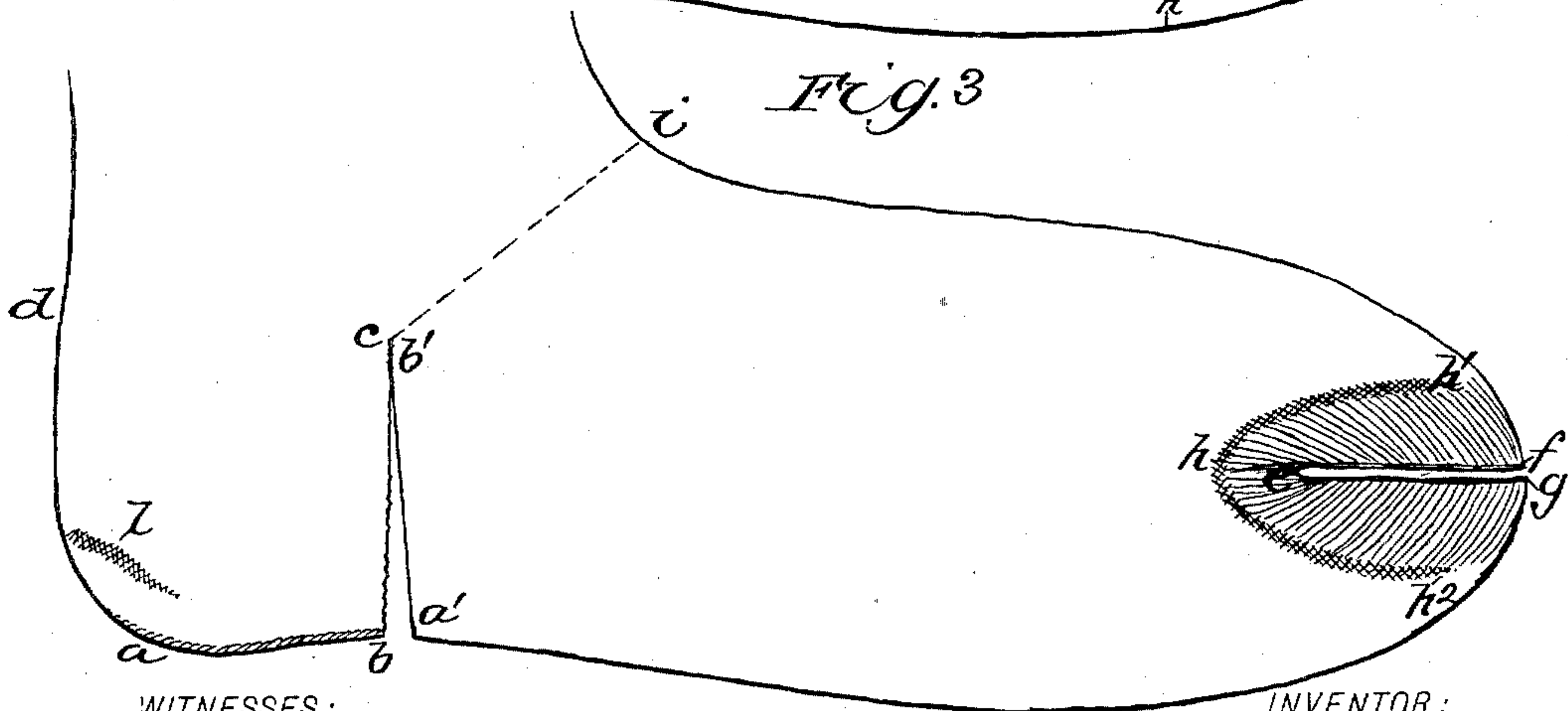
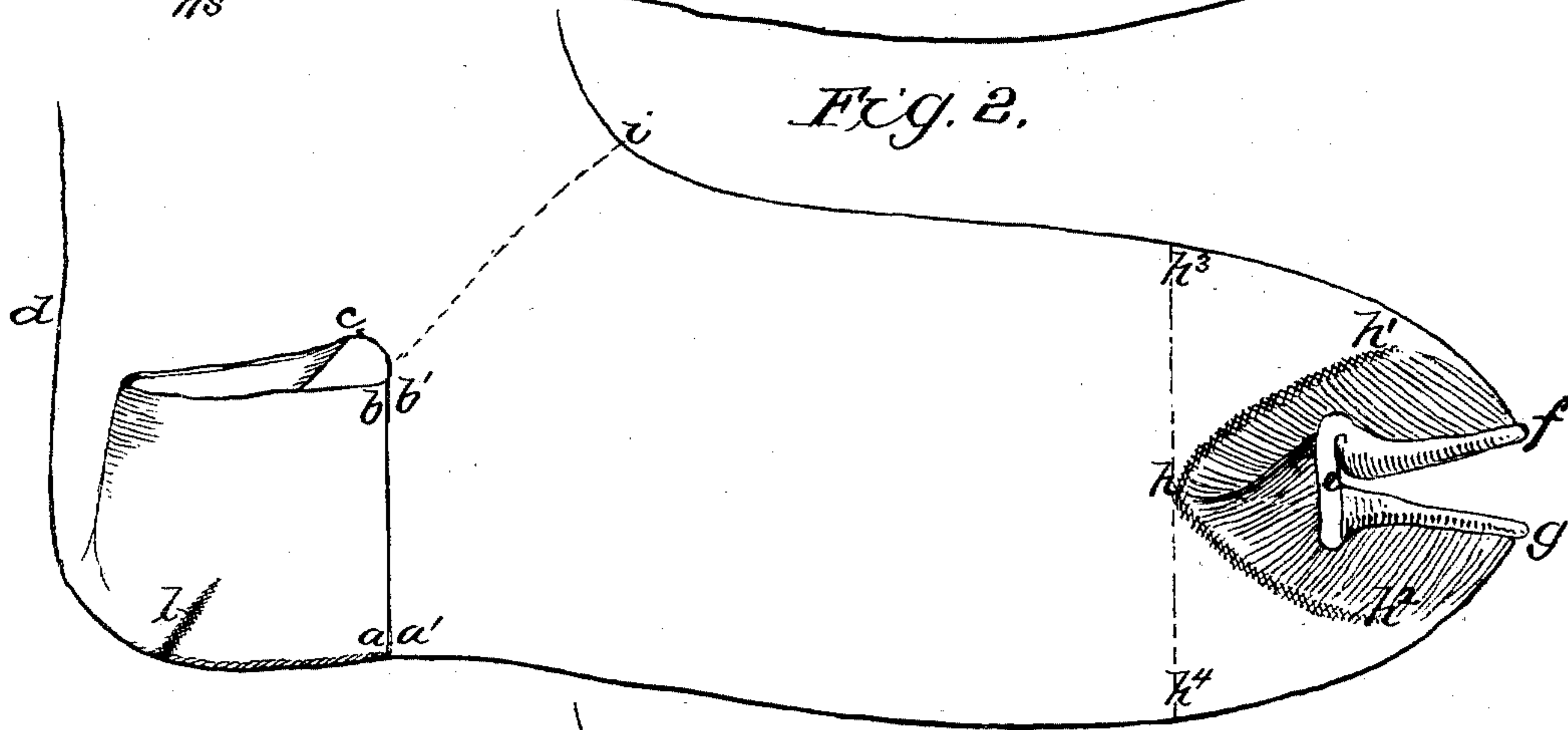
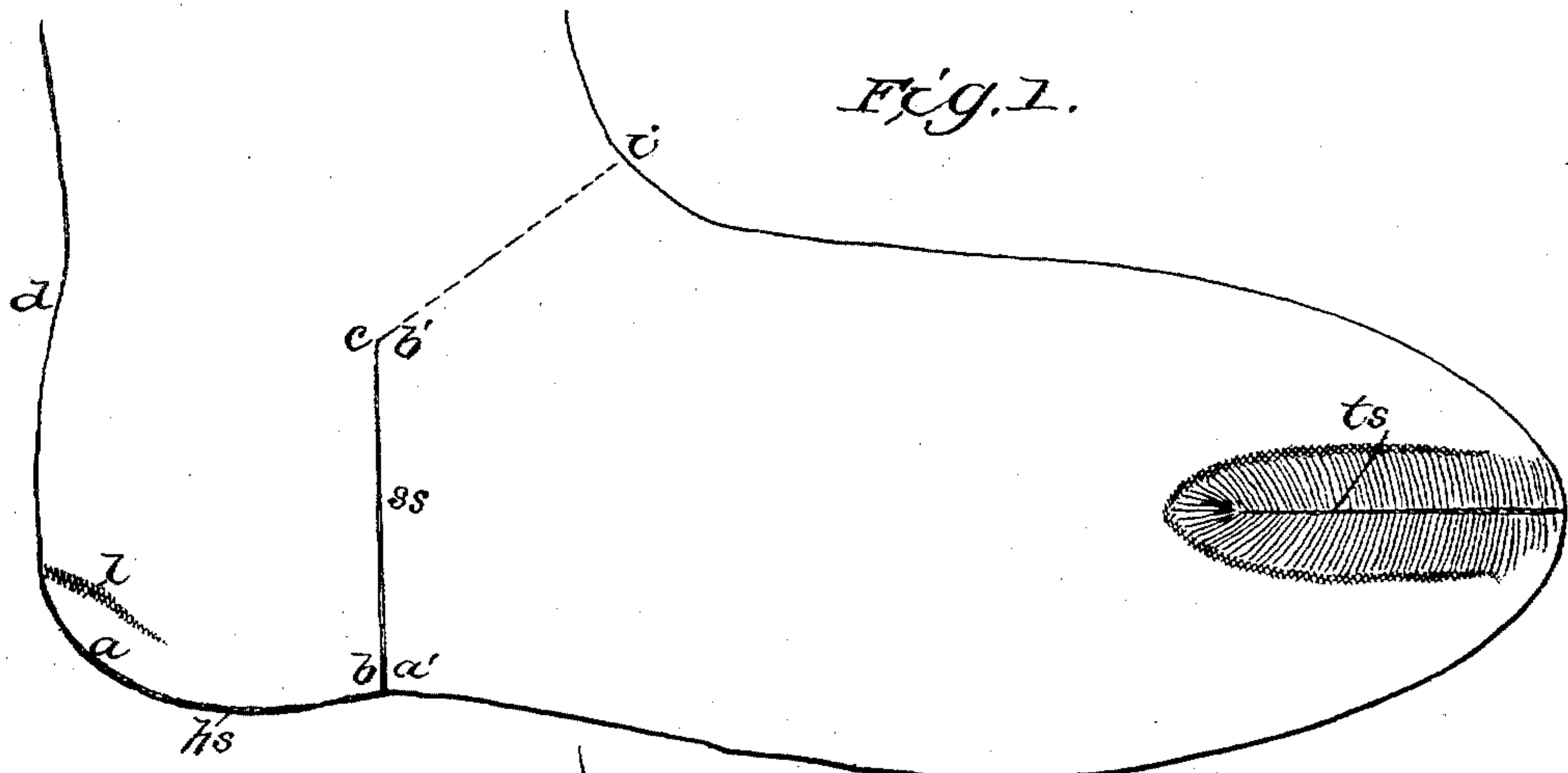


(No Model.)

F. W. SIMONS.  
METHOD OF KNITTING AND FORMING HOSE.

No. 468,212.

Patented Feb. 2, 1892.



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# UNITED STATES PATENT OFFICE.

FREDERICK W. SIMONS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CARRIE WILSON, OF SAME PLACE.

## METHOD OF KNITTING AND FORMING HOSE.

SPECIFICATION forming part of Letters Patent No. 468,212, dated February 2, 1892.

Application filed September 2, 1891. Serial No. 404,561. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK W. SIMONS, residing at Philadelphia, (Frankford,) Philadelphia county, State of Pennsylvania, have  
5 invented a new and useful Improvement in Methods of Knitting and Forming Hose, of which the following is a specification.

My invention is in the nature of an improved method of knitting and forming hose,  
10 whereby the sock or stocking has its heel, foot, and toe knit continuously on a circular-knitting machine without removal, transfer, or addition of any fabric knit on any other machine, and whereby also the heel is knit continuously with the foot, and is afterward cut,  
15 readjusted, and looped together, as herein-after fully described.

Figure 1 is a side view of the foot or lower portion of the stocking as completed. Fig. 2  
20 is a view of the foot as it leaves the knitting-machine and ready to be cut and looped together, and Fig. 3 is a view of the same parts cut and with the adjoining edges brought together for the looper.

25 Any ordinary circular seamless knitting-machine will suffice in carrying out my invention.

In proceeding to knit a stocking, the leg is knitted in the usual or any approved way until the turn of the instep indicated by the dotted line *i* is reached. Then about one half of the needles of the circular-knitting machine are thrown out of operation. These needles  
30 thrown out are (see Fig. 2) the ones which knit the instep or part of the stocking from *b'* on one side around the line *i* across the instep to the point *b'* on the other side. The knitting with the other half of the needles being continued, it forms the heel portion *d* with a detached  
35 circumscribed or puckered inner selvage edge *b c*. In knitting the heel portion a row of fashioning-stitches *l* is knit in to give roundness to the heel, this fashioning being effected by lifting out of operation one needle at a time  
40 until the desired shape is obtained. In knitting this fashioning in the heel portion, one side of the heel is knit at a time—*i. e.*, one side of the heel is knit with about a quarter of the needles until the fashioning is complete. Then this quarter of the needles is  
45 thrown out and the other side of the heel is then knit in the same way until the line of

fashioning is complete on that side. In knitting the heel the loops are never transferred from one needle to another, but the webbing  
55 gradually becomes narrower as each needle is thrown out of operation, thus fashioning or shaping the heel. In other words, when a needle is lifted out of operation the fabric produced from the needles left in operation  
60 will be narrower by one loop than it would be if the needle had been left in operation. After the fashioning on both sides of the heel is complete the knitting is continued with that half of the needles which knit the heel  
65 portion until about twenty courses are knit. As soon as the heel has been thus knit, the needles, which were thrown out at the line *b'* *i*, are brought into action again, and the knitting then proceeds with all the needles until  
70 the seamless foot is formed. When the knitting has progressed as far as the transverse dotted line *h<sup>3</sup> h<sup>4</sup>*, the change is then made for knitting the toe. For this purpose one half of the needles are lifted out of action, (the  
75 half that knits either of the triangular tongues in Fig. 2.) Assuming that it is the needles knitting on line *h h<sup>3</sup>* or top tongue that are thrown out, then the knitting on the line *h h<sup>4</sup>* proceeds back and forth, and at every course  
80 a needle is lifted out of action to give the fashioning or taper, as shown, by the row of fashioning-stitches *h h<sup>2</sup>* until the tongue is brought to a point. This fashioning of the toe is effected by the same manipulation of the needles employed in fashioning the heel. Then  
85 the needles which have knit this portion are lifted out of action and the knitting on the line *h h<sup>3</sup>* proceeds in a similar way, lifting a needle out of action at each course until the  
90 top tongue is fashioned to a tapering shape by the row of fashioning-stitches *h h'*. This being finished to a like point, the needles are then all thrown into action and the knitting proceeds with the full set of needles to knit  
95 the full width of the foot for a short distance, forming that portion of the fabric lying between the marginal line *f e g* and the row of fashioning-stitches *h h' h<sup>2</sup>*. The knitting operation is then complete and the stocking is  
100 removed from the machine. The next step is to sever the heel portion by cutting on the line *a b*, Fig. 2, and to turn the heel portion down, as in Fig. 3. The severed edge *a b*,



then, when properly trimmed, forms the bottom of the heel, the proper curvature being given to the ball of the heel by the row of fashioning-stitches *l*. The selvage edge *b c*,  
 5 Fig. 2, is by the same operation straightened out and brought vertical and into adjacent position to the cut edge *a' b'* of the foot, Fig. 3, and it only remains to fasten together the two bottom edges of the heel *a b* and to unite  
 10 the selvage edge *b c* to the cut edge *a' b'*, which operation is effected by the ordinary operation of looping the edges together on a looper. The two united edges *a b* then form the heel-seam *h s*, Fig. 1, and the two edges  
 15 *c b b' a'* form the blind side seam *s s*, Fig. 1. The two edges *e f* and *e g* of the toe are then brought together, as in Fig. 3, and are looped together in a similar manner to form the toe-seam *t s*, (seen in Fig. 1,) which comes upon  
 20 the side of the foot, where it produces no discomfort to the wearer.

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

25 1. The method of knitting and forming hose, which consists in first knitting the leg portion, then discontinuing the knitting of the instep, continuing the knitting of the heel por-

tion to form the detached circumscribed selvage edge *b c*, then resuming the knitting of 30 the instep along with the heel and knitting the foot and toe portion, then cutting the heel portion from the foot and turning it down to a position at right angles and trimming the heel portion, and finally looping together or 35 uniting the cut edges of the heel and also the selvage edge of the heel and cut edge of the foot, substantially as shown and described.

2. The method of knitting and forming hose, which consists in first knitting the leg por- 40 tion, then discontinuing the knitting of the instep, continuing the knitting of the heel portion to form the detached circumscribed selvage edge *b c*, introducing a series of fashioning-stitches *l* to give roundness to the heel, 45 then resuming the knitting of the instep and heel together to form the foot and toe, then cutting the heel from the foot on line *a b*, then turning the heel down and trimming it, and uniting certain of its edges to each other and 50 certain to the foot, substantially as shown and described.

FREDERICK W. SIMONS.

Witnesses:

JOHN SHALLCROSS,  
 WALLACE WILSON.