

No. 654,694.

Patented July 31, 1900.

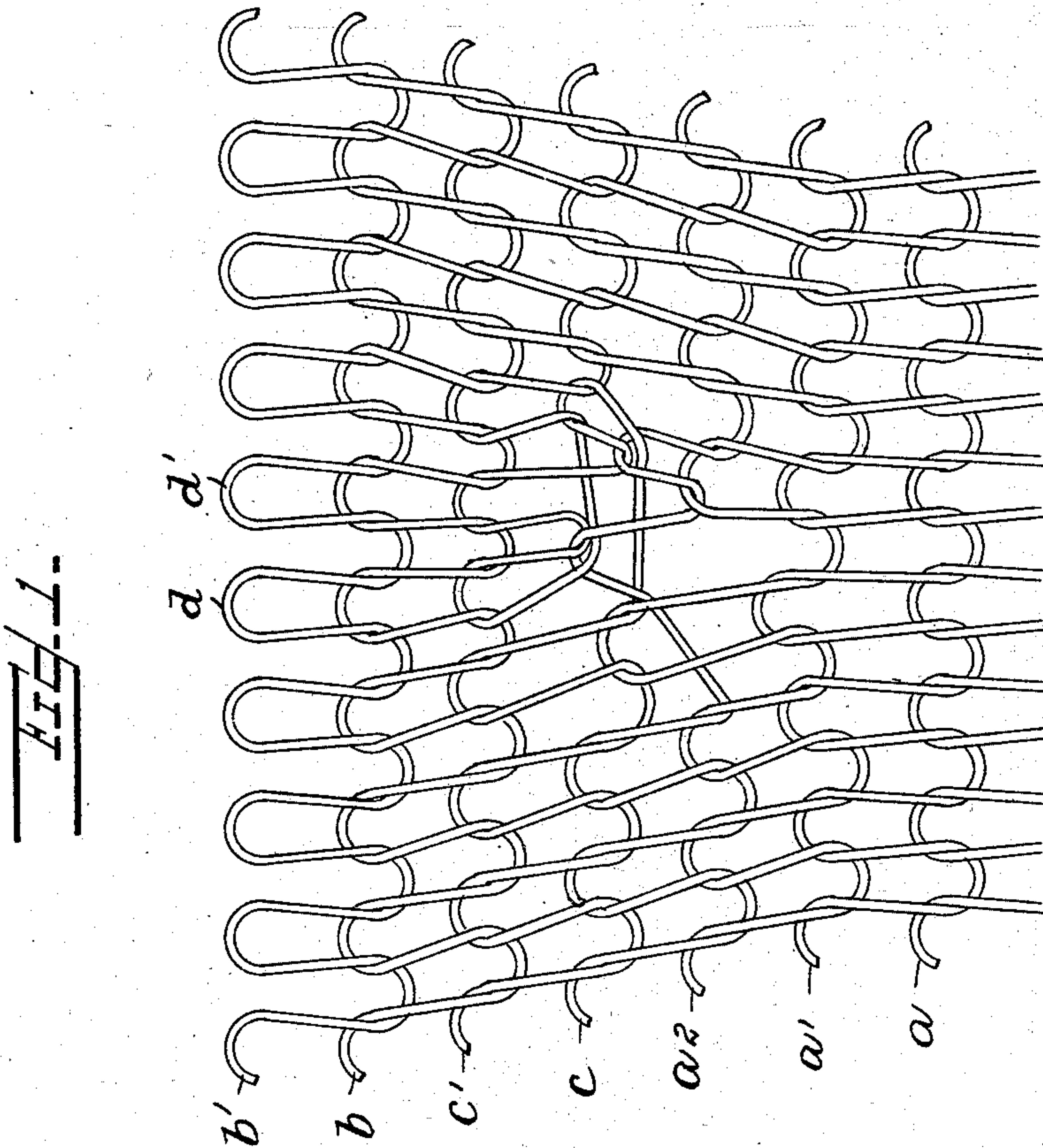
F. WILCOMB.

TUBULAR FABRIC AND METHOD OF CONSTRUCTING SAME.

(Application filed Dec. 7, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 2.

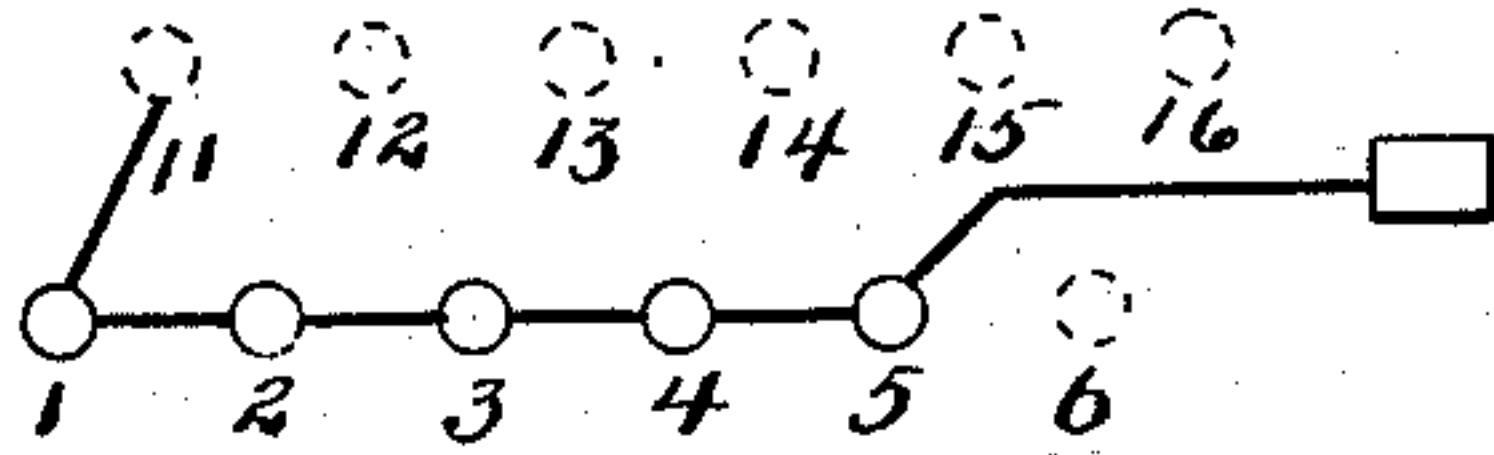


Fig. 3.

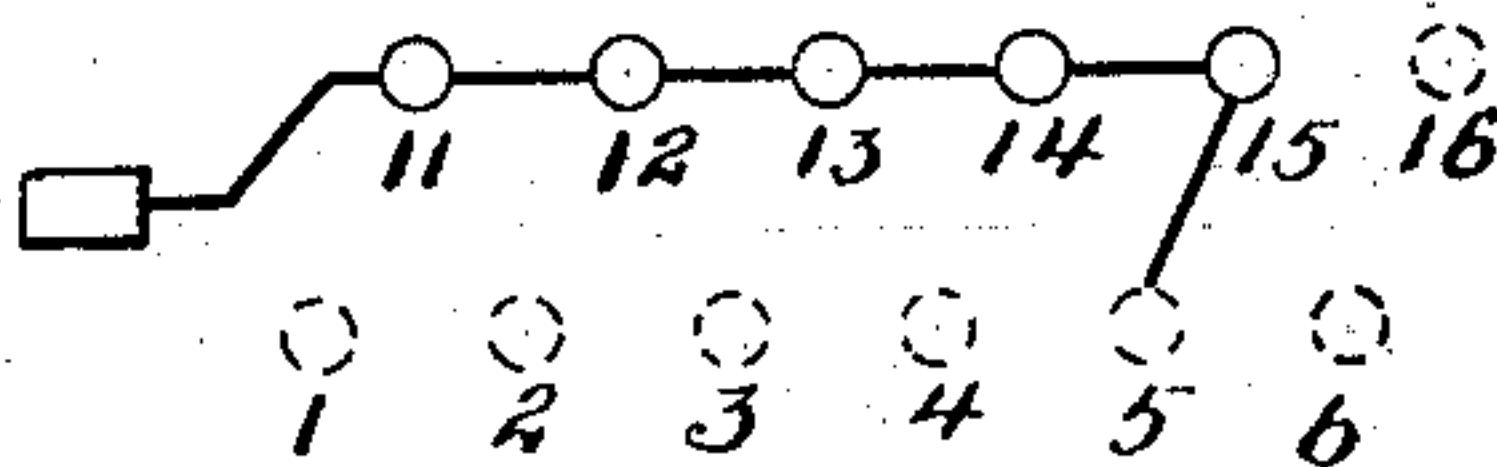


Fig. 4.

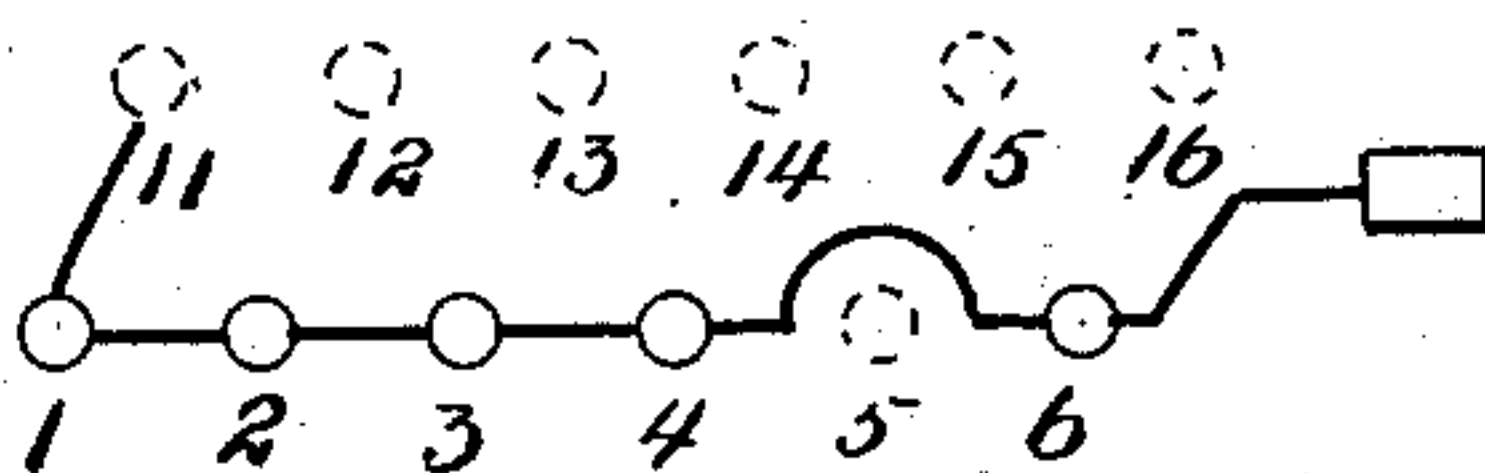


Fig. 5.

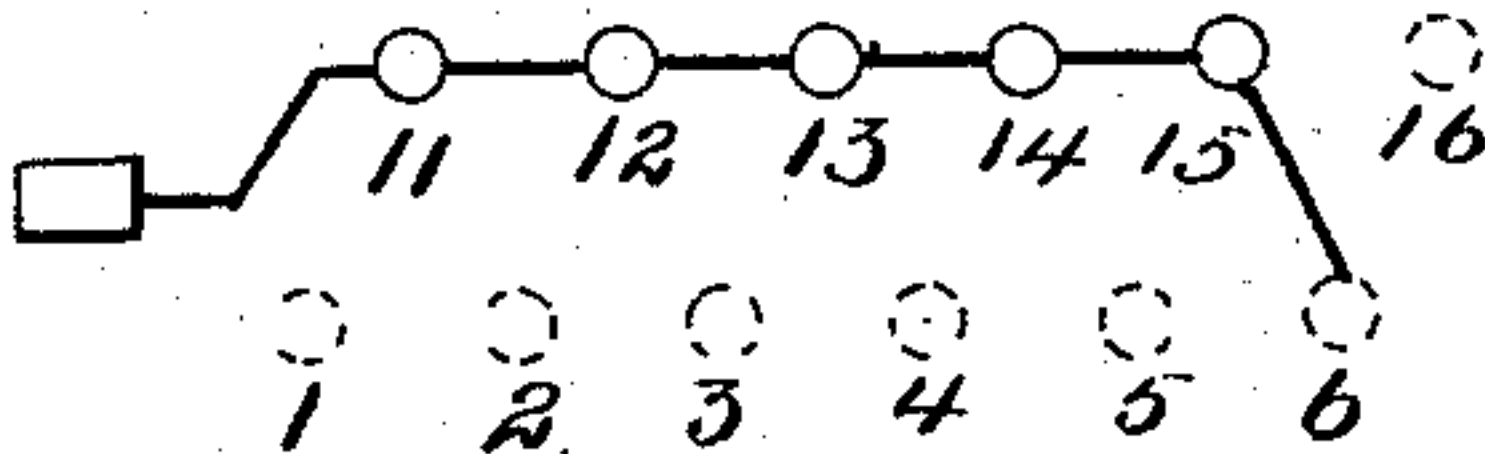


Fig. 6.

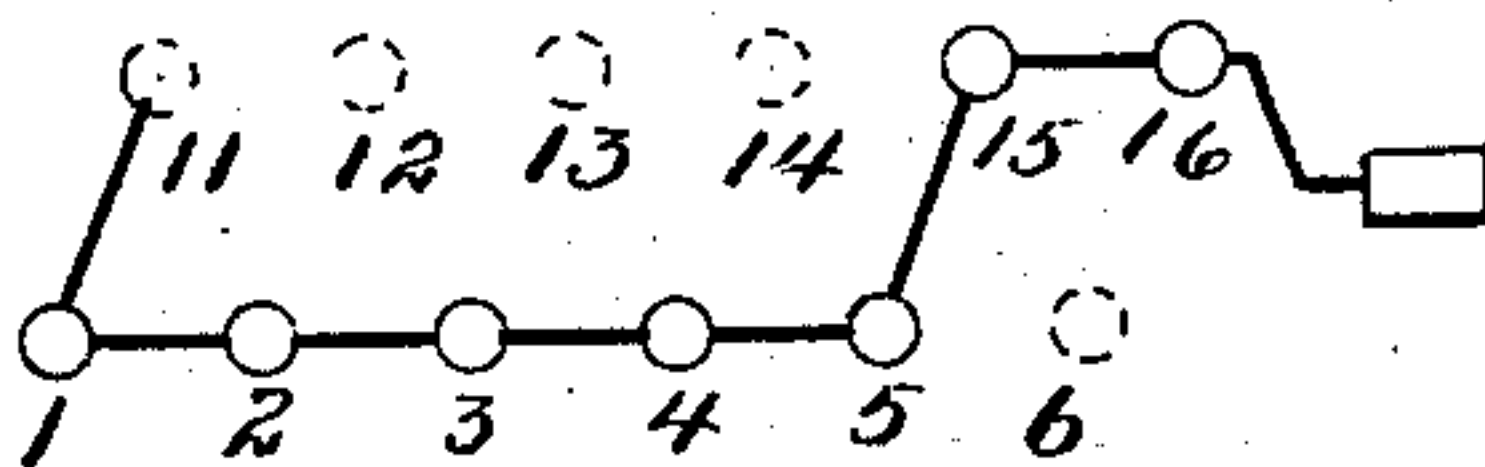


Fig. 7.

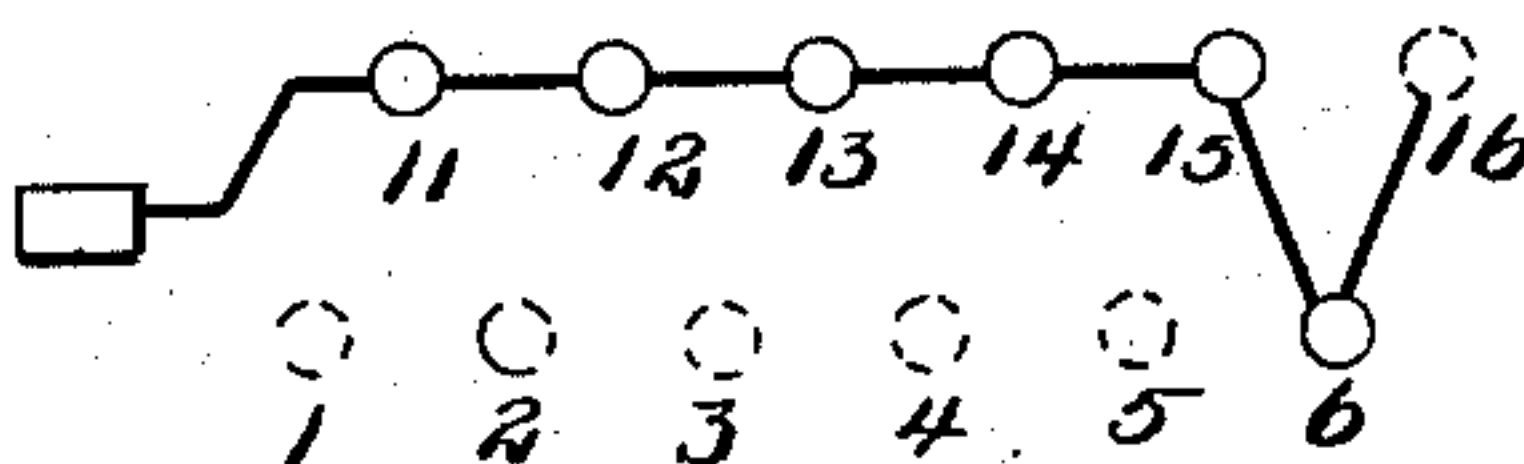


Fig. 8.

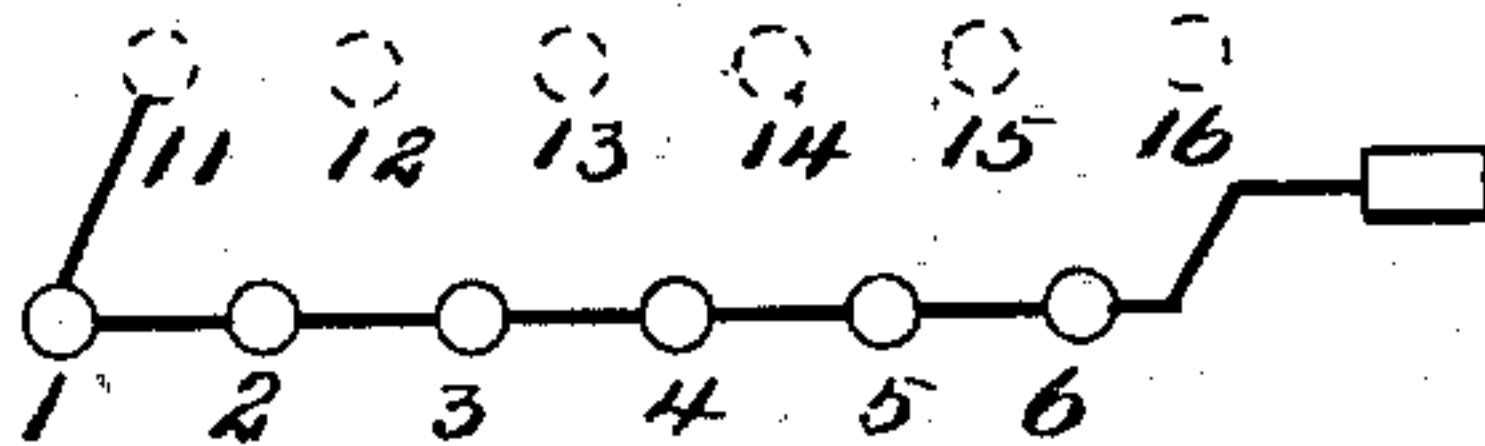


Fig. 9.

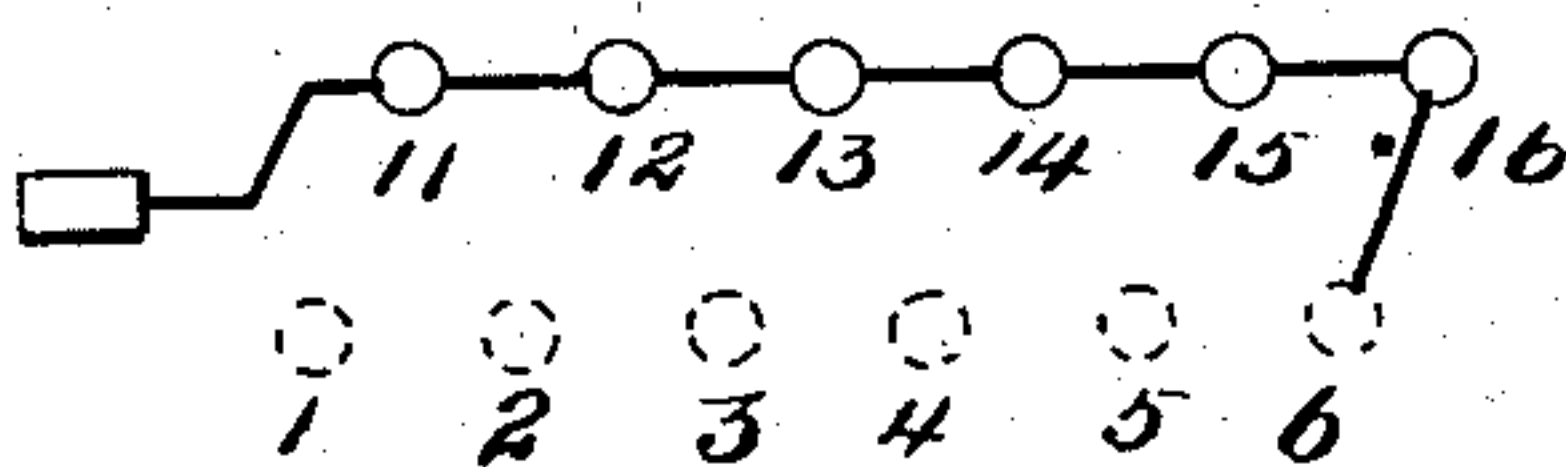
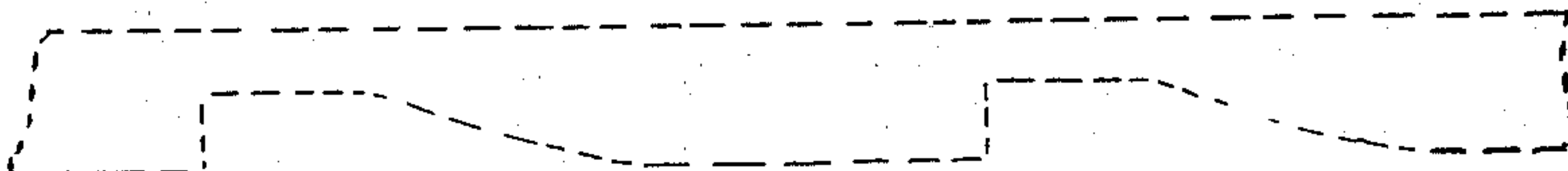


Fig. 10.



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# UNITED STATES PATENT OFFICE.

FRANK WILCOMB, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR TO THE  
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## TUBULAR FABRIC AND METHOD OF CONSTRUCTING SAME.

SPECIFICATION forming part of Letters Patent No. 654,694, dated July 31, 1900.

Application filed December 7, 1897. Serial No. 661,014. (No specimens.)

*To all whom it may concern:*

Be it known that I, FRANK WILCOMB, a citizen of the United States, residing at Pawtucket, county of Providence, and State of Rhode Island, have invented a new and useful Improvement in Tubular Fabrics and Methods of Constructing the Same, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Speaking generally, my invention consists of a novel tubular fabric shaped by additional loops introduced at intervals without leaving holes in the fabric at the points where the new loops are introduced and without producing a rib at that point and a novel method of knitting by which this is accomplished.

In the accompanying drawings, Figure 1 is a front view, enlarged, of a portion of the fabric embodying my invention. Figs. 2 to 9 are views showing graphically the method of knitting at the point of inserting additional loops. Fig. 10 is a side elevation of a tubular fabric embodying my invention.

My novel method of knitting consists in the following: The formation of the regular rounds of loops is as in the ordinary knitting, (see Figs. 2 and 3,) where the thread is fed to needles 1, 2, 3, 4, and 5 of the front bank of needles and 15, 14, 13, 12, and 11 of the rear bank of needles. When the fabric is to be widened, I proceed as follows: In knitting on the front course one additional loop is formed on needle No. 6 and the loop on needle No. 5 preceding said additional loop omitted, the thread passing directly from the loop preceding the omitted loop to said additional loop. (See Fig. 4.) This step produces a sort of a brace between the additional loop and the loop from which the thread proceeded to this additional loop. In the next step the thread goes across to the rear course and connects with the rear loops without forming any additional loop on the rear course. (See Fig. 5.) This gives a bridge from the additional loop of the front course to the rear course. In the next round in the front course all the loops except the additional loop are cast, and then two loops in the rear course are formed—to wit, the loop preceding the additional loop

and the additional loop of the rear course (see Fig. 6)—upon needles 15 and 16. In this way the additional loop upon the rear course is braced or bridged with the loop preceding it and with the front course—that is to say, it is pulled toward the front course. Both of these threads—to wit, the thread leading to the additional loop in the front course and the thread leading to the loop preceding the additional loop—and the additional loop on the rear course being straight, threads will have a tendency to contract and draw the additional loops of opposite courses toward each other and toward the front course. Also the loop which was omitted in the first round in the second round is formed. This will have a tendency to borrow from the opposite course, and thus draw the two courses together. After the formation of the additional stitch of the rear course of this round the additional loop of the front course and all of the other loops of the rear course are cast. (See Fig. 7.) As a consequence this makes the thread again cross from the front to the rear course and has a tendency to further draw or close up the orifice or, what is the same thing, draw the two rows together. The regular knitting then proceeds with the additional loop on each course. (See Figs. 8 and 9.) Speaking generally, we have the thread crossing twice with an omitted loop in the front course, which enables the other loops to be drawn together to close up the orifice. In other words, the additional wales at this point, front and back, are formed partially from the thread going to make the opposite wale. In this way the two wales, front and back, are to a certain extent drawn toward each other.

Wherever I have spoken in this description of front and back courses I have merely used the terms "front" and "back" as opposites of one another, as where I have spoken of front a back may be used and where I have spoken of back a front may be used, so long as opposite courses are used. By "courses" I mean when the fabric is being formed all the loops formed in one-half of the circumference of the fabric, and by "round" I refer to all of the loops formed in the entire circumference of the fabric, and by "wales" I refer to a corresponding vertical line of loops.



I wish it to be distinctly understood that wherever in this specification I have referred to a certain action taking place on the front course or wale and another action taking place upon the rear course or wale these terms are simply used to refer to opposite courses, banks, or wales in the same fabric.

From the foregoing and upon reference to the figures where  $a$   $a'$   $a''$  show portions of three rounds before widening,  $b$   $b'$  portions of two rounds after widening, and  $c$   $c'$  portions of two rounds at the point of widening, it will be seen that at the point of widening I have produced a fabric in which there is no orifice where the two additional loops are introduced and which fabric has the following characteristics: At the points of widening two new wales  $d$  and  $d'$  are made to appear to be started together, the stitches of the two new wales at their starting-point being bound together by the threads of two rounds of knitting crossing each other. The threads so crossing being shorter than the thread used in making a loop serves to draw the two new wales together and are almost or quite indistinguishable from the meshes of the fabric, giving the fabric the appearance of being narrowed or of knitting two wales into one, as in the case of narrowed fabrics, and at the same time strengthening the fabric at that point.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. The method of knitting widened tubular fabric which consists in omitting the end loop and forming an additional loop in the front course, the thread passing directly from the last loop formed preceding the omitted loop to said additional loop, passing the thread from the additional loop of the front course to the rear course forming the rear course and in the next succeeding round forming all the loops except the additional loop of the front course and forming an additional loop of the rear course, then the additional loop of the front course and forming the remaining stitches of said rear course.

2. In the method of knitting widened tubular fabric, forming with the front course the additional loop of the rear course and the loop preceding the additional loop of the rear course.

3. In the method of knitting widened tubular fabric, forming with the front course, the end and an additional loop of the rear course, then forming an additional loop of the front course and then forming the rear course.

4. In the method of knitting widened tubular fabric, forming all but the additional loop of the front course, then forming the end and the additional loop of the rear course.

5. In the method of knitting widened tubular fabric forming the front course, the end and an additional loop of the rear course, then forming an additional loop of the front

course, then forming the rear course and omitting in that course the additional loop in the rear course.

6. In the method of knitting widened tubular fabric forming all but the additional loop of the front course, then forming the end and an additional loop of the rear course, then forming the additional loop of the front course, then forming the rear course, omitting the additional loop of the rear course.

7. In the method of knitting widened tubular fabric forming all but the additional loop of the front course, then forming the end loop of the rear course and then forming the additional loop of the front course, then forming all but the additional loop of the rear course.

8. The hereinbefore-described tubular fabric in which the additional loops or wales are drawn together to close the hole at the point of widening in which a loop is omitted preceding the additional loop of the front course, the thread being carried directly from the last preceding loop of said course to said additional loop, and from said loop to the rear course, and in the next round the loop preceding the first additional loop of the rear course and the first additional loop of said course are formed with the loops of the front course.

9. The hereinbefore-described tubular fabric in which an additional loop of the rear course and the loop preceding an additional loop of the rear course are formed with the front course.

10. The hereinbefore-described tubular fabric in which an additional loop of the rear course and the loop preceding the additional loop of the rear course are formed with the front course, and a loop upon the additional wale of the front course is formed with the succeeding rear course.

11. The hereinbefore-described tubular fabric in which an additional loop of the rear course and the loop preceding an additional loop of the rear course are formed with the front course, and in that course a loop being omitted from the additional front wale.

12. The hereinbefore-described tubular fabric in which an additional loop of the rear course and the loop preceding the additional loop of the rear course are formed with the front course and a loop upon the additional wale of the front course is formed with the succeeding rear course, a loop upon the additional rear wale being omitted in that course.

13. The hereinbefore-described tubular fabric in which an additional loop of the rear course and the loop preceding the additional loop of the rear course are formed with the front course, and in that course a loop being omitted from the additional front wale, and in which a loop upon the additional wale of the front course is formed with the succeeding rear course, a loop upon the additional rear wale being omitted in the last-mentioned course.

14. The hereinbefore-described tubular fab-



ric in which an additional loop of the rear  
course is formed with the front course and in  
that course a loop being omitted from the ad-  
ditional front wale, a loop for the additional  
5 front wale being formed with the succeeding  
rear course the additional wale of that rear  
course being omitted.

In testimony of which invention I have  
hereunto set my hand.

FRANK WILCOMB.

Witnesses:

FRANK S. BUSSE,  
M. F. ELLIS.