No. 767,487. PATENTED AUG. 16, 1904.

W. E. MONROE.

SCREEN.

APPLICATION FILED DEC. 19, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

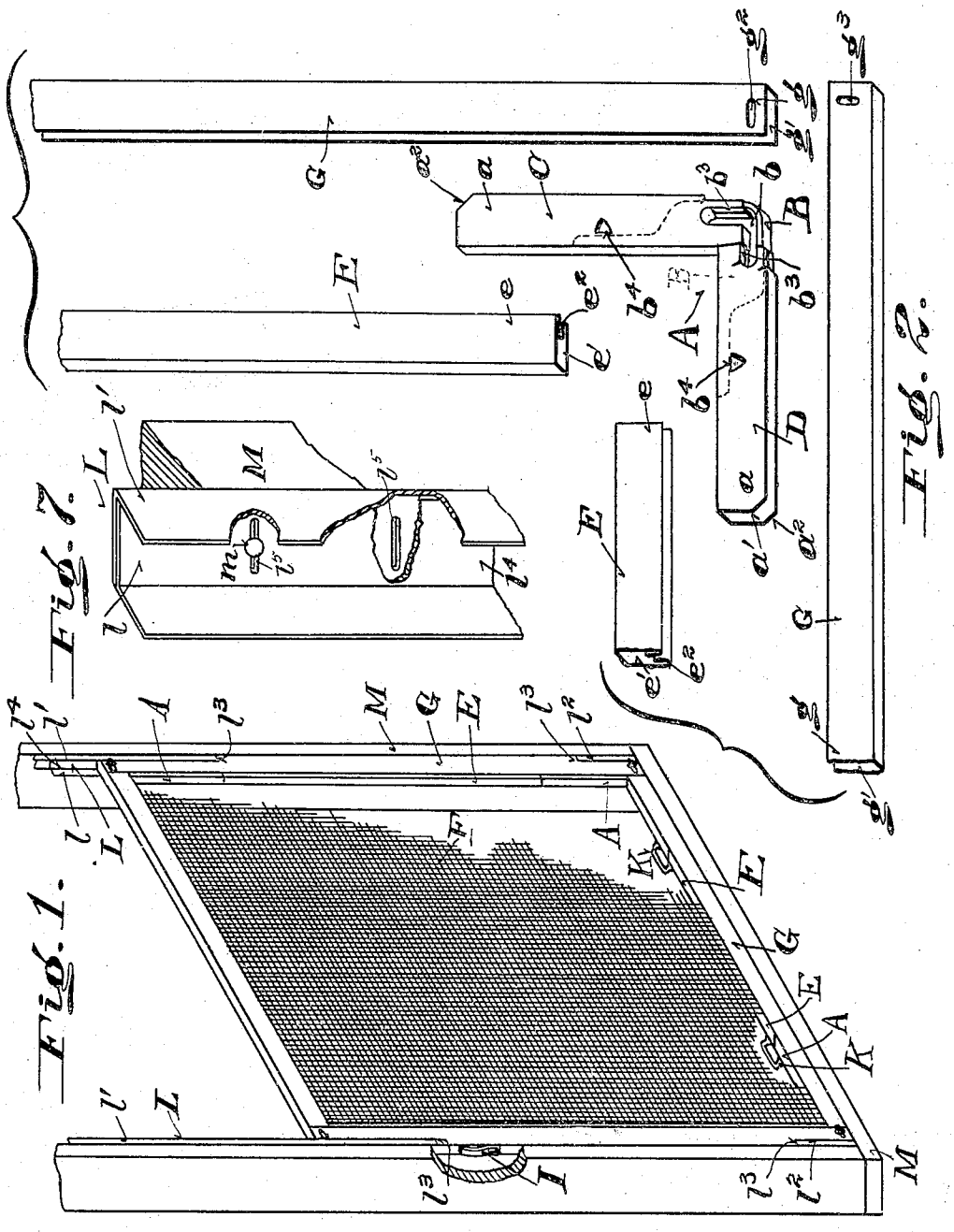

Fig. 1.

Fig. 2.

Fig. 3.

Witnesses.
Henry N. Bauch
Herbert F. Sarden

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William E. Monroe,
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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 9.

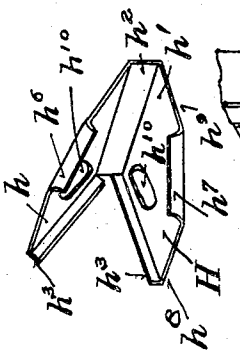

Fig. 4.

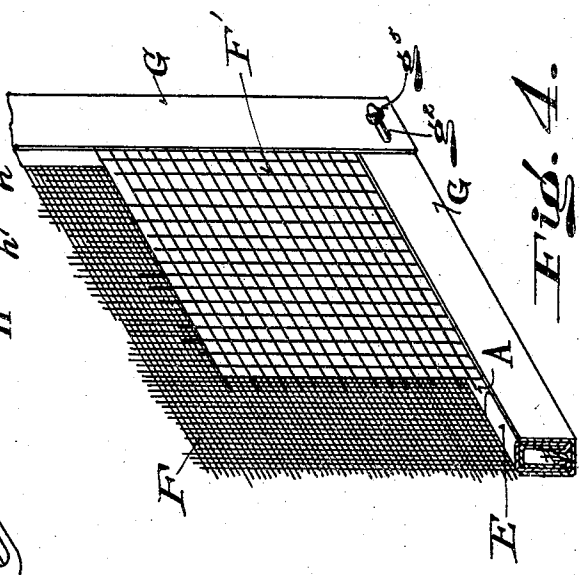

Fig. 3.

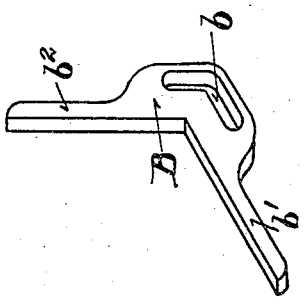

Fig. 8.

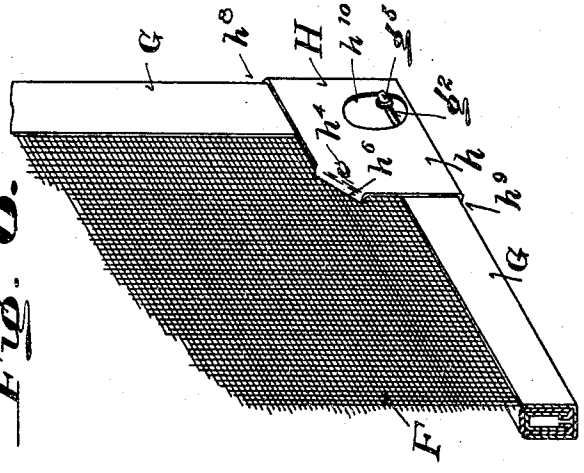

Fig. 5.

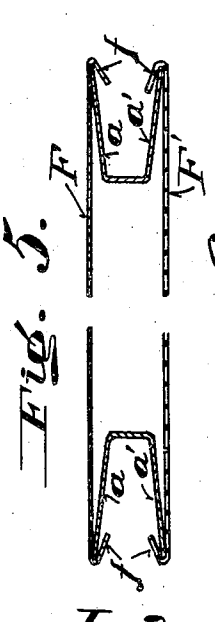

Fig. 6.

Witnesses.

Henry N. Bannon

Herbert F. Hardesi

Inventor:

William E. Monroe,

by R. F. Herbolet, his Attorney.

No. 767,487. Patented August 16, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM E. MONROE, OF NEWPORT, KENTUCKY, ASSIGNOR OF ONE-HALF TO FRANK NUNNING AND FRANK NUNNING, JR., OF CINCINNATI, OHIO, DOING BUSINESS UNDER THE FIRM-NAME AND STYLE OF FRANK NUNNING & SON, OF CINCINNATI, OHIO.

SCREEN.

SPECIFICATION forming part of Letters Patent No. 767,487, dated August 16, 1904.

Application filed December 19, 1903. Serial No. 185,867. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. MONROE, a citizen of the United States, residing at Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Screens, of which the following is a specification.

My invention relates to screens—such as window-screens, door-screens, and the like—and has for its object the providing of a screen of the character mentioned of simple and durable construction which is capable of being readily assembled and taken apart for the purpose of renewing the screen-cloth therein, and the invention will be readily understood from the following description and claims and from the drawings, in which—

Figure 1 is a perspective view of my improved device shown in assembled form in connection with a window-frame partly broken away, the screen-cloth being also shown partly broken away. Fig. 2 is a perspective view showing the several frame-sections of my improved device in dismantled form, but correlated in approximate position for assembling one corner thereof. Fig. 3 is a perspective view of the corner-brace of my improved device. Fig. 4 is a perspective view showing one corner of my improved device, the frame-sections being shown in assembled form and showing a fine-mesh screen at one side and a coarse or protecting mesh screen at the other side thereof, the several corners of my improved device being duplicates of each other. Fig. 5 is a cross-section showing the walls of the inner frame-sections flexed outwardly for receiving the screen-cloth, a fine-mesh screen-cloth being shown as received upon one side and a coarse or protecting mesh screen-cloth being shown as received upon the other side of the frame-sections. Fig. 6 is a cross-section of the same, but showing the walls reflexed to normal position and the outer frame-sections telescoped to innermost position about the inner frame-sections and cloths in full lines and also showing the outer frame-sections in dotted lines in assumed position for adjusting the size of the screen. Fig. 7 is a perspective view, partly broken away, of a portion of the runway of my improved device. Fig. 8 is a perspective view showing one corner of my improved device in assembled form and having the outer corner-section taking over the corner thereof. Fig. 9 is a perspective view of the said outer corner-section.

A is an inner corner-section, of which there is preferably one at each corner.

B is the corner-brace of the inner corner-section and has an aperture b at its angle and wings b' b^2. From the respective wings a channeled or U-shaped stile-section C and a channeled or U-shaped rail-section D projects, forming, respectively, part of the rail and stile—that is, of the side and the bottom or top of the inner frame of the screen—the stile-section and rail-section being secured to the corner-brace by having flanges b^3 thereon taking over said corner-brace and having teats b^4 struck out from the U-shaped pieces and taking over the corner-brace. A spanner-section E connects the corner-sections for aiding in forming the stile or rail of the inner frame, the spanner-section telescoping with the corner-sections for affording adjustability in width or height of the frame. The spanner-section is preferably U-shaped, the walls e e' of which have flanges e^2 at their outer edges turned inwardly, the walls a a' of the corner-sections taking into the spanner-section, the extreme end corners of the walls being cut away, as shown at a^2, for permitting the corner-sections to be readily inserted into the spanner-sections. This construction permits the same inner corner-sections to be used for a wide range in sizes of screens.

F F′ are screen-cloths, either one or both of which are adapted to be placed over the inner frame, outer channeled or U-shaped sections G, having walls g g', taking over the cloth and walls of the inner frame for holding the cloth in place. In Figs. 4, 5, and 6 the cloth

F is shown as of fine or fly-screen mesh, placed upon one side of the frame, while the cloth F′ is a heavier cloth of coarse or protecting mesh placed upon the other side of the frame.

My improved device provides means whereby two screen-cloths of different mesh, separated a distance corresponding to the thickness of the inner frame, may be releasably secured to the same frame, and also permits screen-cloth to be placed on either side of the frame.

In placing the cloth upon the inner frame the outer edge *f* of the cloth is bent over the wall and turned into the channel of the inner frame-sections, the wall at one or both ends of the inner frame having been slightly bent or flexed outwardly, as shown in Fig. 5, preparatory to having the outer channel-sections placed thereover, as shown in Fig. 6. As will be noticed from Fig. 5, when the outer edge of the wall of the inner frame is bent or flexed outwardly it swings that edge into a vertical plane nearer the vertical plane of the middle of the frame, and the cloth being placed over the edge so flexed, when the edge is reflexed to normal position, the cloth will be stretched.

The outer frame-sections G take over the inner frame-section and the screen-cloth which has been placed thereon, thereby locking the cloth in position, the said outer channel-sections also compelling the outwardly-bent walls of the inner channel-sections to resume their normal position, thereby stretching the cloth upon the frame. In the form shown the outer channel-sections forming the outer stiles take over the outer channel-sections forming the outer rails at the corners of the screen, the outer stiles being provided with slots g^2 at each end, the outer rails being preferably provided with slots g^3, bolts taking through said slots and the apertures *b*, which apertures *b* give clearance for the bolts, with nuts g^5 screwing over the bolts, thus completing an outer channel-frame having an inner channel which takes over the inner channel-frame having an outer channel, already described. My improved construction provides a metallic screen having a box-like frame adjustable in width. The slots g^2 g^3, either or both, are for the purpose of permitting final adjustment in width or height of the frame for accommodating various sizes of window-frames, transoms, or the like for which the screen may be intended, it being only necessary to slip the outer channel-pieces laterally to exactly fit the screen to its intended location, the outer channel-sections being preferably of approximately a length for the finished frame.

H is an outer corner-section. This outer corner-section is preferably struck from one piece of metal and consists of walls *h h′*, connected by a web h^2, the walls being each provided with a flange h^3, the flanges when the corner-pieces are in position substantially meeting at their edges. A nut-and-bolt connection h^4 takes through apertures in the walls of the outer corner-section, screwing the parts rigidly in place. The outer corner-section also, preferably, has flanges h^6 h^7 at its inner diagonal edges. The outer channel-sections G are received by the channels h^8 h^9 in the outer corner-section, the channels h^8 h^9 being of a width to permit lateral adjustment of the outer sections G for providing final adjustment of the frame to size. An aperture h^{10} gives clearance for the bolt and nut g^5. A spring I is suitably secured to one of the stiles when used as a window-screen, the rail also in that case being provided with lifts K.

For affording a ready means for inserting or removing the screen when used as a window-screen and forming a runway of simple and durable construction I provide the runway L, comprising, preferably, an angle-plate *l* of substantially the length of the runway and angle-plates *l′* and l^2 at the respective ends of the angle-plate *l*, there being a space l^3 between the angle-plates *l′* and l^2 of a length slightly less than the height of the screen. If the runway is of a length substantially the height of the window-frame, as is usually the case for ordinary window-frames, the angle-plate *l′* will be of a length slightly longer than the height of the screen, the angle-plate l^2 being short, with the space l^3 of sufficient length to permit ready insertion of the screen-frame into the channel l^4 of the runway, the front walls of the angle-plates *l′* l^2 taking over the top and bottom, respectively, of the screen-frame. In forming the runway the angle-plates *l′* l^2 are placed to rear of the angle-plate *l*, with nails *m* or other retaining means taking through slots l^5 in the angle-plates and into the window-frame M for forming the runway, the slots being provided for permitting adjustability between the walls of the runway.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a screen of the character described, the combination of inner and outer frame-sections, each having a pair of flexible walls connected at one longitudinal edge and free at the other longitudinal edge for permitting the latter edge to be flexed, screen-cloth adapted to be bent over the free edge of either wall of the inner frame-section when flexed, with the walls of the outer frame-sections taking over both the walls of the inner frame-sections and the edges of the screen-cloth for reflexing the edges of said inner walls to normal position and thereby stretching said screen-cloth and confining the edges thereof, substantially as described.

2. In a metallic window-screen frame, the combination of inner channel-sections whose side walls extend outwardly radially of the frame and outer channel-sections whose side walls extend inwardly radially of the frame

and telescope over said first-named walls, said outer channel-sections having slots at the corners of said frame for permitting lateral adjustment of said outer channel-sections, and means passing through said slots for securing the parts in adjusted position, substantially as described.

3. In a metallic screen of the character described, the combination of an inner frame having a pair of flexible outwardly-extending walls each of which is arranged to have screen-cloth take thereover, and outer channel-strips having walls taking over both said screen-cloths and both said walls of said inner frame, substantially as described.

4. In a screen-frame of the character described, the combination of inner U-shaped channel-pieces having walls whose free ends project outwardly radially of the frame and outer U-shaped channel-pieces having walls whose free ends project inwardly radially of the frame and take over said walls of said inner U-shaped channel-pieces and form a box-frame, substantially as described.

5. In a screen-frame of the character described, the combination of inner U-shaped channel-pieces having walls whose free ends project outwardly radially of the frame and outer U-shaped channel-pieces having walls whose free ends project inwardly radially of the frame and take over said walls of said inner U-shaped channel-pieces and form a box-frame, and means at the corner of said screen-frame for permitting adjustment of said outer U-shaped channel-pieces relatively to each other, substantially as described.

6. In a screen-frame of the character described, the combination of inner U-shaped channel-pieces having walls whose free ends project outwardly radially of the frame, and outer U-shaped channel-pieces having walls whose free ends project inwardly radially of the frame and take over said walls of said inner U-shaped channel-pieces and form a box-frame, and a corner-section taking about said outer U-shaped channel-pieces at the respective corners of said frame, substantially as described.

7. In a metallic screen-frame of the character described, the combination of inner corner-braces B, channel-sections C and D having walls $a\ a'$ secured to the corner-braces, and spanner-sections E having walls $e\ e'$ telescoping with the first-named channel-sections for forming the inner frame, and outer channel-sections G having walls $g\ g'$ taking over said walls $a\ a'$ and $e\ e'$, substantially as described.

8. In a metallic screen-frame of the character described, the combination of inner corner-braces B, channel-sections C and D having walls $a\ a'$ secured to the corner-braces, and spanner-sections E having walls e and e' and flanges e^2 telescoping with the first-named channel-sections for forming the inner frame, and outer channel-sections G having walls $g\ g'$ taking over said walls $a\ a'$ and $e\ e'$, substantially as described.

9. In a metallic screen-frame of the character described, the combination of inner corner-braces B, channel-sections C and D having walls $a\ a'$ secured to the corner-braces, and spanner-sections E having walls $e\ e'$ telescoping with the first-named channel-sections for forming the inner frame, outer channel-sections G having walls $g\ g'$ taking over said walls $a\ a'$ and $e\ e'$, said outer channel-sections having slots for permitting lateral adjustment of said outer channel-sections, and means passing through said slots for securing said outer channel-sections in place, substantially as described.

10. In a metallic screen-frame of the character described, the combination of inner corner-braces B, channel-sections C and D having walls $a\ a'$ secured to the corner-braces, and spanner-sections E having walls $e\ e'$ telescoping with the first-named channel-section for forming the inner frame, outer channel-sections G having walls $g\ g'$ taking over said walls $a\ a'$ and $e\ e'$, and corner-sections H taking over said walls $g\ g'$, substantially as described.

11. In a metallic screen-frame of the character described, the combination of inner corner-pieces comprising channel-sections C and D having walls $a\ a'$, and spanner-sections E having walls $e\ e'$ telescoping with the first-named channel-sections for forming the inner frame, and outer channel-sections G having walls $g\ g'$ taking over said walls $a\ a'$ and $e\ e'$, substantially as described.

In testimony whereof I have signed my name hereto in the presence of two subscribing witnesses.

WILLIAM E. MONROE.

Witnesses:
WILLIAM H. SCHMIDT,
HERBERT F. HARDEN.