

(No Model.)

E. HENKELS.
MACHINE MADE LACE.

No. 329,739.

Patented Nov. 3, 1885.

Fig. 1.

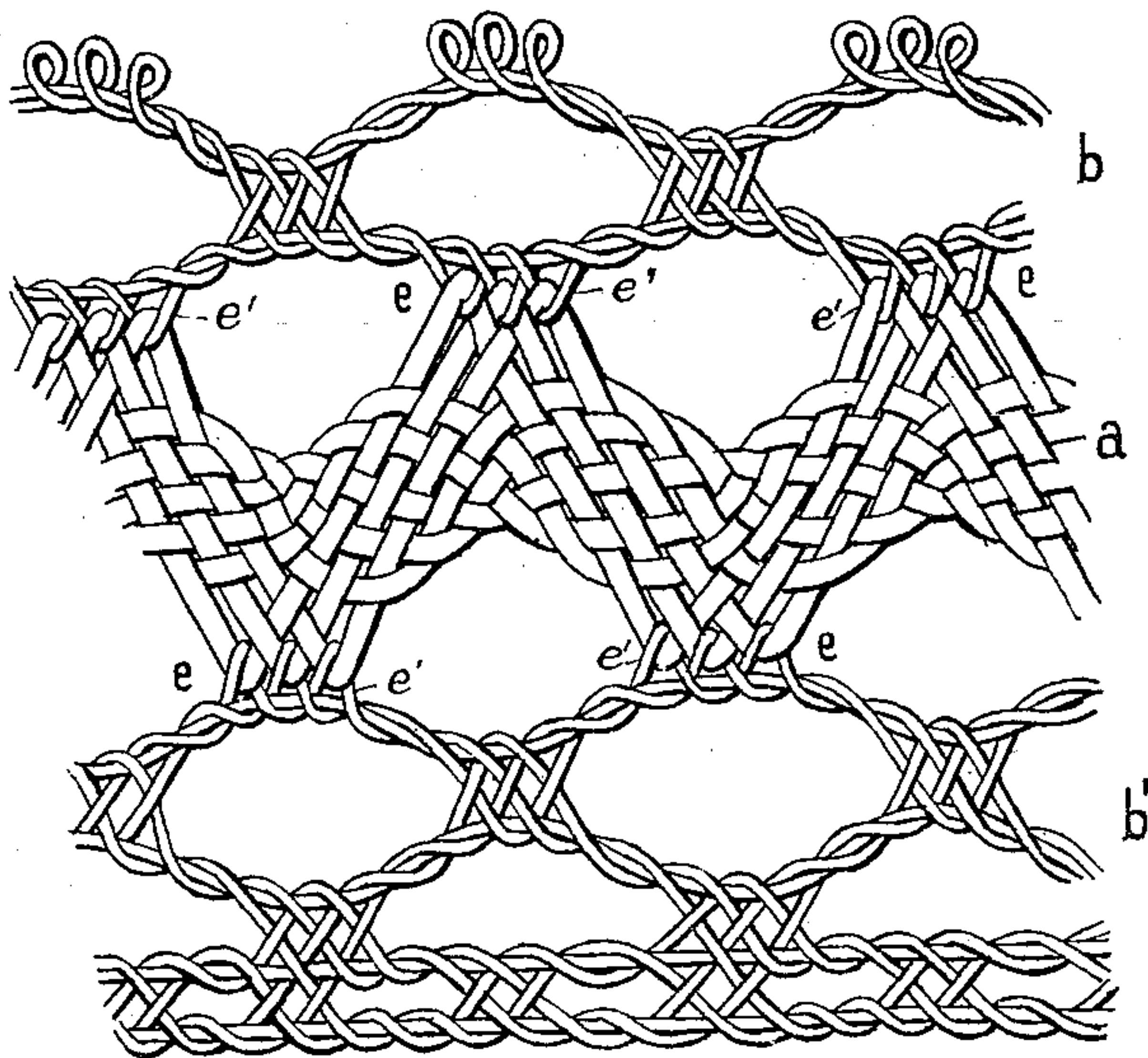
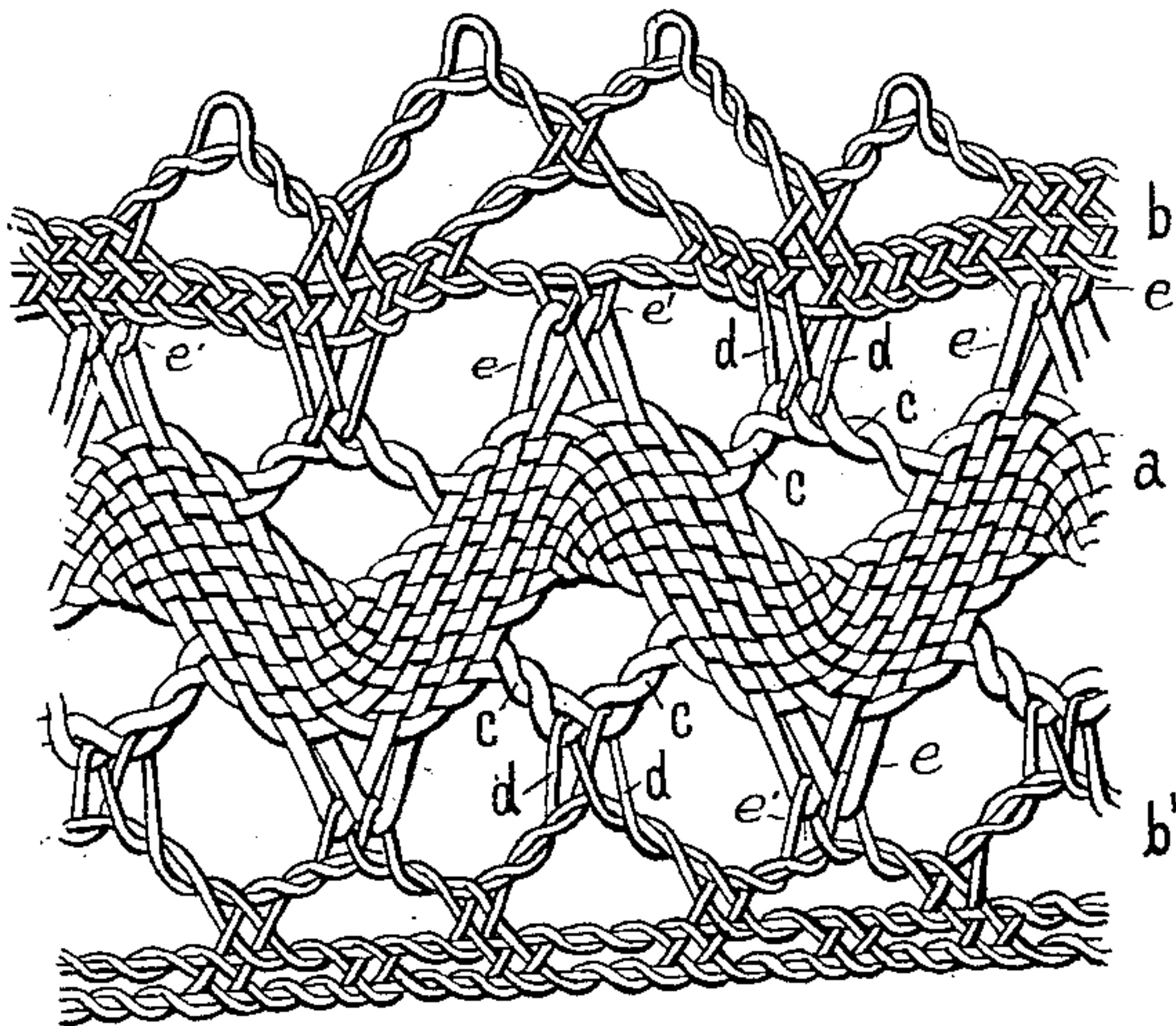


Fig. 2.



Attest:

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ERNST HENKELS, OF LANGERFELD, PRUSSIA, GERMANY.

MACHINE-MADE LACE.

SPECIFICATION forming part of Letters Patent No. 329,739, dated November 3, 1885.

Application filed October 2, 1884. Serial No. 144,528. (No model.)

To all whom it may concern:

Be it known that I, ERNST HENKELS, residing at Langerfeld, district of Hagen, Kingdom of Prussia, German Empire, have invented a new and useful Improvement in Machine-Made Lace, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to lace of the kind manufactured on machines such as are described in Letters Patent of the United States Nos. 288,236 and 293,020; and it consists in such lace as an article of manufacture, constituting a closely-plaited zigzag or serpentine portion, (representing that commonly called "rick-rack braid,") combined with an open lace portion of any desired pattern, (representing that known as "pillow-lace,") the union between the said two varieties of lace being such that the threads of one variety do not pass into the other and become a part thereof, but that they only become interlocked with the threads of the other variety, as will more fully appear. As is well known, zigzag or serpentine braids are produced on plaiting-machines by imparting, in a certain definite order and by means of weights, different degrees of tension to the threads to be plaited, such of the threads as have less tension becoming, under these conditions, plaited more loosely, and forming alternately on either side of the more heavily loaded and tension threads bows or salient portions of more or less pointed form. Heretofore machine-made braids of this kind have either been single braids or close combinations of two or more of them, or combinations with plain straight braids. In the latter two cases the connection between the individual braids is attained by causing the threads of least tension, which form the salient portions of the braid, to pass over from one braid to the other, and vice versa. Braids of this character have had a lace-ground formed thereon by hand with the crochet-needle. When, however, a closely-plaited zigzag or serpentine portion having the characteristics of rick-rack braid is to be produced on lace-machines, combined with an open ground of imitation pillow-lace consisting of two, three, or more threads, it cannot be produced by means of the described mode of connection of the serpentine braids with each other, for the reason that in the

manufacture of pillow-lace all the threads require to be kept at a considerable degree of tension by means of comparatively heavy weights, while in the zigzag braid the threads are kept at different tensions, those to be used for the connection (with the lace) being the slackest ones. The transition of the lace-forming threads into the zigzag portion, or of the threads of the zigzag portion forming the bows thereof into the lace, would, therefore, in the first instance, cause a disturbance in the succession of threads of different tension in the zigzag portion, and, besides, an intertwining of comparatively slack threads (forming the bows of the zigzag portion) with threads of high tension in the lace. A regular and efficient working of the threads—such as is required to produce the desired pattern—would in consequence be impossible. In order to obviate this difficulty, the threads connecting the lace proper with the zigzag portion are, according to my invention, not caused to pass from one of these parts into the other; but they are so conducted in the simultaneous making of both portions as only to become linked with each other, and then to return to the portion to which they belong.

In the accompanying drawings, Figures 1 and 2 represent, on an enlarged scale, two pieces of lace having differing forms of zigzag portions and arrangement of their threads and of different designs, both embodying the present invention, the threads of the zigzag portions being represented thicker than those of the lace portion, so as to render the threads of each more readily distinguishable.

Referring to said figures, *a* is the zigzag portion or serpentine braid denoted by thick threads, and *b b'* the lace portion or pillow-lace work combined therewith.

In the manufacture of this improved lace the devices of the lace-machine are operated simultaneously to produce both portions of the same, and in forming the zigzag portion certain of the threads thereof are caused to separate at the projecting points or bows, as at *e*, from the main body of threads, and to pass around certain of the threads, *e'*, of the lace portion, and thereupon return immediately to the said body of threads. Thus each portion is connected at the required points to the other portion by means of threads that have become

linked or engaged with each other at their bends, and which, subsequent to such linking or engagement, return directly to their companion threads without being called upon to co-operate in the formation of the other portion of the lace. In instances where the zigzag portion *a* is very broad or the points deep, as in Fig. 2, further connections between it and the lace portions *b b'* may be provided intermediate of the points of the zigzag portion *a* by causing two or more threads of the portion *a* to separate therefrom, as at *c*, and become linked with the threads *d* of the lace portions *b* and *b'*, and then to return to the said portion *a* in like manner as the threads at *e*. It may be remarked that should the threads of the zigzag portion *a*, which form the connections herein described, be weighted to the same extent as the threads of the lace portions *b* or *b'*, and be of the same quality, it is possible to allow them to pass into the lace portion, while like threads of the lace portion may also pass into the zigzag portion *a*.

In the patterns illustrated by the drawings there is one zigzag portion representing serpentine braid between two strips of pillow-lace; but the zigzag portion may also be at the edge of the work, or two or more zigzag

portions of equal or different width may be combined with the lace portion or portions, and, finally, the zigzag portion and the lace portions may be carried out in different colors without departing from the particular nature or character of the invention.

What I claim as new is—

As a new article of manufacture, the herein-described machine-made lace, consisting in the combination of a multiplicity of threads closely plaited or interwoven to form a zigzag portion (representing rick-rack braid) with an open lace portion constituted by a multiplicity of threads, (representing pillow-lace,) the connection or union between the two portions being formed by threads of one portion linked with threads of the other, the said threads, subsequent to their re-engagement, passing back to the portion to which they belong, substantially as described.

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

ERNST HENKELS.

Witnesses:

GEORGE KOCH,
ROB W. SCHOENLE.