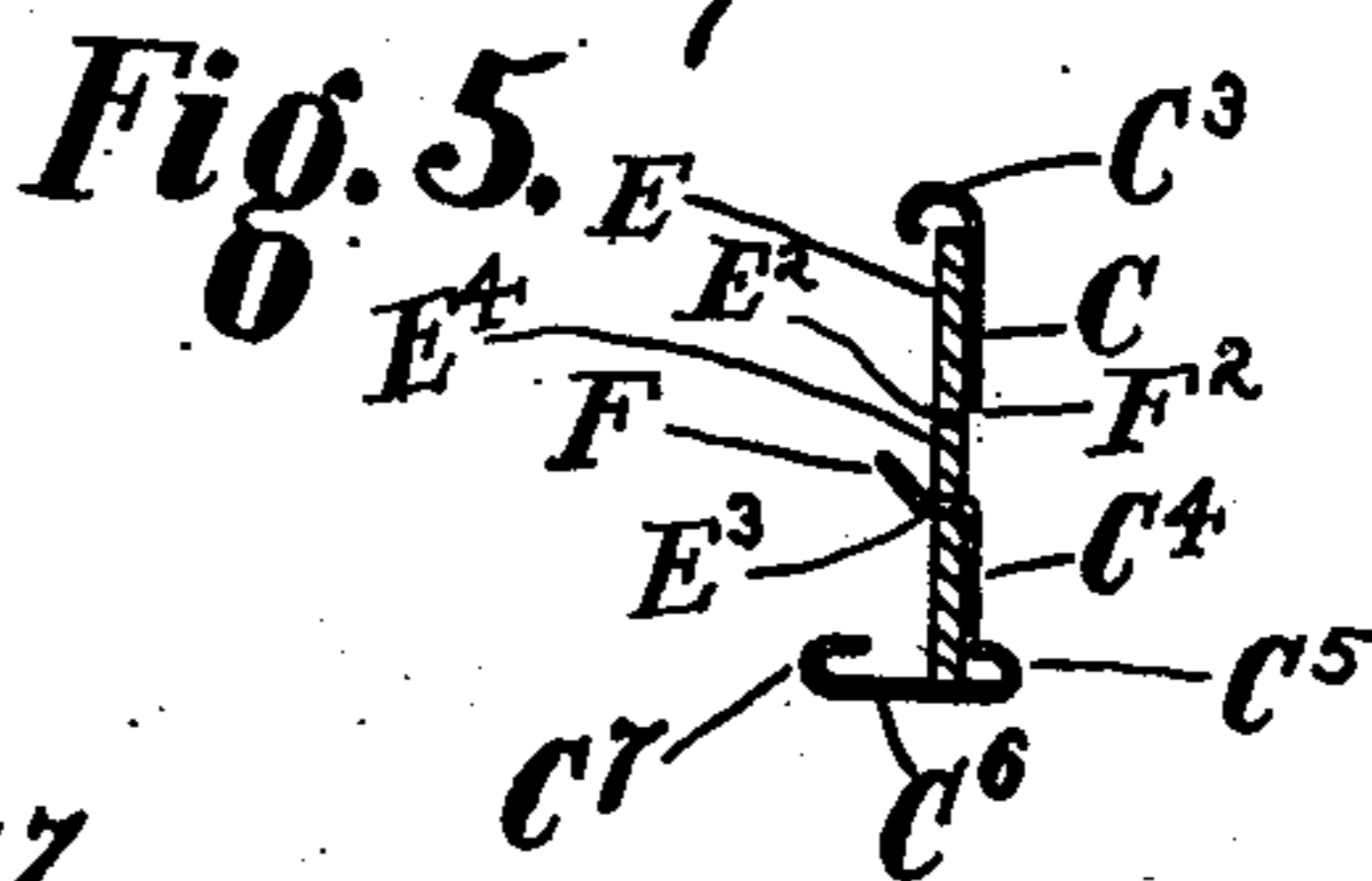
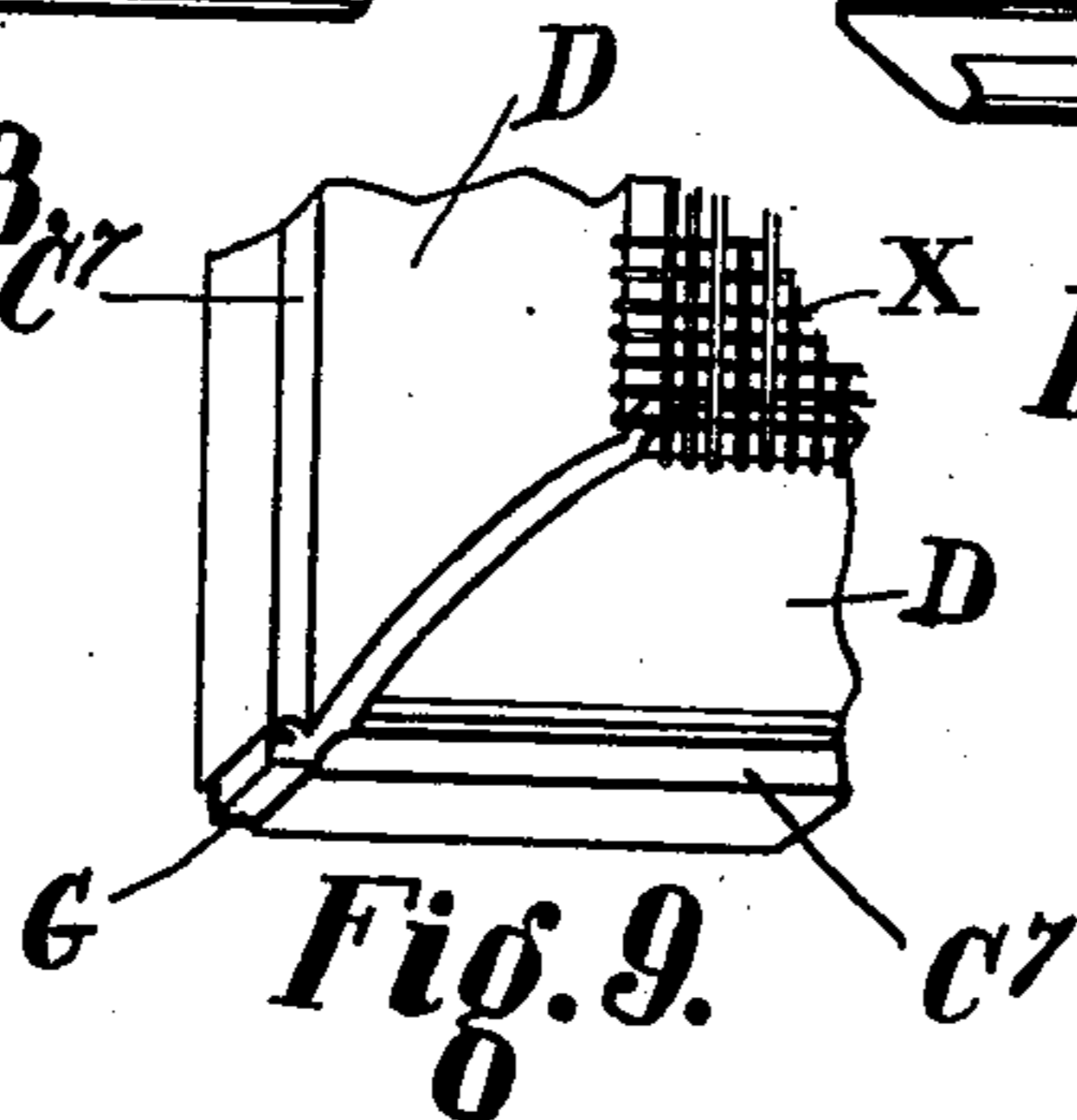
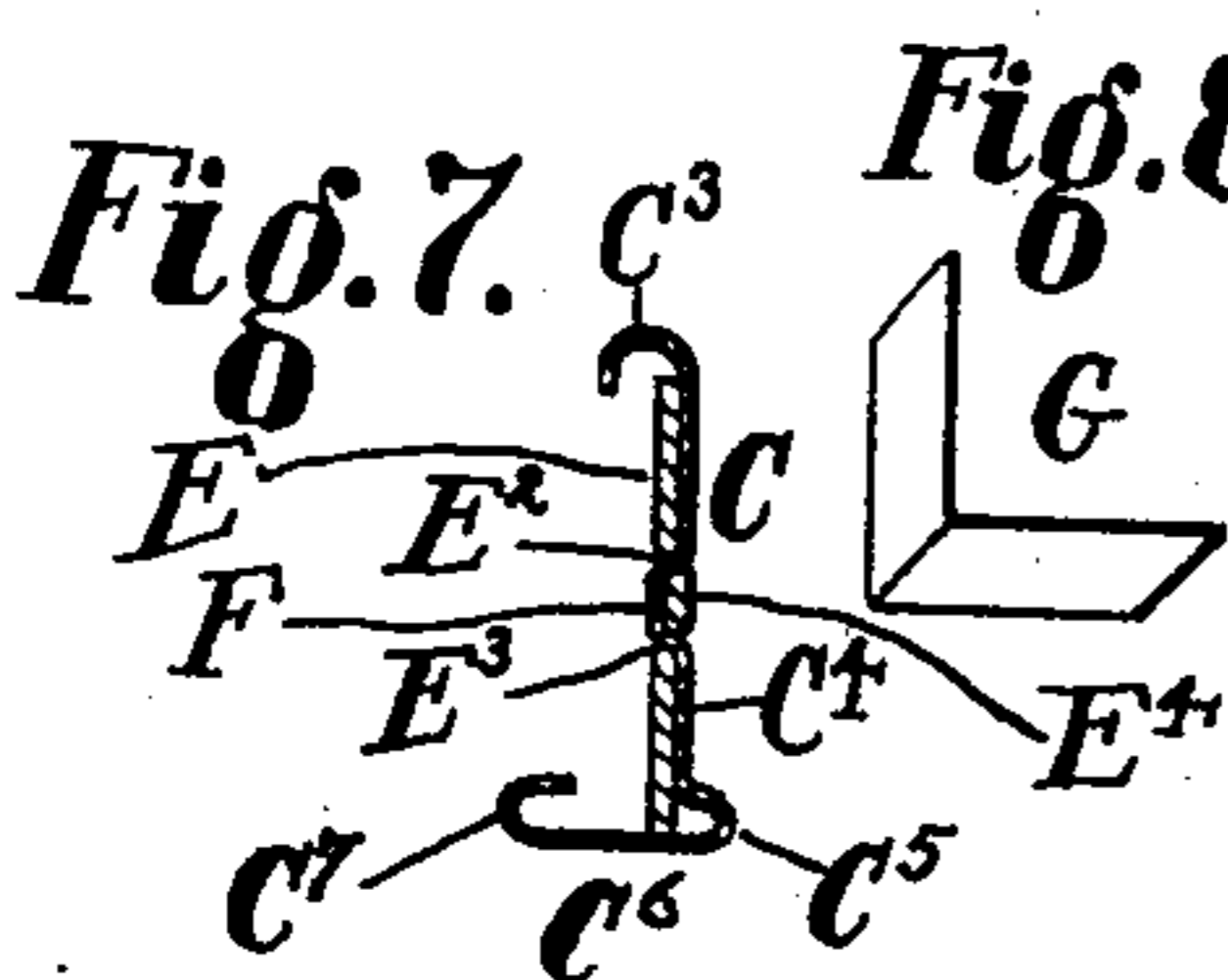
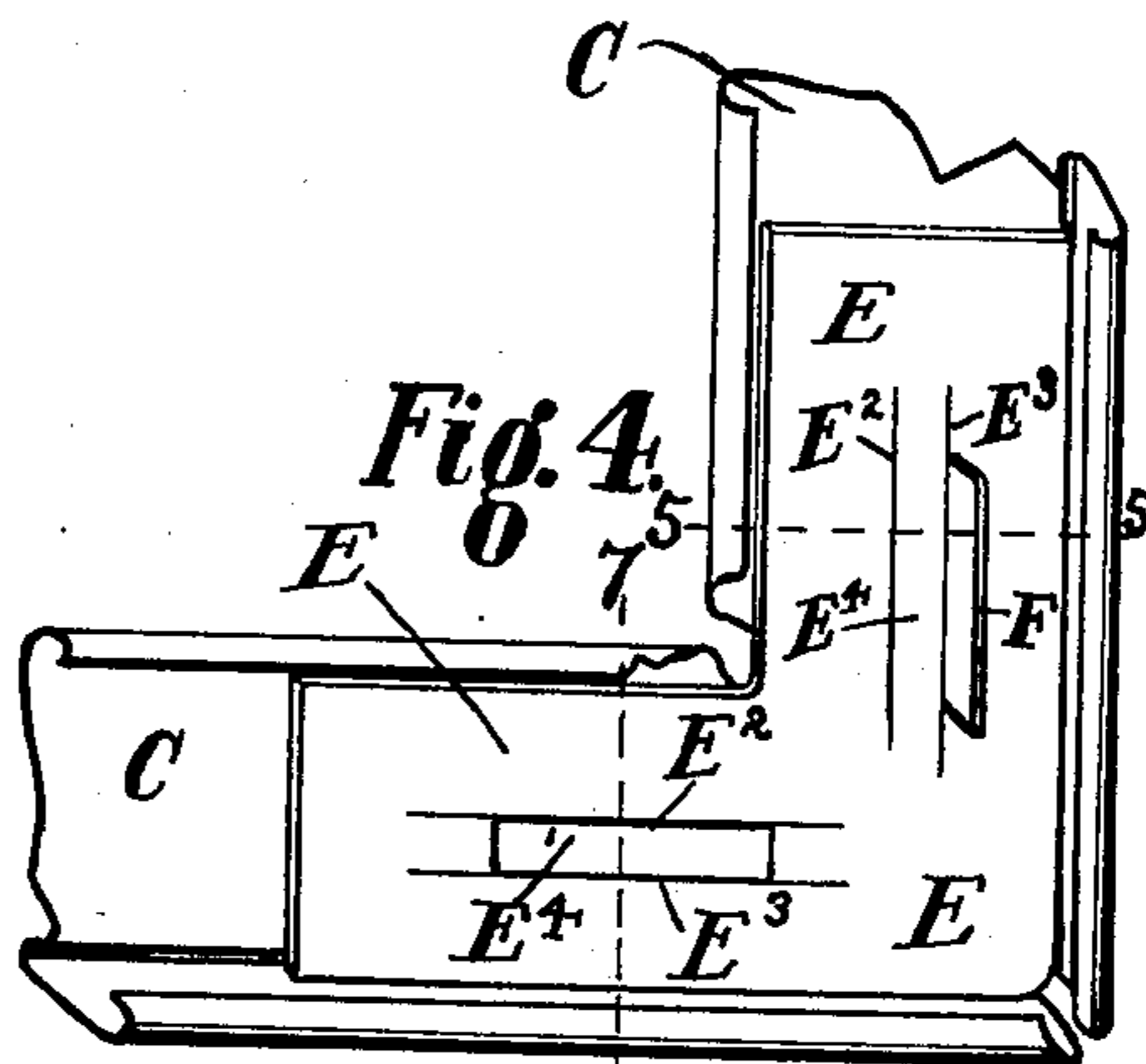
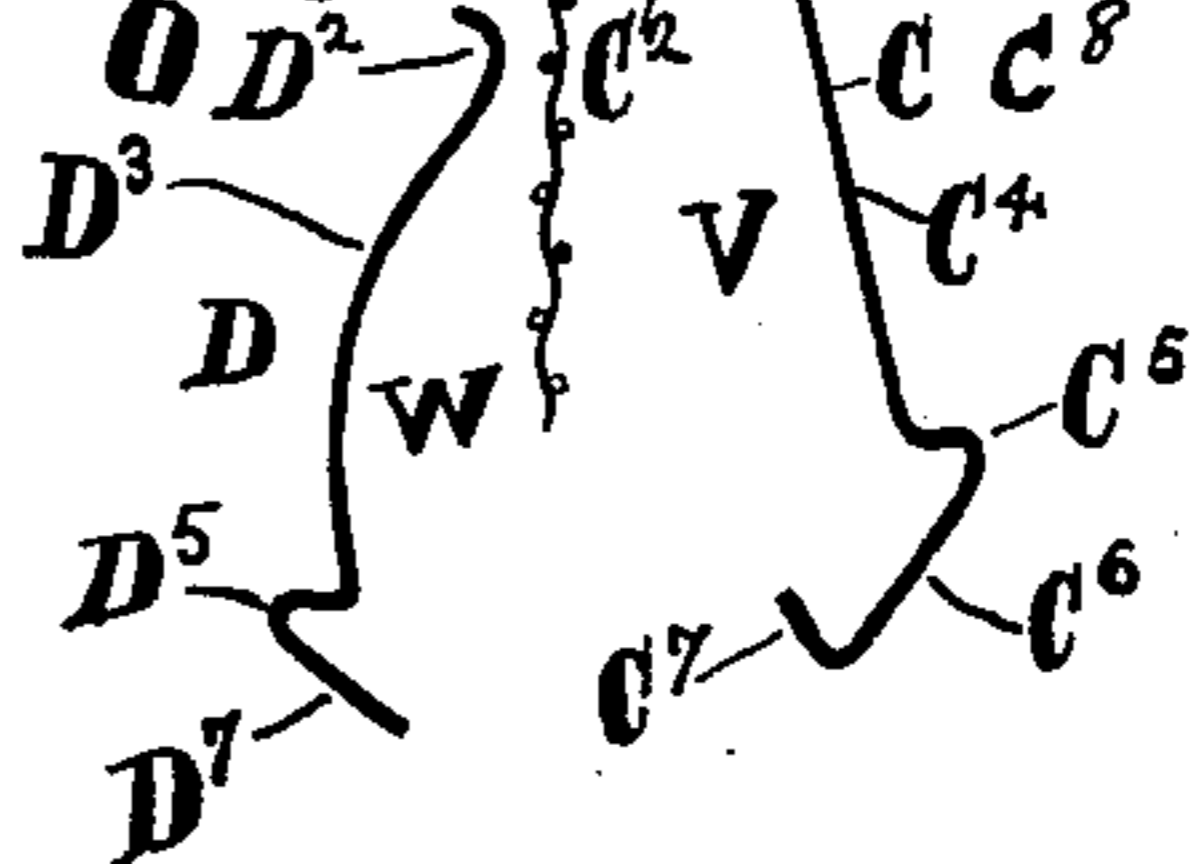
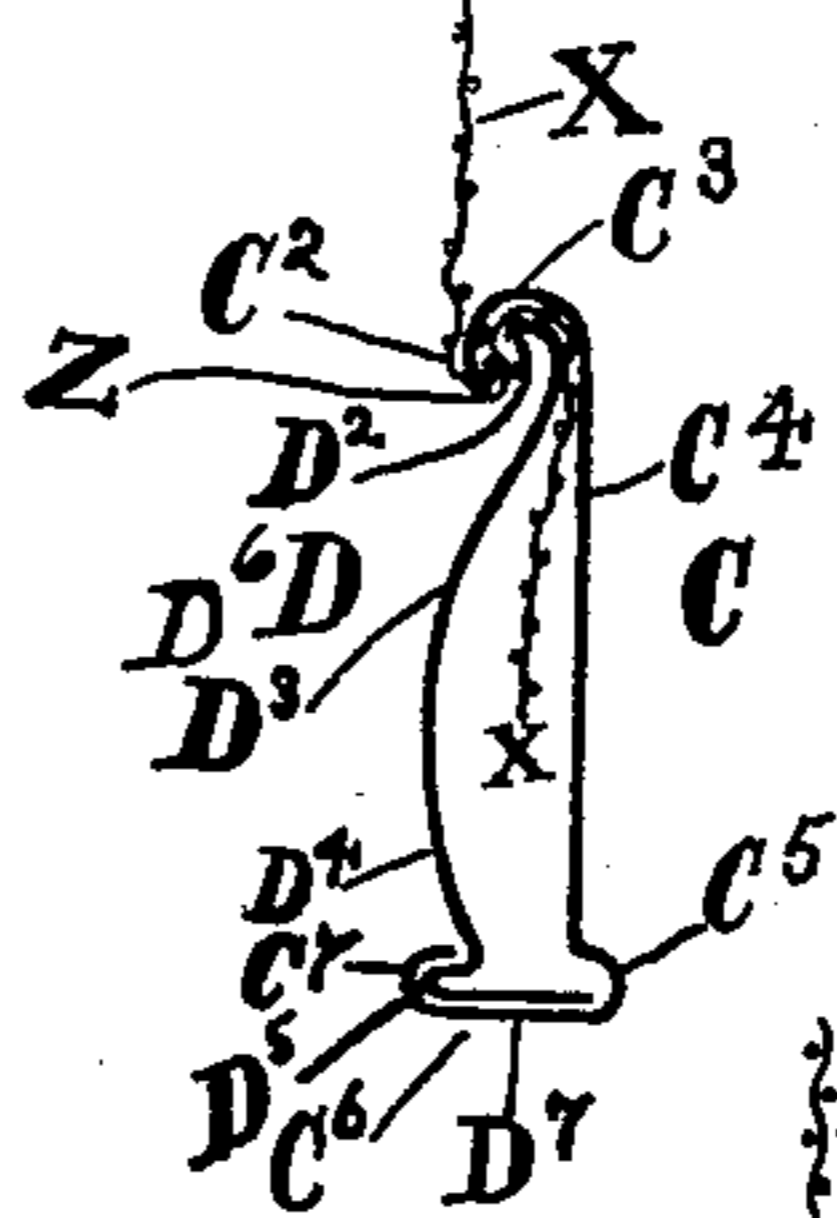


APPLICATION FILED AUG. 26, 1904.

Patented May 31, 1910.

2 SHEETS—SHEET 1.



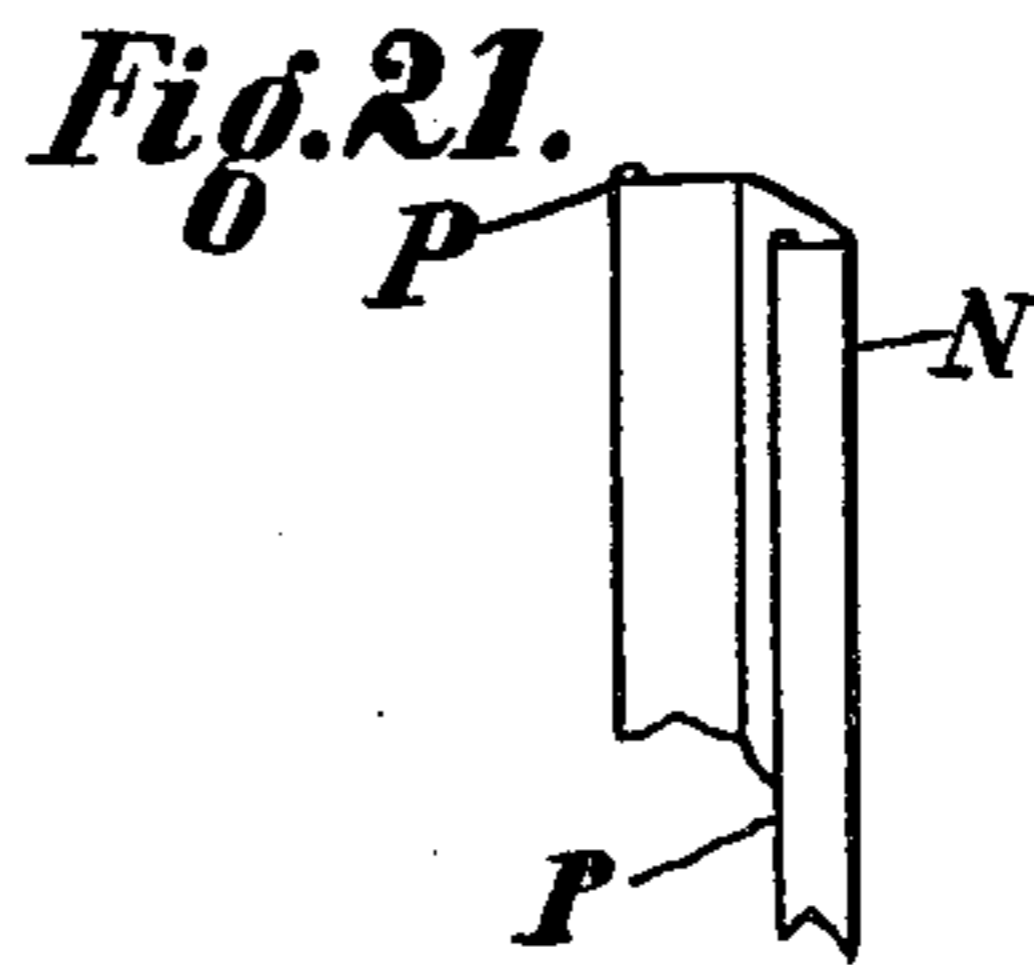
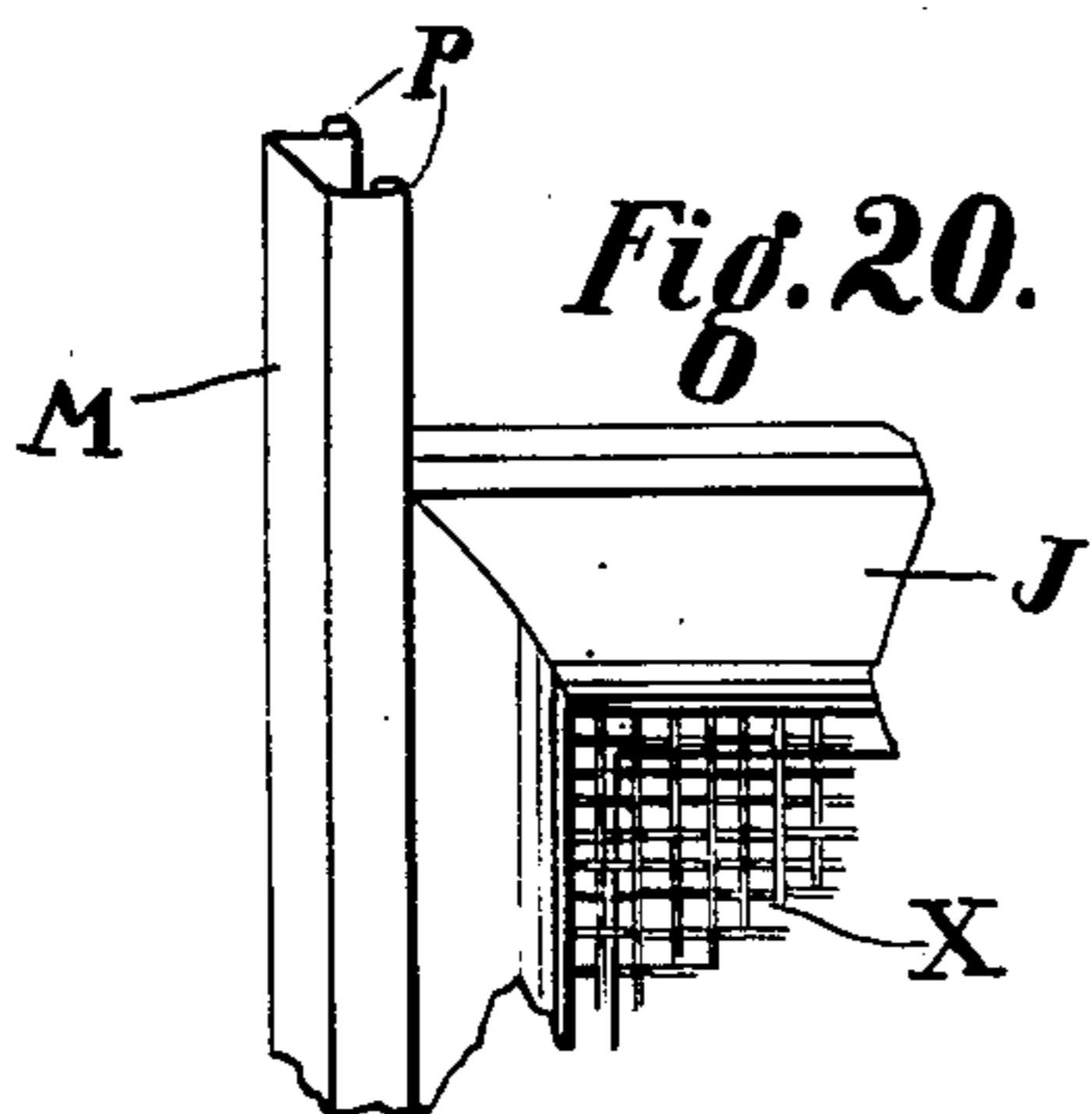
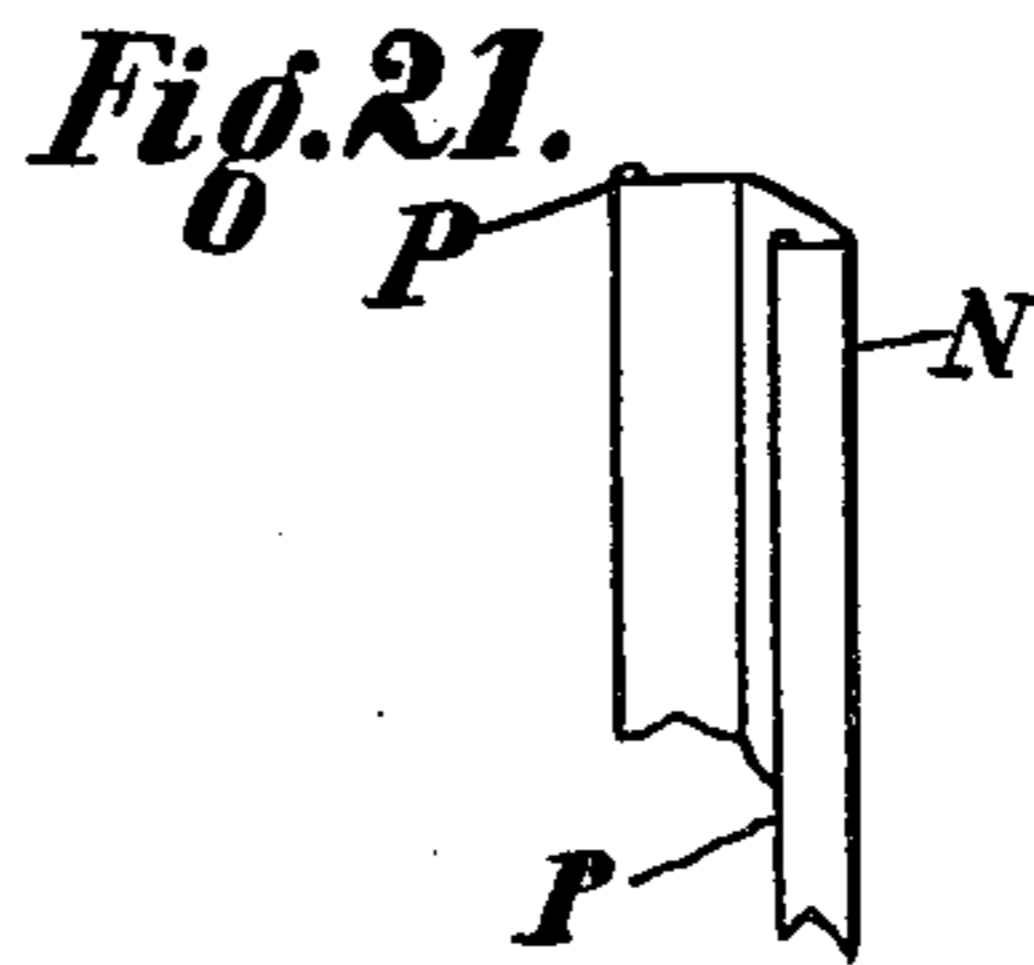
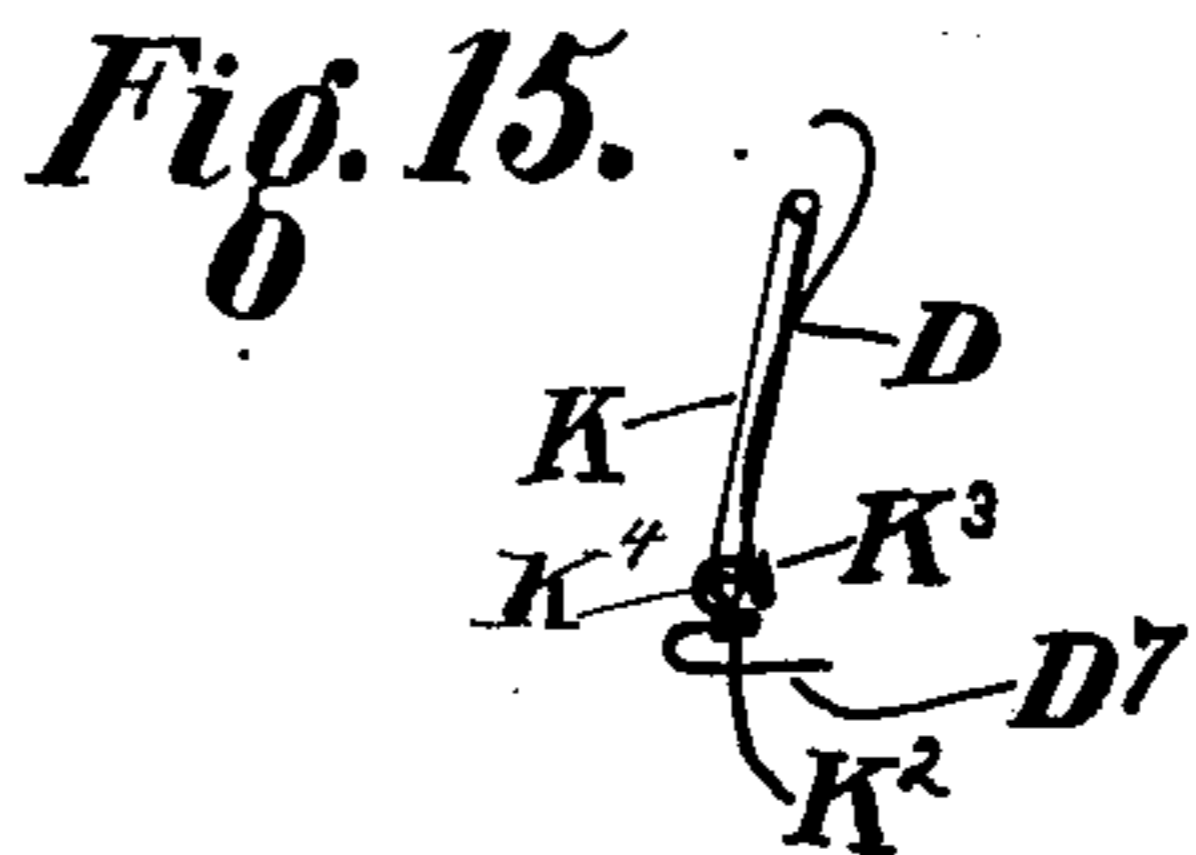
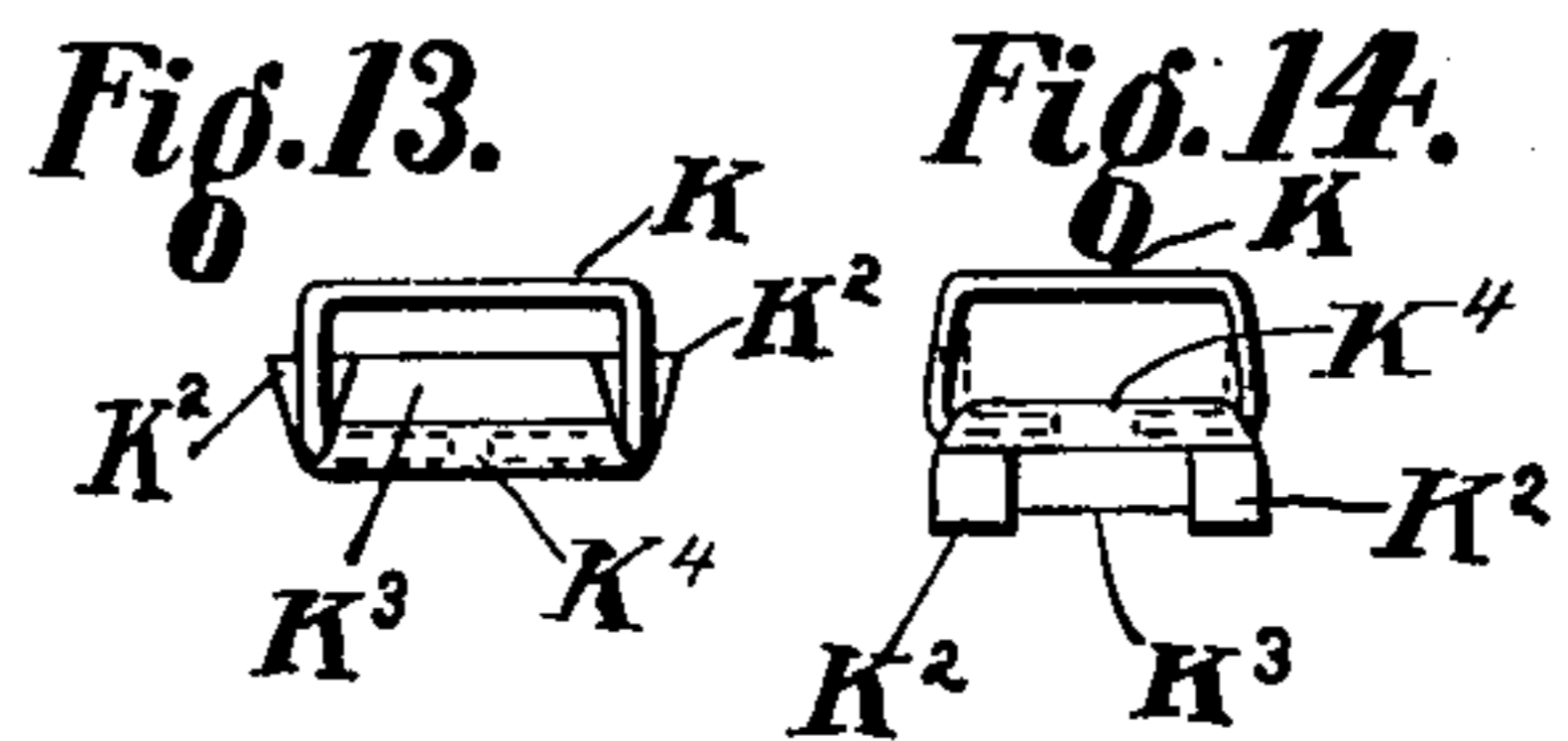
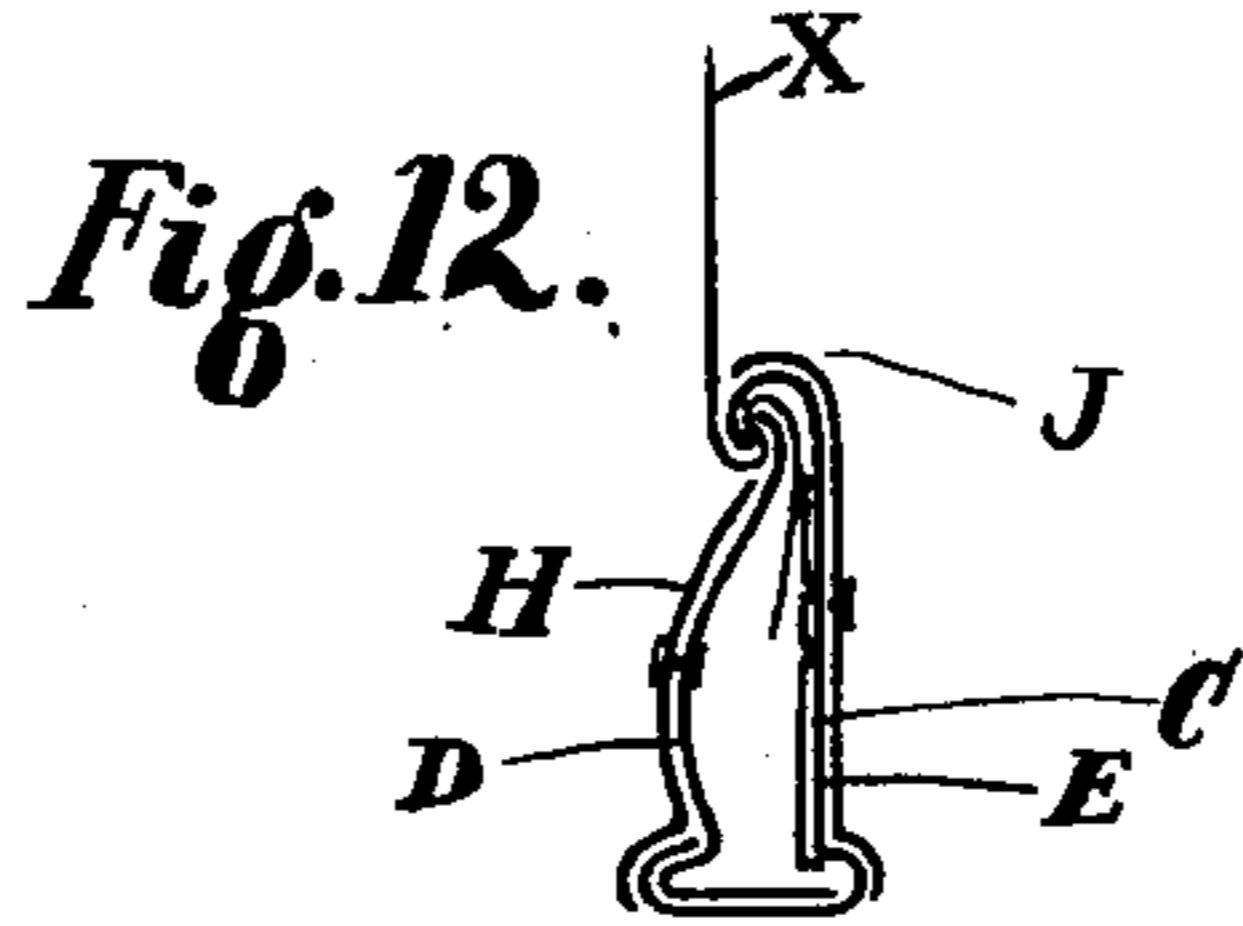
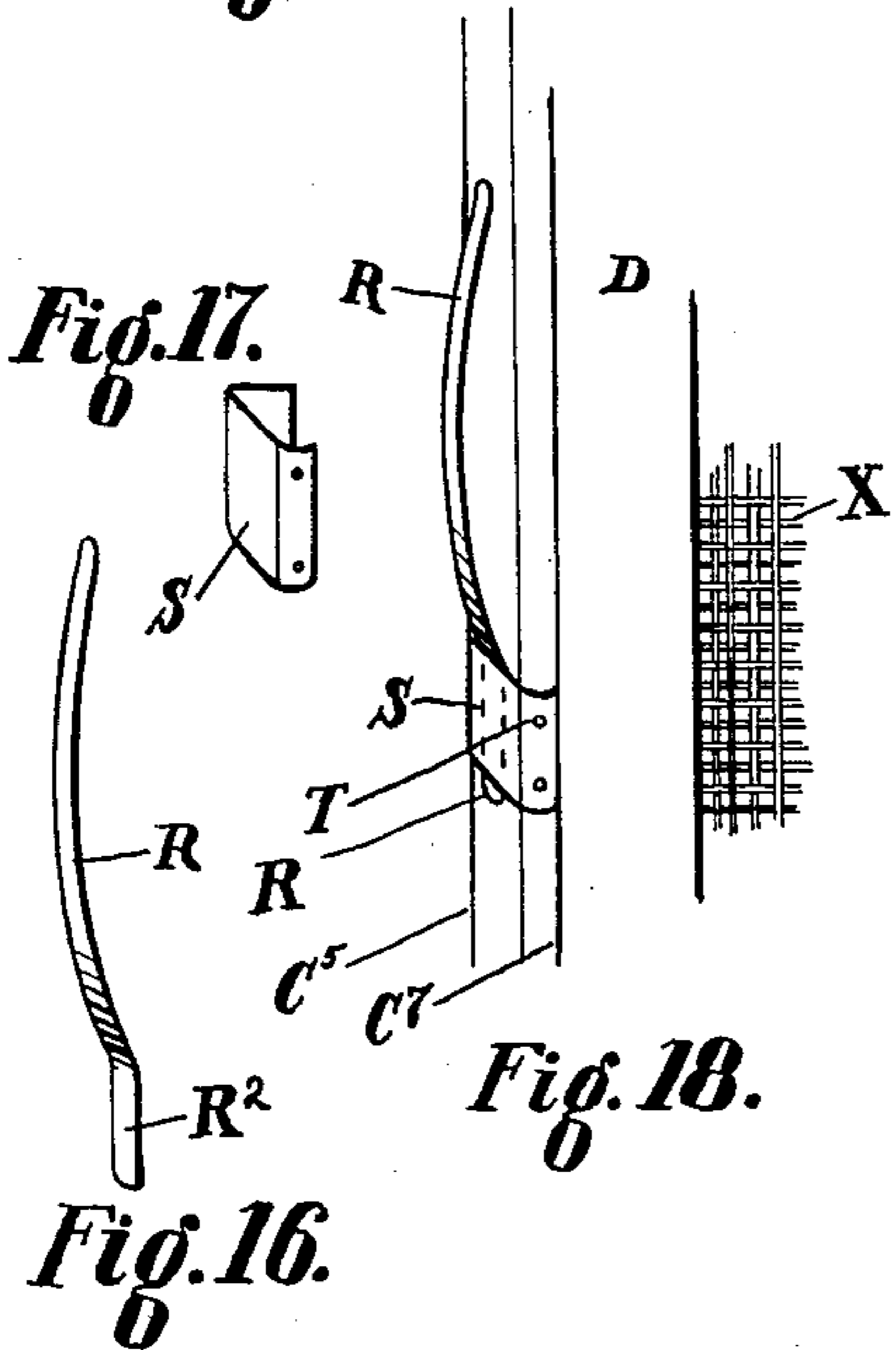
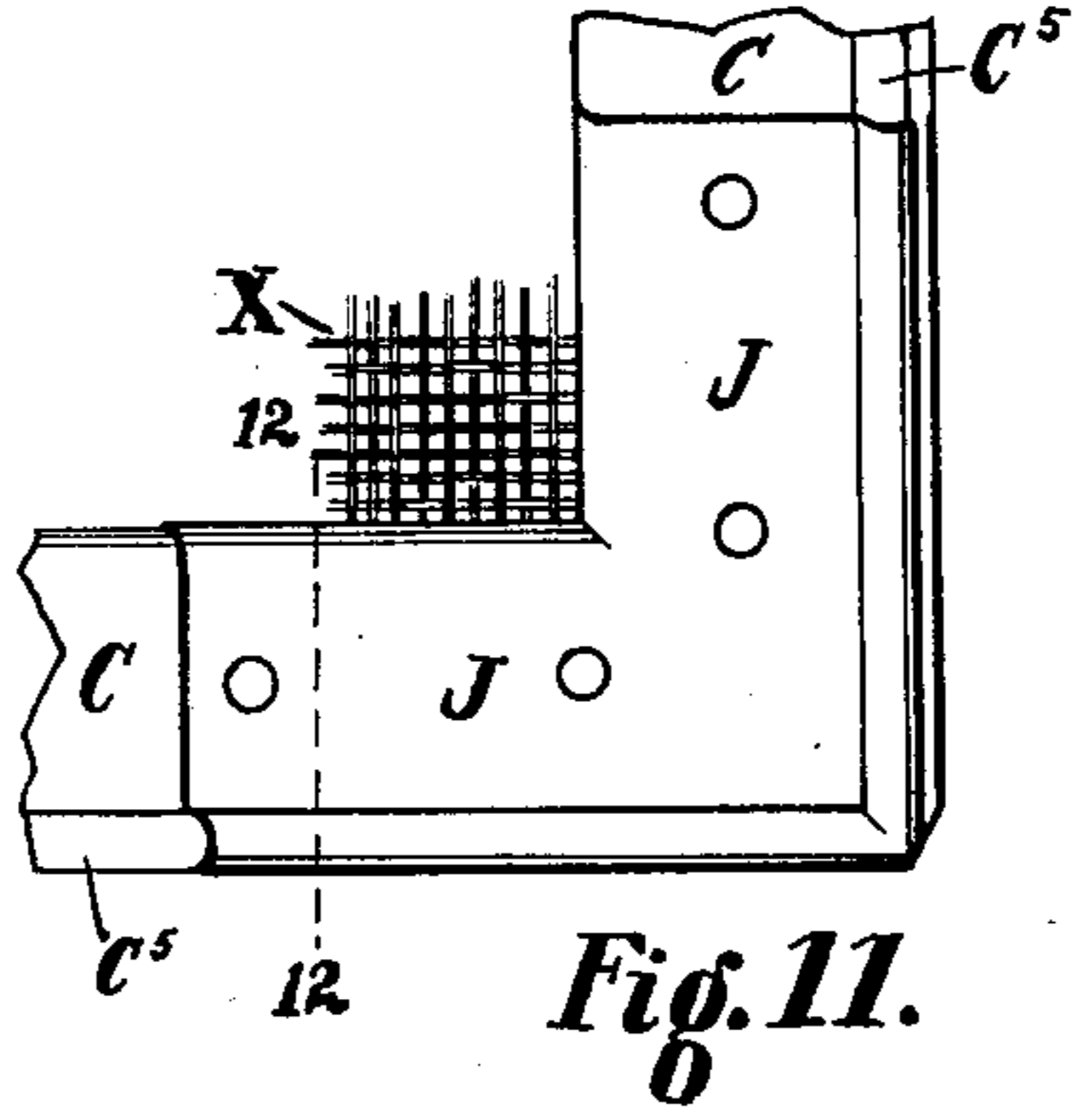
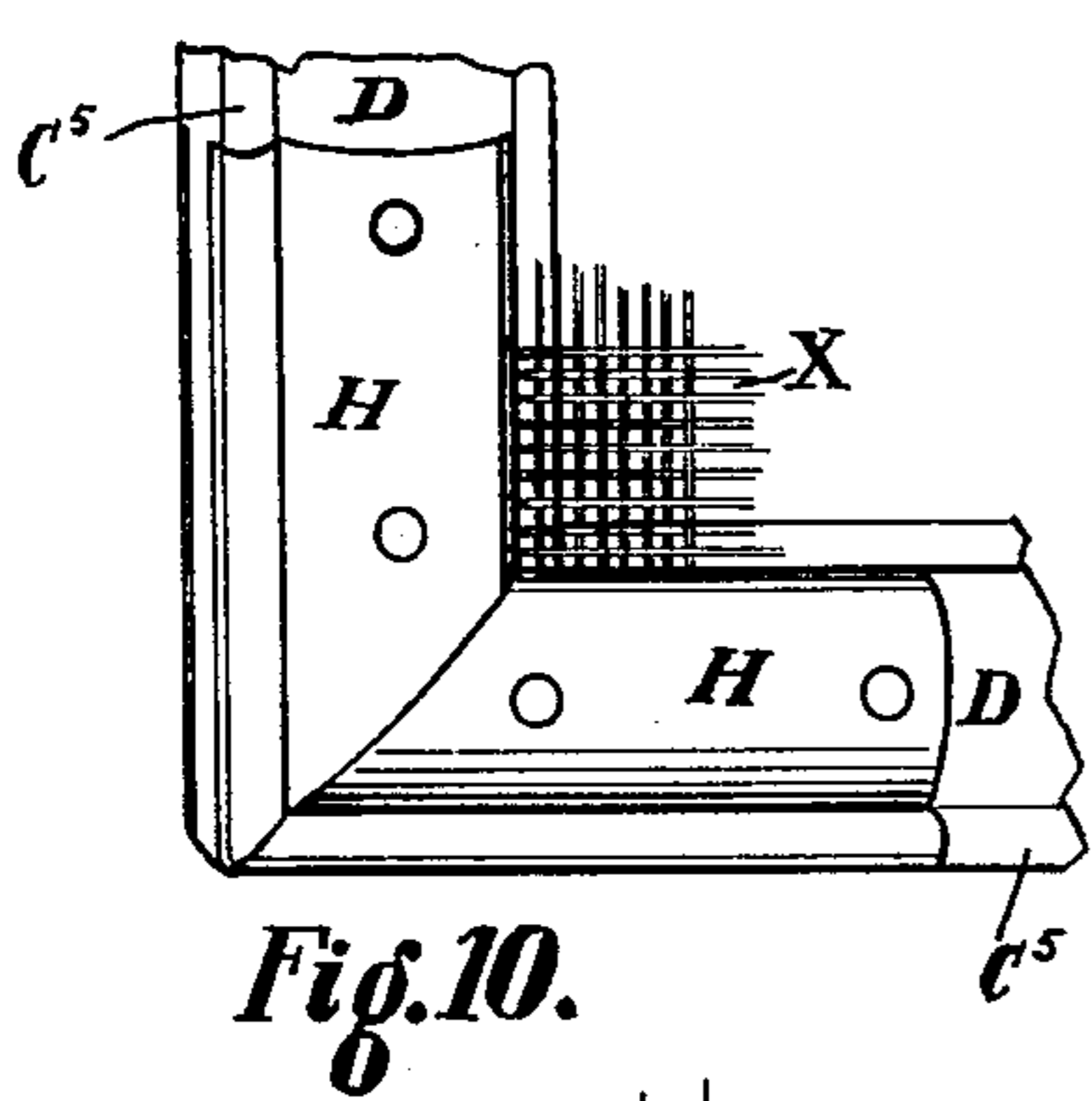
INVENTOR
Henry Higgin
BY his ATTORNEY
Wm. Hubbell Fisher

H. HIGGIN.
WINDOW SCREEN.
APPLICATION FILED AUG. 26, 1904.

959,859.

Patented May 31, 1910.

2 SHEETS—SHEET 2.



WITNESSES
Franklin Alden
J. Smith,

INVENTOR
Henry Higgin
BY HIS ATTORNEY
Wm. Hubbell Fisher

UNITED STATES PATENT OFFICE.

HENRY HIGGIN, OF NEWPORT, KENTUCKY, ASSIGNOR TO THE HIGGIN MANUFACTURING COMPANY, OF NEWPORT, KENTUCKY, A CORPORATION OF WEST VIRGINIA.

WINDOW-SCREEN.

959,859.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed August 26, 1904. Serial No. 222,296.

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 Campbell and State of Kentucky, have invented certain new and useful Improvements in Window-Screens, of which the following is a specification.

One of the main features of my invention relates to the special construction of the metallic screen frame. The object of this feature is to provide a frame that shall by reason of the improved constructions of its parts, be light of weight, be strong, and be readily and economically manufactured.

Certain features of my invention relate to special and advantageous constructions connecting the side pieces of the frame and the end pieces of the frame at the corners. Another provision of this invention is that in combination with this improved construction, and as one of the accompanying resultant advantages, the frame, when combined with the wire screen cloth shall have a water table and drip edge by which the water collecting on the cloth from rain or any other cause, shall be conducted away from the lower frame, and have an immediate opportunity to rapidly run or drip off from the screen, and thus leave the wire cloth and the frame dry, in this manner preventing every part of the screen from rusting.

Another feature of my invention is an advantageous combination of the handles for lifting or otherwise moving the screen, with a screen frame of the kind herein mentioned.

A certain feature of my invention is an improved construction of the slides, which I provide to be applied to the window frame and in which the side edges of the screen slide, and whereby the screen is conveniently held in the window.

These and other important features of my invention and 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 similar letters of reference indicate corresponding parts,—Figure 1 is a perspective view of a screen and of a portion of each slide, this figure illustrating, in general, my invention.

The inner side of the screen is toward the beholder. Fig. 2 represents a transverse section taken in the plane of any one of the dotted lines 2, 2, of Fig. 1. It should be here remarked that either end of any one of the four pieces which constitute respectively the side border pieces and the end border pieces, and which enter into the binding of the screen, would appear substantially the same as in Fig. 1. Fig. 3 represents the wire screen cloth, and, on one side thereof, one of the complementary pieces, and on the other side, the other of the complementary pieces which when brought together, and duly combined form the article shown in Fig. 2. Fig. 3 represents certain steps in the formation of the screen. Fig. 4 is an elevation of a corner piece for uniting two adjacent border pieces of the frame, parts of such adjacent corner pieces being shown united thereto. The purpose of this figure, and of the succeeding Figs. 5, 6 and 7 is to show the mode of union, and the result of such mode of union. Fig. 5 is a section, taken at right angles to the plane of the corner piece and in the plane of the dotted line 5, 5, of Fig. 4. Fig. 6 is an elevation of the other side of the corner piece, shown in Fig. 4. Fig. 7 is a section similarly taken in the plane of the dotted line 7, 7, of Fig. 4. Fig. 8 is a view in perspective of the angulated small corner piece used in finishing the extreme portion or tip of the corner. Fig. 9 is a perspective view of a corner of the frame, and showing the angle piece of Fig. 8, in position therein. This is a view of the inner side of a corner, before the corner cap or finish is put upon the side of the corner. Fig. 10 shows a perspective view of the inside of a corner of the screen, after the corner cap or finish that is for this side of the corner has been put thereon. Fig. 11 shows in perspective a view of the other side of the corner shown in Fig. 10, and shows the other corner cap or finish which belongs to this side of the corner and which has been put in place thereon. Fig. 12 is a transverse section, taken in the plane of the dotted line 12, 12, of Fig. 1, and more particularly illustrating how these cap corner pieces are combined with the side and end pieces of the binding. Figs. 13 and 14 are detail elevations of the handle or lift, which is a convenient means for lifting or otherwise moving the screen. Fig. 15 is a transverse section of the inner

piece of the binding and of this handle. The section is taken in the plane of the dotted line 15, 15, of Fig. 1, and illustrates the manner in which this handle is combined with the frame. Fig. 16 is an edge view of one of the preferred forms of springs employed to keep the frame in position, at the desired height in the window. Fig. 17 is a view of a clamp which may be used to secure the spring in position on the frame. Fig. 18 is a view in perspective of this spring and this clamp and of a part of the frame. The view illustrates the mode in which this spring and clamp are applied. Fig. 19 is a view in perspective of a modified construction of this spring and clamp. Fig. 20 is a perspective view of a part of the frame, and a part of the slide, in which the adjacent side piece of the frame piece slides, when in position in the window. Fig. 21 is a perspective view of the slide at the opposite side of the window, and which receives the adjacent binding or edge portion of the screen.

I will now proceed to describe my invention in detail.

A indicates the entire screen.

X indicates the screen cloth.

B, B indicate the side frame pieces, one on each side at the screen edge. There is a binding at the edges of the screen cloth. This binding at each side edge of the screen is indicated by B, and at the top and at the bottom edge of the screen by B². This binding is constructed substantially as follows: There is an outer piece C, and an inner piece D. The inner piece D has at the top a curve D². Lower down, it curves down and then out to a plane somewhat in advance of the plane of the wire screen cloth X, if said plane were extended downward. This curve of piece D, I indicate by D³. The piece D then inclines backward in a slight curve as shown at D⁴. At the base it extends forward and re-curving on itself, makes the shoulder D⁵. It then extends rearward forming the base D⁷. The side composed of the curves D², D³, and incline D⁴, I indicate by the character D⁶. The outer or opposite piece C is curved over at the top in a curve C³. The free end (edge of the piece C) of this curve terminates in the thickened portion C². The latter is preferably formed by sharply bending or folding this free end in upon itself. The curve C³ surmounts and merges into the more vertical portion C⁴. Near its bottom, the latter is bent out and then back forming the curved portion C⁵ forming at the opposite side a recess. Thence it extends along inwardly and forms the bottom C⁶. Then it curves up and back forming the curve C⁷. I will indicate the entire upright portion above the bottom by the character C⁸.

When combined, for use, the curve D² of

the piece D lies under and within the curved portion C³ of the piece C. The bottom portion D⁷ of the piece D lies upon the bottom C⁶ of piece C. One edge of the bottom D⁷ is in the recess C⁵ of piece C, and the other edge, viz.: the curved edge D⁵ occupies the recess of the curve C⁷ of the piece D. The wire screen cloth X coming from the middle portion of the screen is bent around the part C² of piece C, and up into the curve C³ and extends between this curved part C³ and the curved part D² of piece D, and thence as far as may be down between the parts D⁶ and C⁸. The screen cloth X is held firmly between the pieces C and D and cannot be pulled out.

Before alluding to any of the advantages of this construction, I will describe the preferred and advantageous mode of putting together the screen and the parts C and D. The parts D and C are formed, preferably out of sheet metal. The part D is first formed in the shape shown in Fig. 3, which blank I designate by W, and so the part C is formed as shown in this figure, which blank I designate by V. Then the adjacent edge of the wire screen cloth X is by means of a suitable tool rolled up and around the points C² and into the recess of the curved portion C³, closely following said curve. The screen cloth X thus bent will retain its shape thus conferred, and its position relatively to the parts C² and C³. The part D is now applied to the cloth X and to the part C, first by inserting the curved part D² into the curved part C³, and then bringing the part D⁷ within the parts C⁷, C⁶ and C⁵. The parts C⁶ and D⁷ are then simultaneously bent upward toward the parts D², C³, until they assume the position illustrated in Fig. 2. The part or edge C⁷ is then bent inward and down upon the part D⁵, until it occupies the position shown in Fig. 2. The binding of one side of the screen has now been completed. The bindings of the other side and of the ends of the screen are formed in like manner. The ends of the binding are preferably made to be at an angle of fortyfive degrees to the length of the binding, in order to the more closely unite when combined as the frame of the screen. See Figs. 4, 6 and 9.

A convenient and advantageous means for uniting these bindings at the corners of the frame is as follows:—I provide a stiff flat angulated corner piece E, see Figs. 4, 5, 6 and 7, capable of being manipulated in a stamping press. This corner piece E is to be united to one of the parts D or C of the binding already described. I prefer to unite it to the part C. In each end portion, I cut two parallel slits E² and E³. The part lying between these slits I designate by E⁴. In each part C of the binding near the corner end I make one longitudinal cut F²,

and two transverse cuts F^3 , F^2 , one at each end of this slot. By this means, I form a piece or flap F . I then bend this flap inward as shown in Figs. 4 and 5, until it stands at a right angle to the plane of the part C^4 of the part C . It is now passed through the slit E^3 of the corner piece E . It is now in the position shown in Figs. 4 and 5. The parts thus placed are subjected to pressure by a suitable press. This pressure turns the flap F down upon the part L , and the pressure against the flap being continued, the flap forces the part E^4 into the opening in the part C formerly occupied by the flap before the latter was formed in part C by cutting, and bent out as shown in Fig. 4. As the result of this operation, the part E^4 is partly in part C , and partly in the corner piece E , and all of the flap F is in the corner piece E . The parts C and the corner pieces E are very firmly united, and a very strong corner is the resultant product of this operation. The slit E^2 is of course preferably present, as it the better enables the metal of E^4 to be passed into the opening in the part C left by bending out the flap.

When cutting the slits E^2 and E^3 , I prefer to cut them longer than the length of the flap. Then I can put the flap nearer to the real corner, or farther from it. In this way, I can within reasonable limits, make the sides of the frame longer or shorter, and the ends of the frame longer or shorter. The frame can thus be better fitted to a window of a size a little different from the commercial sizes of windows. This is a very simple adjustment. Of course the adjustment is made before the flap is turned down and pressed into the corner piece E . In making such adjustments of the binding, in a large number of instances, there will be a gap at the extreme corner between the binding of the side and the binding of the end. This gap is preferably covered, and a very suitable device consists of the angle piece G shown separately in Fig. 8, and in position in Fig. 9. The edges of this angle piece respectively fit the recesses formed by the curved parts C^5 and D^5 of the binding, and are held securely in place.

To complete the finish of the cover, I provide a corner cap H , and a corner cap J . Cap H fits over the inner bindings D , D , at the corner, see Fig. 10, and cap J fits over the outer bindings C , C , at the corner. Thus cap J is an outside one, and cap H is the inside one. These caps are duly fastened to the frame, preferably by rivets.

A convenient mode of uniting a lift or handle to the frame is as follows:— K is a handle, having a sheet metal securing piece K^4 having flaps K^2 and K^3 . A suitable slot L is formed in the inside binding, in the present case, binding D . The flaps K^2 , K^2 and K^3 are passed through this slot, and

then bent, the flap K^3 being bent in a direction the opposite from the flap K^2 , see Fig. 15.

The screen A is duly held in the window preferably by metal guides at each side, secured to the window frame. The preferred mode of securing these guides to the window frame consists in inserting screws or nails through the bottom of the guide and into the frame. One of these guides M is seen in Fig. 1, and in Fig. 20. The other guide N is seen in Fig. 1 and Fig. 21. These guides are similar, except that one of the sides of the slide N is not so wide as the other. This is to allow the adjacent binding of the screen to be more readily introduced into it. The guides not only hold the screen, but permit it to be moved up and down in the window. Guides as guides are not new. The advantageous improvement of these slides consists in the rolled over and down edges P . This construction is not only simply, and easily effected, but it confers strength and stiffness on the slide. It also prevents the fingers of the operator of the screen, or window sash being cut by the sharp edges of the slide. This is an important desideratum.

The springs R , R , employed to frictionize the screen in the slides are suitably connected to the screen edge. I connect the shank R^2 of the spring, see Figs. 16 and 18, to the edge of the binding by means of a saddle clamp S , see Fig. 17, which comes over the shank R^2 , and embraces the edges C^5 and C^7 of the binding, see Fig. 18. There it is secured in place, preferably by riveting as shown. These springs are shown in position in Fig. 1. A modified and very convenient construction of the spring and saddle clamp is shown in Fig. 19, where these parts are made of one piece, the saddle clamp S^2 dispensing with the shank R^2 mentioned.

Certain of the advantages of my invention arise out of the increased facility in putting together the several portions of the screen, constructed with such object in view.

The preferred order in which the several parts are assembled is as follows:—The parts C of the binding, in the condition shown in Fig. 3, are laid back down upon a table. The corner pieces E are then laid within the binding pieces. After the pieces E and the binding pieces C are mutually adjusted so that the screen is of the proper width and height, these pieces E are united to the binding as heretofore specified. The angle pieces G are put in place. The edges of the wire cloth are duly rolled into place within the part C^3 , as heretofore described. The lift handles K , K , K , are united to the part D of the binding. This part D , still in the condition shown in Fig. 3, is now applied to the part C and to the screen cloth as heretofore mentioned, and the lower portions bent to place, as shown in Fig. 2. Pressure then applied to the part D along the bend D^3 ,

forces the part D^2 tightly up against the wire cloth and the part C^3 . The part D^3 being bent inward somewhat by this pressure, is permanently lengthened, and the parts D^2 and C^3 , with wire cloth between them, are permanently locked. Thereafter the corner cap pieces H and J are applied to the corners and secured to them. The springs R, R, are secured to the edge of the screen. The entire screen is now ready to be applied to a window. The guides being now secured to the window, the screen is placed therein. It is now ready for use. I thus present a new construction, complete in all details, and very advantageous.

Certain advantages of the binding as constructed are that the lock C^3 , C^2 , D^3 , holds the screen cloth secure. The enlarged smooth rounded bead edge C^2 prevents the cloth from being injured in that location. The cloth is not unduly stretched, but is well locked.

When the screen is exposed to rain or is otherwise wetted, the water coming down the screen, etc., will drop off and down from the edge Z, Fig. 2, of the cloth screen, and cannot remain to rust or corrode the cloth or the frame.

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 within the spirit and scope of my invention.

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

1. The binding consisting of the part D having the curved portion D^2 , the portion D^3 extending away from the part C, the part C having the curved portion C^3 and the terminal free enlarged rounded edge C^2 , the curved portion D^2 located within the rounded edge C^2 , and means for locking the opposite end of part D to the opposite end of part C, substantially as and for the purposes specified.

2. In a screen, a binding composed of the parts C, C^2 , C^3 and the part D, formed and united, substantially as and for the purposes specified.

3. In a screen, the part D having the curve D^2 , and the part C having the curve C^2 and the curve C^3 , inclosing the curved part D^2 , and the screen cloth caught in the curve C^2 and located between the parts D^2 and C^3 , substantially as and for the purposes specified.

4. In a screen, the part D having the curve D^2 , and the part C having the curve C^3 , terminating at its free edge in the beaded part C^2 , and the screen cloth curved on the bead and extending between the

curved part C^3 and the curved part D^2 , the curved part C^2 in connection with the back part of the curved portion C^3 inclosing the curved part D^2 , substantially as and for the purposes specified.

5. In a screen binding, the binding part D having the curve D^2 and curve D^3 , D^4 , and foot curve D^5 and bottom D^7 , and the part C having part C^3 , and part C^4 , and bottom curve C^5 , and bottom C^6 , and final bottom bend C^7 , the part D being located relatively to the part C, as follows, the part C^3 being made to inclose and be the outside of the part D^2 , the bottom bends C^5 and C^7 and bottom C^6 being made by pressure to permanently inclose the bend D^5 and the bottom D^7 , substantially as and for the purposes specified.

6. In the screen, the part D, as shown in Fig. 3, and the part C as shown in Fig. 3, these parts being in juxtaposition, the part D^2 being within the curved part C^3 , and the part D^7 , above the part C^6 , the curvature of the part D being altered under pressure, the parts D^7 and C^6 bent up, and the part C^7 around the part D^5 , substantially as and for the purposes specified.

7. In the screen, the part D, as shown in Fig. 3, and the parts C and C^2 , as shown in Fig. 3, and the wire cloth inserted between these partially formed parts and caught in the part C^2 , these parts put into juxtaposition, the two opposite parts C and D securely locked under pressure together, substantially as and for the purposes specified.

8. In a screen, the part composed of the curved portions D^2 , D^3 , and incline D^4 , formed as described, and the part C^3 as described, the extension D^4 therefrom, and means at the ends opposite from parts C^3 and D^2 for locking and holding the adjacent ends together, substantially as and for the purposes specified.

9. In a screen, the binding part D having the curve D^2 and curve D^3 , D^4 , and foot curve D^5 , and bottom D^7 , and the part C having part C^3 , lying close to and outside of the curved part D^2 , and having part C^4 , and bottom curve C^5 , and bottom C^6 , and final bottom bend C^7 , these bottom bends C^5 and C^7 and bottom C^6 inclosing the bottom bend D^5 and the bottom D^7 , substantially as and for the purposes specified.

10. In a screen having the part C^3 , C^4 , C^5 , C^6 and C^7 and the interlocking part D having the curved end D^2 and the curved portion D^5 and the straight portion D^7 , forming the screen frame, and the corner-piece E located between the parts C^4 and D^3 , and the parts C^3 and D^7 , and having a slit E^3 , the portion C having a cut out flap F inserted through slit E^3 , and bent, substantially as and for the purposes specified.

11. In a screen, the combination of a binding and of a corner piece, the binding part

having a flap F, and the corner piece having a slit through which this flap extends, the flap being bent down upon the corner piece, and pressed down, a part of the metal of the corner piece being thereby present in the opening in the binding first occupied by the flap, substantially as and for the purposes specified.

12. In a screen, the combination of a binding piece, and of a corner piece, the binding piece having a flap F and the corner piece having two parallel slits, leaving a piece between about the width of the flap, the flap inserted through one of these slits and bent down toward the other, and subjected to pressure, the metal of the corner between the slits thereby introduced into the opening in the binding first occupied by the flap, substantially as and for the purposes specified.

13. In a screen, the combination of the corner piece and a binding piece, one having a flap and the other having a slit longer than the flap, the flap located in the slit and bent over on the slitted piece, and a portion of the metal of the slitted piece located in the opposite piece, the outer surface of the flap lying flush with the surface of the slitted piece, substantially as and for the purposes specified.

14. In a screen, the combination of the corner piece and a binding piece, one having a flap and the other having two slits longer than the flap, the flap located in the slit and bent over on the slitted piece so as to lie on the metal between said slits, the metal between said slits being extended into the opening first occupied by the flap, and the flap occupying the space vacated by the movement of the said metal between the slits, substantially as and for the purposes specified.

15. In a screen, the combination of the corner piece, and a binding piece, one having a flap and the other slitted, the flap being bent over and lying on the metal of the slitted piece, the metal of the latter extended into the opening made by the folding out of the flap, and the flap occupying the space vacated by the advance of the said metal of the slitted piece into the flap opening, substantially as and for the purposes specified.

16. In a screen, the combination of a binding having the recesses at C⁵ and D⁵, and corner pieces for holding the adjacent bind-

ings together, and the angulated extreme corner piece, whose respective edges enter the said recesses of the binding, substantially as and for the purposes specified.

17. In a screen, the handle or lift, the handle support K⁴ having the flaps K², K³, and a binding piece, having a slit, the flaps extended through the slit, and bent away inside the said binding piece, and a complementary binding piece united to the first named binding piece, and concealing the flaps of the handle, substantially as and for the purposes specified.

18. In a screen, the binding substantially as described, and the cloth united thereto, and interior corner pieces uniting the adjacent bindings, and the exterior corner finish pieces, and the angulated extreme corner pieces of one piece, substantially as and for the purposes specified.

19. In a screen, the combination of a binding substantially as described, and the cloth united thereto, and interior corner pieces, to which the bindings held thereby are relatively adjustable in the direction of their length, and the exterior corner finish pieces all of these corner pieces being one sided, and adapted for one side only and conforming to the shape of the binding, substantially as and for the purposes specified.

20. In a screen, the combination of a binding substantially as described, and the cloth united thereto, and interior corner pieces, to which the bindings held thereby are relatively adjustable in the direction of their length, and the exterior corner finish pieces one sided and angulated in one piece, and the angulated extreme corner pieces each of one piece of sheet metal, substantially as and for the purposes specified.

21. In a screen, the combination of the pieces C and D of the binding, and the screen cloth secured thereto, and the outer corner finish pieces in one piece, angulated, located on the outside of this two part binding and respectively conformed to the exterior shape of these bindings, substantially as and for the purposes specified.

In testimony whereof, I have set my hand to this specification, in the presence of two subscribing witnesses.

HENRY HIGGIN.

Attest:

JAMES HENRY HAYES, Jr.,
FRANK BERNAL.