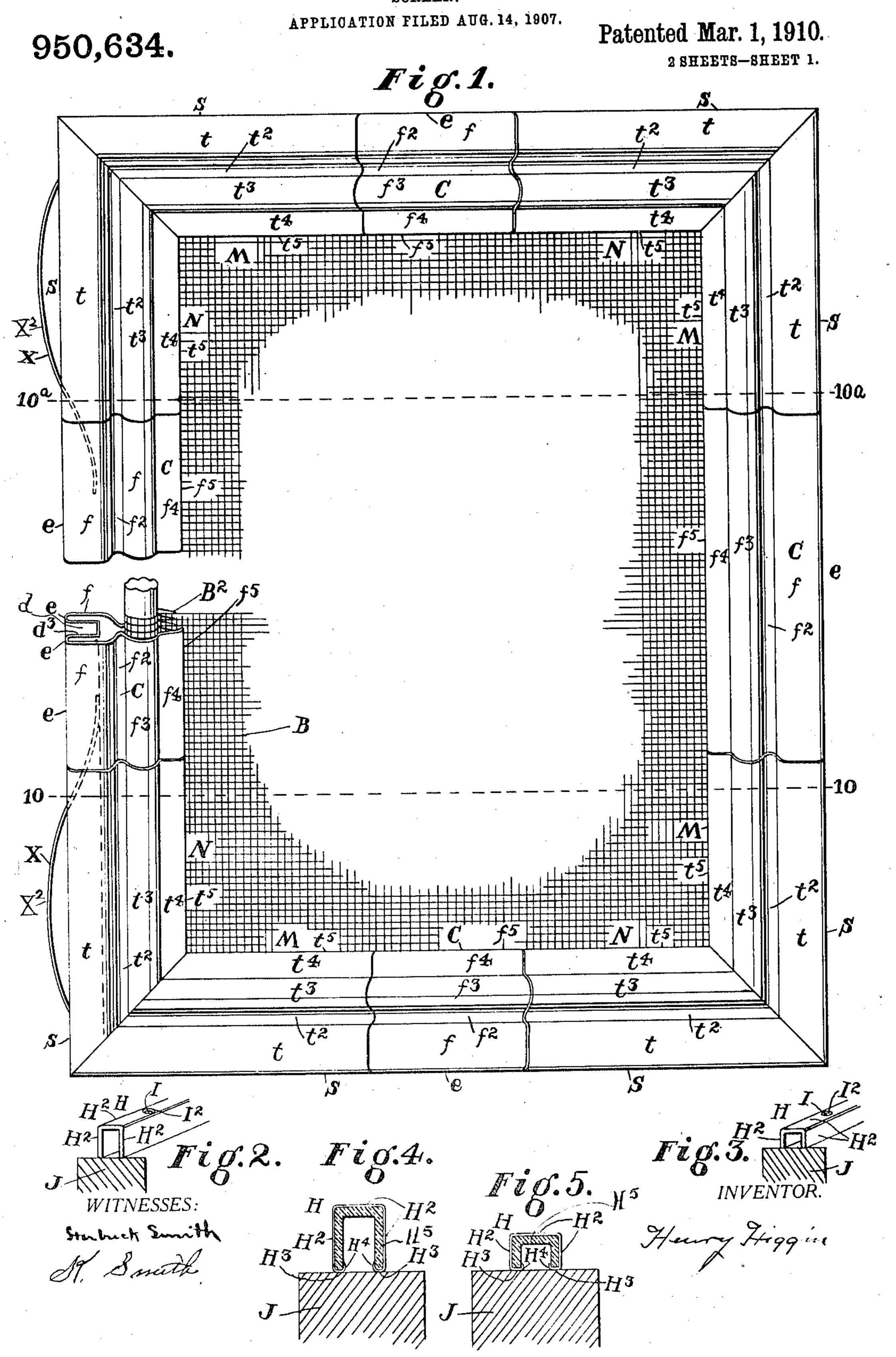
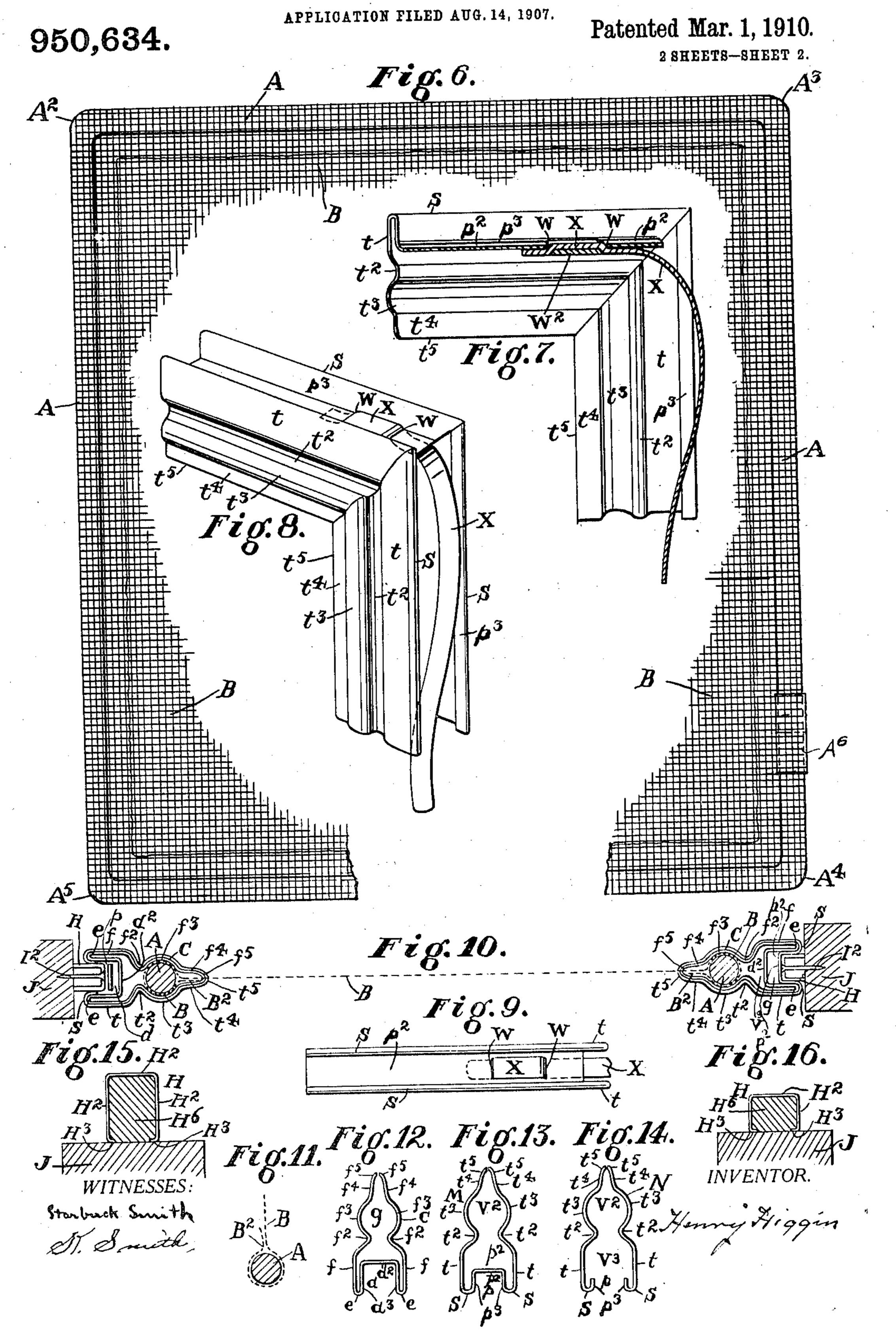
H. HIGGIN. SCREEN.



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UNITED STATES PATENT OFFICE.

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SCREEN.

950,634.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY HIGGIN, a citizen of the United States, and a resident of the city of Newport, in the county of Camp-5 bell and State of Kentucky, have invented certain new and useful Improvements in Screens, of which the following is a specification.

The several features of my invention and 10 the various advantages resulting from their use conjointly or otherwise will be apparent from the following description and claims.

In the accompanying drawings, making part of this specification, and in which simi-15 lar letters of reference indicate corresponding parts,—Figure 1 is a view partly in elevation and partly in perspective section, of a screen illustrating my invention. Fig. 2 is a view in perspective of a short length of that 20 guide for the screen which is attached to the left hand side (viewed from within the house) of the frame of the window which is to receive the screen. Fig. 3 is a perspective view of a short length of that guide for the 25 screen which is attached to the right hand side of the window which is to receive the screen. Fig. 4 is an enlarged end elevation of the guide shown in Fig. 2, and at the left hand in Fig. 10, and illustrating the pre-30 ferred construction thereof. Fig. 5 is an enlarged end elevation of the guide shown in Fig. 3, and at the right hand in Fig. 10, and illustrating the preferred construction thereof. Fig. 6 is a view in elevation of the 35 primary frame of the screen, and of the adjacent portions of the screen cloth applied thereto. Fig. 7 is a view partly in section and partly in perspective elevation of an outside corner for the frame. This corner 40 embodies certain features of my invention. Fig. 8 is a perspective view of this outside corner from another point of view. Fig. 9 corner (shown in Figs. 5 and 6) to which the 45 spring is united. Fig. 10 is a cross section of the completed screen taken in the plane of the dotted lines 10, 10, or of the dotted lines 10a, 10a, of Fig. 1, when the frame is in position in the window, the guides which are 50 attached to the window frame and are employed to hold the screen in place being also shown in section. Fig. 11 is a transverse section of the primary or rod frame and of a portion of the screen around and in prox-55 imity to this rod frame. Fig. 12 is a trans-

verse section of the molding which extends around the entire screen. Fig. 13 is a view of one end of the style of corner which at each corner embraces the molding indicated in Fig. 12 and shown in Fig. 1. Fig. 14 is a 60 view of the other end of the corner, one end of which is shown in Fig. 13. Fig. 15 represents an end elevation illustrating a modified construction of the guides shown in Figs. 2, 4, and at the left hand in Fig. 10. Fig. 16 65 represents an end elevation illustrating a modified construction of the guides shown in Figs. 3, 5 and at the right hand in Fig. 10.

I will now proceed to describe in detail my

improved screen. As a first step in the construction of the screen, I provide a primary frame A. This consists of a rod bent at four places to form the respective corners A², A³, A⁴ and A⁵. The two ends of the rod where they meet are 75 preferably joined firmly together. One means, and a preferred one, for joining together the ends of this rod-frame is the sleeve A⁶. Into the opposite ends of this sleeve, the respective ends of the rod- are 80 passed. The place where these ends of the rods shall meet is preferably at one of the sides because the top and bottom parts of the screen are subjected to more abuse and strain than are the sides; and the place of 85 their meeting at the side is preferably near a corner of the frame so as to be within the strengthening embrace of one of the corner pieces. The screen-cloth B, also known as wire-netting, is applied to this frame. The 90 edge portions of this screen-cloth are bent over and around the adjacent portions of the primary frame A, and so as to have a slight lap B² on the main body of the screen-cloth within and beyond the primary frame. In 95 Figs. 1, 10 and 11, this overlapping of the screen-cloth by the edge portions is illustrated. is a plan or bottom view of that part of this | Thus in Fig. 11, the screen-cloth is shown bent around the frame rod A and lapping at B2 against the screen-cloth. This primary 100 frame and screen-cloth thus combined I reinforce with a molding C, which I so form as to embrace the primary frame and the screen-cloth there and in that vicinity. This molding or secondary frame consists of a 105 strip of sheet metal, bent so as to form in end view the shape shown in Figs. 1 and 10, and by itself in Fig. 12. This shape is symmetrical on each side. The molding has a bottom groove d. The roof of the groove is in- 110

dicated by d^2 and the sides of the groove by d^3 , d^3 . These sides at the bottom extend sidewise and outward forming the bottom portions e, e. From the outer side of these bottom portions e, e, the metal is extended up and forms the outer sides f, f. These in turn respectively merge into the adjacent neck pieces f^2 , f^2 , at which point the molding is contracted. The neck pieces f^2 , f^2 , enlarge into the semi-cylindrical portions f^3 , f^3 , and these latter terminate in the contracted flanged edges or lips f^4 , f^4 , whose free terminal edges f^5 , f^5 , incline inward toward each other. After this molding C has been ap-15 plied to the primary frame and cloth screen, the rod A and screen-cloth around it are tightly embraced within the semi-cylindrical portions f^3 , f^3 , viz.: within the space g, (Fig. 12) as shown in Figs. 1 and 10, in connection 20 with the illustrative Figs. 11 and 12, and the lips or flanges f^4 , f^5 ; f^4 , f^5 , tightly pinch and hold between them the adjacent portion of the main body of the screen-cloth near the rod A, and also the lap B2 of the screen-25 cloth, as indicated in Figs. 1 and 10. The screen-cloth is thus tightly held fast and cannot pull loose from around the primary frame, but remains in position, and well and flatly stretched upon the frame. The mold-30 ing thus applied extends around and forms the exterior or surface frame on the top, bottom and sides. The frame is now ready to receive the corners, whose construction and application also constitute features of my in-35 vention. These corners are alike, and a description of any one will serve as a description of each of the others.

The corner piece, as its name implies, has a part M extending in one direction and a sec-40 ond part N extending in another direction, namely: at right angles to the part M. This entire corner piece is made of thin sheet metal, preferably of copper. The part M is symmetrical on each side and continuous 45 throughout. It has at the base, the groove p having a roof p^2 , and the sides p^3 , p^3 . At the base of these sides the metal is bent outwardly and forms the bottom ends s, s. The metal then extends up outside and forms the 50 sides t, t. These sides t, t, are bent toward each other forming the contracted portion or neck t^2 , t^2 , of the molding M; the metal is next extended outwardly and around in a curved direction forming the semi-cylin-55 drical parts t^3 , t^3 . It is then extended in the lips or flanges t^4 , t^4 , which respectively terminate in the turned-inwardly edge portions t⁵, t⁵. This corner part M embraces the frame molding C, of Fig. 12 heretofore de-60 scribed, and everywhere fits it closely, substantially as shown in Fig. 1 and at the left hand portion of Fig. 10. The parts p^3 , p^3 , p^2 , fit within the groove d of the molding C, and the sides p^8 , p^8 , are respectively

walls d^3 , d^3 . The cylindrical space V^2 is occupied by the cylindrical portions f^3 , f^3 , of the molding C, and the lips t^4 , t^5 , t^4 , t^5 , press closely upon the respective lips f^4 , f^5 , f^4 , f^5 , of the molding C.

The corner part N is made like the corner part M in configuration, with the exception that the inner side walls p^3 , p^3 are not connected by a roof or partition p^2 , and an open space V³ there remains extending from the groovespace p toward the neck t^2 , t^2 . The inner side walls p^3 , p^3 , preferably extend a short distance only toward the space V². This corner part N embraces the molding C substantially in the same manner as the part M 30 embraces it,—see Fig. 1 and the right hand

portion of Fig. 10.

My improved screen is held in place by guides, in conjunction with spring mechanism. The springs are of suitable form and 85 are suitably attached, and the preferred mode and place of locating them is as follows: A spring of the shape of that shown and indicated in Figs. 1, 7, 8 and 9, is present. In the roof p^2 of the corner part M, I 90 make two transverse cuts W, W, and then press the metal W² of this roof between the cuts inward toward the space V². I then insert the end portion of the spring X beneath this metal W2 and the inward surface 95 or top of the roof p^2 , substantially as illustrated in Figs. 7, 8 and 9. When once set thus in place, the spring X will securely remain in position. Yet at any time after the screen has been completed, and whether in 100 use or not, either or both of the springs can be readily removed, as desired and for any reason. The principal reason for the removal of a spring is because it is broken or defective and should be replaced by a new 105 one. In practice, but few springs are defective, and the springs if properly made will last a long time. The drawing, Fig. 1, illustrates the position of these springs relatively to the adjacent side edge of the screen. The 110 springs X are in reverse position relatively to each other. That is, the free ends of the springs point toward one another. This free end of each spring, shown in dotted lines, is free to slide toward the midlength of the 115 screen as the arch X2 of the spring is pressed toward the screen. It is to be noted that the absence of a roof p^2 in the part N, allows the spring X free play, when compressed toward and into the space d. The guides for holding the screen in the window are objective ones; that is to say, each projects out in the form of an elongated strip or bead, instead of being in the form of a sunken channel to receive a bead or strip attached to the screen. These guides are respectively attached to the adjacent window frame. In many cases, and in fact usually, they are connected to what is known as the 65 closely adjacent to the inner side of the bead J, which is a constituent part of the

window frame and serves to separate and to participate in forming the guideways in which the lower sash and the upper sash respectively slide. These guides are at-5 tached to the window frame by suitable means. In the present illustrative instance, they are connected thereto by nails I2, whose heads are sunken in the countersunk holes I of the guide. The two guides are of differ-10 ent heights, that is to say, of different degrees of extension. Thus the right hand guide H, see Figs. 3, 5, 16 and the right hand portion of Fig. 10, is comparatively low say, for instance, is three-sixteenths of 15 an inch in height, or outward extension from the window frame J, and the left hand guide H, Figs. 2, 4 and 15, and the left hand portion of Fig. 10, is somewhat higher, and is for instance five-sixteenths of an inch in 20 height, or outward extension from its ad-

jacent window frame J. It is now proper to explain the mode of locating the screen in the window. The operator takes the screen and applies the left 25 hand vertical edge of the screen so that the left hand guide H fits into the opening p, d, of the combined moldings, see the left hand portion of Fig. 10. He then presses the screen toward the left, thus compressing the 30 arch of each spring X between the guide H and the roof d^2 of the primary molding, until nearly all of the guide (i. e. its extension from the window frame J) has entered and is within the groove d of the primary mold-35 ing and lies between the sides or walls p^3 , p^3 , of the corner piece M. The screen is now far enough to the left to allow the right hand side edge of the screen to pass the right hand guide H. But when this right hand side 40 edge of the screen comes opposite this right hand guide, the operator allows the springs X, X, to act. As they operate, they push the screen toward the right causing the right hand corner pieces M, M, to receive within 45 their grooves d, d, this right hand guide H, substantially as illustrated at the right hand end of Fig. 10. The springs X, X, elastically continue to cause the right hand edge of the screen to embrace the right hand guide 50 H. At the same time, the extra height (projection) of the left hand guide H will cause it to project into the groove p, d, of the compound molding made up of the molding C and the corner part N. Therefore the screen 55 cannot leave either of the guides H, H, and is held by them in position, in the window. The screen is free to slide up or down on these guides H, H, the roof p^2 of the mold-

face of the left hand guide H and sliding thereon. It will be observed that each of the corner 65 pieces M, N has a four-fold function. First,

60 right hand guide H and sliding thereon, and

ing C bearing against the outer face of the

the springs X, X, bearing against the outer

it (each piece M, N) strengthens that corner of the screen where it is. Second, on the left hand side of the screen, the parts M, M, each respectively hold the fixed end of the adjacent spring X, and thirdly, the parts N, N, 70 of each corner provide a groove wherein the spring can be received, and wherein the adjacent high guide can be received. Fourthly, on the right hand edge of the screen, each corner being reserved and the part N thereof 75 receives the right guide H, and the shallow groove of this part N of the corner enables the screen to be rightly located relatively to both this guide and the left hand guide when the screen is in use. A fifth possible func- 80 tion is that the grooves in the parts N, M, of the corners, at the top and bottom of the screen allow the beads respectively fixed on the top and bottom of the window frame to enter them, the said grooves, when it is de- 85 sired to fully close and make dust proof the slight space between the screen and such adjacent top or bottom part of the said window frame. Among the other advantages resulting from the use of these features of my in- 90 vention, I now mention the following. When moisture gathers on the screen from the rain or the dew, or from washing the windows, any moisture descending on the screen-cloth and finding its way into the pri- 95 mary molding, or the corner piece does not stop at the roof d^2 , or the roof p^2 , and cause these to rust or oxidize, but having an opportunity to descend, it passes down into the bottom grooves of the parts e and S, and 100 there is out of the way of injuring the most important portions of the moldings. In these bottom grooves it will dry again. Another advantage is that the guides H, H, not being grooved to receive the edges of the 105 screen, they will not cut or injure the hands of the person working at the window, or cleaning the latter, as is usually the case where grooved guides are used, as such grooved guides have for the most part sharp 110 edges. Another advantage is that both sides of the screen frame are fully seen and are not partially hidden, as is the case where certain other kinds of guides are employed. The sides of the screen frame being thus fully seen, 115 the appearance of the screen is quite symmetrical, and where the sides are of handsomely rarked metal, etc., the whole of such beauty is visible to charm the eye.

Another advantage of a screen construct- 120 ed as hereinbefore specified, is that the entire edge of the wire netting (screen-cloth) is everywhere protected, and not only is this true, but the entire frame admits of a certain expansion and contraction, and will yet 125 keep close to the window frame. Furthermore, the frame will accommodate itself to a certain amount of irregularity in the shape (conformation) of the window frame. All builders of houses are well aware that almost 130

every window of a series meant to be constructed of exactly the same size will vary in size, so the advantage of a screen accommodating itself (as does the one herein de-5 scribed) to the variance in shape of the window, will be obvious.

So far as the primary molding is concerned, the same piece which supports and embraces the rod frame and the screen-10 cloth, also provides a groove for the guide, thus performing this threefold function.

The corner pieces M and N may be made separate and joined at the corner. So also the corner piece N may be made in two 15 pieces and afterward united. But the absence of the roof p^2 in one of the corner pieces, namely: the piece N allows the two parts M and N of the corner to be made of one piece of metal, and be integral. Under 20 certain conditions, the advantage of such a

capability is great.

The guides may each be made of a strip of wood, or be of a solid piece of metal or of a sheet of metal bent. I here present a construction of these guides which embodies certain features of my invention. The guide is made of a strip of sheet metal bent into a U-shape, substantially as illustrated in Figs. 2 and 3, the open side of the guide being next to the window frame. So far as the function of the guide as a projecting guide presenting to the screen a metal surface is concerned, the open space of the guide as disposed, is not a material matter. I desire to have those surfaces of the guide which are exposed to the weather and to moisture of a non-oxidizable material. Of such material I prefer to use copper. Copper is expensive. I therefore make the main portion of this U-shaped guide of sheet steel H5, bent to shape and apply to the outer surface of this steel H5 a very thin lamina or sheet of copper H2. This copper extends over the top and sides of this steel form and extends under the lower ends H⁸ of this steel form, and extends up into the space within the steel form along the upper sides of the latter, making the laps H4, H4. See Figs. 4 and 5. Thus the moisture present on the top or sides or bottoms of the guide, or on the surface of the window frame J cannot reach the steel to rust it, and thus to impair the durability or its usefulness. A modification of this copper coated guide is presented in Figs. 15 and 16. There I employ a strip He of wood and I cover this with the thin copper sheet H2. This sheet H2 extends over the top and sides of the strip He, and also under those edge portions H⁸, H⁸ of the bottom which are adjacent to the sides. In this way, I utilize the copper lamina or sheathing H2 to protect the wood from the attacks of moisture.

A great many slight changes might be made in the general form and arrangement

of the parts described without departing from my invention, and hence I do not confine myself to the precise details set forth, but consider myself at liberty to make such slight changes and alterations as fairly fall 70 within the spirit and scope of my invention.

What I claim as new, and of my invention and desire to secure by Letters Patent,

1S:---

1. In a screen, the combination of the pri- 75 mary rod frame, and the screen-cloth extended around this frame and lapped upon itself beyond the frame, a molding made in one piece, and having the lips f^4 , f^4 , located at opposite sides of the screen-cloth and 80 its lap and respectively provided with the tips f5, f5, which pinch the screen-cloth tightly between them, and the semi-cylindrical parts f^3 , f^3 , embracing the rod and the screen-cloth there, and below these last 85 named parts, the constricted neck the sides extending outward from this neck and merging into the sides f, f, extending down and terminating in the bottom bends e, e, which latter respectively extend inwardly and there 90 unite with the inner walls d³, which extend up, and the roof d^2 united to the upper ends of the walls d^3 , d^3 , these walls d^3 , d^3 and the roof d^2 forming the complete groove d, substantially as and for the purposes speci- 95 fied.

2. In a screen, a corner having a portion adapted to embrace the frame and having a groove p, a roof (or bottom) of the groove, the walls of the groove terminating 100 in the bends, the bends, and walls extending respectively from these bends and then a contracted neck formed by the extension of these walls, semi-cylindrical portions formed by the continuation of these walls, 105 and a contracted portion formed by the approach of these walls toward the screencloth, substantially as and for the purposes

specified. 3. In a screen, a corner having a portion 110 having walls approaching each other at their edges, for holding the screen-cloth, a cylindrical portion, formed of the walls each shaped into a semi-cylindrical form, a contraction or neck formed by said walls below 115 said cylindrical part, and the further extension of the walls, and the bends formed by the further extension of the walls, and the backwardly secured ends of the walls, substantially as and for the purposes 120 specified.

4. In a screen, a primary frame and screen-cloth applied thereto, a primary molding having a central portion of a cylindrical form, embracing the first named 125 frame, a corner having a portion provided with a cylindrical part embracing the first named frame, and having on one side of this cylindrical part a pair of lips holding between them the screen-cloth, a contracted 130

neck on the other side of said cylindrical portion and an enlarged portion beyond the neck, and provided with a groove and a roof thereto, both formed by the reëntering of 5 the walls of this corner, substantially as and

for the purposes specified.

5. In a screen, a frame and screen-cloth applied thereto, a primary molding having a central portion of a cylindrical form em-10 bracing the first named frame and further provided with the lips for holding between them the screen-cloth, a corner having a portion provided with a cylindrical part embracing the first named frame, a contracted neck 15 on the side of this cylindrical part nearest the outer edge of the frame, and an enlarged portion beyond the neck and provided with a groove whose roof and sides are formed by the reëntering of the walls of this cor-20 ner, substantially as and for the purposes specified.

6. In a screen, a frame and screen-cloth wrapped around said frame, a primary molding having a central portion of a cylin-25 drical form, embracing the first named frame, and further provided with lips on one side of this cylindrical part which tightly hold the screen between them, and a corner piece having a portion provided 30 with a cylindrical part embracing the cylindrical part of the primary molding, and a pair of lips respectively outside of the lips of the primary molding and converging at their free edges to the screen-cloth, the por-35 tion of this corner part on the other side of the cylindrical part being provided with a groove, substantially as and for the purposes

specified.

7. In a screen, a frame and screen-cloth 40 applied thereto, a primary molding having at one end a groove, and a central portion embracing the said frame, and at the other end a pair of lips engaging the screen-cloth, and a corner having a cylindrical portion 45 embracing the cylindrical portion of the primary molding, and a pair of lips respectively outside of and extending over the lips of the primary molding, and further provided with extending walls which 50 embrace the corresponding walls of the primary molding, and are carried down beyond the bends of the mouth of the groove of the first named molding, and up within the groove of said primary molding and are 55 there provided with a roof which is situated nearer the outer edge of the screen than the roof of the groove of the primary molding, substantially as and for the purposes specified.

8. In a screen, a frame and screen-cloth applied thereto, a primary molding having a hollow cylindrical portion embracing and securing said frame in position, and further provided with a groove adapted to receive the guide of the window frame, and i

a corner, a part of which has a cylindrical portion embracing the cylindrical part of the primary frame, and lips which engage the screen-cloth, substantially as and for the purposes specified.

9. In a screen, a frame and screen-cloth applied thereto, a primary molding having. a hollow cylindrical portion embracing and: securing said frame in position, and provided with a groove to receive the guide 75 of the window frame, and a corner, a portion of which has a cylindrical portion embracing the cylindrical part of the primary frame, and lips which engage the screencloth, this portion of the said corner ex- 80 tending out into two walls respectively outside of the grooved portion of the primary. molding, substantially as and for the purposes specified.

10. In a screen, a frame and screen-cloth 85 applied thereto, a primary molding having a hollow cylindrical portion closely embracing said frame, and provided with a groove to receive the guide of the window frame, and lips which engage the screen-cloth, and 90 a corner, a portion of which has a cylindrical part embracing the cylindrical part of the primary frame, and walls extending from said cylindrical portion along the outside of the side walls of the groove of 95. the primary molding and then around the free edges of the walls of said groove, and backward for a distance, substantially as

and for the purposes specified.

11. In a screen, a frame and screen-cloth 100 applied thereto, a primary molding having a hollow cylindrical portion closely embracing said frame, and provided with a groove to receive the guide of the window frame, and lips which engage the screen-cloth, and 105 a corner, a portion of which has a cylindrical part embracing the cylindrical part of the primary frame, and walls extending from said cylindrical portion along outside of the side walls of the groove of the pri- 110 mary molding and then around the free edges of the walls of said groove, and backward for a distance, and lips which embrace the lips of the primary molding, substantially as and for the purposes specified.

12. In a screen, a primary frame and screen-cloth wrapped around it, a molding closely embracing the primary frame and engaging the screen-cloth, this molding provided with a groove and a corner consisting 120 of two parts, one part having a cylindrical portion embracing that cylindrical portion of the primary molding which embraces the primary frame and provided with a roof, and the other portion of the corner consist- 125 ing of a cylindrical portion embracing the primary molding, and whose walls extend from the said cylindrical portion and down outside of the walls of the groove of the primary molding and lap around the bottom of 130

said walls, substantially as and for the pur-

poses specified.

13. In a screen, a primary frame, screencloth applied thereto, and a primary mold-5 ing, having a cylindrical portion which embraces the primary frame and provided with lips which engage the screen-cloth, and also having a groove adapted to receive the guide of the window frame, in combination with 10 a corner consisting of two pieces, one of said pieces embracing the primary molding and provided with a groove lying within the groove of the primary molding, the other of said corners embracing the primary mold-15 ing at the cylindrical portion, and also embracing the outer walls of the primary molding between which the groove of the primary molding is contained, but said corner portion being open at bottom so as to admit the 20 guide of the window frame within it, and also within the groove of the primary molding as far as the roof of the latter, the first named portion of the corner piece being provided with an incision W, W, and a portion 25 of the roof raised therefrom combined with a spring whose adjacent end is inserted through said incision and between the raised portion of the roof and the adjacent portions thereof, the other end of the spring resting 30 in the groove of the primary molding at the other side of the corner, substantially as and for the purposes specified.

14. The combination of guides on the

window frame, and a screen provided with a primary frame, and a molding embracing 35 the same, a spring, reversible corners, respectively located at opposite edge portions of the frame, each of these reversible corners respectively provided with grooves, and adapted to permit the spring to lie within 40 the groove of one part of the corner piece, while the other portion of the corner piece is provided with a groove having a roof, said corner piece when in duplicate and used on the opposite edge of the frame, permit- 45 ting that portion of the corner piece provided with a groove having a roof to be used in conjunction with the guide on that edge of the frame, while the first named portion of the opposite corner piece is used in con- 50 junction with the guide at the opposite edge, the spring on the one side retaining the screen upon the window frame guide at the opposite edge of the window, one of the grooves of the reversible corner piece at its 55 bottom provided with means for attaching the heel of the spring, the spring curved and connected at its heel on the one groove, and extending in the groove around the corner and located in the other groove of the corner, 60 substantially as and for the purposes specified.

HENRY HIGGIN.

Attest:

STARBUCK SMITH, K. SMITH.