

(No Model.)

H. HARDWICK.
INGRAIN CARPET FABRIC.

No. 353,135.

Patented Nov. 23, 1886.

FIG. 1.

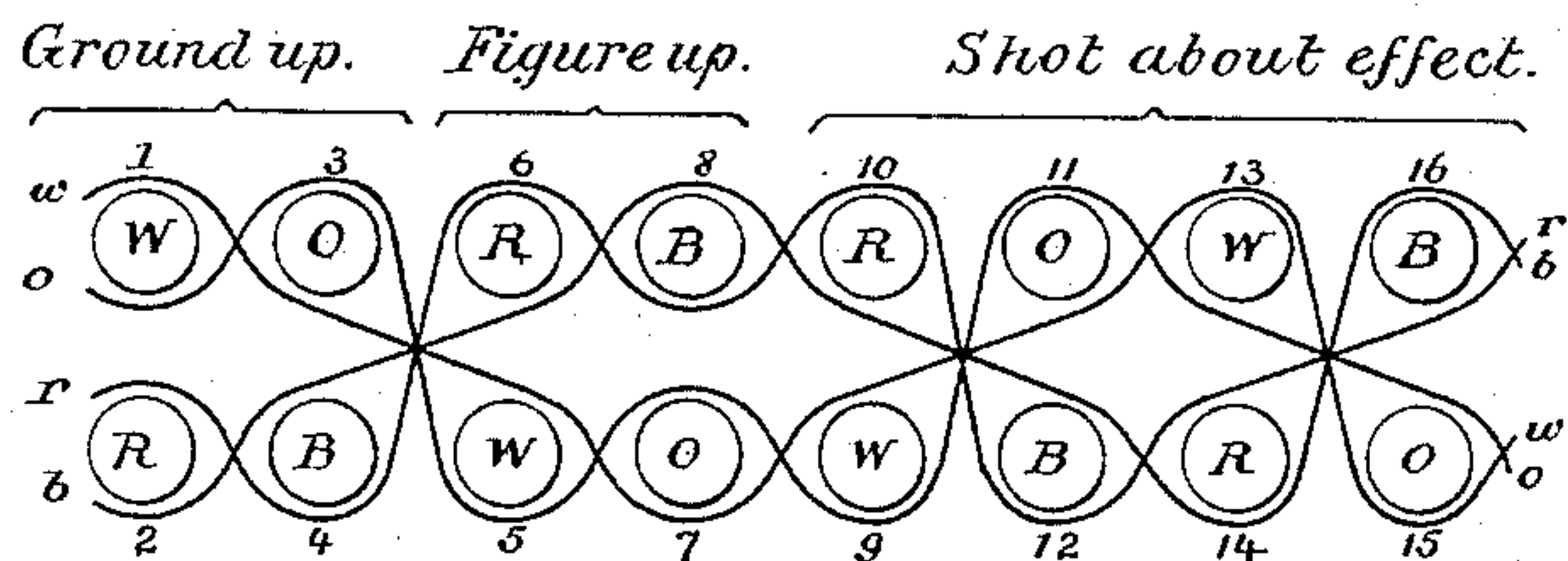


FIG. 2.

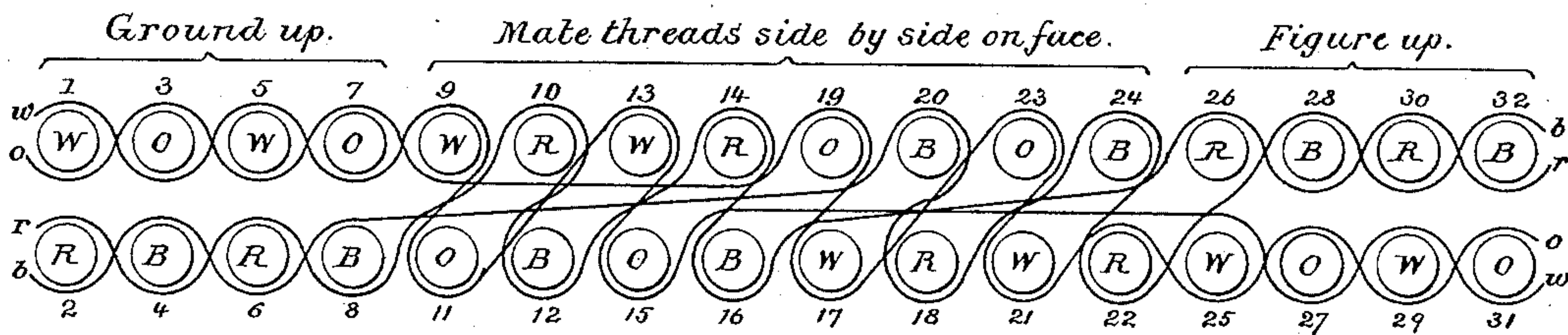
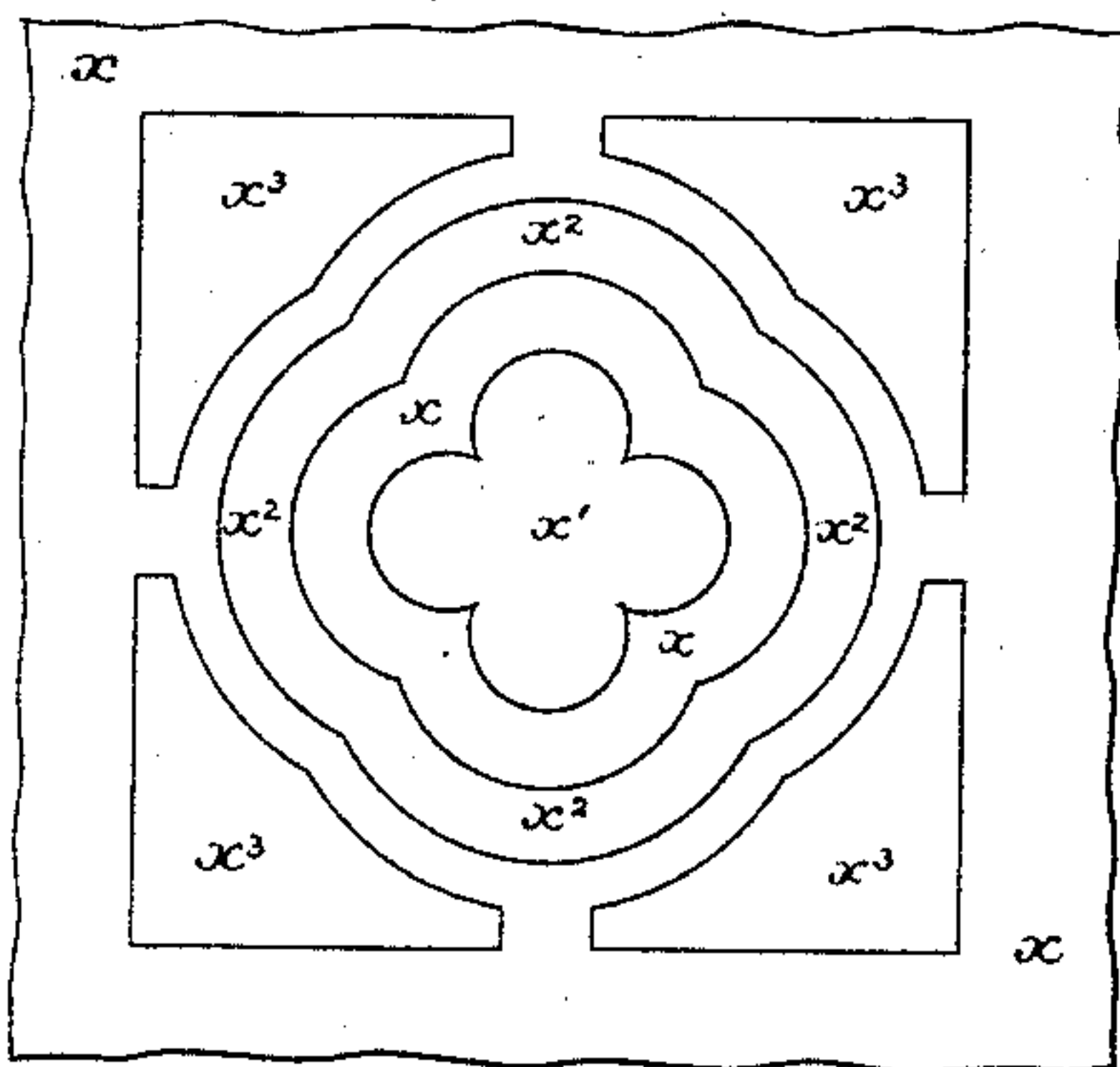


FIG. 3.



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UNITED STATES PATENT OFFICE.

HARRY HARDWICK, OF PHILADELPHIA, PENNSYLVANIA.

INGRAIN CARPET FABRIC.

SPECIFICATION forming part of Letters Patent No. 353,135, dated November 23, 1886.

Application filed May 4, 1886. Serial No. 20 1,653. (No specimens.)

To all whom it may concern:

Be it known that I, HARRY HARDWICK, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Ingrain Carpet Fabrics, of which the following is a specification.

The object of my invention is to so make a two-ply ingrain carpet as to provide a more acceptable distribution of colors in the pattern
10 than is possible when the carpet is woven in the usual manner; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

15 Figure 1 is an exaggerated diagram, illustrating the usual method of weaving a two-ply ingrain carpet; Fig. 2, a similar view illustrating my improved method of weaving, and Fig. 3 a diagram illustrating the object of my in-
20 vention.

In weaving ordinary two-ply ingrain carpet four sets of warp-threads and four weft-threads are usually employed, two of said weft-threads forming the figure and the other two forming
25 the ground, each of the figure-threads having as its mate one of the ground-threads, and these threads being so arranged that when a figure-thread appears upon the face of the fabric, its mate thread appears on the back, the
30 figure-thread appearing upon the back when the mate ground-thread appears upon the face. This will be understood on reference to Fig. 1, which illustrates the old way of weaving.

35 We will suppose the figuring weft-threads to be red and black, and to be indicated by the letters R and B, and the ground weft-threads to be white and olive, and indicated by the letters W and O.

40 It will be observed that the red and white weft-threads are mate threads, and that one appears upon the back when the other is upon the face, the black and olive weft-threads being similarly mated. This result is necessi-
45 tated in the usual manner of weaving two-ply ingrain carpets, owing to the manner in which the warp-threads are operated.

There are four sets of warp-threads—two

for the ground and two for the figure—and these threads are usually of the same colors as
50 the weft-threads, each weft-thread, where it appears upon the face of the fabric, being bound by a warp-thread of its own color.

In the diagram, the letters *r b w o* indicate, respectively, the red, black, white, and olive
55 warp-threads.

There is in the loom for weaving the fabric a lifter-board for the ground-warps, and a lifter-board for the figure-warps, and a harness shaft or frame for each of the four warps, and there
60 is but one operation of the Jacquard needles for every two picks of the loom, there being an operation of the ground and figure lifter boards in succession between the operations of the Jacquard needles. Each Jacquard needle
65 controls two tails—one connected to the figuring-warps *b* and *r*, and the other to the ground-warp threads *w* and *o*—and the lifter-boards are so constructed that when the figuring-tail of the needle is adjusted so as to be lifted by
70 the figure lifter board, the ground-tail will not be acted on by the ground-lifter board when it rises. The weft-threads are inserted in a certain order—for instance, in that shown by the numerals applied to the threads in the
75 drawings, the order there illustrated being white, red, olive, black, and this being then repeated.

In Fig. 1 of the drawings I have illustrated the full number of changes possible when the
80 old mode of weaving is adopted, the first section showing the ground-threads up, the second section showing the figure-threads up, and the third section showing what are known as “shot-about” effects, or part figure and
85 part ground, these effects being produced by a reversal in the order of lifting the warp-threads.

I have deemed it best to give a detailed statement of the operations of the loom necessary
90 in weaving a piece of fabric of the character shown, as this will make it clear that the ordinary method of working the warp-threads necessitates the disposal of the mate threads in the manner which I have before mentioned.
95

The operations are as follows:

	Shot.	Color.	Figure-lift board.	Ground-lift board.	Harness-shaft lifts:	Threads down.	
	1	White.	Rises; no lift.	At rest.	White to bind on face.	Red, black, and olive.	60
5	2	Red.	At rest.	Lifts white and olive.	Red.	Black to bind on back.	
	3	Olive.	Rises; no lift.	At rest.	Olive to bind on face.	Red, black, and white.	
	4	Black.	At rest.	Lifts white and olive.	Black.	Red to bind on back.	65
10	5	White.	Lifts red and black.	At rest.	White.	Olive to bind on back.	
	6	Red.	At rest.	Rises; no lift.	Red to bind on face.	Black, white, and olive.	
	7	Olive.	Lifts red and black.	At rest.	Olive.	White to bind on back.	
	8	Black.	At rest.	Rises; no lift.	Black to bind on face.	Red, white, and olive.	70
15	9	White.	Lifts red and black.	At rest.	White.	Olive to bind on back.	
	10	Red.	At rest.	Rises; no lift.	Red to bind on face.	Black, white, and olive.	
	11	Olive.	Rises; no lift.	At rest.	Olive to bind on face.	White, red, and black.	
20	12	Black.	At rest.	Lifts white and olive.	Black.	Red to bind on back.	75
	13	White.	Rises; no lift.	At rest.	White to bind on face.	Olive, red, and black.	
	14	Red.	At rest.	Lifts white and olive.	Red.	Black to bind on back.	
	15	Olive.	Lifts red and black.	At rest.	Olive.	White to bind on back.	80
25	16	Black.	At rest.	Rises; no lift.	Black to bind on face.	Red, white, and olive.	

The heavy dividing-lines indicate where the jacquard changes.

30 In carrying out my invention I discard the alternate operation of the Jacquard needles, and instead operate them on each pick of the loom, so that by a proper arrangement of the cards, and without interfering with the usual order of insertion of the weft-threads, the warps
35 may be so operated as to permit the bringing of successively-introduced or mate threads side by side on the same face of the fabric, as shown in Fig. 2 of the drawings, instead of disposing them one above another, as in Fig. 1.

40 I may dispense with the usual harness shafts or journals of the loom, and lift all of the threads for each pick by means of a single lifter-board; but I prefer to employ the same loom as is now employed for weaving two-ply in-
45 grain carpet, the only change necessary being in the mechanism for operating the Jacquard cylinder and the use of double the number of cards formerly employed.

50 It will be understood that the new arrangement of threads is adopted only in those portions of the fabric in which the pattern requires the new effect or novel distribution of colors attained by my invention, the relation of the mate threads to each other in other portions of the fabric remaining the same as at
55 present.

I am aware that in making an ordinary in- 85 grain carpet mate threads necessarily appear side by side for a very limited distance where the figure changes and the threads are crowded together; but this appearance is not intentional, and does not form a defined part of the pattern, 90 and hence is distinct from my invention, in which the appearance of the mate threads side by side upon the same face forms a definite feature of the pattern, and is brought about by a definite and novel operation of the warp- 95 threads. For instance, in Fig. 3 I have shown a pattern in which the portions x are ground, the portion x' figure, the portion x'' shot-about effects, and the portions x''' mate-thread effects.

I claim as my invention— 100

A two-ply ingrain carpet fabric in which mate weft-threads appear side by side on the same face of the fabric where it is double- 105 ply, and form a part of the pattern of the fabric, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two sub-
scribing witnesses.

HARRY HARDWICK.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.