

Aug. 9, 1938.

H. H. EVERHARD
SCREEN CONSTRUCTION
Filed March 6, 1936

2,126,544

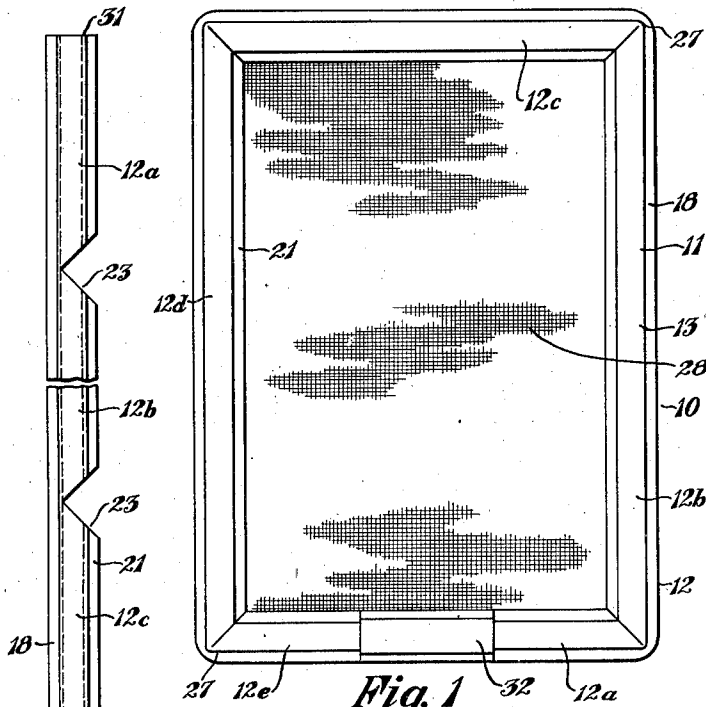


Fig. 1

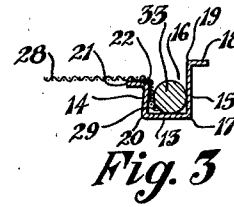


Fig. 3



Fig. 4

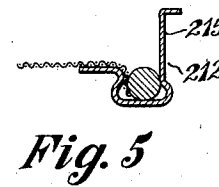


Fig. 5

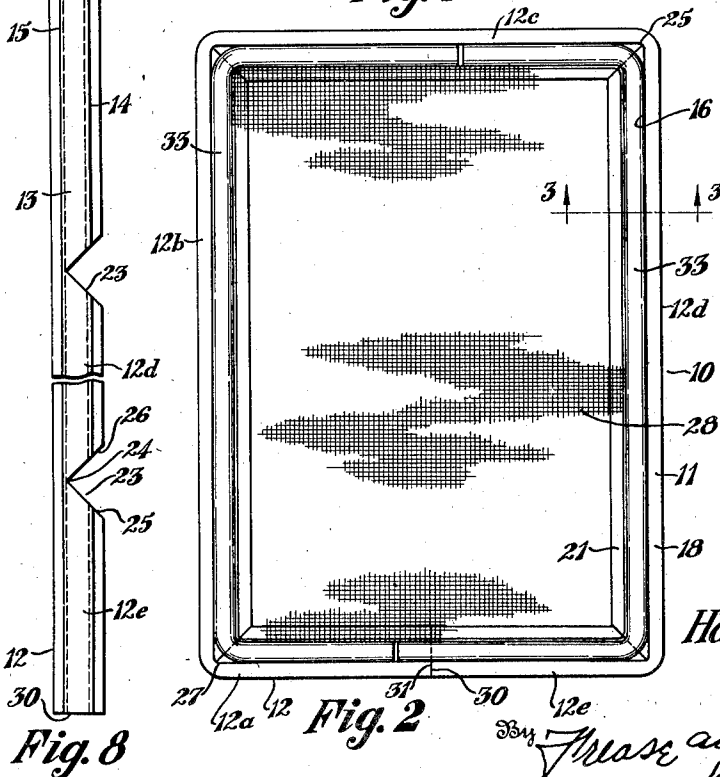


Fig. 2

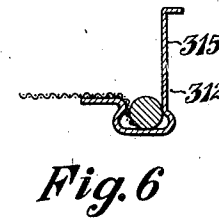


Fig. 6

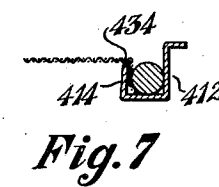


Fig. 7

Inventor
Harry H. Everhard

By *Wase and Bishop* Attorneys

UNITED STATES PATENT OFFICE

2,126,544

SCREEN CONSTRUCTION

Harry H. Everhard, Canton, Ohio

Application March 6, 1936, Serial No. 67,455

3 Claims. (Cl. 156—14)

The invention relates to screen construction more particularly adapted for use in providing screen closures for windows and particularly for windows having metal frames, and which includes for each screen, metal frame members each having a longitudinal U-shaped groove or channel, a screen fabric stretched across the frame, and one or more wire or rod members located in the channels and wedge engaging the edge portions of the fabric.

Screens of such general type are shown in my prior U. S. Patent No. 1,614,191, and also in my prior U. S. Patent No. 1,695,091.

Particularly in the case of screens for windows having metal frames, it is desirable that the frame members of each screen be provided with flat abutment flanges for fitting tightly against the metal window frame, rather than utilizing screen frames having metal strip edges abutting against the window frame.

Outturned abutment flanges on the screen frame members provides the desired tight closure, and at the same time enables the securing of the screen to the window frame by heads of screws or nails engaging with the outturned flanges of the screen frame, the shanks of the screws or nails being screwed or driven into the window frame.

Some screen frames including the improvements of my said U. S. Patent No. 1,614,191 have been made each of four separate members having outturned longitudinally extending flanges, the members being connected with each other at the frame corners by formed corner pieces welded to the ends of the frame members. This construction requires the utilization for each usual rectangular frame of four separate corner pieces and assembling and welding the four separate corner pieces to the four separate frame members.

Moreover the use of the corner pieces preclude the sliding of the screen frame in grooves having a narrow width, as is desirable in many instances.

On the other hand, while the frames of the screens of my U. S. Patent No. 1,695,091 are made by mitering and bending a single strip of material, yet the particular box flange construction of my U. S. Patent No. 1,695,091 requires a relatively great amount of material and does not provide an outturned flange either for strengthening purposes or for purposes of providing a means of securing the screen frame tightly against a window frame by the means of heads of screws or nails, and such frames are not adapted to slide in relatively narrow grooves.

The objects of the present invention include in

general the provision of an improved screen construction, utilizing in an improved manner, desirable characteristics of the screens of my prior U. S. Patent Nos. 1,614,191 and 1,695,091.

More particular objects of the present invention include the provision of screen construction including a screen frame having outturned abutment flanges, the screen frame being formed and associated with the screen fabric and one or more clamping rods so as to enable the construction of the frame with a minimum amount of metal, preferably strip steel, and at the same time to provide a strong and relatively rigid screen structure.

Further particular objects of the present invention include the provision of an improved screen construction in which the screen frame is made of one piece of metal, preferably formed strip steel, and has single ply side flanges on its frame members for sliding in narrow window frame grooves.

The foregoing and other objects are attained by the screen and frame construction, apparatus, parts, improvements, combinations, and sub-combinations, which comprise the present invention, and the nature of which is set forth in the following general statement, and preferred embodiments of which together with their mode of use are set forth in the following description and which are particularly and distinctly pointed out and set forth in the appended claims forming part hereof.

The nature of the improved screen and frame construction of the present invention may be described in general terms as including a one piece frame having preferably four side sections included in a single strip of metal preferably strip steel formed as a flanged U-channel having a channel base and channel side walls forming a groove, one of the channel side walls preferably having a greater depth than the other, and the channel strip having portions of one of the channel side walls and base cut away at each corner of the frame preferably in the form of a 90° miter cut-out, and the one piece channel strip being bent on the other channel side wall at each corner and the bent channel side wall having a one piece abutment flange extending laterally outwardly therefrom with respect to the frame opening, the abutment flange extending around the corners and being cold drawn or worked by the bending of the channel at the frame corners. The channel side wall preferably also has flanges extending laterally inwardly with respect to the frame opening.

The frame furthermore includes preferably for each corner a bent rod, wedge inserted in the channel groove, and preferably the rods are bent in a U-shaped form to extend around at least two of the frame corners in the channel groove.

When the frame is used as part of a screen, a piece of screen fabric is laid over the frame opening and clamped in the channel groove by means of the wedging rods.

By way of example, several embodiments of the present improvements are illustrated in the accompanying drawing forming part hereof, in which

Figure 1 is a plan view of one side of a screen including a frame and other parts embodying the present improvements;

Fig. 2, a plan view of the opposite side thereof;

Fig. 3, a fragmentary transverse sectional view thereof as on line 3—3, Fig. 2 with distant parts removed, and showing the cross-section of one form of improved frame member utilized in making the frame of Figs. 1 and 2;

Figs. 4, 5, 6, and 7, are views similar to Fig. 3, each showing the cross-section of another form of frame member adapted for being utilized to make frames embodying the present improvements;

Fig. 8, a fragmentary view showing a preferred one piece strip of metal, preferably strip steel, formed with a U-groove or trough, and with both inturned and outturned flanges, and mitered ready for making the preferred one piece frame of the complete screen shown in Figs. 1 and 2.

Similar numerals refer to similar parts throughout the drawing.

The improved screen indicated generally by 10 in Figs. 1, 2, and 3, includes a frame 11 preferably made of one piece of formed strip metal 12, preferably strip steel, and including successively, commencing at one end thereof, longitudinal portions or sections 12a, 12b, 12c, 12d, and 12e.

The strip 12 is formed of a single strip of steel so as to provide a groove or channel base 13, opposite groove or channel forming side walls 14 and 15 extending in the same direction from opposite edges of the groove or channel base 13. The depth of the channel side wall 15 as shown in Fig. 3 is greater than the depth of the channel side wall 14, the channel side walls 14 and 15 and the channel base 13 forming a longitudinally extending U-channel or groove indicated by 16.

The channel side wall 15 thus at one of its longitudinal edges is joined with one of the edges of the channel base 13 at the channel corner 17, and at its other longitudinal edge the channel side wall 15 is joined with one edge of a longitudinally extending abutment flange 18 at the channel corner 19.

The channel side wall 14 is likewise at one of its longitudinal edges joined with one of the edges of the channel base 13 at the channel corner 20, and at its other longitudinal edge the channel side wall 14 is joined with one edge of a longitudinally extending flange 21 at the channel corner 22.

The abutment flange 18 extends laterally and as shown substantially at right angles to the channel side wall 15 in a direction opposite to the lateral extension of the channel base 13 with respect to the channel side wall 15, and the channel flange 21 extends laterally with respect to the channel side wall 14 in a direction opposite to the lateral extension of the abutment flange 18 with respect to the channel side wall 15.

Before being formed to make the improved frame 11, both the flanges 18 and 21 are out-turned flanges with respect to the channel side walls 14 and 15, respectively, but after being bent to form the frame 11, the abutment flange 18 becomes an outturned flange and the flange 14 becomes an inturned flange with respect to the frame opening.

For the purposes of the present improvements, the one piece strip 12 has portions removed, preferably so as to form four 90° miter cut-outs each indicated by 23, and the apex 24 of each miter cut-out terminating substantially at the inner face of the channel side wall 15, portions of the flange 21, the channel side wall 14 and the channel base 13 being cut away for each miter cut-out.

The one piece flanged channel strip 12 is then bent about the apex of each miter cut-out, preferably so that the opposite edges 25 and 26 of each miter cut-out abut against each other, thus forming the four corners 27 of the frame 11, in each of which the material of the continuous one piece outturned flange 18 extends around the corner and is stretched in making the corner bend, thereby cold working or drawing the steel in the flange 18 at each corner 27, and strengthening each corner by extending laterally integrally from the bent outer channel side wall around each corner as shown.

For making a screen in conjunction with the improved frame 11, a piece of screen fabric, preferably wire fabric 28 is cut to a shape so as to extend across the frame opening and lay upon the frame flanges 21, there being sufficient material at edge portions 29 of the piece of screen fabric 28 to be bent down over the channel section corners 22 and against the inner face of the channel section side walls 14.

After bending the frame corners as aforesaid, the ends 30 and 31 of the one piece frame strip 12 preferably abut against each other as shown in Fig. 2, and as shown the sections 12a and 12e of the one piece frame are connected with each other, by being spot welded or soldered to a short channel 32 which fits over the outer sides of the channel sections 12a and 12e, so that the abutment flange 18 will have a continuous flat face extending entirely around the screen frame at the inner or groove side of the frame.

The screen structure is completed by pressing one or more clamping rods 33 into the grooves 16 of the frame channel, each rod 33 being preferably bent to extend around one and preferably two of the corners of the frame 11, and each rod 33 clamping and wedging the edge portions 29 of the screen fabric against the inner face of the channel side walls 14 and stretching the piece of screen fabric 28 tightly across the frame opening, and at the same time the preferred bent rods strengthen the frame corners and serve as connectors for the sections of the channel strip 12 at each corner.

The improved screen 10 as thus constructed attains the objects of the improvements, requires a minimum of material, and provides a strong and rigid frame particularly at the corners, and also provides the desired outturned flat abutment flange for the frame.

In Figs. 4, 5, 6, and 7 are shown respectively other forms of channel strips 112, 212, 312, and 412 which are generally similar to the channel strip 12, and which may be used for making the improved frames of the present improvements.

In the channel strips 112, 212, and 312, the

channel side walls 115, 215, and 315 about which the frame corner bends are made, are of increasing height, for example to accommodate varying heights of fittings on steel sashes.

5 In the channel strip 412 the channel side wall 414 is not provided with a flange and terminates at the edge 434.

I claim:

10 1. A one-piece metal strip frame for a screen fabric, the frame including a channel base and channel side walls, said frame having side sections angular with respect to each other forming corners and a frame opening, portions of the channel base and the inner channel side wall with respect to the frame opening being cut away at each of the corners, the outer channel side wall with respect to the frame opening being bent at each of the corners, and a continuous flat abutment flange extending laterally outwardly from the outer channel side wall and extending integrally with the bent outer channel side wall around the corners.

20 2. A one-piece metal strip frame for a screen fabric, the frame including a channel base and

channel side walls, said frame having side sections angular with respect to each other forming corners and a frame opening, portions of the channel base and the inner channel side wall with respect to the frame opening being cut away at each of the corners, the outer channel side wall with respect to the frame opening being bent at each of the corners, and a continuous flange integral with and extending angularly outward from the outer channel side wall and around the corners.

3. In a metal strip frame for a screen fabric, the frame including a channel base and channel side walls, said frame being provided with a right angle corner having side sections extending therefrom, portions of the channel base and the channel side wall within the angle being cut away at the corner, the other channel side wall having a right angle bend at the corner, and a continuous flange integral with and extending angularly outward from the outer channel side wall and around the corner.

HARRY H. EVERHARD.