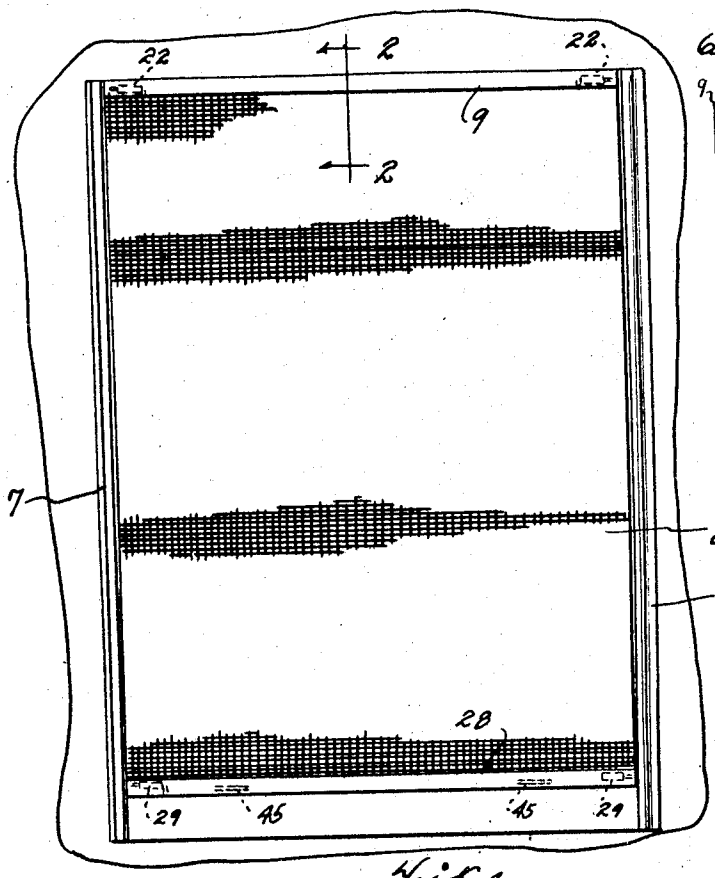


Fig. 1

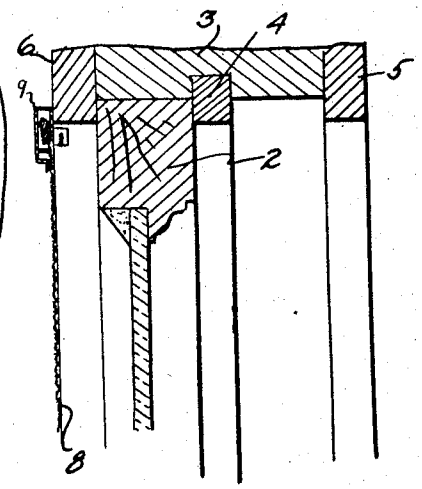


Fig. 2

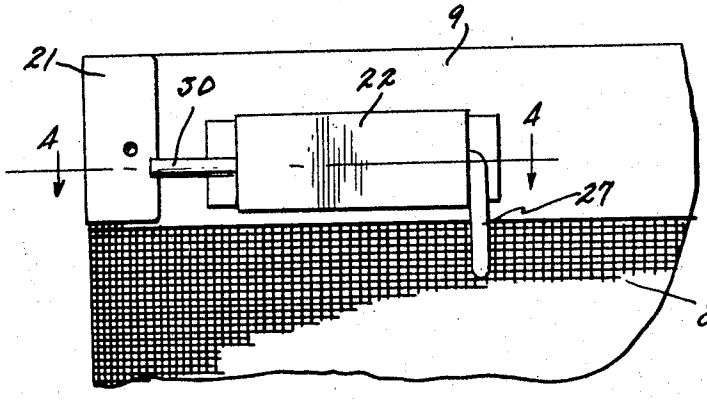


Fig. 3

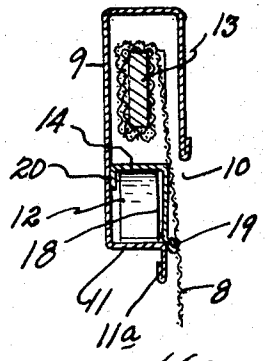


Fig. 5

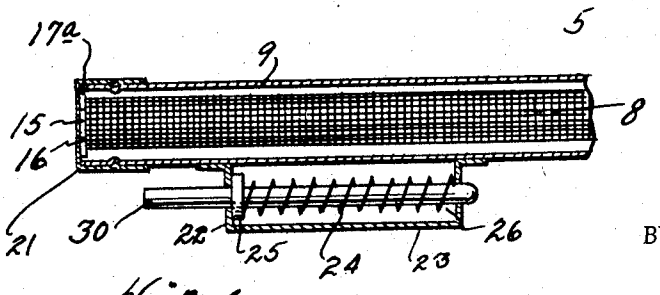


Fig. 4

INVENTOR.
LEWIS L. BREDIN

BY

ATTORNEY.

Jan. 8, 1935. L. L. BREDIN 1,987,140

FRAMELESS WINDOW SCREEN

Filed Jan. 19, 1933 2 Sheets-Sheet 2

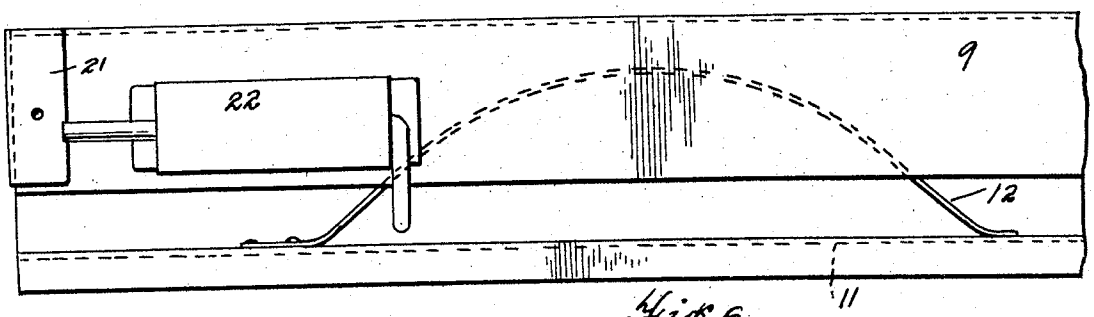


Fig. 6

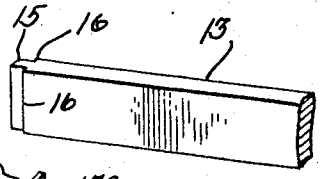


Fig. 7

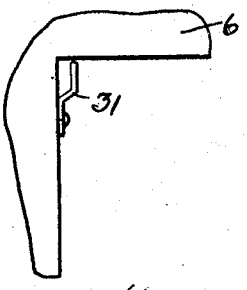


Fig. 13

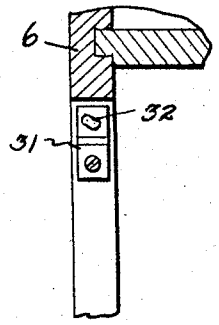


Fig. 14

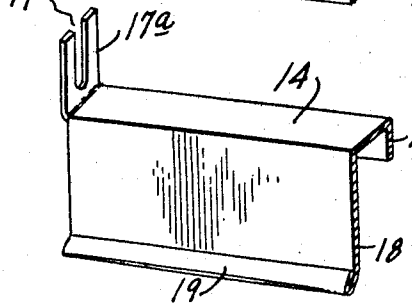


Fig. 8

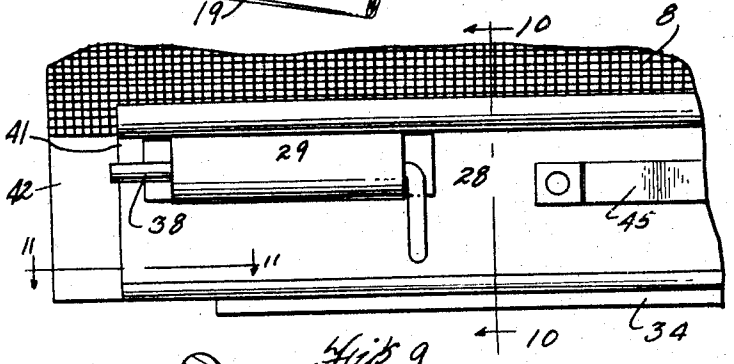


Fig. 9

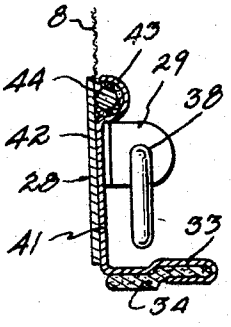


Fig. 10

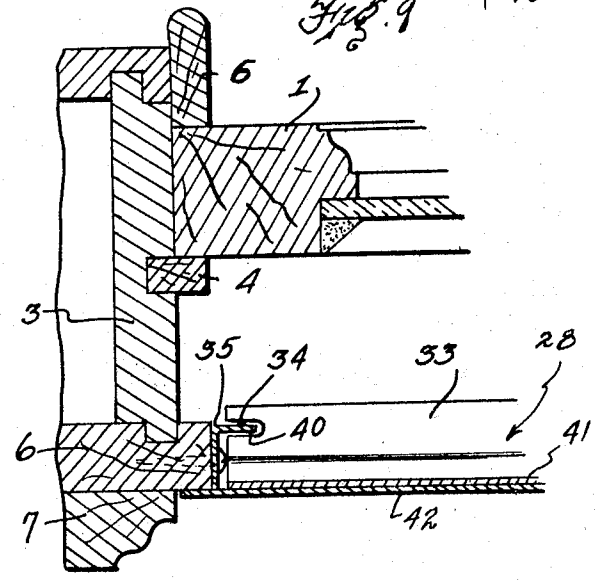


Fig. 11

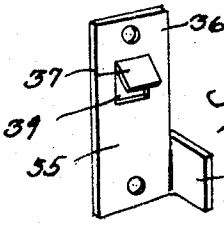


Fig. 12

INVENTOR.
LEWIS L. BREDIN

BY

ATTORNEY.

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UNITED STATES PATENT OFFICE

1,987,140

FRAMELESS WINDOW SCREEN

Lewis L. Bredin, Detroit, Mich., assignor to Chamberlin Metal Weather Strip Company, Detroit, Mich., a corporation of Michigan

Application January 19, 1933, Serial No. 652,501

12 Claims. (Cl. 156—14)

This invention relates to improvements in window screens and more particularly to a frameless screen construction and its method of mounting and association with a window frame or opening.

In the common window screens in use a frame is provided that fits in the window opening or against the frame providing the openings and in colder sections of the country is required to be taken down in the fall and erected in the spring. Such framed screens require considerable storage space and are awkward to handle, and one of the objects of this invention is to provide a screen having a top and a bottom cross frame member only enabling the same to be rolled up when removed from the window for storage and thus are more easily handled and require considerably less storage space than the usual type of screen.

With my improved screen a further feature and object of the invention is involved in the provision of an upper cross bar so positioned relative to the window frame as to enable it to be erected from the interior of the building and so constructed that the unframed screen edges lie in contact with the outer face of the window frame or stop member provided therefor.

A feature of the invention is provided by an upper cross bar which is dual in character having a screen supporting bar and a casing in which the bar is insertable and is forced toward the upper part of the casing by a spring means supported in the lower part of the casing. By such arrangement, when the screen is erected and the lower cross bar fastened in place, a tension is placed on the screen which is attached at the upper end to the bar and thus holds the screen taut.

It is likewise a feature and object of the invention to provide a screen construction that is comparatively simple and inexpensive to manufacture; that permits a very ready assembly of the parts; and further provides for an adjustment in the length of the screen.

These and other objects and novel features of the invention are hereinafter more fully described and claimed, and the preferred form of construction of a screen embodying my invention is shown in the accompanying drawings in which—

Fig. 1 is a front elevation of a window frame showing my improved screen erected therein.

Fig. 2 is a cross section on an enlarged scale taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged detail elevation of a portion of the upper cross frame and screen showing a convenient means for fastening the same in position in a window frame.

Fig. 4 is a section taken on line 4—4 of Fig. 3.

Fig. 5 is a section taken on line 5—5 of Fig. 3.

Fig. 6 is an enlarged elevation of a portion of the upper cross frame before assembly with the screen and screen supporting bar.

Fig. 7 is a perspective view of a portion of the screen supporting bar insertable in the upper cross frame.

Fig. 8 is a supporting member or holder for the bar of Fig. 7.

Fig. 9 is an elevation of a portion of the lower cross member and the latch means for securing the same in place.

Fig. 10 is a section taken on line 10—10 of Fig. 9.

Fig. 11 is a cross section of a window frame on line 11—11 of Fig. 10 showing the lower cross frame in section.

Fig. 12 is a perspective view of a convenient form of a strike and retainer member for the latch on the lower cross member.

Fig. 13 is a side elevation of a convenient means for securing the latch member of the top cross frame in position.

Fig. 14 is a front elevation thereof.

The screen, as hereinafter described, may be made for attachment to window frames or any framed opening and for convenience is here shown in association with the usual wooden window frame and sliding sash. In such type of construction, referring more particularly in Figs. 2 and 11, a lower sash 1 is shown and in Fig. 2 is shown a similar upper sash both of which are slidable in sash grooves formed in the frame 3 by means of the intervening stop 4, the inner stop or finish member 5 and the outer blind stop 6 on which the screen is to be mounted and on the outer face of which a finish strip 7 may be provided, which strip is so associated with the stop 6 as to provide a vertical flange against which the vertical edges of the screen 8 may lie.

In the preferred construction the top cross member, shown in Fig. 3, consists of an outer casing 9 having an opening 10 in its inner face and is preferably of rectangular form having an inturned bottom wall 11 on which wall is supported two or more leaf springs 12, only one of which is here shown, but it is to be understood that there may be several such springs along the length of the channel formed in the member 9. Within the hollow interior of the casing is mounted the screen bar 13 and its holder 14, an end of each of which is shown respectively in Figs. 7 and 8 and a cross section of which is shown in Fig. 5.

The bar 13 has a short end portion 15 of reduced thickness providing shoulders 16 on opposite sides

thereof and this portion 15 fits within the slot 17 of the holder which is formed by an upwardly bent lug 19a, it being understood that there is a lug provided at each end of the holder 14 which is approximately of the same length as the casing 9 and the holder 14 has a depending flange or skirt 18 at the forward side which projects through the opening 10 of the casing 9 and the bottom edge 15 which is folded upon itself and slightly outturned providing a bar like element against which the body of the screen 8 engages, and provides a tight contact between the screen body 8 and the flange 18 to prevent ingress of insects through the casing 9 and thence into a room through the opening 10 of the casing. The holder 14 at its inner edge has a downturned flange 20. It will be understood from Fig. 5 that the upper end of the screen 8 may be wrapped about the screen bar 13 with several turns and the bar then inserted in the holder 14 and the assembled bar and holder then inserted longitudinally in the end of the casing 9 in which it is slidable and with the spring elements 12 lying between the flanges 18 and 20 of the holder. The springs 12 tend to force the holder 14 and screen bar 13 toward the upper part of the casing 9. It will be noted that the edge 19 of the flange 18 on the holder in contact with the downturned edge 11a at the bottom of the casing 9 and thus is supported thereby when the screen 8 is stretched.

Due to the bar 13 having several turns of the body of the screen wrapped thereabout, the length of the exposed portion of the screen may be varied within the limits determined by the length of the several turns of the screen. Thus the screen is adjustable in length for various lengths of window openings. This variation in length is provided to accommodate comparatively small variations in length of the window frame due to variation in manufacture or which are made to exact dimensions and yet in any of its adjusted lengths the screen is maintained taut by the spring elements 12 as will be hereinafter more fully described. After the screen bar 13 and its holder have been inserted in the casing 9 a sheet metal U clip 21 is preferably positioned over each open end of the casing 9 to prevent the end of the inserted bar from engaging directly against the side face of the window frame.

The upper cross bar which includes the casing 9 and the screen bar 13 and its holder 14 is provided with a pair of retaining members or latches one at each opposite end thereof and indicated generally at 22. The latch member consists of a sheet metal housing 23 secured to the inner face of the casing 9 and the end walls of the housing are apertured to receive a bolt 24 which is formed with a shoulder provided by a washer 25 against which one end of a compression spring 26 engages forcing the bolt to the position shown in Fig. 4. The bolt at the one end is provided with an outturned end 27 by which it may be retracted from the position shown in Fig. 4.

The lower cross frame of the screen member, indicated generally at 28 in Fig. 9, is likewise provided with a latch element 29 similar in all respects to the latch member 22 on the upper cross frame. It is to be noted that the forward end 30 of the bolt 24 shown in Fig. 4, when in its extended position, does not extend to the end of the casing 9. The bolt at each end of the casing 9 is positioned in the same relationship and when the casing is positioned, as indicated in Fig. 2, it engages the outer face of the blind stop 6 in which position the latch member 22 extends within the window opening as the latch member is also spaced from the upper edge of the casing 9. For cooperation with the bolt 24 I provide in the two opposite upper corners of the window frame a lug 31 shown in side and face elevation respectively in Figs. 13 and 14. The lug has an elongated slot 32 into which the terminal end 30 of the bolt 24 engages and by means of which the upper cross member is held in position against the face of the stop 6.

The lower cross bar 28 is shown in elevation and in section in Figs. 9, 10 and 11 wherein it will be seen that it is formed of sheet metal L shaped in cross section having a base 33 return-bent upon itself in a manner to securely hold a felt pad 34 on its lower face which, when the screen is in position in the frame, engaged the window sill and prevents marring of the surface thereof by contact of the metal portions with the sill.

As shown in Fig. 11, this base portion 33 has a slot 34, it being understood that there is a slot at each end thereof. At the bottom end of the blind stop 6, at the window sill is provided a strike and retainer member 35 which has a vertical portion 36 lying in engagement with the face of the member 6 and is provided with a struck out portion or lug 37 which lies at an angle to the vertical and forms a strike for the end of the bolt 38 of the latch 29 on the lower cross frame. The bolt is retracted by engaging the strike plate and then, due to its being spring pressed, is forced into the aperture 39 provided by the striking out of the lug 37. The retainer 35 also has a portion 40 at the lower end thereof lying at a right angle to the base 36 of the member 35 which engages in the slot 34 formed in the base portion 33 of the lower cross frame 28. Thus when the lower cross frame is in its lowermost position it is held from lateral displacement at the bottom by these portions 40 of the members 35 and it is also held from movement vertically by the strike plate or lug 37 beneath which the bolt 38 of the cross member 28 engages.

The latch members 22 of the top cross frame and the latch members 29 of the lower cross frame are on the inside of the screen when erected in the window frame and, as previously stated, the top cross frame, as shown in Fig. 2, engages the outer face of the member 6 and thus the outer edge of the screen body lies in engagement with this outer face of the member 6 along the vertical sides thereof and when the lower cross member 28 is positioned in place the screen is held taut due to the action of the springs 12 which are placed under tension by bringing the lower cross frame to place in engagement with the sill.

It is to be understood, of course, that prior to erection the screen bar 13 has been either wrapped or unwrapped to provide proper length of the exposed screen body so that the screen body is placed under tension by positioning the lower cross bar in its locked position on the sill as above described. As indicated in Fig. 11, the lower cross frame 28 is formed of sheet metal having the base 33 and the vertical portion 41 and to the outer face of this portion 41 is secured a flat strip 42 which is of a length equal to the width of the screen body 8 while the member 41 is shorter as will be understood from Fig. 9. This permits the strip 42 to engage over the outer face of the member 6 as shown in Fig. 11 and thereby holds the screen 8 flat against the said outer face of the stop 6 which is also held against the said stop 6 by the upper cross frame as previously stated.

To secure the lower edge of the screen body 8

to the lower cross frame the member 41 is formed at its upper edge with a U shaped portion 43, the open side of which is opposite the upper edge of the member 42. The lower edge of the screen is placed in this U shaped member 43 and a rod 44 forced thereinto and then the members 42 and 41 are riveted together by the rivets securing the handles 45 to said lower cross frame. Thus the lower edge of the screen is prevented from removal from the lower cross frame 28. The handles are provided to permit the person erecting the screen to place a downward pressure on the cross frame 28 to bring the latch bolt 38 beneath the strike plates 37 and place the spring members 12 under tension. This holds the screen body under tension to thereby hold the screen body taut and in close engagement with the outer face of the member 6.

From the foregoing description it will be evident that my improved screen is of comparatively simple construction, the upper and lower cross bars being formed of sheet metal which is easily shaped, and a screen is provided that is adjustable in length to accommodate variation in the length of the window opening and that in all positions of adjustment the screen may be made taut by the securing of the lower cross frame in place to thereby place the spring members under tension, and that the various objects of the invention are attained by the construction described.

Having thus fully described my invention, its utility and mode of operation, what I claim and desire to secure by Letters Patent of the United States is—

1. A screen for mounting upon the outer face of a window frame comprising a screen body, upper and lower cross frames, the screen body being fixedly attached to the lower cross frame, said upper cross frame having a bar insertable longitudinally therein to which the upper edge of the screen is secured and about which the screen may be wrapped to provide a greater or less length of exposed screen body, spring means for forcing the bar upwardly to place a tension on the screen body when the lower cross frame is secured in place, and means operable from the interior of the window opening for detachably securing both the upper and the lower cross frames in position.

2. A screen for mounting upon the exterior face of a window frame comprising a screen body having upper and lower cross frames, the screen having one end fixedly attached to one of the frames and a bar removably supported in the other cross frame to which the other end of the screen is secured, said bar having several turns of the screen body thereabout for adjustment of the length of the exposed screen body by wrapping or unwrapping one or more turns of the screen thereabout, yieldable means in said other cross frame engaging the bar and placing the screen body under tension when secured in place, latch members upon the interior face of each of the cross frames, and means on each vertical side face of the window frame at both the upper and the lower ends thereof engaged by the respective latch members, this arrangement providing a screen adapted to be erected from the interior of the window with the screen lying on the exterior face of the window frame.

3. A screen for securing to a window frame having a blind stop, said screen comprising a screen body having upper and lower cross frames only, a latch member adjacent each end of each cross frame, means on the inner side face of the blind stop at the top and at the bottom to detachably receive the said latch elements of the respective cross frame and thereby secure the screen in place, the arrangement of the latch elements positioning the opposite vertical edges of the screen body in engagement with the outer face of the blind stop, a removable element in one of the cross frames to which an end of the screen is attached and about which the screen body is wrapped for adjustment of the length of screen body between the cross frames, and spring means for supporting the said bar whereby in the erection of the screen the screen body is placed under tension.

4. A screen for a window frame, comprising a screen body, a cross frame of hollow form constituting a casing having an opening in its wall to receive one end of the body portion of the screen, means within the casing to which the screen end is attached, said means being adapted to adjust the exposed portion of the screen body whereby the same may be shortened or lengthened, a holder for the said means, said holder and means being removable as a unit longitudinally of the said body for adjustment of the screen length, spring means in the said hollow cross frame for supporting the holder and tending to draw the screen into the casing, means for securing the said cross frame to the upper part of a window frame with the screen body on the exterior face thereof, and means at the bottom end of the screen for securing the same to the window sill, the adjusted length of the exposed screen body being less than the length of the window opening whereby said body is placed under tension by the spring means through fastening the bottom end of the screen to the window sill.

5. A screen for a window frame, comprising a screen body, a cross frame of hollow form constituting a casing having an opening in its wall to receive one end of the body portion of the screen, means within the casing to which the screen is attached, said means being adapted to adjust the exposed portion of the screen body whereby the frame may be shortened or lengthened, a holder for the said means, spring means in the said hollow cross frame for supporting the holder and tending to draw the screen into the casing, means for securing the said cross frame to the upper part of a window frame with the screen body on the exterior face thereof, and means at the bottom end of the screen for securing the same to the window sill, the adjusted length of the exposed screen body being less than the length of the window opening whereby said body is placed where tension by the spring means through fastening the bottom end of the screen to the window sill.

6. In a window screen, a cross member comprising a rectangular casing having an opening in one side face, a bar, and a holder for said bar slidable as a unit longitudinally into the casing, a screen body attached to the bar and extending through the opening of the casing, spring means tending to move the holder and bar in a plane parallel with the plane of the body, and means at the opposite end of the screen for attaching the same to one end of a window frame to thereby place a tension on the screen when erected.

7. In a window screen a cross frame consisting of a sheet metal casing having an opening in one face thereof, an element movable in the plane of the screen and supported within the casing

to which an end of the screen is attached, a spring means tending to draw the screen body into the casing, means for securing the said cross frame in position in a window opening with the screen body on the exterior face of the window frame, and means for securing the other end of the screen to the opposite end of the casing, the screen body when mounted being placed under tension by the spring means.

8. In a window screen, a cross frame consisting of a rectangular sheet metal casing having an opening in one side face thereof, a screen body extending through the said opening, a bar within the casing about which an end of the screen is wrapped, a sheet metal holder for the bar having a flange extending through the opening and engaging the body of the screen, spring means in the casing engaging the said holder tending to move the same in a plane parallel with the plane of the exposed portion of the screen, means on the said cross frame for securing the same in a window frame, and means on the other end of the screen for attaching the same to the window frame and thereby tending to move the holder against the tension of the springs to thereby hold the screen body taut.

9. In a window screen, a screen body, an upper and a lower cross frame therefor, the upper cross frame comprising a hollow casing having an opening in the inner face thereof through which the screen body extends, means movable within the casing parallel with the body of the screen to which the said screen is attached, a latch means for securing the said face against the outer face of a window frame whereby opposite edges of the exposed screen body lie in contact with said face of the window frame, spring means in the said hollow casing tending to draw the body of the screen thereinto, a cross bar at the opposite end of the screen body consisting of an L shaped sheet metal member providing a base for engaging the sill and a vertical flat portion to which the screen end is attached, a releasable latch element at each end thereof, a plate at the bottom of the opposite vertical sides of the window frame forming a strike member for the latch elements, said plates also having a portion extending outwardly from the face of the window frame, and slots provided in the base of the bottom cross frame through which the said last named portions of the plates extend when the cross frame has been brought into latching position.

10. A screen for a window frame comprising a screen body, a cross frame at the upper end thereof, a cross frame at the lower end thereof, a bar carried by said upper cross frame to which an end of the screen is attached and on which the screen may be rolled or unrolled through manual rotation of the bar to adjust the length of the screen between the frames, a spring means carried by the upper cross frame and supporting the bar, means for detachably securing the upper cross frame to the upper part of the window frame with the screen body on the exterior face thereof, stationary latch elements provided at the bottom of the vertical sides of the window frame, and means on the lower cross bar for engaging the latch element detachably securing the cross bar in contact with the sill and maintaining the screen under tension by the said springs.

11. In a screen for mounting on the exterior face of a window frame, an upper and a lower cross frame attached to the screen body, means for detachably securing the respective cross frames to the upper and lower portions of the window frame, a member slidably supporting the upper cross frame, a tensioning means between said member and the upper cross frame caused to be placed under tension by securing the lower cross frame in position whereby the screen member is stretched taut to hold the otherwise unsupported edges thereof in engagement with the outer face of the window frame.

12. A screen for mounting upon the exterior face of a window frame comprising a screen body, a cross frame for each of its opposite ends, one of the cross frames containing a predeterminable portion of the screen rolled thereon and providing a predeterminable exposed length of screen body, a support for the said cross frame containing the rolled up portion of the screen slidably supporting the same for movement in the plane of the exposed length of the screen body and holding the same from rotation to prevent unrolling of the screen thereon by pulling on the other cross frame, spring means resisting sliding movement of the cross frame containing the said rolled up portion of the screen body whereby, upon movement of the other cross frame in a direction away from the frame containing the rolled portion, the exposed screen body is held taut by said spring means with its side edges in engagement with the respective portions of the window frame.

LEWIS L. BREDIN.