

No. 668,692.

Patented Feb. 26, 1901.

P. RUTHARDT.  
DOUBLE PILE FABRIC.  
(Application filed Oct. 16, 1896.)

(No Model.)

fig. 1.

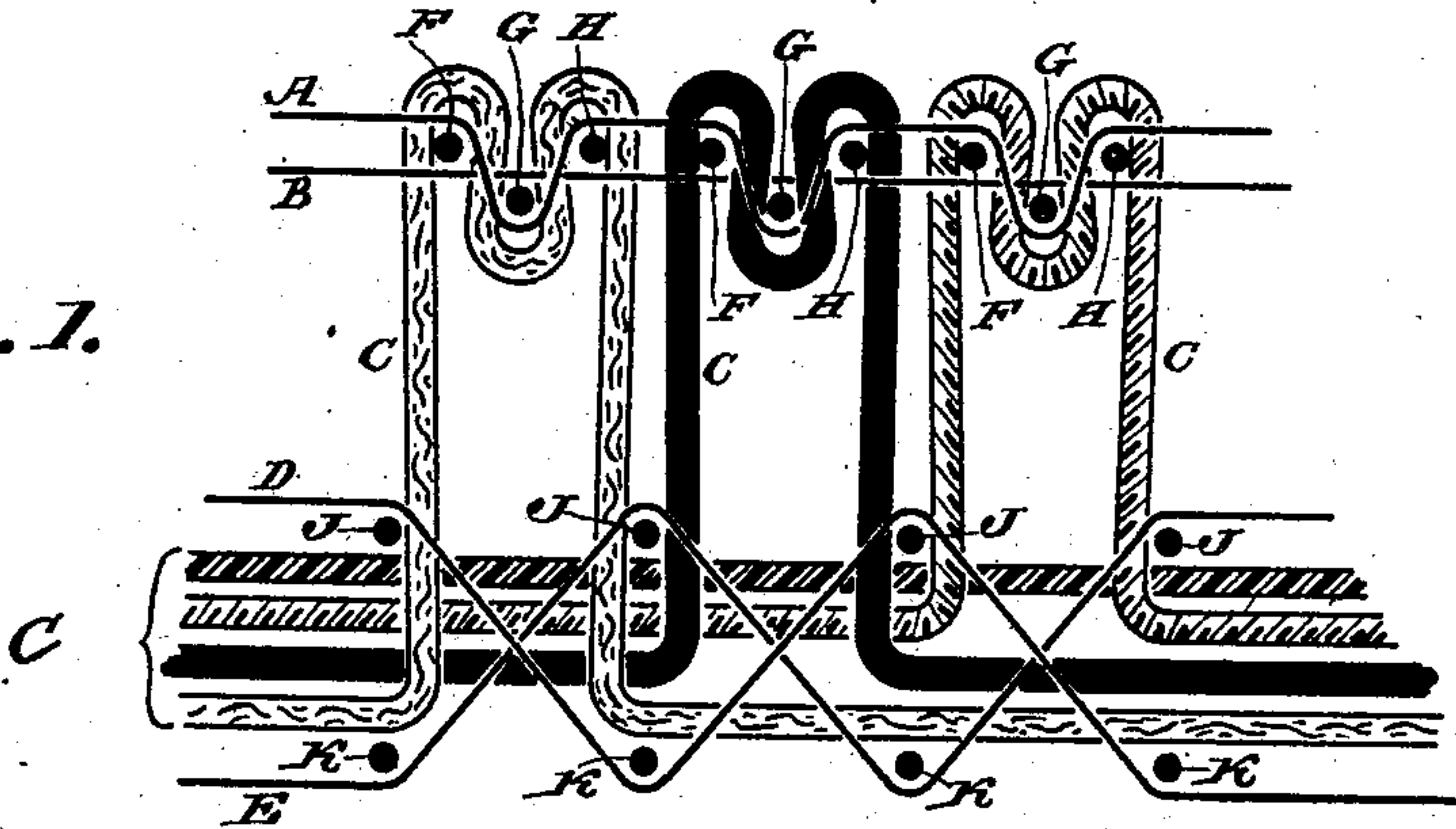


fig. 2.

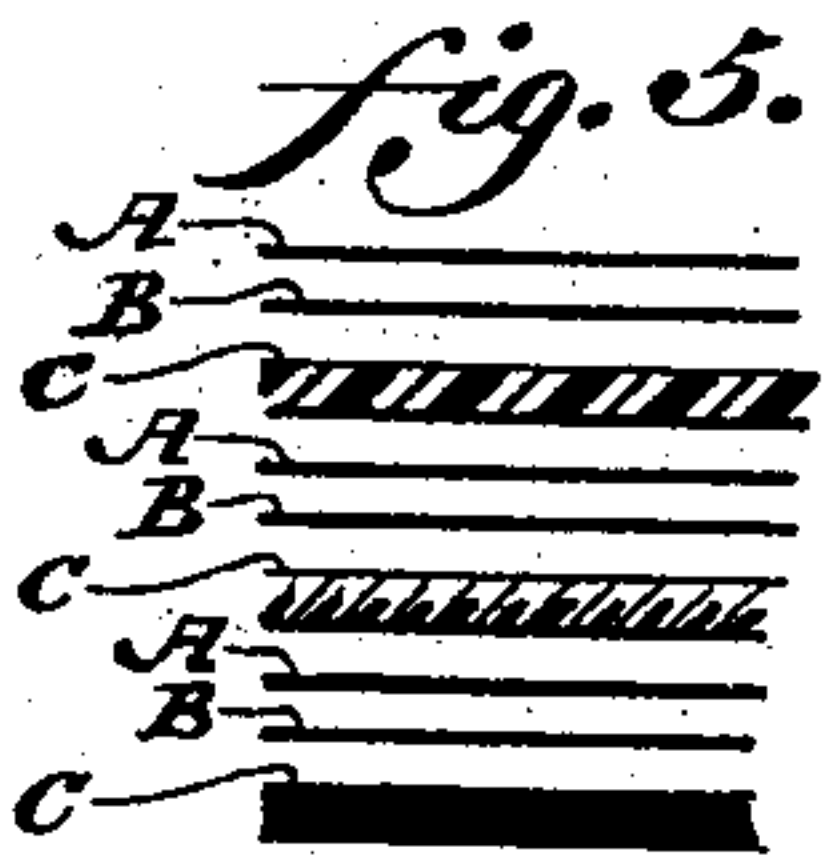
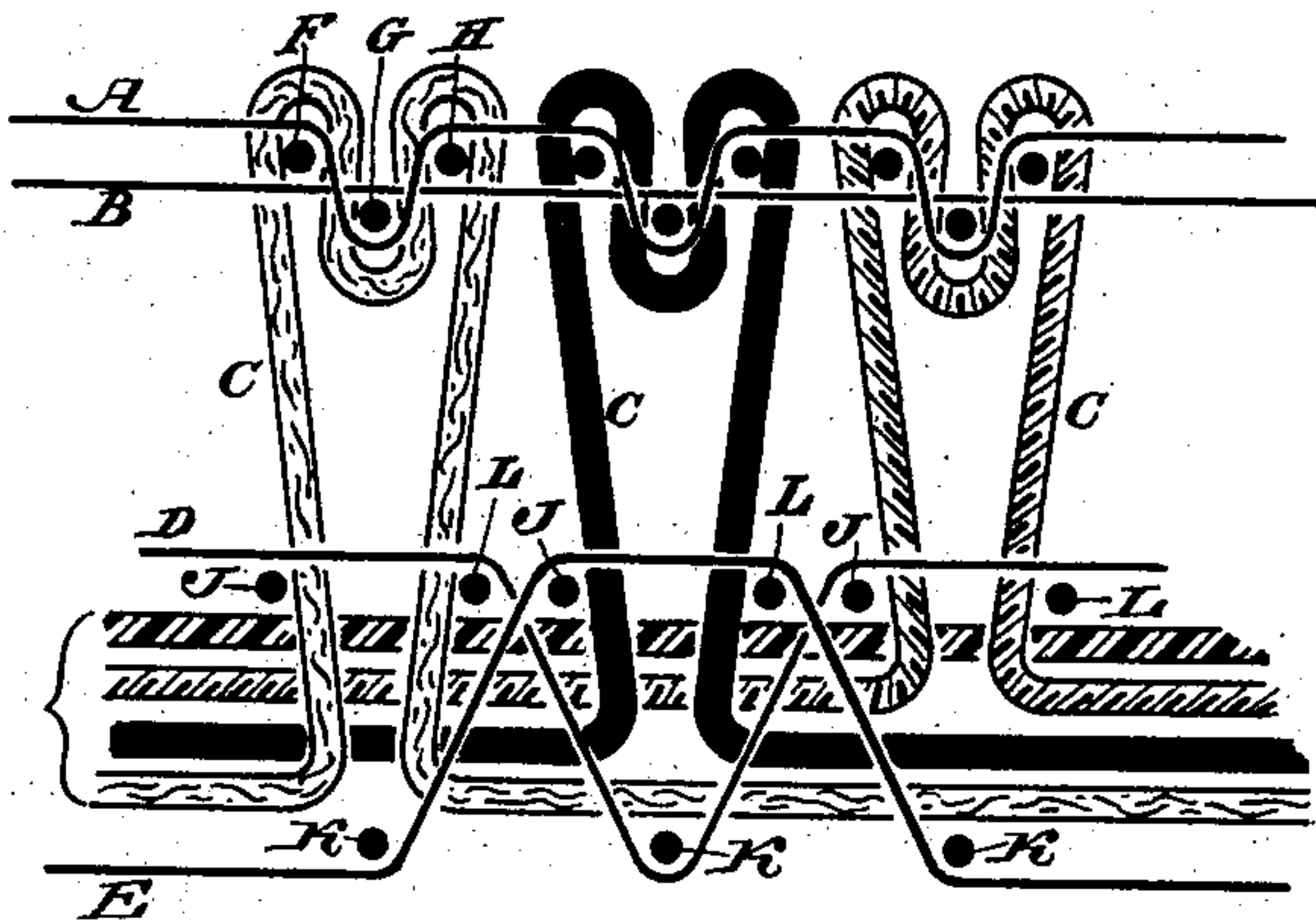


fig. 4.

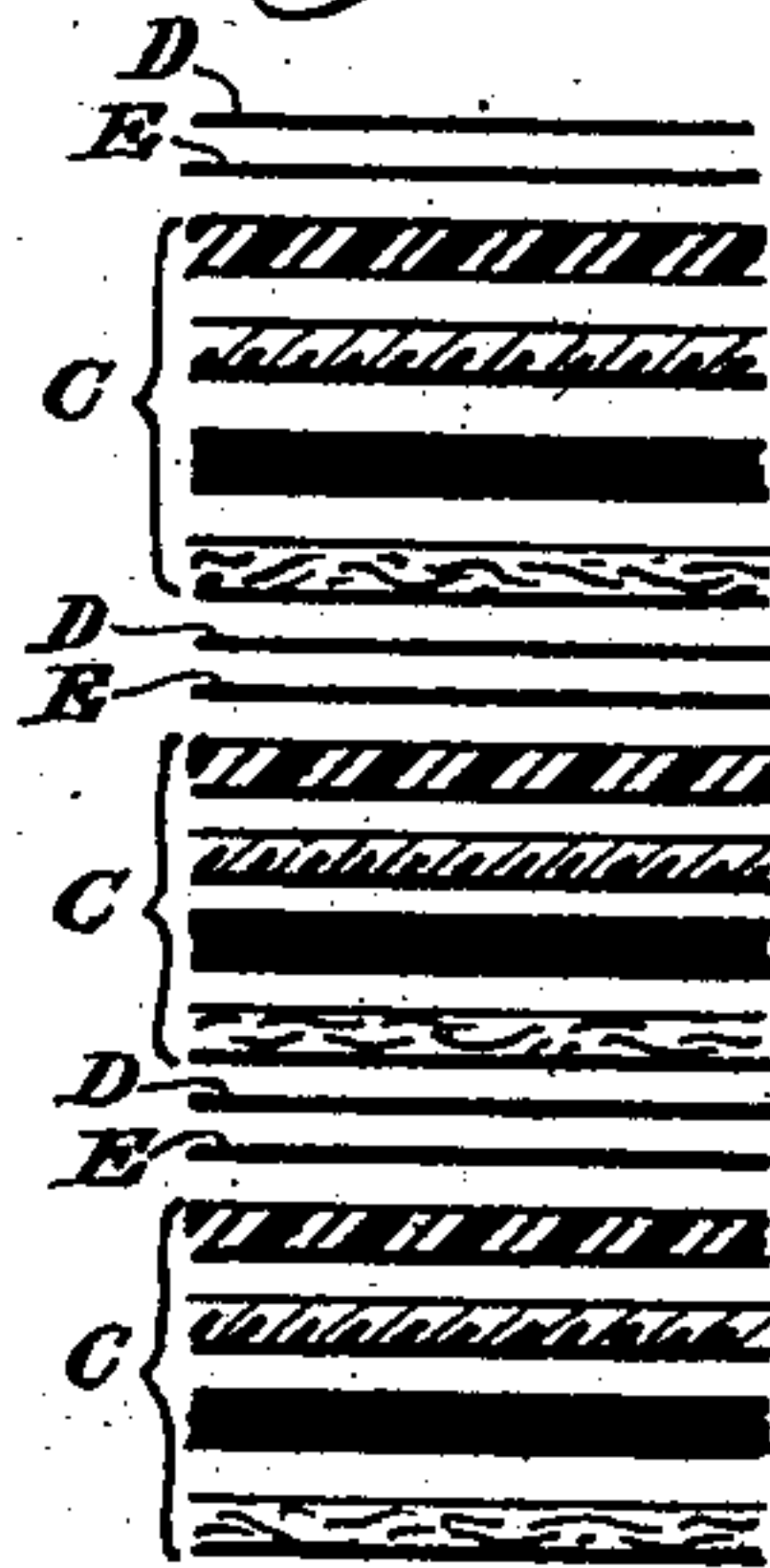
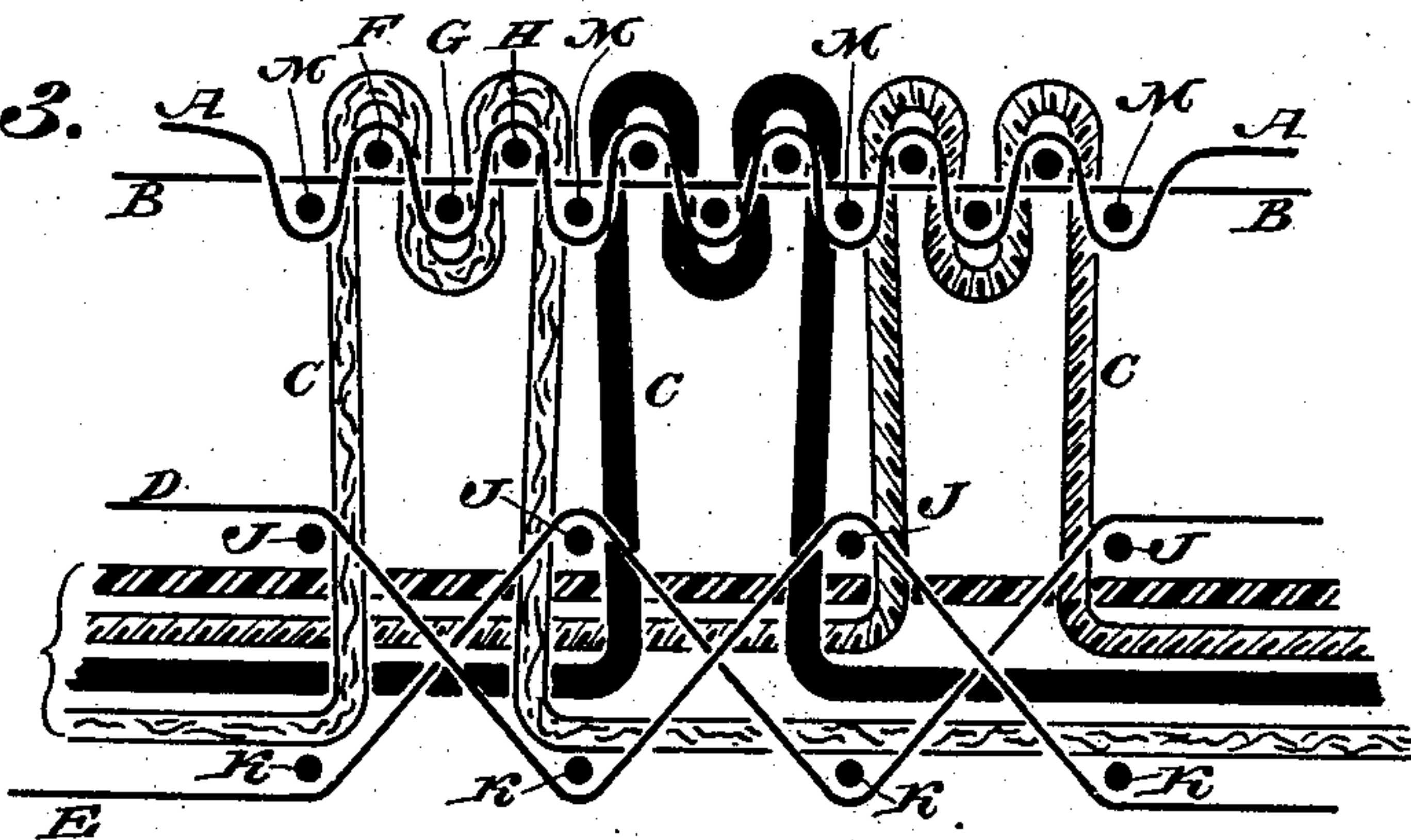


fig. 3.



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# UNITED STATES PATENT OFFICE.

PAUL RUTHARDT, OF HAMELN, GERMANY.

## DOUBLE-PILE FABRIC.

SPECIFICATION forming part of Letters Patent No. 668,692, dated February 26, 1901.

Application filed October 16, 1896. Serial No. 609,050. (No specimens.)

*To all whom it may concern:*

Be it known that I, PAUL RUTHARDT, a citizen of the United States, residing at Hameln, Germany, have invented a certain new and  
5 useful Improvement in Double-Pile Fabrics; and my invention is designed more particularly for furniture-plush and carpet, but is applicable to woven fabrics generally, such as color-designed multiple-frame double-pile  
10 fabrics, of which the following is a specification, said invention having been patented by me in Germany in Letters Patent No. 85,508, of date October 10, 1894.

In the well-known Wilton carpets the pile  
15 is formed by inserting wires when weaving the fabric, the former being cut out after the pile has been fastened by shots of filling to the ground-weave. The design is formed by color-dyed worsted threads being selected and  
20 raised by a jacquard above the pile-wires and afterward lowered again, according to the design intended. There are usually four or five frames applied in weaving Wilton carpets—*i. e.*, the jacquard governs four or five differ-  
25 ent colors within one dent-space of the reed. As there is in each dent-space only one color-thread required to be raised at a time by the jacquard in order to form a pile-loop over the inserted wire, the remaining three or four  
30 color-threads are lying in the back of the fabric. So the backing of Wilton carpets being formed substantially of worsted color-threads is the main reason why Wilton carpets are so much more expensive than any  
35 other carpets woven with pile-wires—say, for instance, than tapestry velvet, the backing of which consists of a cheap material, such as jute, &c. The production of fabrics woven with inserted pile-wires, such as Wilton, is  
40 a rather slow one, as the insertion of wires does not allow a high speed to be given to the loom.

The present invention is designed to weave  
45 Wilton carpets and fabrics of similar character, as a double-pile fabric woven face to face in order to save the expensive colored worsted backing now in a common Wilton carpet and in order to be able to run the respective looms on a high speed, and thus give  
50 a largely-increased production.

The invention, as above stated, is designed with more particular reference to the manu-

facture of carpets and furniture-plush, and it is in connection with the former that I shall now proceed to describe it with reference to 55 the accompanying drawings.

In a common Wilton carpet—say one of four frames—those colored figure-threads which are not at time required to bind over the pile-wire in order to produce the design are lying 60 in the back of the fabric, as stated above. I name these threads “dead - working color-threads.” An attempt has been made to make a double-pile four-frame Wilton carpet by locating two frames of the color-threads when 65 dead-working into the upper fabrics and two frames into the lower fabrics, so that in order to form the pile-figures the color-threads had to be lowered down from the upper fabric into the lower one and those of the lower fabric 70 to be lifted into the upper fabric, and after their being fastened to the respective fabrics by shots of weft the figuring-threads had to reverse their movement. The defect of this method is that the weaver cannot see when 75 there is a color-thread missing on account of two frames of color-threads being located in the upper fabrics, so that one of said frames has at least to remain in the upper fabrics as dead-working color-threads, and thus hide 80 the pile-figuring color-threads below them.

Attempt has been made to make a double-pile multiple-frame fabric, in which the lower fabric is made exactly like a Wilton carpet and the upper fabric like a moquette carpet. 85 Regarding this method it is also defective, in that the weaver cannot see when there is a color-thread missing on account of the color-threads being hidden below the fillings which are located above the stuffer-warp of the up- 90 per fabric.

Attempt has been made to make a double-pile multiple-frame fabric in which all the dead-working color-threads are located in the lower fabric and the working figuring color- 95 threads are raised and bound into the upper of the two fabrics around a pick of filling, then returned to the lower fabric to be bound around a pick of filling, again raised and bound into the upper fabric by a pick of fill- 100 ing, and then returned to the lower fabric to be bound and carried therein as warp. The defect of this method is that the tufts are doubled, presenting four ends to each spot,



thus lengthening the figure and making it twice the length of the figure of a common Wilton carpet. Another strong defect of this method is that the tufts are not well bound  
5 in the upper fabric, being fastened to the same by only one shot of filling.

My invention is designed to meet the defects of the mentioned methods by locating all the frames—*i. e.*, all of the colored threads,  
10 and there may be any number of them—into the lower fabric, so that these pile-threads when figuring always have to be lifted into the upper fabric and after having been fastened to the same by shots of filling are lowered again into the lower fabric, where said  
15 threads remain as long as they are not required to form any figure of the design, the binding of the figuring color-threads being so arranged in the upper fabric that the tufts  
20 are firmly bound to the upper fabric, so that the weaver can easily see when there is a figuring color-thread missing.

Figures 1, 2, and 3 represent longitudinal sectional views of the fabric in a line parallel  
25 with the warp-threads. Fig. 4 represents a face view of the colored threads and binder-warps of the lower fabric, and Fig. 5 a corresponding view of the upper fabric.

In the actual fabric the strands are of course  
30 closely packed together. In the drawings, however, they are represented as widely separated in order that the structure of the fabric can be more readily perceived.

A, B, D, and E are the binder-warps.  
35 C represents the colored threads of the frames. There are four frames shown in the drawings, but I wish it to be understood that any number of frames may be applied.

In Figs. 1 and 2 the structure of the upper  
40 fabrics is exactly the same—*i. e.*, the pile-loop is fastened to the fabric by three shots of filling F, G, and H, the first and third shots lying above the binder-warp B and under the binder-warp A, the second shot lying under  
45 the binder-warp B and above the binder-warp A. The colored thread C binds over the first, under the second, and over the third shot of filling.

In the lower fabric of Fig. 1 all of the colored threads are inclosed between the shot J  
50 above and the shot K below them, both shots being kept in their position by the binder-warps D and E.

In the lower fabric of Fig. 2 all of the colored threads are inclosed between the two  
55 shots L and J above and the shot K below them, these shots being also kept in their position by the binder-warps D and E. These two shots above all of the colored threads are  
60 applied in order to obtain a better closing-pile in the lower fabric, if required.

In Fig. 3 the lower fabric is quite the same

as it is in Fig. 1; but in the upper fabric the shot M is added to divide and separate the adjacent pile-loops, thus giving a firmer stand  
65 to said loops in the ground-weave and producing in this way even spaces between the loop ends—*i. e.*, a more even and regular looking pile. As shown, the shot M is placed below the binder-warp B and over the binder-  
70 warp A, separating the ends of the adjacent pile-loops.

I wish it understood that the structure of the lower fabric of Fig. 2 may be also joined with the structure of the upper fabric of  
75 Fig. 3.

It will be observed that after the two fabrics have been separated by cutting the tufts, the upper fabric, woven either with or without the tuft-separating shot M, will have an appearance that has not yet been produced by  
80 any of the known forms of binding, since the tufts, looked at from the back side, are bound over the first, under the second, and over the third shot of filling, and each of these tufts  
85 is liable to be of a different color, which is not possible to be reached by similar bindings that refer to uni or plain color double-pile fabrics. This is an important feature of construction in my fabric.  
90

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

1. A color-designed multiple-frame double-pile fabric having its figuring pile-threads,  
95 where not required by the pattern, inclosed between shots of filling and binder-warp threads in the lower fabric and bound in the upper fabric by passing over the first, under the second and over the third shots of filling  
100 and exposed to view, and then returned to the lower fabric to be bound therein until again required to appear in the pattern, the first upper binder-warp following the figuring pile-warp in its course about the wefts,  
105 and the second upper binder-warp passed above the second and below the first and third shots of filling.

2. A color-designed multiple-frame double-pile fabric having its figuring pile-threads,  
110 where not required by the pattern, inclosed between shots of filling and binder-warp threads in the lower fabric and bound in the upper fabric by passing over the first, under the second and over the third shots of filling  
115 and exposed to view, and additional binding-shots of filling lying between and separating the adjacent pile-loops of the said upper fabric.

PAUL RUTHARDT.

Witnesses:

OTTO KUHLMANN,  
ADOLF KUSTER.