W. A. BISHOP.

SCREEN.

APPLICATION FILED OCT. 31, 1914.

1,152,390.

Patented Sept. 7, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

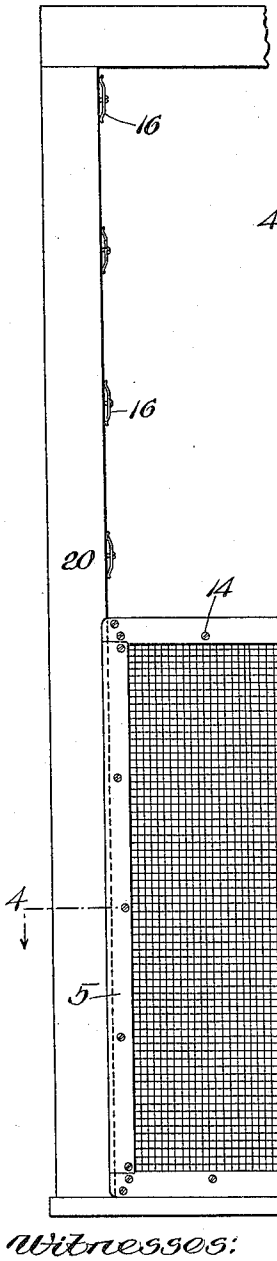


Fig. 2.

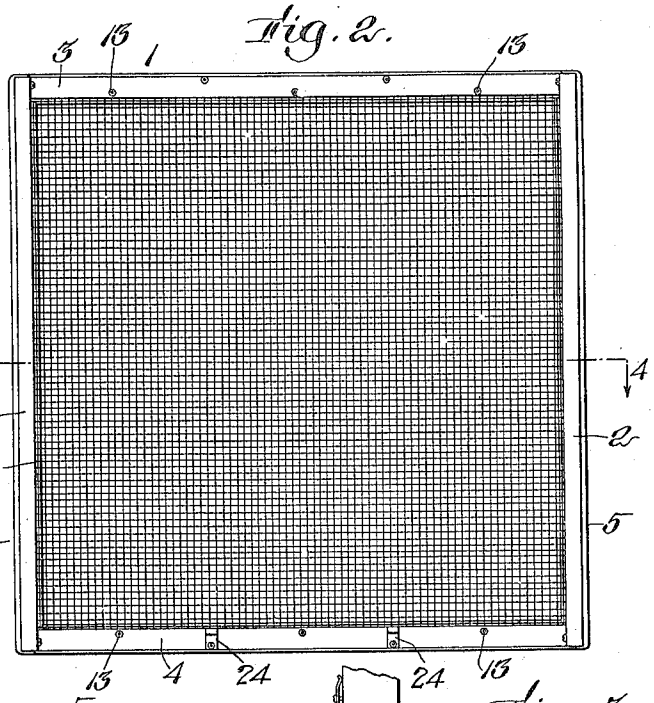
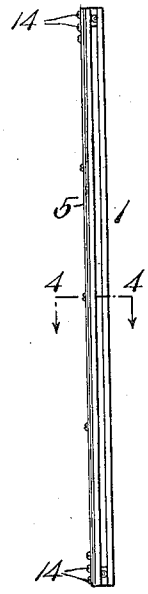


Fig. 3.



Witnesses:
H. C. Bowser.
A. H. McGlinchey.

Inventor:
Warren A. Bishop
by his attorney
Charles F. Richardson

W. A. BISHOP.

SCREEN.

APPLICATION FILED OCT. 31, 1914.

1,152,390.

Patented Sept. 7, 1915.

2 SHEETS—SHEET 2.

Fig. 4.

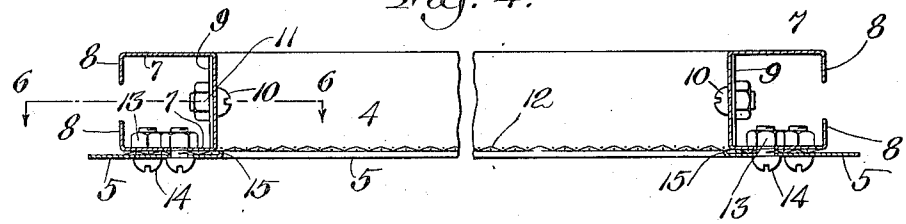


Fig. 5.

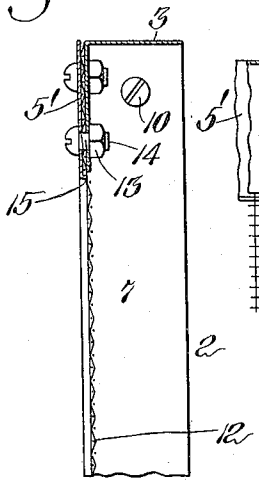


Fig. 6.

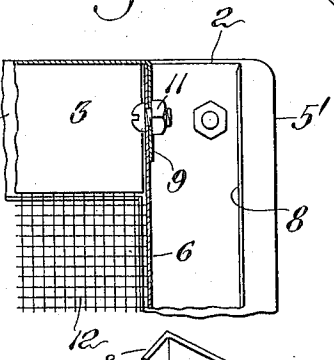


Fig. 7.

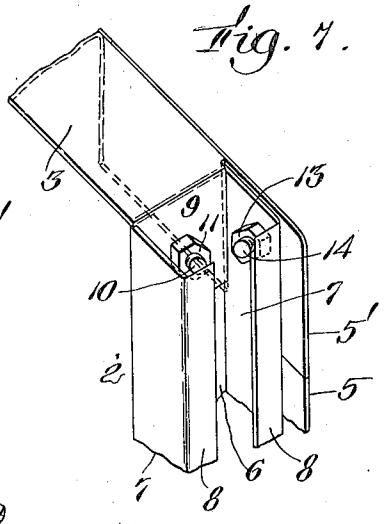


Fig. 7a

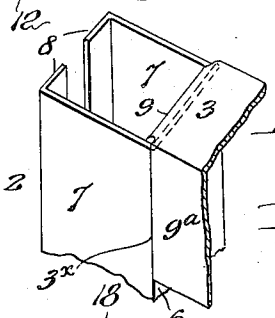
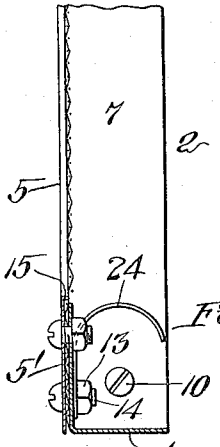


Fig. 8.



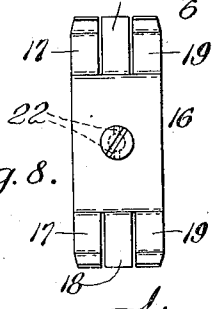


Fig. 9.

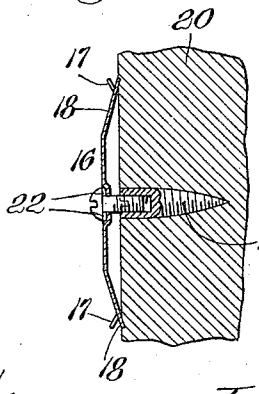


Fig. 10.

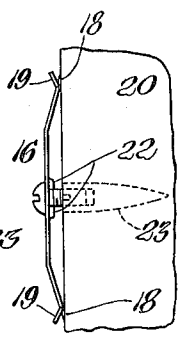
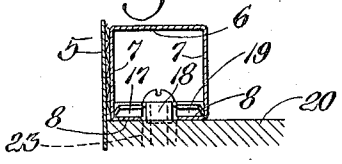


Fig. 11.



Witnesses:

H. C. Bowser.

A. H. McGlinchey.

Inventor:

Warren A. Bishop

by his attorney

Charles D. Richardson

UNITED STATES PATENT OFFICE.

WARREN A. BISHOP, OF LOWELL, MASSACHUSETTS.

SCREEN.

1,152,390. Specification of Letters Patent. Patented Sept. 7, 1915.

Application filed October 31, 1914. Serial No. 869,625.

To all whom it may concern:

Be it known that I, WARREN A. BISHOP, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Screens, of which the following is a specification, reference being had therein to the accompanying drawings.

The principal objects of my invention are to provide, first, a metallic frame for a screen, for doors, windows and the like, light in weight, rigid and durable in structure; second, means whereby the mesh of a screen may with facility be secured to and removed from the frame, and stretched when secured to the frame; third, spring members adapted to be easily mounted, as upon a window frame, to engage suitable grooves in the frame, control and guide the frame of the screen in its various positions and movements, and to subject the screen frame, that is the top and bottom bars of it, to tension rather than compression, thereby tending to prevent a twisting of the frame, if of wood, out of shape; and other features that may appear hereinafter.

In the drawings illustrating the principle of my invention, and the best mode now known to me of embodying the same in operative structure, Figure 1 shows my improved screen and guides arranged in a window casing, in front elevation; Fig. 2 is a rear elevation of the screen; Fig. 3 shows a side elevation of the screen; while in the subsequent figures showing full sized details, Fig. 4 is a horizontal section of the screen on line 4—4, Figs. 1, 2 and 3; Fig. 5 is a vertical section on line 5—5 of Fig. 1; Fig. 6 is a vertical section of the corner portions of the frame, on line 6—6 of Fig. 4; Fig. 7 shows in perspective the construction at the corner portions of the screen; Fig. 7^a is a perspective view to show what does not distinctly appear in Fig. 7; Figs. 8, 9 and 10 are respectively a plan, a longitudinal section, and a side elevation of screen guides; and Fig. 11 shows a guide engaging guide flanges of side piece in section.

A metallic frame 1, Figs. 1, 2 and 3, for a screen comprises two parallel side guide pieces 2, parallel top and bottom pieces 3, 4, and screen-locking face-plates 5, 5′; all of which may be struck up out of thin suitable metal, by any well-known process.

Each side piece has a bottom 6, Figs. 6 and 11, two parallel sides 7, Figs. 4 and 7, of equal depth, with portions 8, bent inwardly at right angles, and forming lips lying in a plane parallel with that of the bottom, and having their adjacent edges parallel, with a space between to form a longitudinal slot throughout the length of the side piece, and opening into the channel formed within the side piece.

The top and bottom pieces 3, 4, Fig. 5, are with the exception of their end portions 9, Figs. 6 and 7, L-shaped in cross section; each end portion 9 being an extension of one arm of the L and adapted to be bent upon itself at right angles and toward the other arm of the L; and when assembled with the side pieces, capable of engaging and being secured to the outer end portion of the bottom of the channel in its respective side piece, as with small screws 10 and nuts 11. It will also be noticed that the square end of the other arm 9^a, Fig. 7^a, abuts the outside of the bottom 6 of the side piece 2 at 3^x; and that consequently the top and bottom pieces 3, 4 always form rigid right angles with side pieces 2 because the abutting members cannot be moved to form an acute angle, and hence they resist any force tending to cause the members forming the adjacent right angle to become an obtuse angle.

The structure so far described is absolutely incapable of transverse bending, and its four corners are rigid right angles.

To secure the mesh of the screen to the frame, a piece 12, see Figs. 4 and 5, is cut enough larger than the area of the inside of the frame to allow its edge portions to overlie the faces of the side, top and bottom pieces of the frame. When the mesh is in proper position, the top and bottom locking plates 5′, 5′ and the side locking plates 5, 5, are placed over the edges of the mesh which by means of nuts 13, and screws 14, passing through the lock plates, the mesh and the four sides of the frame, become rigidly secured to the frame in proper position. The interior edges of these lock plates have locking lips 15, Figs. 4 and 5, projecting inwardly against the mesh of the screen, but just beyond the edges of the screen opening of the frame, so that, as the lock plates move into locking position on the frame, these locking lips by slightly bending, at the points of contact, the wires of the mesh out of a straight line, tend to put them under

tension and cause the mesh within the opening of the frame to lie perfectly flat, and remain in one plane.

By arranging the top and bottom lock plates 5′ so that they become rigidly fixed not only to the top and bottom pieces 3, 4, of the frame, but also to the end portions of the trough-shaped side pieces 2 of the frame, the frame becomes absolutely rigid at its four corners; and by reason of the shapes of its cross sections, the sides and the top and the bottom pieces of the frame cannot be bent transversely. In short, a frame constructed as above described is permanent in shape; and the mesh of its screen may be easily mounted in, or removed from, the frame, and may be of a tension such as will cause it to lie flat.

Another feature of my invention resides in a spring guide 16, Figs. 1, 8, 9, 10 and 11, adapted to be used with any frame provided it has the longitudinal grooves whose principle of operation and construction has just been described. It comprises a spring plate having its two opposite end portions each provided with three downwardly and outwardly inclined fingers 17, 18, 19, that one in the middle 18 being designed to dig sufficiently into the wood, as of a window casing 20, to hold the guides in operative position; while the other two fingers 17 and 19 have slightly upturned ends with beveled outside corners. Through the middle of the plate is a hole as for a screw whereby when the plate is in operative position, a turning of the screw may tighten the tension of the spring plate more or less and correspondingly cause the middle fingers to settle into the material of the frame upon which it is mounted. To prevent the screw from turning, the under side of its head has two prongs 21 which may slidingly engage two indentations 22 in the top of the spring guide 16.

It will be noted that the width of the middle fingers 18 is less than the width of the longitudinal slot in the side strips 2 of the frame, while the outside width of these fingers is less than the width of the groove but greater than the width of the longitudinal slot; so that when one or more of these spring guides are arranged in alinement as upon the sides of a window casing 20, the inside surfaces of the lips 8 of the trough pass under the outside spring fingers 17, 19 of the plates, the sides of which are in close proximity to the parallel sides of the groove, and hold the screws through the plates and the middle locking fingers out of contact with the sides of the longitudinal slots in the side pieces of the frame. These spring members may be arranged in line, at suitable distances apart; metal threaded inserts 23 being permanently fixed in, say, window casing, for the spring-controlling screws. Such a screw-hole member is not essential to my invention, but I find it extremely useful in that the frequent removals of the controlling screws cannot destroy the wood that would otherwise be required to hold the screw. In other words, the screw always has positive screw threads to engage.

To use my invention, two guide members opposite each other may be located as upon the window casing, and then two more, distant from the former less than the length of the side pieces of the frame. To mount the frame upon the guides, the top pair may be slightly inclined toward the user in a convenient plane so that the open ends of the top of the side pieces of the frame, may be pushed under the adjacent ends of the spring fingers; and when in such position, the frame may, against the slight resistance offered by the lock fingers of the guides, be swung into the normal plane of all the guides; and then forced downward into engagement with the lower pair of guides which at once contact the inside of the lock lips constituting the sides of the longitudinal slots in the side pieces of the frame. The frame is now in proper relation to the window frame, and the guides required above to permit the raising of the screen, may, if not already in, be put into position; and when in position, the screen may be lifted, as by finger grips 24 on the inside of the bottom piece 4 of the frame, and such additional guide members as may be needed placed between the guides first fixed to the casing.

To remove the screen frame, the reverse of the above described operation may take place; that is after a removal of only those guide members that prevent the screen frame from being swung out of the frame of the window casing.

In fine, by means of my invention I have done away with such objections as those arising from wooden frames that are flimsy; that are warped and will not freely slide on their guides; or if not out of shape, that make use of wooden guide strips which in time become bent or broken and interfere with, or completely prevent raising or lowering the screen.

It is to be understood that the various features of my invention may be varied without departing from the spirit thereof. For example, to use my spring finger guides, it is not necessary that the frame of the screen be of the particular construction shown, provided there are suitable longitudinal troughs or channels in the side pieces to engage the under sides of the spring fingers of the guide. Further, that feature whereby the rigidity of the frame is obtained, is in no way dependent upon the particular shape of the groove slots for the spring guides. A wooden guide strip with suitable guide slots

therefor, might, if thought desirable, be used. Still further, the locking face-plates for giving tension to the meshes of the screen do not require a metal frame. They can be used with an ordinary wooden frame having any kind of guide slots and guides.

Desiring to protect all of the features of my invention in the broadest manner legally possible, what I claim is:

1. A metallic screen frame comprising two channeled side pieces; and a top and a bottom piece, each being L-shaped in cross-section, and having two plane end extensions bent at right angles to the main piece, each extension engaging and secured to, the adjacent portion of the bottom of the channel of the side piece; and metallic plates connecting the end portions forming the corners of the frame.

2. A metallic screen frame comprising two channeled side pieces, and a top and a bottom piece, each L-shaped in cross section: each of said latter pieces having the end of one arm of the L abutting the outside of the bottom of the channel of the side piece, and having the end of the other arm extended, and bent to form a right angle, to engage and be secured to the inside of the bottom of the channel of the side piece; all designed to obtain a screen frame with rigid corners.

3. A screen frame; metallic plates with inwardly bent lips, to overlay one face of the frame; the lips lying just within the edges of the screen opening through the frame to engage and with them to confine and firmly secure the edge portions of the wire meshing of the screen, lying between the face of the frame, and said plates, to confine the screen in one plane.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WARREN A. BISHOP.

Witnesses:
HERBERT L. BISHOP,
ALBERT E. MOORS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."