C. L. FETTERLY.

WOVEN FABRIC.

APPLICATION FILED JAN. 29, 1910.

975,940.

Patented Nov. 15, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

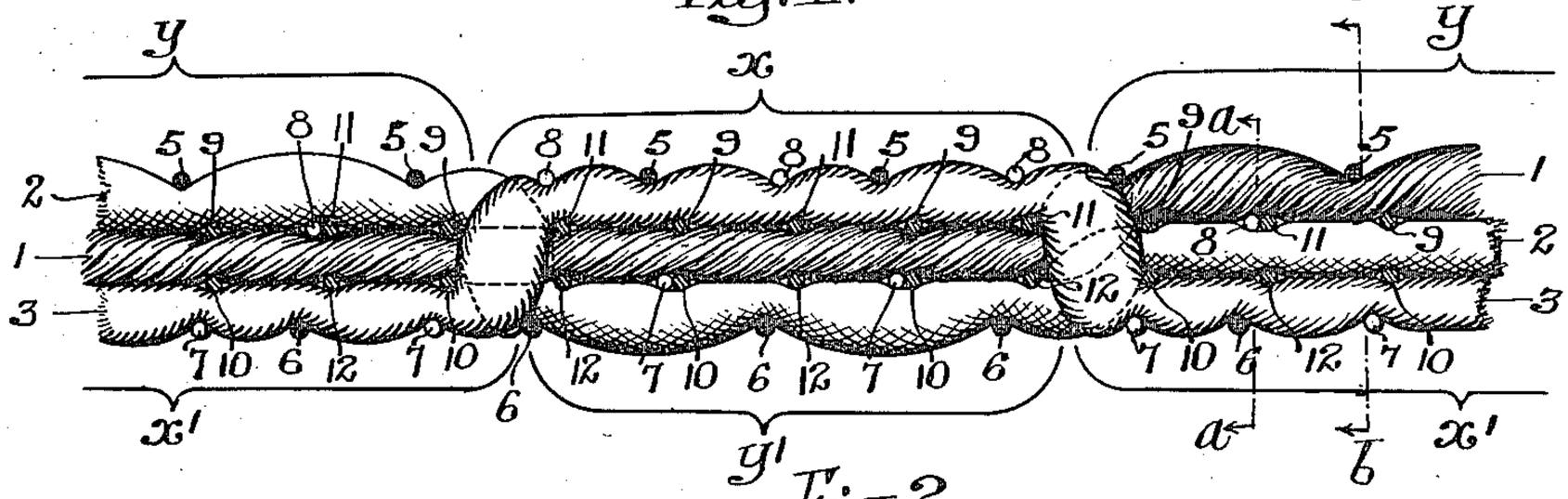


Fig. 2.

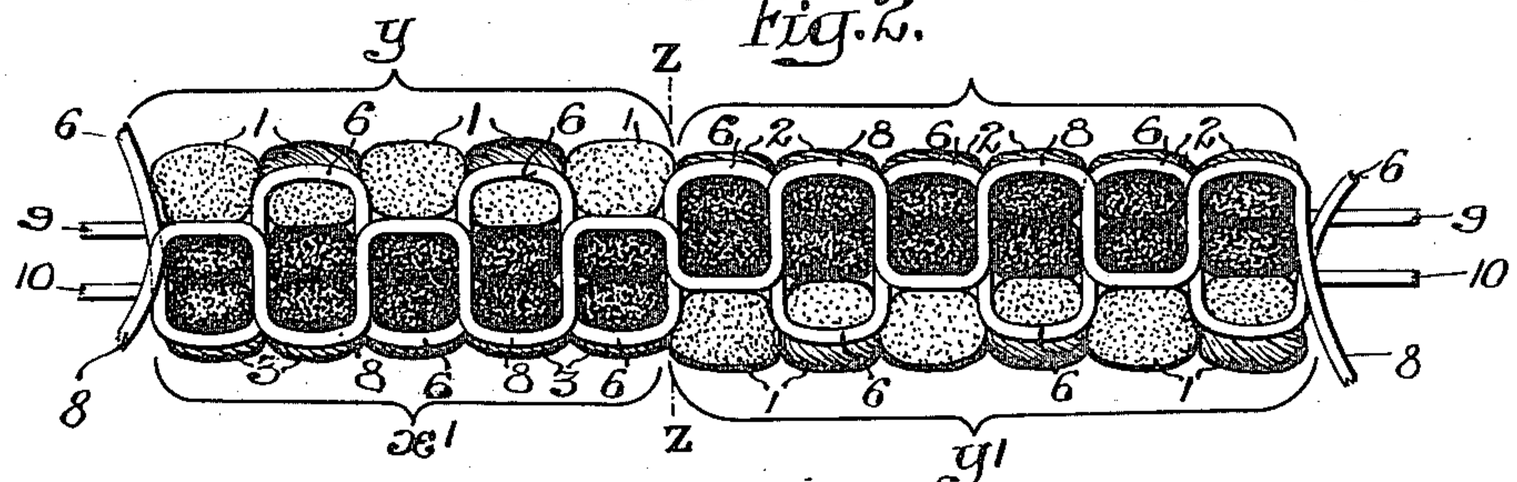


Fig. 3.

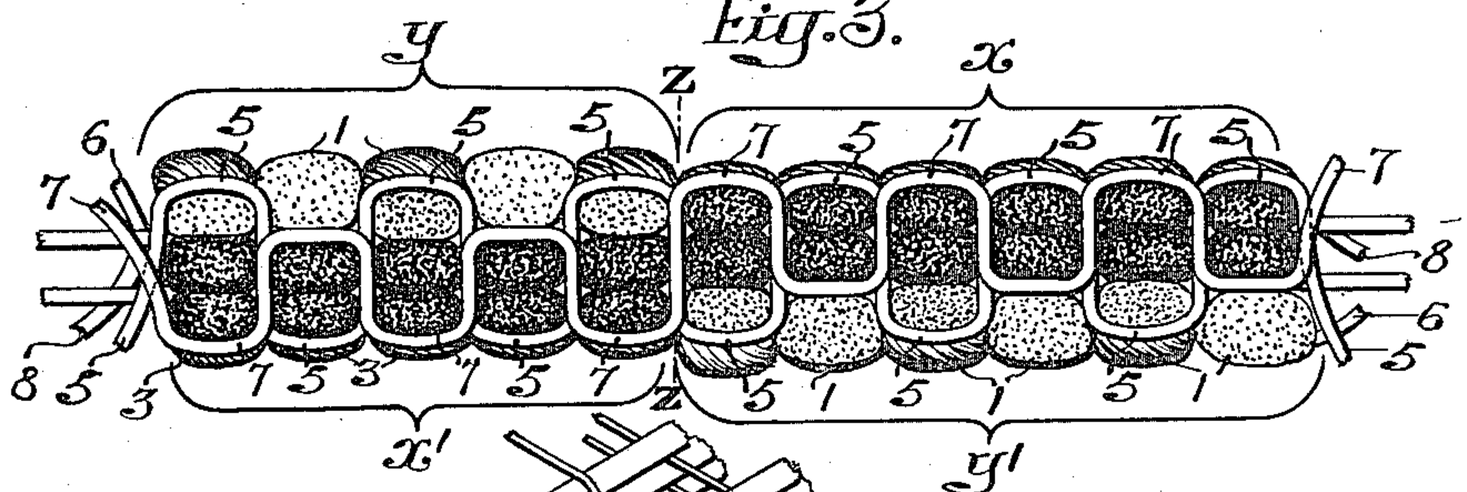
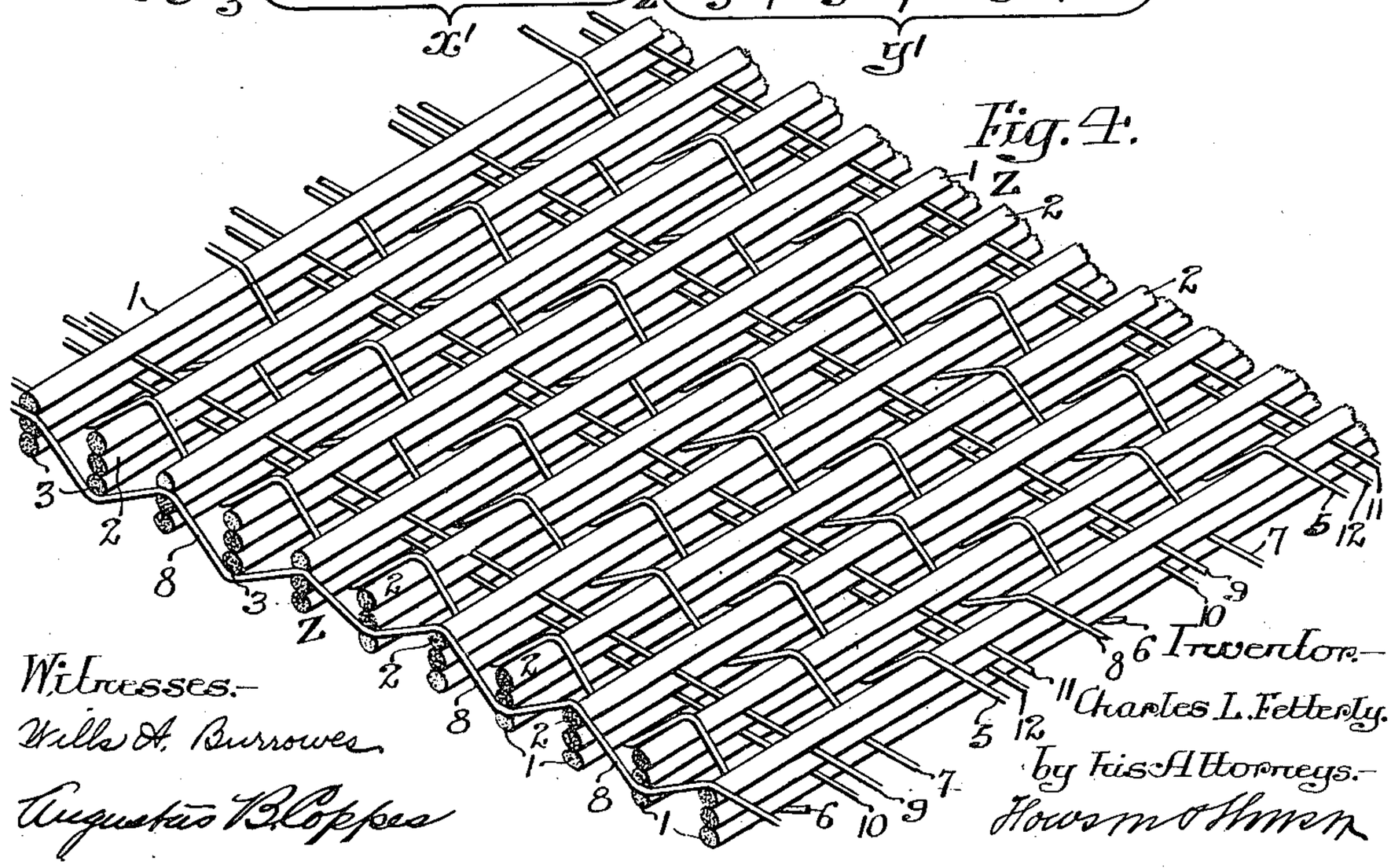


Fig. 4.



Witnesses.-

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2 SHEETS—SHEET 2.

Fig. 5.

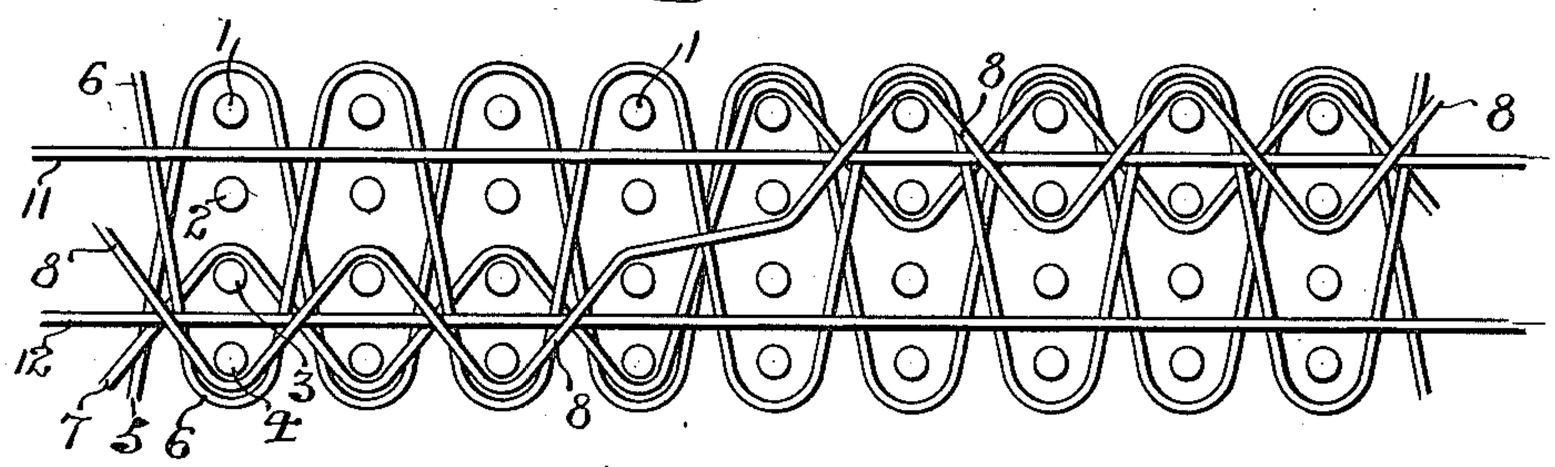


Fig. 6.

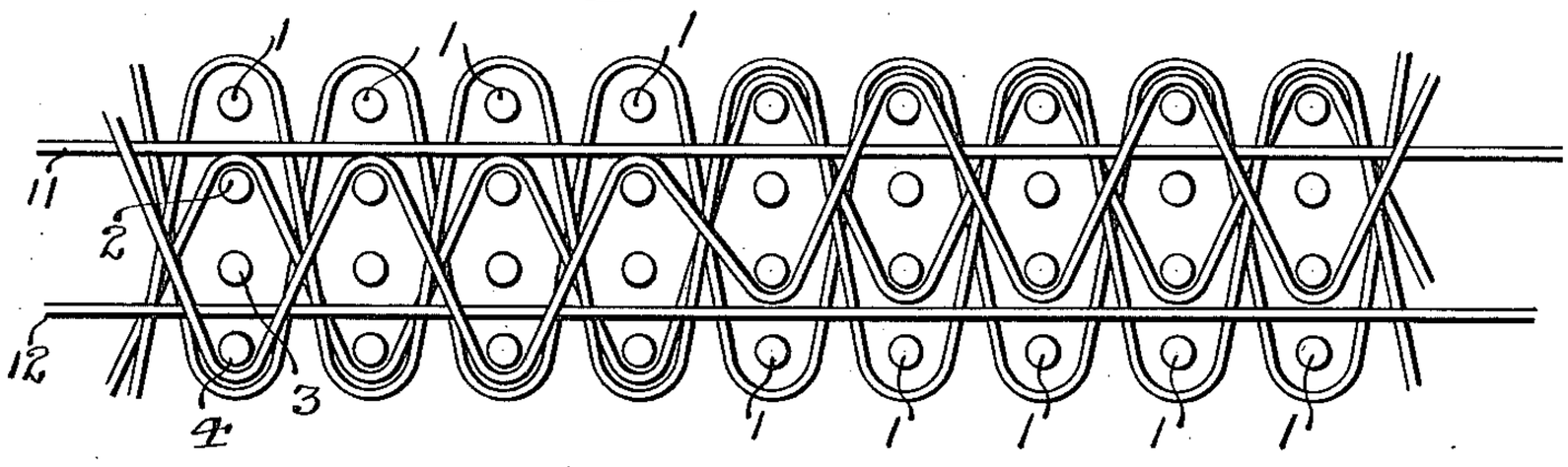


Fig. 7.

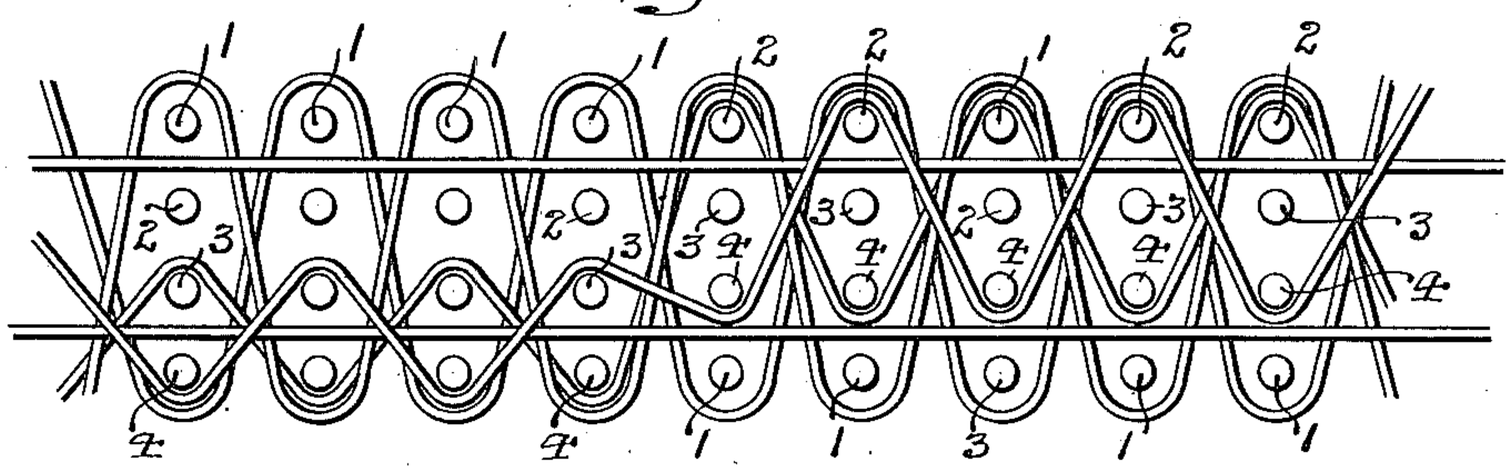
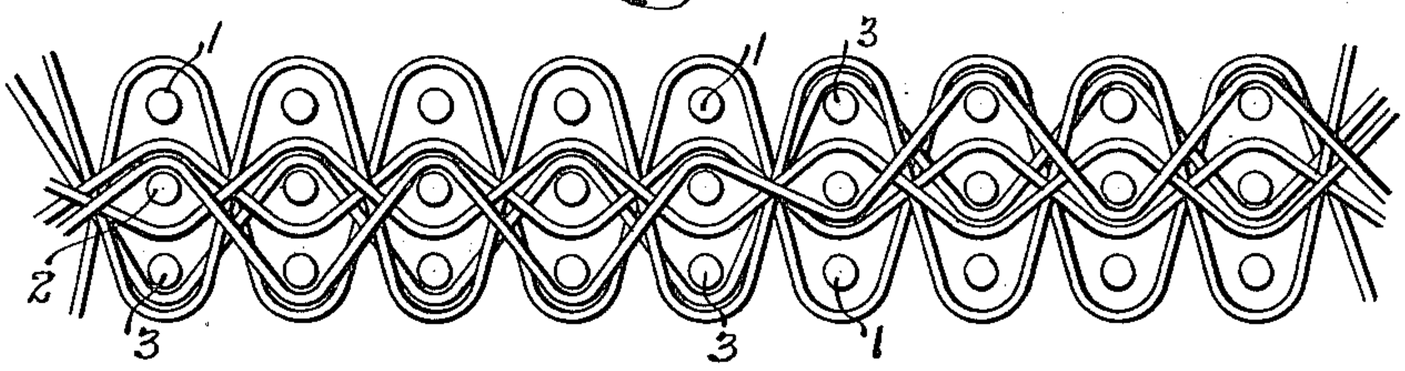


Fig. 8.



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UNITED STATES PATENT OFFICE.

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WOVEN FABRIC.

975,940. Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed January 29, 1910. Serial No. 540,772.

To all whom it may concern:

Be it known that I, CHARLES L. FETTERLY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Woven Fabrics, of which the following is a specification.

My invention relates to certain improvements in woven fabrics, but more particularly to the class of fabrics known as Scotch "art squares" which are reversible and particularly adapted for floor coverings. Attempts have been made, in this class of fabrics, to bring out the design in a "raised" effect, *i. e.* to cause the outer surfaces of the weft threads that are forming the design to project beyond those that form the ground weave, with the result that the design has been but slightly "raised," while the durability of the ground weave is sacrificed in order to produce the raised effect.

It is, therefore, one of the objects of my invention to produce a fabric of the above mentioned class that will have its design prominently "raised" on each face, and its ground weave well bound and durable.

Another object is to obtain variable heights of the raised design in the same fabric.

These objects I attain in the following manner, reference being had to the accompanying drawings, in which:

Figure 1, is a transverse sectional view through the warp of a three-ply, three color fabric produced in accordance with my invention; Fig. 2, is a section through the weft, taken on the line *a*—*a* Fig. 1; Fig. 3, is a section through the weft, taken on the line *b*—*b* Fig. 1; Fig. 4, is a diagrammatic perspective view of one form of my invention, the threads being separated to clearly show their functions and arrangement; Fig. 5, is a diagrammatic transverse sectional view through the weft of a four-ply fabric; Fig. 6, is a diagrammatic transverse sectional view through the weft of a four-ply fabric and showing a modified form of binding; Fig. 7, is a diagrammatic transverse sectional view through the weft of a four-ply fabric showing three forms of binding; Fig. 8, is a diagrammatic transverse sectional view through the weft of a three-ply fabric showing a modified form of binding.

Referring to the drawings, (Figs. 1 to 4 inclusive) 1, 2 and 3 are figuring weft threads of large diameter; 5 and 6 are binder warps which operate alternately to chain-bind from surface to surface, all the wefts in every shed; 7 and 8 are auxiliary warps for binding and tying-in the weft threads only when they are forming the ground weave, as shown at *x* and *x'* (Figs. 1, 2 and 3) but which do not bind or tie any portions of weft threads that are brought to the surface to produce the raised design, as shown at *y* and *y'* (Figs. 1, 2 and 3); and 9, 10, 11 and 12 are the stuffer warps which are arranged in a manner which will be described hereinafter. The arrangement of the warps as they come through the reed, is such that; alternate slits contain four threads each, namely, a chain binder 5, an auxiliary binder 7, a stuffer 9, and a stuffer 10, and the intervening slits also contain four threads each, namely, a chain binder 6, an auxiliary binder 8, a stuffer 11 and a stuffer 12. In the weaving of the fabric the chain binder warps 5 and 6 are raised and lowered alternately to bind each group of weft threads, as clearly shown in Fig. 4. The auxiliary binder warps 7 and 8 are operated alternately by the jacquard, but never bind a weft when the latter is made to form a part of the raised design. The stuffer warps serve to bring the proper wefts into the design and run through the fabric adjacent the surface picks; being positioned as previously mentioned in the drawing-in arrangement, and as clearly shown in Figs. 1 and 4. Thus, by employing weft threads of great diameter; binding the ground weave by the auxiliary binder warp 7 and 8; tying portions of the wefts forming the raised design and positioning the stuffer warps as specified, I have produced a fabric that is durable and which has its design well defined and raised above the ground, as clearly shown in Figs. 1, 2 and 3 at *y* and *y'*.

I have shown (Figs. 2 and 3) how the auxiliary threads operate when making a change from the raised design to the ground on upper surface and from ground to the raised design on the lower surfaces. The point of change is indicated at Z and the wefts, as they are bound by the auxiliary binders, are shown in heavy dark stippling.

In the modification, Fig. 5, I have shown a case of four color wefts, 1, 2, 3 and 4,

where the auxiliary binders 7 and 8 bind two wefts to form the ground. In this case the ply of weft directly beneath each surface assists in forming the raised design, as do also the stuffer warps between them.

Fig. 6, shows a case where, in a four color fabric, the auxiliary warp binds three of the wefts, and the raised design is produced entirely by the outer surface wefts.

By weaving a fabric as shown in Fig. 7, where the auxiliary warps bind variable numbers of the wefts I obtain various heights in the raised design, either on opposite faces of the fabric, as shown in the drawing, or on the same face,—as would be the case if Figs. 5 and 6 were combined to form one fabric.

The three-ply fabric shown at Fig. 8 has the stuffer warp stitching the middle ply of wefts, thereby creating a sound body of the "tying in" of the wefts.

Fabrics of this class have heretofore been constructed where the outer surface wefts were stitched by extra warp, when forming the design ground, but as there was no tying in or binding, their extra threads soon became loose and of no avail. In my fabric, on the contrary, the auxiliary warps always bind and tie in at least two weft threads, which have stuffers passing between them; the action and result being that the wefts naturally tend to expand and spring apart, and in so doing also tend to keep the auxiliary warps tight. Thus it will be understood that a fabric constructed in accordance with my invention possesses all the possibilities of the "art square" fabric design and in addition allows the design to be clearly brought out in a well defined raised effect from a durable ground weave.

I claim:—

1. A fabric having a raised design interwoven on each face and formed by portions of the weft threads that project beyond the portions of the weft threads which form the ground weave, the same consisting of three or more plies of figuring weft threads of large diameter, stuffer warps directly adjacent the surface wefts, an auxiliary warp for binding two or more plies of weft and stuffer warps to form the ground weave, and a chain binder warp for binding the raised design to the ground weave.

2. A woven fabric especially adapted as a floor covering and having a raised design on each face, the same consisting of three or more series of figuring weft threads of large diameter, stuffer warps directly adjacent the surface wefts, an auxiliary warp for binding two or more wefts and stuffer warps between them in each shed to form the ground weave, and a chain binder warp for tying, to the ground weave, portions of the wefts which form the raised design.

3. A woven fabric especially adapted as a floor covering and having a raised design on each face, the same consisting of three or more series of figuring weft threads of large diameter, stuffer warps directly adjacent the surface wefts, an auxiliary warp for binding two or more wefts and stuffer warps between them in each shed to form the ground weave, and a chain binder warp for tying, to the ground weave, the portions of weft which form the raised design and the stuffer warps when they are adjacent the raised design.

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

CHARLES L. FETTERLY.

Witnesses:
WM. E. SHUPE,
WM. A. BARR.