Aug. 5, 1952 A. LANG 2,605,826

WINDOW SCREEN SECURING MEANS

Filed April 17, 1950 2 SHEETS—SHEET 1

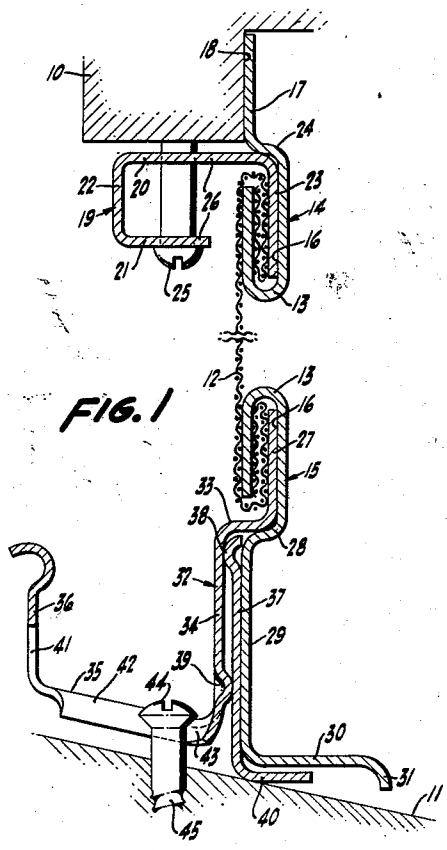


FIG. 1

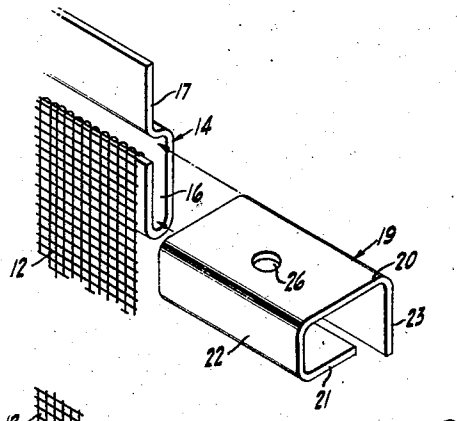


FIG. 2

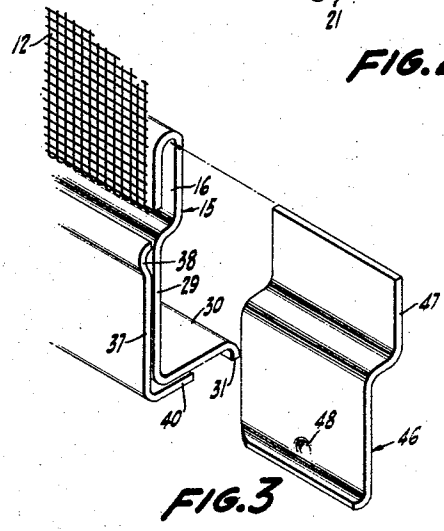


FIG. 3

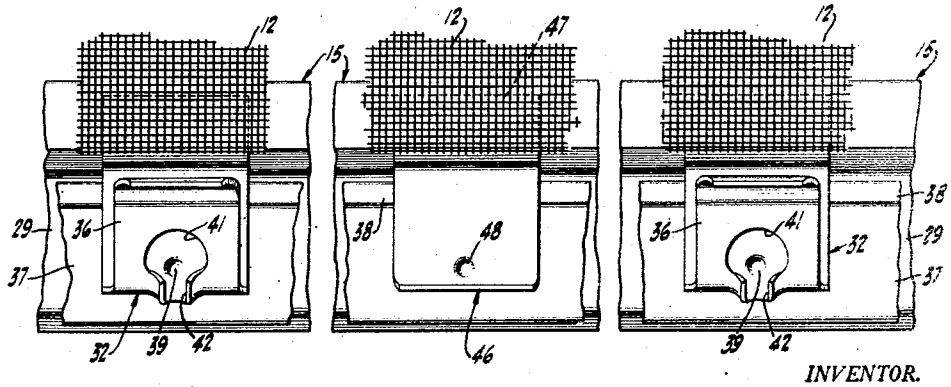


FIG. 4

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WINDOW SCREEN SECURING MEANS

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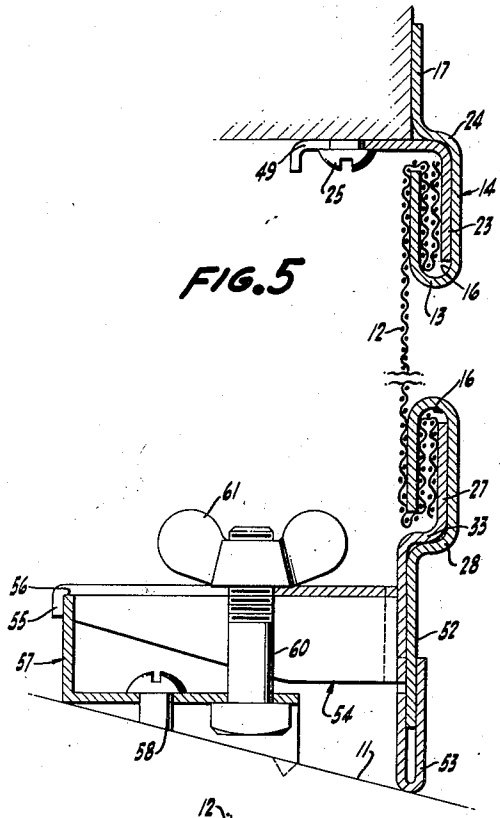


FIG. 5

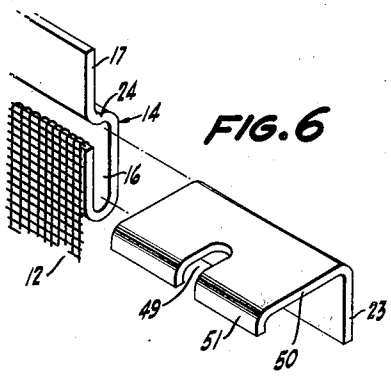


FIG. 6

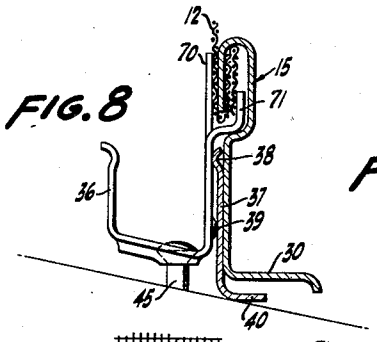


FIG. 8

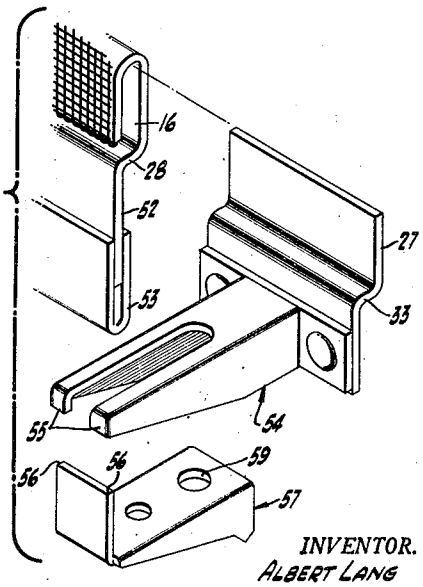


FIG. 7

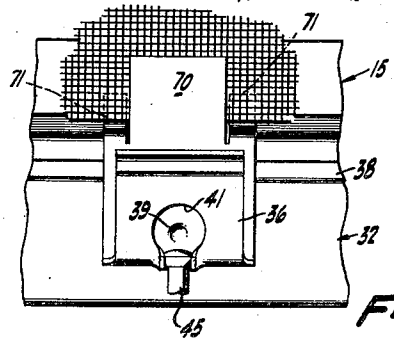


FIG. 9

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WINDOW SCREEN SECURING MEANS

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7 Claims. (Cl. 160—328)

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This invention relates to window screens and is particularly concerned with frameless screens and means for securing the screen material to an edge holding strip and to means for securing such strips to a window frame.

While frameless screens, generally characterized by the provision of a flexible screen body having one or more of the edges thereof provided with rigid screen holding strips, have long been successfully used, difficulties have arisen with respect to the means by which the strip is secured to the screen and to the means by which the strip is secured to the window frame. Means heretofore used for both such purposes have been expensive and complicated, difficult of adjustment and have involved a multiplicity of parts which rendered them unsuited to economic manufacture.

It is among the prime objects of the present invention to provide a novel and improved screen of the character set forth having improved, effective and efficient means by which the screen is secured to an edge holding strip.

Another object of the present invention is to provide novel and improved means by which a strip securing means is engaged with the strip to be secured.

A further object of the present invention is to provide a new and improved construction in which the screen is secured to an edge strip in conjunction with the securement to the strip of a securing means for the strip in such manner that a single instrumentality may function as both means for securing the screen in the strip and means for securing the strip to the frame of a window.

A further object of the present invention is to provide a securing means for a screen strip which may be readily adjusted with respect to the strip so that requirements for securing means location may be compensated for at the place of installation and so as to avoid the necessity of permanent fabrication of the parts in assembled relation at the factory.

A further object of the present invention is to provide a strip for a frameless window screen having a new and improved means for sealing the strip with respect to a window frame.

Numerous other objects and features of the present invention will be apparent from consideration of the following specification taken in conjunction with the accompanying drawings, in which:

Fig. 1 has a vertical sectional view through a screen, its edge holding strips and securing means therefor.

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Fig. 2 is an exploded perspective view showing the parts of the tops of the securing means of Fig. 1.

Fig. 3 is an exploded perspective view similar to Fig. 2 showing details of construction of the bottom securing means of Fig. 1.

Fig. 4 is a front elevation showing the bottom strip and its securing means.

Fig. 5 is a view similar to Fig. 1 showing a modified form of the securing means for the strips of the screen.

Fig. 6 is an exploded perspective view similar to Fig. 2 of the top securing means of Fig. 5.

Fig. 7 is an exploded perspective view similar to Fig. 3 of the bottom receiving means of Fig. 5.

Fig. 8 is a vertical section of a further modified form of securing means and strip assembly.

Fig. 9 is a front elevation of the securing means of Fig. 8.

In general the inventive concept of the present application may be defined as being carried out by the provision of a flexible screen which is secured within a return bent portion of an edge holding strip together with securing means for the strip engaged within the same return bent portion. In so locating the securing means within the channel which receives the screen edge, the securing means act to assist in locking the screen in position. While the securing means may be permanently and rigidly locked in the channel, such means are preferably mounted to slide therein so as to permit adjustment at the place of installation. The invention also provides means for securing a sealing strip within the edge holding strip so as to provide an effective and efficient seal between such strip and a window frame.

Referring now more particularly to the drawings, in Fig. 1 the blind stop of the frame is indicated by the numeral 10, while the numeral 11 illustrates the lower sill of the frame. A woven wire or fabric screen is identified by the numeral 12, its upper and lower edges being received within the return bent portion 13 of upper and lower screen holding strips 14 and 15 respectively. In both instances the return bent portion 13 forms a channel 16 in which the screen edge is lodged. The screen edge, as illustrated, is preferably return bent within the channel 16 to secure it against accidental displacement therefrom.

The upper holding strip 14 is formed in addition to the return bent portion 13 with an outwardly extending flange 17 which is adapted to bear against and seal the outer face 18 of the blind stop 10. For securing the upper strip 14

to the blind stop 10 there is provided a securing member generally indicated by the numeral 19. The member 19 is generally U shaped in cross-section and includes an upper horizontal wall 20 and a parallel lower horizontal wall 21 joined by an intermediate vertical wall 22. The free outer edge of the upper wall 20 is turned at right angles thereto to form a channel engaging flange 23 which is mounted within the channel 16 and in contact with the screen edge located therein. While the flange 23 is in frictional contact with the inner wall of the channel and with the screen edge to assist in securement of the screen within the channel, it is longitudinally slidable to permit adjustment thereof. As indicated at 24, the flange 17 is inwardly offset with respect to the outer wall of the return bent portion 13 so as to form a shoulder which engages the right-angular bend of the wall 20 with respect to the flange 23 and thus to engage the securing member 19 to preclude dislodgement of the flange 23 from the channel by transverse movement thereof with respect to the strip. For attaching the securing means to the blind stop 10, an attaching screw 25 is provided the shank of which passes through registering apertures 26 in the upper and lower walls 20 and 21, respectively, so as to engage the shank at spaced points, thus precluding a pivotal movement of the securing means 19 with respect to the screw and with respect to the frame 10.

By this construction it will be seen that the strips 14 may be formed at the factory of indefinite length and a screen may be located in the channel thereof and the securing means 19 loosely applied at such intervals as may be found required. As specifications for the window frames to which the screen is to be applied are received the strip members 14 and their companion members 15 may be cut to the desired length and the securing means moved longitudinally to the approximate point assumed to be desirable and such screens may then be delivered. When the position for the screws 25 is determined, the securing means 19 are slipped longitudinally of the strip and the screws are then inserted, thus permanently attaching the securing means in their newly located position and acting in such position to assist in retaining the screen edge within the channel 16. Since the securing means is slidable with respect to the strip 14, it can be formed to releasably engage the screw by use of a bayonet slot opening entering through the vertical wall 22 if desired.

By further reference to Fig. 1 and with reference to Figs. 3 and 4, it will be seen that the lower securing means for the lower strip 15 comprises end securing elements having vertical flanges 27 which are slidably mounted within the channel 16 of the lower strip 15 and are engageable with the edge portion of the screen folded within the channel in the same manner as the flange 23 with the upper securing member. The lower securing strip 15 is also provided with an inturned shoulder 28 similar to the shoulder 24 and a downwardly extending flange 29 comparable with the flange 17 of the upper strip 14. At the terminable edge of the flange 29, however, the lower securing strip 15 is formed with an outwardly turned flange 30 terminating in a downwardly extending lip 31 forming an extension which is adapted to lie over the upper face of the sill 11. The flange 27 of the lower securing member, generally indicated by the numeral 32, is formed with a shoulder 33 engageable with the shoulder 28

in order to preclude outward movement of the flange with respect to the channel and the shoulder 33 is formed with a downwardly extending flange 34 which terminates in an outwardly extending surface 35 disposed at slightly obtuse angle with respect to the flange 34. The outer edge of the surface 35 is provided with an upwardly extending flange 36 which forms a manipulating handle for the lower end securing means.

For sealing the lower strip with respect to the surface of the sill 11, there is provided a vertically adjustable sealing element 37 having an upper curved head 38 adapted to form frictional engagement with the inner surface of the flange 34 of the securing means. The flange 34 of the securing means is also provided with a detent 39 adapted to engage the inward facing surface of the member 37 to form a frictional lock therefor whereby it will be retained in its downwardly adjusted position for sealing engagement with the surface of the sill 11. The lower end of the member 37 is outwardly turned, as indicated at 40, in parallelism with the end of 30 of the flange 29, thus acting in conjunction therewith to seal the surface 11.

For engaging the securing means with the sill 11, a keyhole slot is provided, its head opening 41 being located in the lower portion of the vertically extended flange 36, while the elongated shank of the opening, indicated at 42, extends into the inclined surface of the portion 35 of the securing means and terminates in a slight recess indicated at 43, which is adapted to receive the head 44 of an attaching screw 45. By this arrangement it will be seen that the enlarged opening 41 may readily receive the head 44 of the screw 45. Inward movement of the securing means will cause the surface adjacent the shank portion 42 of the slot to be engaged under the head 44 of the screw whereby continued inner movement of the securing means will cam the securing member downwardly to tension the screen and to force the sealing member 37 into sealing engagement with the surface of the sill 11. The final lodgement of the head 46 within the recess 43 at the inner end of the shank of the keyhole opening is such as to preclude accidental displacement of the securing means from the head.

In the construction and arrangement of parts shown in Fig. 4, it will be noted that only two end securing elements 32 are employed. However, a central element 46 is provided and is somewhat similar thereto. The member 46 is similar to the securing means in that it is provided with a flange 47 lodged within the channel 16, which flange is slidable within the channel and engages the edge of the screen in order to assist in securing the same within the channel. The member 46 is likewise similar to the securing member 32 in being provided with a detent 48 which engages the inner face of the sealing member 37 in order to cooperate with the head 38 to secure the sealing member in its vertically adjusted position.

Referring now to Figs. 5, 6, 7 and 8 of the drawings, it will be seen that the specific means of attaching the securing means to the frame may take form other than that disclosed in Figs. 1 to 4, inclusive. In Fig. 6, the upper securing strip 14 is identical with that shown in Figs. 1 and 2, and within the channel 16 thereof are located the upper edge of the screen 12 and the flange 23 of a securing means, which is slidable but locked against accidental displacement from

the channel by the inwardly turned shoulder 24. In this form of the invention, in lieu of the substantially U-shaped body which engages at spaced points the shank of the screw 25, the screw 25 is received through a simple inwardly directed slot 49 of a flange 50 extending at right angles to the flange 23 seated within the channel 16. An outer lip 51 is formed at the free edge of the flange 50 in order to preclude accidental dislodgement of the member from the head of the screw 25.

The lower screen securing strip of that form of the invention shown in Fig. 5 is identical with the strip 15 of Fig. 1 in that it has the return bent portion 13 forming the channel 16 for receiving the flange 27 of the securing means. The shoulder 28 engages the shoulder 33 of the securing means to lock the flange against accidental movement from the channel. In lieu of the sealing strip 37 of Fig. 1, the lower strip of Fig. 5 is formed with a simple downwardly extending flange 52 which has fitted over the edge thereof a return bent sealing strip 53 which is frictionally slidable on the edge of the flange 52 to provide a seal against the upper surface of the sill 11 of the bottom strip of Fig. 5, including a bifurcated engaging piece 56, the outer ends of which are turned downwardly to form catch hooks 55. When the lower strip is to be secured, the hooked ends 55 of the bifurcated member 54 engage the upper outer corners 56 of the bracket 57, which bracket is rigidly secured to the surface 11 by a screw, or the like, indicated at 58. The bracket 57 is also provided with an aperture 59, through which extends a securing bolt 60 provided with a wing nut 61. In attaching the device the wing nut is loosened on the bolt 60 and the bifurcated members moved inwardly to straddle the shank of the bolt 60 and to engage the hooked ends 55 with the corners 56. Thereafter the wing nut 61 may be tightened outwardly on the shank of the bolt 60 and in such tightening movement the securing means 54 rocks about the corners 56, thus lowering the outer end of the securing means and applying tension on the screen and causing the sealing member 53 to snugly engage the surface of the sill 11 to seal the same.

A further form of the invention is disclosed in Figs. 8 and 9 in which the channel engaging portion of the securing means generally indicated by the numeral 70 is formed by lips 71 stuck out from an upward extension 62 of a body flange 63. In other respects the securing means is in conformity with the structure of Fig. 1. It will be noted that the extension 62 is co-planar with the body flange 63 and thus provides an internal surface which bears against the lower portion of the screen to secure the screen between it and the outer face of the return bent portion 13 of the holding strip 15. The lips 71, while slidable in the channel 16, also act in the manner of the flange 27 to assist in the screen securement.

From the foregoing it will be seen that the present invention provides a novel, simple and improved construction and arrangement of parts whereby readily adjustable securing means is mounted with respect to a screen engaging strip and whereby such securing means acts in conjunction with the strips as a means for assisting in securing the screen within the channel. It will, of course, be understood that the invention is not limited to the specific structure here shown and that numerous changes, modifications and the full use of equivalents may be resorted to in the practice of the invention without departing from the spirit or scope of the same, as outlined in the appended claims.

Having thus described my invention, what I claim and desire to obtain by Letters Patent is:

1. A frameless window screen construction comprising a sheet of screen material adapted to be secured at one end to one end of a window frame, a holding strip for the other end of said sheet of screen material for securing it to the opposite end of the window frame, said holding strip comprising a flat plate folded upon itself longitudinally to form spaced inner and outer parallel vertically disposed portions integrally connected longitudinally along their edges which are remote from the adjacent end of the window frame, the other edge of said inner portion extending short of the other edge of said outer portion, said holding strip at the latter edge of said outer portion being bent substantially right-angularly to form an inturned horizontal shoulder extending inwardly a substantial distance and disposed at a spaced distance below the adjacent edge of said inner portion, said sheet of screen material having said other end thereof folded around the free edge of said inner portion and disposed in the space between said portions, a securing member having a vertically disposed tongue disposed between said portions and interposed between said other end of the screen material and said outer portion, said securing member at the end of the tongue remote from the juncture of said portions being bent right-angularly to form a horizontal shoulder in abutting engagement with the horizontal shoulder of the holding strip, the tongue having a height such that the end thereof remote from the shoulders extends substantially beyond the edge of said inner portion about which the sheet of screen material is folded, whereby said tongue is retained in said strip, and means for connecting said securing member to the adjacent end of the window frame.

2. A frameless window screen construction comprising a sheet of screen material adapted to be secured at one end to one end of a window frame, a holding strip for the other end of said sheet of screen material for securing it to the opposite end of the window frame, said holding strip comprising a flat plate folded upon itself longitudinally to form spaced inner and outer parallel vertically disposed portions integrally connected longitudinally along their edges which are remote from the adjacent end of the window frame, the other edge of said inner portion extending short of the other edge of said outer portion, said holding strip at the latter edge of said outer portion being bent substantially right-angularly to form an inturned horizontal shoulder extending inwardly a substantial distance and disposed at a spaced distance below the adjacent edge of said inner portion, said sheet of screen material having said other end thereof folded around the free edge of said inner portion and disposed in the space between said portions, a securing member having a vertically disposed tongue disposed between said portions and interposed between said other end of the screen material and said outer portion, said securing member at the end of the tongue remote from the juncture of said portions being bent right-angularly to form a horizontal shoulder in abutting engagement with the horizontal shoulder of the holding strip, the tongue having a height such that the end thereof remote from the shoulders extends substantially beyond the edge of

said inner portion about which the sheet of screen material is folded, whereby said tongue is retained in said strip, said holding strip at the inner edge of its shoulder being bent to form a vertical portion, said securing member at the inner edge of its horizontal shoulder being bent to form a vertical portion extending toward the adjacent end of the window frame at a spaced distance from the registering portion of the holding strip, a sealing member having a portion interposed vertically between said latter mentioned portions of the securing member and the holding strip in yieldable frictionable contact therewith for vertical movement relative thereto, and means for connecting said securing member to the adjacent end of the window frame.

3. A frameless window screen construction comprising a sheet of screen material adapted to be secured at one end to one end of a window frame, a holding strip for the other end of said sheet of screen material for securing it to the opposite end of the window frame, said holding strip comprising a flat plate folded upon itself longitudinally to form spaced inner and outer parallel vertically disposed portions integrally connected longitudinally along their edges which are remote from the adjacent end of the window frame, the other edge of said inner portion extending short of the other edge of said outer portion, said holding strip at the latter edge of said outer portion being bent substantially right angularly to form an inturned horizontal shoulder extending inwardly a substantial distance and disposed at a spaced distance below the adjacent edge of said inner portion, said sheet of screen material having said other end thereof folded around the free edge of said inner portion and disposed in the space between said portions, a securing member having a vertically disposed tongue disposed between said portions and interposed between said other end of the screen material and said outer portion, said securing member at the end of the tongue remote from the juncture of said portions being bent right-angularly to form a horizontal shoulder in abutting engagement with the horizontal shoulder of the holding strip, the tongue having a height such that the end thereof remote from the shoulders extends substantially beyond the edge of said inner portion about which the sheet of screen material is folded, whereby said tongue is retained in said strip, and means for connecting said securing member to the adjacent end of the window frame, including a generally horizontally disposed inwardly extending member having a slot extending inwardly at right angles from the plane of the sheet of screen material and adapted to receive the shank of a fixed screw with the head of the screw bearing against the margins of the member defining the slot so as to progressively increase the tension on the screen as the screw approaches the end of the slot.

4. A frameless window screen construction comprising a sheet of screen material adapted to be secured at one end to one end of a window frame, a holding strip for the other end of said sheet of screen material for securing it to the opposite end of the window frame, said holding strip comprising a flat plate folded upon itself longitudinally to form spaced inner and outer parallel vertically disposed portions integrally connected longitudinally along their edges which are remote from the adjacent end of the window frame, the other edge of said inner portion extending short of the other edge of said outer portion, said holding strip at the latter edge of said outer portion being bent substantially right-angularly to form an inturned horizontal shoulder extending inwardly a substantial distance and disposed at a spaced distance below the adjacent edge of said inner portion, said sheet of screen material having said other end thereof folded around the free edge of said inner portion and disposed in the space between said portions, a securing member having a vertically disposed tongue disposed between said portions and interposed between said other end of the screen material and said outer portion, said securing member at the end of the tongue remote from the juncture of said portions being bent right-angularly to form a horizontal shoulder in abutting engagement with the horizontal shoulder of the holding strip, the tongue having a height such that the end thereof remote from the shoulders extends substantially beyond the edge of said inner portion about which the sheet of screen material is folded, whereby said tongue is retained in said strip, said holding strip at the inner edge of its shoulder being bent to form a vertical portion, said securing member at the inner edge of its horizontal shoulder being bent to form a vertical portion extending toward the adjacent end of the window frame at a spaced distance from the registering portion of the holding strip, a sealing member having a portion interposed vertically between said latter mentioned portions of the securing member and the holding strip in yieldable frictionable contact therewith for vertical movement relative thereto.

5. A frameless window screen construction comprising a sheet of screen material adapted to be secured at one end to one end of a window frame, a holding strip for the other end of said sheet of screen material for securing it to the opposite end of the window frame, said holding strip comprising a flat plate folded upon itself longitudinally to form spaced inner and outer parallel vertically disposed portions integrally connected longitudinally along their edges which are remote from the adjacent end of the window frame, the other edge of said inner portion extending short of the other edge of said outer portion, said holding strip at the latter edge of said outer portion being bent substantially right-angularly to form an inturned horizontal shoulder extending inwardly a substantial distance and disposed at a spaced distance below the adjacent edge of said inner portion, said sheet of screen material having said other end thereof folded around the free edge of said inner portion and disposed in the space between said portions, a securing member having a vertically disposed tongue disposed between said portions and interposed between said other end of the screen material and said outer portion, said securing member at the end of the tongue remote from the juncture of said portions being bent right-angularly to form a horizontal shoulder in abutting engagement with the horizontal shoulder of the holding strip, the tongue having a height such that the end thereof remote from the shoulders extends substantially beyond the edge of said inner portion about which the sheet of screen material is folded, whereby said tongue is retained in said strip, said holding strip at the inner edge of its shoulder being bent to form a vertical portion, said securing member at the inner edge of its horizontal shoulder being bent to form a vertical portion extending toward the adjacent end of the window frame at a spaced

distance from the registering portion of the holding strip, a sealing member having a portion interposed vertically between said latter mentioned portions of the securing member and the holding strip in yieldable frictionable contact therewith for vertical movement relative thereto, and means for connecting said securing member to the adjacent end of the window frame, including a generally horizontally disposed inwardly extending member having a slot extending inwardly at right angles from the plane of the sheet of screen material and adapted to receive the shank of a fixed screw with the head of the screw bearing against the margins of the member defining the slot so as to progressively increase the tension on the screen as the screw approaches the end of the slot.

6. A frameless window screen construction comprising a sheet of screen material adapted to be secured at one end to one end of a window frame, a holding strip for the other end of said sheet of screen material, said holding strip comprising a flat plate folded upon itself longitudinally to form spaced inner and outer parallel vertically disposed portions integrally connected longitudinally along their edges which are remote from the adjacent end of the window frame, the other edge of said inner portion extending short of the other edge of said outer portion, said sheet of screen material having said other end thereof folded around the free edge of said inner portion and disposed in the space between said portions, a securing member carried by the strip by having a vertically disposed tongue disposed between said portions and interposed between said other end of the screen material and said outer portion, said securing member at the end of the tongue remote from the juncture of said portions being bent right-angularly to form a horizontal shoulder, said tongue having a height such that the end thereof remote from said shoulder extends substantially beyond the free edge of said inner portion about which the sheet of screen material is folded, said outer portion being bent to provide an abutment disposed closely adjacent to and generally opposite the free edge of said inner portion and in abutting engagement with said shoulder for preventing

dislodgment of said other edge of the sheet of screen material and said tongue from within the inner and outer portions of the holding strip, and means for connecting said securing member to the adjacent end of the window frame.

7. A frameless window screen construction comprising a sheet of screen material adapted to be secured at one end to one end of a window frame, a holding strip for the other end of said sheet of screen material, said holding strip comprising a flat plate folded upon itself longtudinally to form spaced inner and outer parallel vertically disposed portions integrally connected longitudinally along their edges which are remote from the adjacent end of the window frame, the other edge of said inner portion extending short of the other edge of said outer portion, said sheet of screen material having said other end thereof folded around the free edge of said inner portion and disposed in the space between said portions, and a bent sheet metal latching bracket cooperable with a fixed latching member on the window frame for securing the strip to the adjacent end of the frame and being carried by the strip by having a vertically disposed tongue portion frictionally interposed between said other end of the screen material and said outer strip portion, said sheet metal latching bracket at the end of the tongue portion remote from the juncture of said strip portions being bent right-angularly to form a horizontal shoulder, said outer strip portion being bent to provide an abutment disposed closely adjacent to and generally opposite the free edge of said inner strip portion in abutting engagement with said shoulder for preventing dislodgment of said tongue portion and said other screen end from within the inner and outer strip portions.

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