Nov. 17, 1925.

1,561,470

O. R. KIHM

WINDOW SCREEN

Filed Sept. 23, 1921

Fig. 1.

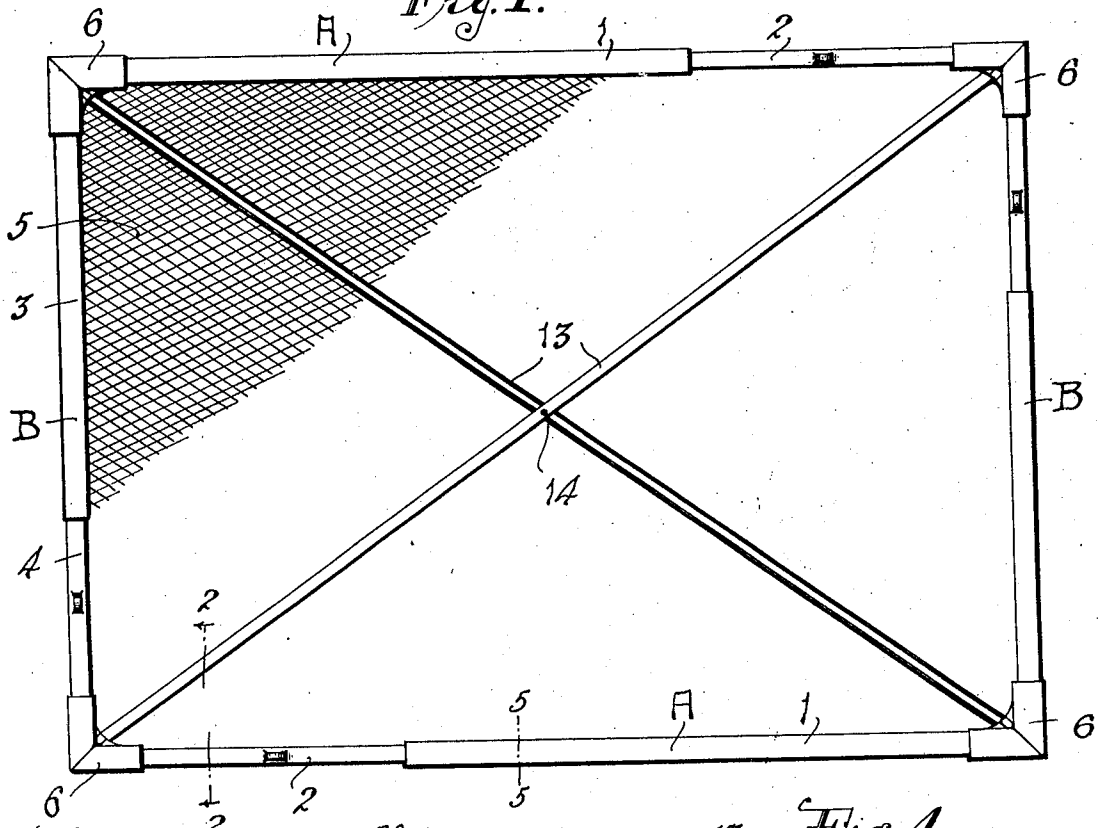
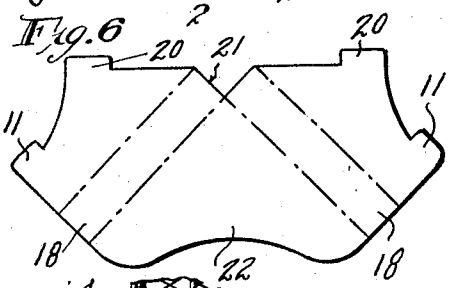


Fig. 6



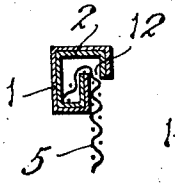
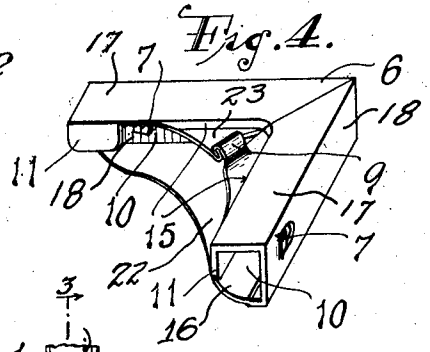


Fig. 5

Fig. 4.



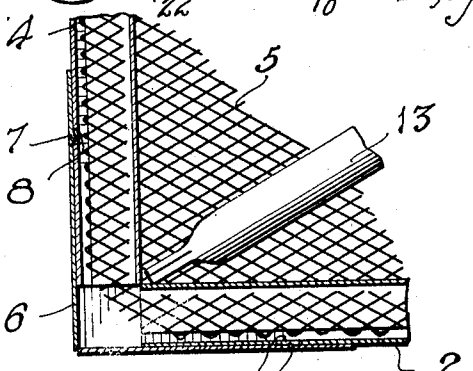


Fig. 3.

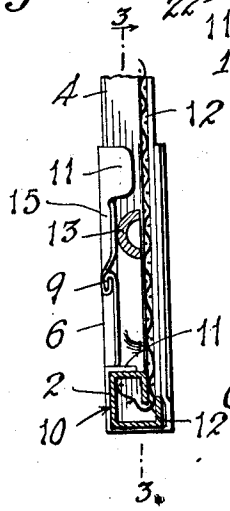


Fig. 2.

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Patented Nov. 17, 1925. 1,561,470

UNITED STATES PATENT OFFICE.

OTTO R. KIHM, OF IRVINGTON, NEW JERSEY, ASSIGNOR TO THE FOSTER SCREEN CO. INC., A CORPORATION OF NEW JERSEY.

WINDOW SCREEN.

Application filed September 23, 1921. Serial No. 502,649.

To all whom it may concern:

Be it known that I, OTTO R. KIHM, a citizen of the United States, and a resident of Irvington, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Window Screens, of which the following is a specification.

This invention relates in general to window screens, and more particularly to frames therefor, one object of the invention being to provide an improved metal corner piece for connecting the side and end pieces of the frame.

Further objects of the invention are to provide a frame including side and end pieces and corner pieces embodying novel and improved features of construction, whereby the side and end pieces can be easily and quickly fixedly connected together without the use of solder, welding, rivets, bolts, or like fastening means; to provide an improved corner piece of sheet metal having right angluarly disposed split tubular sockets to receive the side and end pieces of the frame, the split sides of said sockets opening inwardly and the walls of the sockets being resilient to spring and permit said side and end pieces to be slipped laterally into and out of said sockets to assemble and disassemble the frame, one edge of each of said sockets being formed with a locking tongue to substantially close the respective split side and hold the respective side or end piece against lateral movement from the socket, and said sockets and the side and end pieces being formed with cooperating projections and recesses to hold the side and end pieces against longitudinal movement out of said sockets; to provide such a corner piece in which the corresponding edges of said sockets are connected by integral webs to reenforce the corner piece against distortion and to provide a housing for the end of a brace rod for the frame, and to obtain other results and advantages as may be brought out by the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts throughout the several views,

Figure 1 is a front elevation of a window screen having a frame embodying my invention;

Figure 2 is an enlarged transverse sectional view taken on the line 2—2 of Fig. 1;

Figure 3 is a vertical sectional view through one corner of the frame taken on the line 3—3 of Fig. 2;

Figure 4 is a detached perspective view of the corner piece;

Figure 5 is a transverse sectional view through one side of the frame taken on the line 5—5 of Fig. 1, and

Figure 6 is a plan view of the sheet metal blank of which the corner piece is formed.

In the drawings I have shown my invention embodied in a window screen the frame of which comprises adjustable sides and ends A and B formed of telescoping sections 1, 2, 3 and 4 which have slidably connected therebetween a single piece of loosely woven wire 5 arranged within the frame with the wire strands running diagonally thereof, the ends of adjacent side and end pieces being connected by corner pieces 6.

All of the corner pieces 6 are identical in construction and each is preferably formed of a single piece of sheet metal, preferably by a stamping and embossing process. The sheet of metal of which the corner piece is formed is illustrated in Figure 6, and is so shaped and bent as to provide two right angularly disposed split tubular sockets 10 which are formed of the corresponding front and rear walls 16 and 17 and side walls 18. The split sides of the sockets open inwardly toward each other, as clearly shown in Figure 4, and the edge of the rear walls 17 of each of the sockets is provided with a narrow flange 15 and a tongue 11 which is preferably disposed at the extremity of the wall. The tongue 11 is adapted to substantially close the split side of the corresponding socket, as shown in Figures 2 and 4. The side walls of the sockets are provided with projections 7 which are preferably stamped inwardly from the metal of the wall and are adapted to cooperate with corresponding openings 8 in the sides and end pieces A and B of the frame. The sockets 10 are preferably of a cross-section substantially corresponding to the cross-section of the sides and end pieces A and B.

The corner pieces 6 are preferably initially formed with the tongues 11 bent upwardy substantially parallel with their corresponding walls 17, and in assembling a frame the ends of the side and end pieces are slipped into the split sides of the corre-

sponding sockets 10 which are resilient and adapted to spring so as to permit this lateral insertion of the side and end pieces. The side or end pieces are then adjusted longitudinally until the lugs 7 enter the openings 8, after which the tongues 11 are bent downwardly over the corresponding side or end piece, as shown in Figure 2. If desired, three of the corner pieces may be utilized in the form shown in Figure 4, the side and end pieces being telescopically inserted into the ends of the sockets, the lugs 7 springing outwardly to permit the sliding of the side or end pieces inwardly of the socket and snapping into the opening 8 to hold the side or end piece against longitudinal movement of the same out of the socket. The fourth corner piece has its tongues 11 bent upwardly as above described, and is applied to the corresponding side and end piece with a lateral movement, the walls of the socket springing to permit the application of the corner piece to the frame pieces.

With this construction, it will be obvious that the frame can be easily and quickly assembled, and that lateral movement or twisting of the side and end pieces in the sockets 10 is prevented by the tongues 11, while longitudinal movement of the side and end pieces is prevented by the lugs 7 and openings 8. A strong and durable frame is thus produced. To disassemble the frame it is merely necessary to bend the tongues 11 upwardly and slightly twist the side and end pieces to disengage the openings 8 from the lugs 7 and spring the walls 16 and 17 whereby either lateral or longitudinal movement of the side or end piece out of the end piece is possible.

As above stated, the corner piece is preferably formed of one sheet of metal as shown in Figure 6, the said sheet being bent along the dot and dash lines and carrying lugs 20 which are caused to interlock as at 9 for positively connecting the edges of the sheet. The connection 9 may be in the form of the usual can seam. Obviously, the notch 21 permits the bending of the sheet, the edges of the notch meeting at the angle of the corner piece.

Such a construction admits of the provision of strengthening or reenforcing webs 22 and 23 between the edges of the walls 16 and 17 of the sockets 10, and in addition to reenforcing the corner piece, these webs serve as housings to receive the ends of brace rods 13 which are necessary with adjustable screens, such as described, to prevent warping of the frame during the adjustment thereof. The rods are pivotally connected intermediate their ends as at 14. Obviously, lateral movement of the rods 13 is prevented by the webs 22 and 23.

In the operation of the screen, pressure upon the ends of the frame will cause the sides to collapse or shorten and the ends to extend or lengthen, thereby reducing the length of the screen for any desired purpose, such as adjusting it to window frames of any size and positioning the screen in or removing it from a window.

The sections 1, 2, 3 and 4 of the side and end pieces of the frame may be of any desired construction, but in the present instance I have shown them each as formed of a strip of sheet metal bent into a substantially rectangular tubular shape with the edges laterally spaced from each other to form an opening 12 through which the edge of the screen 5 may be inserted and returned inwardly as shown in Figure 5, whereby the screen is loosely and slidably connected to the sides and ends of the frame and the returned edges prevent the screen from being pulled from the frame by lateral pressure on the screen. The spaces between the free ends of the tongues 11 and the adjacent sides of the sockets 10 form passages for the edges of the screen corresponding to the passages 12 in the sides and ends of the frame.

While I have shown my invention embodied in a screen having an adjustable frame, it will be understood that it is as well adapted for use with rigid frames. Furthermore, the invention may be used with other types of sides and end pieces than that shown on the drawing, and the details of construction of the screen can be modified or changed by those skilled in the art without departing from the spirit or scope of the invention.

Having thus described the invention, what I claim is:

1. A corner piece for frames formed of sheet metal and having two angularly disposed split tubular sockets to receive side and end frame pieces, the split sides of said sockets opening inwardly and one edge of each of said sockets being formed with a tongue to partially close said split side to hold a frame piece against lateral movement from the socket and capable of being bent to permit insertion and removal of a frame piece laterally into or from said socket, one wall of each of said sockets having a lug projecting inwardly therefrom to cooperate with an opening in a frame piece and hold said piece against longitudinal movement out of said socket.

2. A corner piece for frames formed of a single sheet of metal and having two angularly disposed split tubular sockets having resilient walls to permit lateral insertion of side and end frame pieces, the split sides of said sockets opening inwardly and one edge of each of said sockets being formed with an integral tongue to partially close said split side to hold a frame piece against later movement from the socket, corresponding

edges of said sockets being connected by integral webs to reenforce said sockets against relative distortion.

3. A corner piece for frames formed of a single sheet of metal and having two angularly disposed split tubular sockets to receive side and end frame pieces, the split sides of said sockets opening inwardly and one edge of each of said sockets being formed with an integral tongue to partially close said split side to hold a frame piece against lateral movement from the socket and capable of being bent to permit insertion and removal of a frame piece laterally into or from said socket, corresponding edges of said sockets being connected by integral webs to reenforce said sockets against relative distortion, and one wall of each of said sockets having an integral lug stamped inwardly therefrom to cooperate with an opening in a frame piece and hold said piece against longitudinal movement out of said socket.

4. A frame for window screens or the like, comprising side and end pieces, and a plurality of corner pieces each formed of sheet metal and having two angularly disposed split tubular sockets each to receive one of said side or end pieces, the split sides of said sockets opening inwardly and one edge of each of said sockets having a tongue to partially close said split side to positively hold the corresponding side or end piece against lateral movement out of the socket and capable of being bent to permit insertion and removal of a frame piece laterally into or from said socket, said end pieces and said corner pieces being provided with cooperating projections and recesses to hold the side and end pieces against longitudinal movement out of said sockets.

5. A frame for window screens or the like, comprising side and end pieces, and a plurality of corner pieces each formed of sheet metal and having two angularly disposed split tubular sockets each to receive one of said side or said end pieces, the split sides of said sockets opening inwardly and one edge of each of said sockets having a tongue to partially close said split side to positively hold the corresponding side or end piece against lateral movement out of said socket and capable of being bent to permit insertion and removal of a frame piece laterally into or from said socket, said corner pieces having integral lugs stamped therefrom and projecting into said sockets and said side and end pieces having recesses to receive said lugs whereby said side and end pieces are positively held against longitudinal movement out of said sockets.

6. A corner piece for frames formed of sheet metal and having two angularly disposed split tubular sockets, the split sides of which open inwardly and the walls of which are resilient to permit lateral insertion of side or end pieces of a frame into said sockets from said split sides, one edge of each of said sockets having a tongue to partially close said split side to hold the side or end pieces against lateral movement out of said socket each of said sockets having an inward projection to cooperate with an opening in a side or end piece to hold the same against longitudinal movement out of the socket.

7. A frame for window screens or the like, comprising side and end pieces, and a plurality of corner pieces each formed of sheet metal and having two angularly disposed split tubular sockets each to receive one of said side or said end pieces, the split sides of said sockets opening inwardly and one edge of each of said sockets having a tongue to partially close said split side to positively hold the corresponding side or end piece against lateral movement out of the socket and capable of being bent to permit insertion and removal of a frame piece laterally into or from said socket said end pieces and said corner pieces being provided with cooperating projections and recesses to hold the side and end pieces against longitudinal movement out of said sockets, corresponding edges of said sockets being connected by integral webs to reenforce said sockets against relative distortion, and crossed brace rods pivotally connected at their centers and having their ends loosely arranged between said webs to reenforce the frame against warping or like distortion.

OTTO R. KIHM.