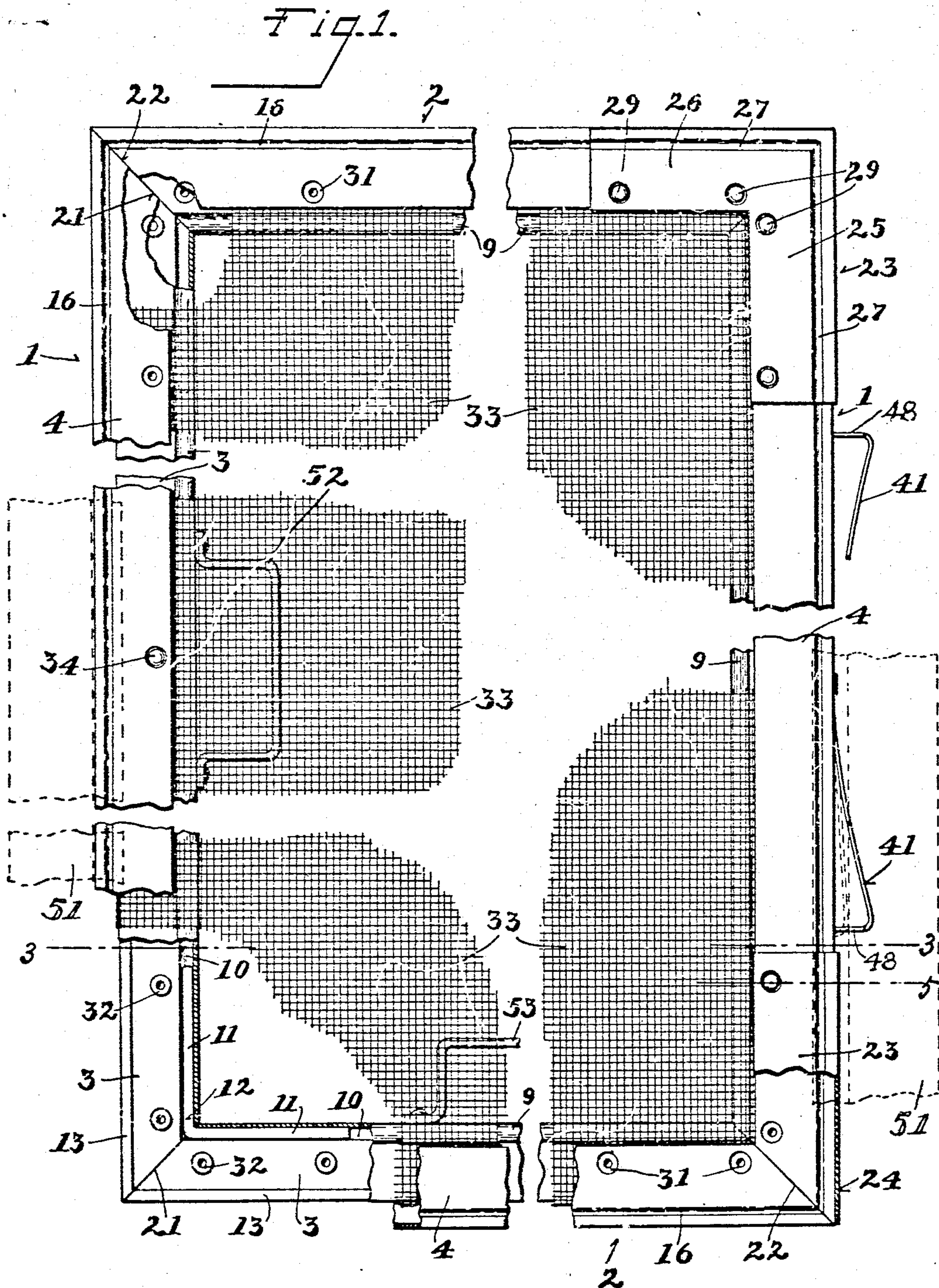


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METAL FRAME SCREEN.
APPLICATION FILED OCT. 3, 1908.

947,838.

Patented Feb. 1, 1910.

2 SHEETS—SHEET 1.



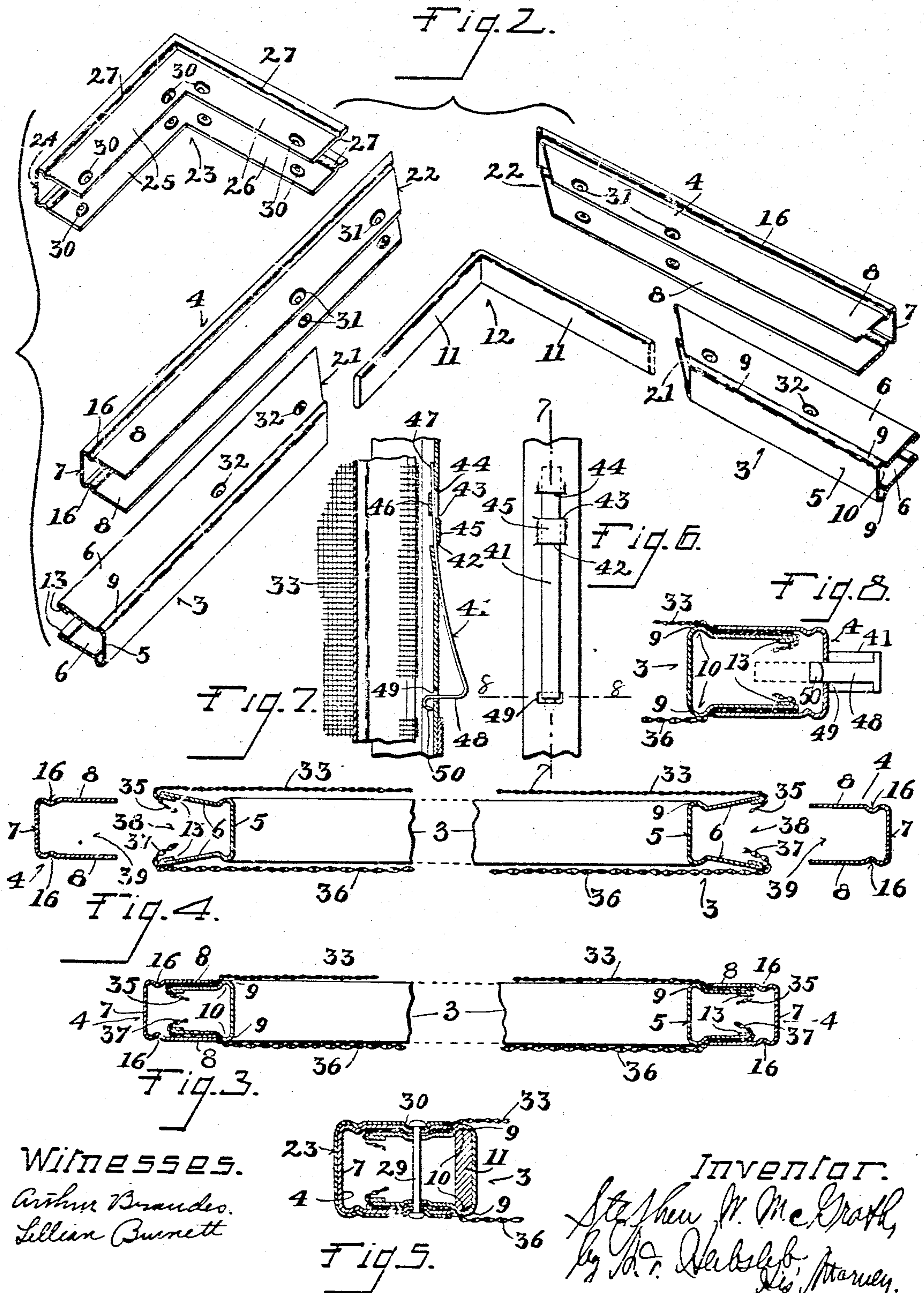
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

STEPHEN W. McGRATH, OF CINCINNATI, OHIO.

METAL-FRAME SCREEN.

947,838.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed October 3, 1908. Serial No. 455,968.

To all whom it may concern:

Be it known that I, STEPHEN W. McGRATH, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Metal-Frame Screens, of which the following is a specification.

My invention relates to metal-frame screens of the box-frame type shown and described in Letters Patent of the United States No. 767,487, granted W. E. Monroe, August 16, 1904, and its object is to improve upon the screen shown and described in that patent, and the invention will be readily understood from the following description and claims and from the drawings, in which latter:

Figure 1 is a front elevation of a metal-frame window-screen embodying my invention, the same being partly broken away and partly in section for better illustration of parts, also showing the friction-spring at the side of the frame in assumed position in dotted lines, the window-frame being also indicated in dotted lines and broken away. Fig. 2 is a perspective view of one of the corners of the frame in separated relation. Fig. 3 is a cross section of my improved device taken on the line 3—3 of Fig. 1 but showing screen-cloths at both sides of the screen. Fig. 4 is a cross section of the parts shown in Fig. 3, taken on a similar line, but showing the same in separated relation. Fig. 5 is a detail in cross section on the line 5 of Fig. 1, showing the frame in assembled relation with the inner reinforce corner and the outer corner in place. Fig. 6 is a detail in edge relation showing the friction-spring in place. Fig. 7 is a vertical section of the same on the line 7—7 of Fig. 6, and Fig. 8 is a cross section of the same on the line 8—8 of Fig. 6.

The stiles 1 and rails 2 of the screen each comprise an inner frame-member 3 and an outer frame-member 4, both of which are of substantial U-shaped channel form in cross section, with the walls of the channels extending in directions substantially parallel with the screen-cloth when assembled for forming a box-frame screen of the character of that shown and described in the aforesaid patent, in which the walls of the frame-members are substantially parallel to the plane of the screen-cloth.

The inner frame-member comprises a base

5 and walls 6 6, the latter extending outwardly from the respective sides of the base.

The outer frame-member comprises a base 7 and walls 8 8, the latter extending inwardly from the respective sides of the base. The walls of these frame-members preferably extend substantially radial of the screen when assembled.

Outwardly extending beads 9 9 are between the base 5 and respective walls 6 of the inner frame-member, being formed up from the sheet metal of which the inner frame-member is composed.

Channels 10 are thus formed, in the ends of which, at the corners of the screen, limbs 11 11 of inner reinforce corner pieces 12 are received. These reinforce corner-pieces are preferably formed of metal which fits the channels and which is bent for forming the limbs, which are substantially at right angles to each other. The limbs are received in the channels of the inner frame-members for reinforcing the screen at the corner thereof. The outer ends of the walls 6 are preferably bent inwardly as shown at 13, being preferably bent back upon the walls and forming strengthening edges for the same.

The walls 8 of the outer frame-members may be provided with inwardly projecting beads 16 adjacent their bases. These beads serve the purpose of strengthening the outer members.

The inner frame-members are preferably mitered at the corners, as shown at 21, and the outer frame-members are preferably mitered at the corners, as shown at 22. An outer corner-piece 23, which preferably comprises a base 24 and walls 25 having extensions 26, covers the joint at each of the corners of the screen. The respective walls and extensions of the outer corner-piece are provided with inwardly extending beads 27. The beads 27 are received within the outer grooves of the beads 16. Rivets 29 pass through the outer corner-piece and the walls of the outer and inner frame-members for securing the parts together, recesses 30 31 32 being formed respectively in the outer corner-piece, and in the walls of the outer and inner frame-members for accommodating the rivet-heads, it being understood that the screen-cloth, shown at 33, will have been secured in place before the frame is riveted together, and, if desired, one or more rivets, as shown at 34, may be passed through the

walls of the outer and inner frame-members intermediate of the corners for securing the parts together.

In assembling the screen, the inner re-
 5 inforce corner-pieces are received in the ends of the channels 10 at the respective ends of the stiles and rails for forming the corners, these inner frame-members respectively being preferably a one-piece structure for the
 10 respective stiles and rails, thereby forming an inner frame for the screen. The walls of the inner frame-members preferably diverge from each other slightly as indicated in Fig. 4. The screen-cloth is received about the
 15 outer ends of these diverging walls and bent inwardly as shown at 35. The inwardly bent end of the screen-cloth is received within the channel of the inner frame-member if desired. There may be a screen-cloth on
 20 but one side of the inner frame as shown at 33 and there may be an additional screen-cloth 36 at the other side of the inner frame, the inner edges 37 of which are bent over the other wall of the inner frame-member
 25 and received within the channels of said frame-members, the said screen-cloth 36 being preferably a protecting cloth of wider mesh than the screen cloth 33. When now the outer frame-members are forced over the
 30 inner frame-members, the walls of the latter which have been in flexed relation, are reflexed into parallelism with the screen-cloth, thereby stretching the screen-cloth between the frame-members at the opposite ends of
 35 the screen. The screen-cloth is firmly clasped between the walls of the respective inner and outer members. The inner edges of the walls of the outer frame-members clamp the screen-cloth between themselves
 40 and the beads of the inner frame-members, over which latter the screen-cloth is curled. The mouths 38 39 of the respective inner and outer frame-members are presented in directions substantially parallel with the
 45 screen-cloth when the screen is assembled. When the outer-frame-members have been received about the inner frame-members and the screen-cloth thereon, the outer corner-pieces are secured in place as hereinbefore
 50 described.

41 41 represent friction-springs one or more of which may be employed. These springs are shown as leaf-springs and are respectively received through slits 42 43 44
 55 in the base of one of the outer frame-members, whereby an outer strap 45 and an inner strap 46 are formed, between which the friction-spring is received, the heel 47 of said spring being received under the base of said outer
 60 frame-member. The said friction-spring extends outwardly away from the screen-cloth in a curve whose convexity is presented toward the side of the screen-frame. In other words, the side of said screen-frame
 65 is tangent to said curve. Said spring is

preferably provided with an inward extension 48, which projects through an aperture 49 in the base of said outer frame-member, there being a toe 50 at the inner end of said extension inside said outer frame-member, which is adapted to contact the inner face of the base of said outer frame-member, thereby limiting the outward projection of said spring and holding said spring in place under tension, the tension of said spring
 75 locking the same in place in the slits and avoiding necessity of other fastening means. When said screen is in place in the window-frame, indicated in dotted lines at 51, which forms a guide-way for the screen, the outer
 80 end of said spring is forced toward the frame of the screen and thereby exerts additional friction against longitudinal movement of the spring at the walls of said slits. If it is desired to release said spring this
 85 may be easily done by forcing the inner end of the inward extension 48 lengthwise of the spring for releasing the toe 50 from contact with the inner face of the outer frame-member, thereby permitting it to pass
 90 through the aperture 49. When forced inwardly, the extension is received within the channels of the frame-members. The side of the screen-frame opposite the spring may be provided with a handle 52 and a suitable
 95 raising handle 53 may also be provided.

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

1. In a metal-frame screen of the character described, the combination of an inner frame-member, an outer frame-member, and a screen-cloth, said frame-members comprising opposed stile and rail lengths, the said lengths of said members being of substantial U-shaped channel form in cross-section comprising a base and side walls having mouths presented toward each other and substantially parallel to the plane of said screen-cloth, the said stile and rail lengths of said inner frame-member each having an outwardly projecting bead extending longitudinally thereof adjacent its base, said screen-cloth being curled over said beads and clamped between the adjacent side walls at one of the sides of said frame-members, said screen-cloth being stretched between the beads of opposed lengths of said inner frame-member so that the plane of said screen-cloth between said beads will be coincident with the outer faces of the said beads for locating said screen-cloth between said beads of said opposed lengths of said inner frame-member to one side of the frame of said screen, substantially as described.

2. In a metal-frame screen of the character described, the combination of an outer frame-member, an inner frame-member, and a screen-cloth, said frame-members comprising opposed stile and rail lengths, the said

lengths of said frame-members being of substantial channel-form in cross-section comprising a base and side walls and having mouths presented toward each other, the said
 5 stile and rail lengths of said inner frame-member having outwardly projecting beads and the said stile and rail lengths of said outer frame-member having inwardly projecting beads, the said beads extending longitudinally of and adjacent to the bases of the
 10 lengths on which the same are located, the said beads being respectively located between the bases of the lengths of that frame-member on which the same are located and the side walls of the lengths of the other of said
 15 frame-members, and said screen-cloth being located between the free edges of said side-walls and beads at one of the sides of said frame-members and stretched between the
 20 beads of opposed stile and rail lengths of said inner frame-member, the said stretched portion of said screen-cloth extending outwardly beyond said beads and side-walls, substantially as described.

25 3. In a metal-frame screen of the character described, the combination of outer and inner frame-members, and a screen-cloth, said inner and outer frame-members comprising opposed stile and rail lengths, the
 30 said lengths of said frame-members being each of substantial channel-form in cross-section comprising a base and opposed side-walls, said opposed side-walls being at the respective sides of said bases, the said stile and
 35 rail lengths of said inner frame-member having outwardly projecting beads adjacent their bases and the said stile and rail lengths of said outer frame-member having inwardly projecting beads adjacent their bases, the
 40 said beads on one of said frame-members being in the lateral planes of the side-walls of the other of said frame-members, said screen-cloth being received between said opposed
 45 side-walls and beads at one of the sides of said frame-members and stretched between the beads of opposed stile and rail lengths of said inner frame-member for locating the plane of said stretched portion of
 50 said screen-cloth when extended to one side of said inner frame-member outside said inner frame-member, substantially as described.

55 4. A metal-frame screen of the character described comprising in combination stiles and rails, having joints at the corners of said screen, said stiles and rails embracing opposed inner and outer frame-members, a
 60 screen-cloth, said frame-members being of substantial channel form comprising a base and opposed side-walls, said opposed side-walls being at the respective sides of the bases, said opposed side-walls at one of said
 65 sides being spaced from said opposed side-walls at the other of said sides, said inner frame-member being provided with an out-

wardly projecting bead extending longitudinally thereof and bent from the metal of which said inner frame-member is composed for forming an inner channel, inner corner
 70 pieces respectively having limbs at substantial right-angles to each other received by said channels in said stiles and rails at the respective corners of said screen, and outer corner-pieces received over said joints at
 75 said corners.

5. In a metal-frame screen of the character described, the combination of stiles and rails comprising inner and outer frame-members of channel form comprising a base and
 80 side-walls spaced apart projecting from said base, a screen-cloth received between the side-walls of said frame-members, said side-walls extending in planes substantially parallel with the plane of said screen-cloth, each
 85 of said inner frame-members having a bead at each side of its base formed therefrom for forming an inner channel, and inner reinforce corner-pieces respectively having
 90 limbs at substantially right angles to each other received in said channels of said respective stiles and rails at the corners of the screen, substantially as described.

6. In a metal-frame screen, the combination of a sheet-metal frame-member provided with slits for forming straps, and a
 95 leaf friction-spring, one end of which is received by said slits for being received alternately under and above said straps of said sheet-metal frame-member at different
 100 points, the other end of said leaf friction-spring extending outwardly on a curve whose convexity is presented toward said frame-member and acting when flexed out of normal position to bind said first-named end
 105 of said spring against said straps.

7. In a metal-frame screen, the combination of a sheet-metal frame-member provided with slits for forming straps, a leaf
 110 friction-spring, one end of which is received by said slits for being received under and above said straps of said sheet-metal frame-member at different points, the other end of said leaf friction-spring extending outwardly on a curve whose convexity is presented toward said frame-member and acting
 115 when flexed out of normal position to bind said first-named end of said spring against said straps, said leaf-friction-spring having an inward extension and said metal frame-member having an aperture through
 120 which said extension is received, and limiting means between said extension and frame-member for limiting the retraction of said outwardly extending end of said spring from said frame-member.
 125

8. In a metal-frame screen, the combination of a sheet-metal frame-member and a
 130 leaf friction-spring adapted to contact the slideway for said screen, said frame member being provided with slits through which one

end of said friction-spring is received, the other end of said friction-spring being bent outwardly from said slits and being provided with an extension, the said frame-member being provided with an aperture for receiving said extension when said spring is flexed out of normal position by contact with said slide-way.

9. In a metal-frame screen, the combination, with a screen-cloth, of a hollow metal-frame embracing inner and outer frame-members having bases and opposed side-walls at the respective sides of said bases, said side-walls being substantially parallel to the plane of said screen-cloth, a friction-spring secured at one end to said frame and adapted to contact the guideway of said screen, the other end of said friction-spring

extending outwardly from said frame, said friction-spring having an inner extension at said other end, the base of one of said outer members having an aperture through which said extension is received between said opposed side-walls at the respective sides of said bases, said extension having a hook in its inner end received through said aperture, and said hook contacting the inside of said frame for limiting the outward movement of said spring, substantially as described.

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

STEPHEN W. McGRATH.

Witnesses:

LILLIAN BURNETT,
O. S. BRYANT.