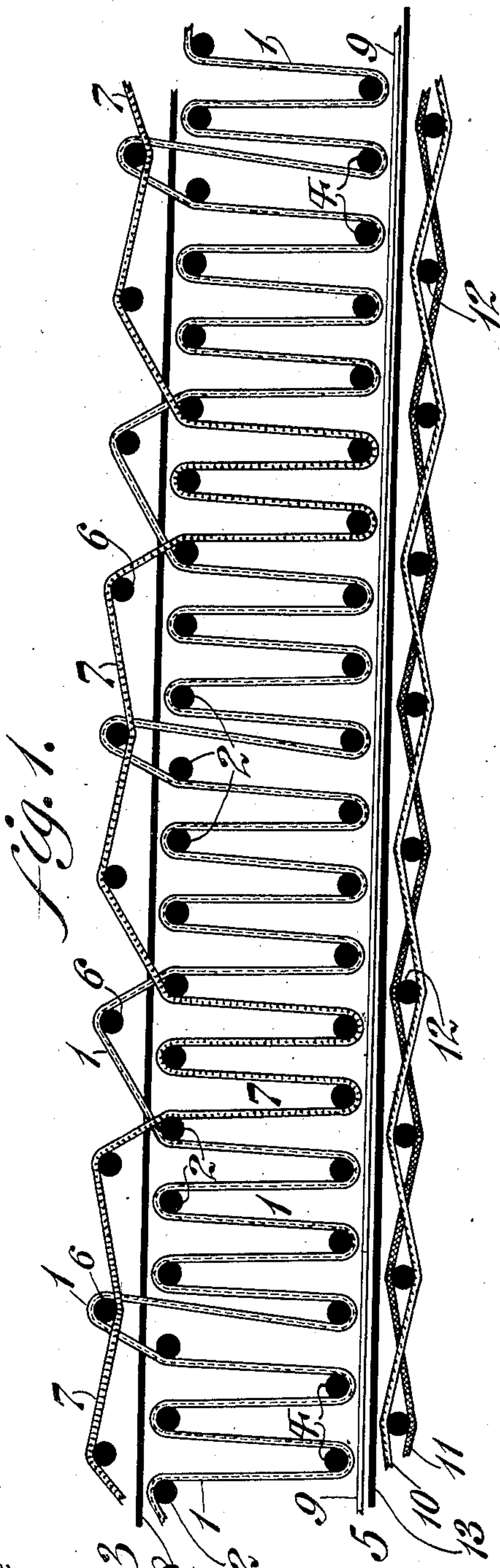


No. 813,131.

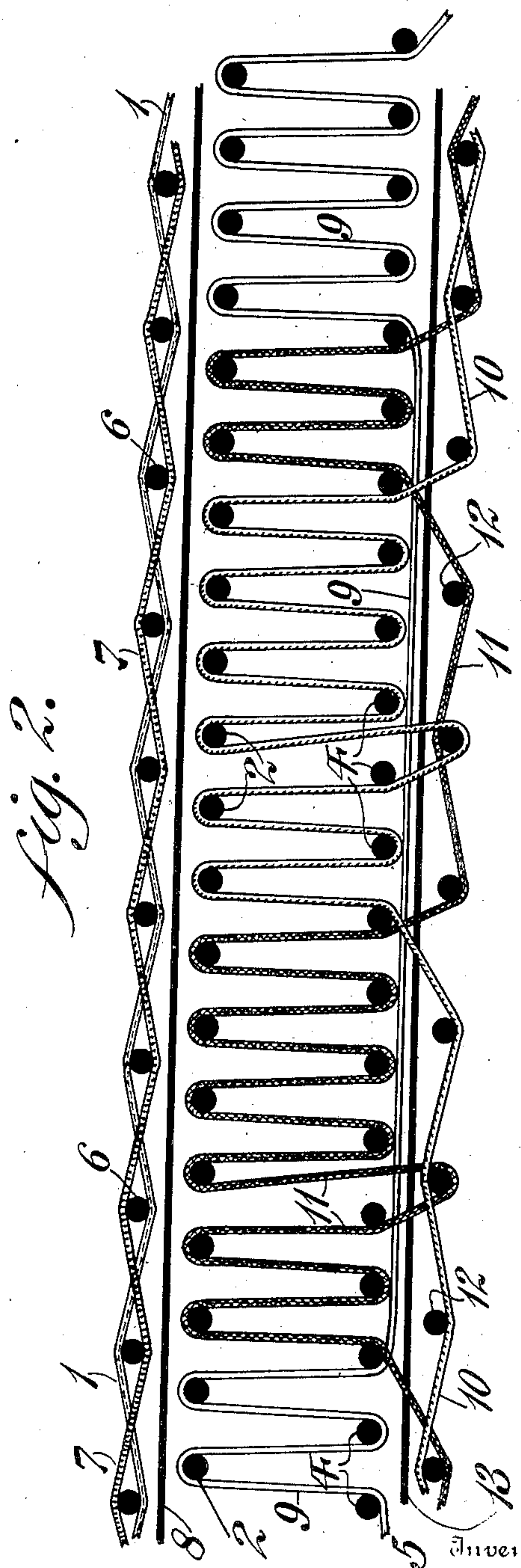
PATENTED FEB. 20, 1906.

J. ZIMMERMAN.
WOVEN PILE FABRIC.
APPLICATION FILED JAN. 18, 1905.

2 SHEETS—SHEET 1.



Witnesses
L. J. Joville,
P. F. Hagle



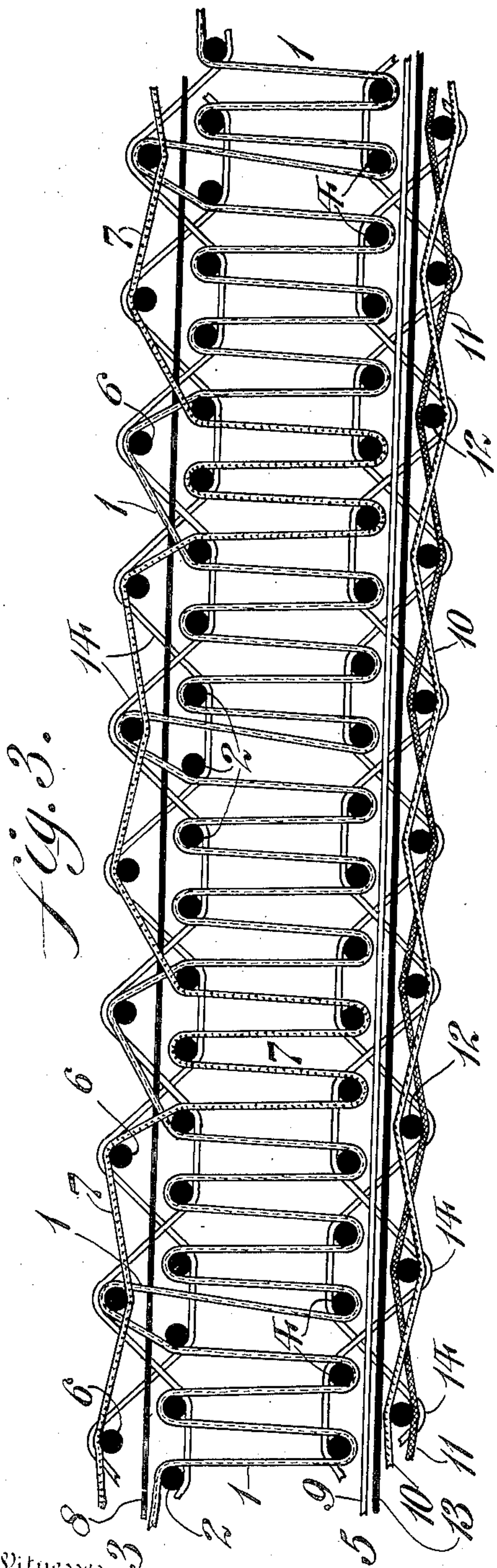
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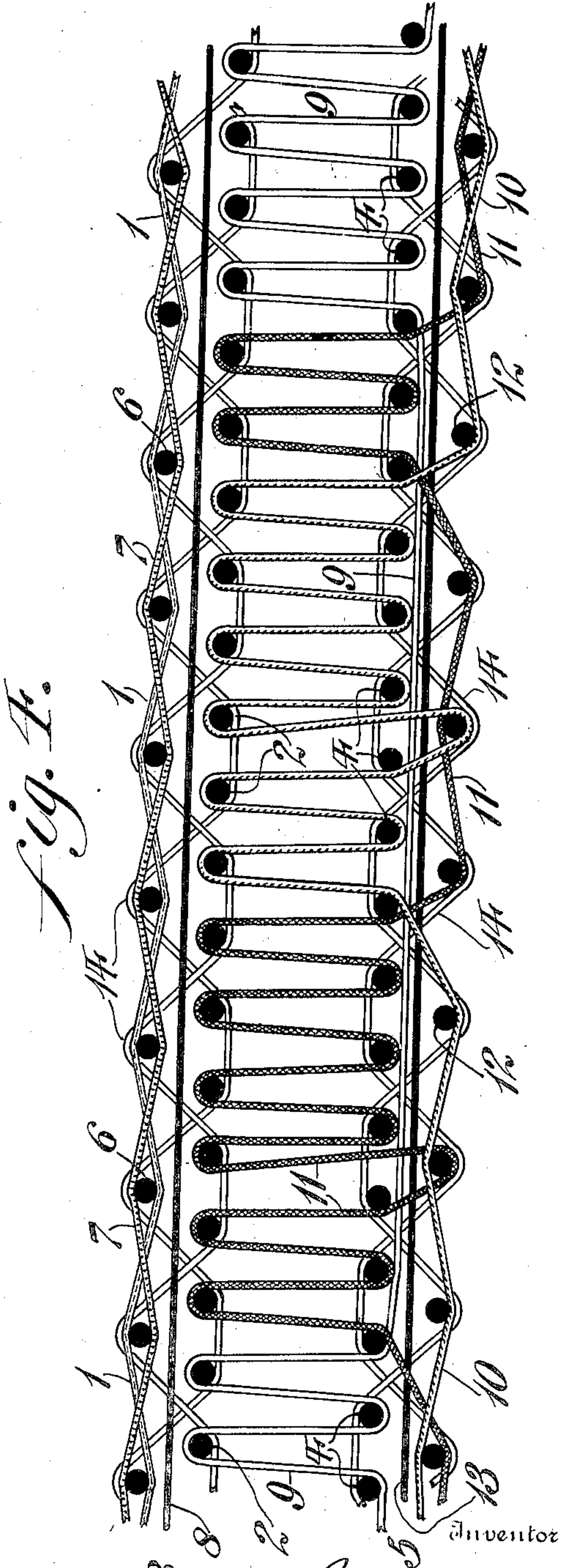
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE

JOHN ZIMMERMAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR
TO PHILADELPHIA TAPESTRY MILLS. A CORPORATION OF PENN-
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WOVEN PILE FABRIC.

No. 813,131.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed January 18, 1905. Serial No. 241,539.

To all whom it may concern:

Be it known that I, JOHN ZIMMERMAN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Woven Pile Fabric, of which the following is a specification.

My invention relates to cut pile fabrics having outer and inner planes of wefts; and it consists in weaving a double cloth after the manner hereinafter described and illustrated in the accompanying drawings.

The invention consists in a relation of weft and pile warp threads such that the warp-threads unite the outer wefts and at the same time form pile.

My invention further consists in binding outer and inner planes of weft-threads and combined binding and pile warp threads in such way by additional binder-warp threads as to unite the inner and outer planes of weft-threads.

My invention further consists in passing a warp-thread under and over successive outer weft-threads and intermediate such passage, using the warp-thread as a pile without disturbing the relation of the warp with reference to the alternate outer wefts.

My invention further consists in combining an additional binding-warp thread with a ground of wefts in outer and inner planes differing in number per plane and a combined binding and pile warp thread and in uniting the outer and inner weft-threads thereby in groups bearing the relation of the total number of weft-threads in the one plane to those in the other.

My invention further consists in forming a pile fabric in such a manner that when it is cut binding-warps uniting the threads of the back will form pile with their extremities.

My invention further consists in using a warp-thread to unite the back wefts of a fabric as cut—that is, a single pile—in such a manner that the extremities of these binding-warps shall form pile and in forming piles intermediate these extremities by another or other pile-warp threads.

My invention further consists in forming a pile fabric with combined binding and pile warp-threads and intermediate pile-threads and in uniting the two planes of wefts by an additional binding-warp.

My invention further consists in forming a

fabric as above described during any desired portion of its length and in thereafter for a portion using the combined pile and binding warp as a simple binding-warp for the back wefts.

My invention further consists in arranging a fabric of the character described so that the pile-warps, which also form binding-warps, are supplied at intervals from opposite sides of the fabric.

A further object of my invention is to use binding-warp threads upon opposite sides of the double-pile fabric to unite the outer wefts and at intervals to throw these warps in from either side at will as piles preferably without interfering with their relation to the outer weft-threads.

A further object of my invention is to form a fabric having combined pile and binding warps, the pile-warps being woven from either side at will, and the opposite side then containing these combined warps as binding-warps only for the outer plane of wefts and in uniting the outer and inner planes of weft-threads by an additional binding-warp.

Figures 1 and 2 represent longitudinal sections of my cut pile fabric with the binding-warps omitted. Figs. 3 and 4 represent longitudinal sections of the completed fabric as respectively shown incomplete in Figs. 1 and 2.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, in Fig. 1 the pile-warp when used for making pile is passed over the wefts 2 in the upper cloth 3 and under the wefts 4 in the lower cloth 5. This operation may be repeated during any desired number of picks, and when required to make a continuous even back said warps may be passed over the weft 6, whereby said pile-warp 1 not only acts as a binding-warp, but is exposed to view on the outside of the back of the body of the fabric, thereby adding to the artistic finish of the same and increasing its durability, as the fabric is more closely interwoven.

When the warp 1 is not to appear in the pile during several consecutive picks, it is passed alternately above and below the weft 6, as seen in Figs. 2 and 4. The pile-warp 7 is also passed above the weft 2 and below the weft 4, and when desired it may be passed above and below the weft 6 for any desired

number of picks, and when said warp 7 is not to appear in the pile during several consecutive picks it is passed alternately above and below the weft 6, as seen in Figs. 2 and 4, and thereby acts both as a figure-warp and a binding-warp, and, furthermore, adds to the artistic finish of the fabric by its being exposed to view on the back of the same and increasing its durability, as the fabric is more closely interwoven.

8 designates a stuffer or body warp which lies between the wefts 2 and 6, in the upper cloth 3, and 13 designates the stuffer or body warp which lies between the wefts 4 and 12 in the lower cloth 5. The object of using the stuffer-warp is to form two weft planes for the purpose not only of giving stability to the fabric, but since the said stuffer-warps in each of the upper and lower cloths pass in a straight line through the same in the finished article, it will prevent stretching, which might otherwise occur, since the other binding-threads pass through the weft planes at an angle.

In Fig. 2 the pile-warps 9, 10, and 11 are passed over the wefts 2 and under the wefts 4 during any desired number of picks and may be passed under the wefts 12 when desired and will then appear on the back of the fabric, by which means said warps 9 and 10 and 11 act both as pile-warps and as binding-warps, and, furthermore, add to the wearing quality and the artistic finish of the fabric.

It will be observed that the threads 1 and 7 are shown in Fig. 1 as being combined pile and binding warps, uniting the outer weft-threads 6 and extending through the fabric as piles in such a manner that when the fabric is cut their extremities will form pile ends from threads 10 and 11, being there plain binding-warps for outer wefts 12, while in Fig. 2, showing another section of the fabric, these warps 1 and 7 form plain binding-warps, uniting the wefts of the outer plane, while the pile-warps for both sides of the double-pile fabric are in this case furnished from the opposite side by warps 10 and 11. The piles are thus woven from either side at will, while the outer and inner planes of wefts are united by additional warp-threads in groups of two and one, the relation borne by the number of wefts in the inner plane to the wefts in the outer plane. Thus portions of the pile fabric upon each side are or may be united as to their inner and outer planes of weft-threads by this additional binding-warp or series of binding-warps alone or by both this binding-warp and the combined pile and binding warp.

It is evident that, if desired, any of the warps 9, 10, and 11 may be retained between the wefts 4 and 12 for any desired number of picks, so that said warps will appear neither in the pile nor on the back of the fabric, as will be apparent with regard to the warp 9

in Figs. 1 and 3, and it is evident that when desired said warp 9 may be caused to answer both as a pile-warp and as binding-warp in a manner similar to that described in connection with the other pile-warps herein referred to.

14 designates the binding-warps which are employed to tie or bind the weft and warp together, said binding-warps passing over two of the inner weft-threads and one of the outer weft-threads, whereby in each shed are two inner weft-threads and one outer weft-thread, the pile-warp being passed around a single inner weft-thread and the binding-warp serving to draw the two inner weft-threads together with the outer weft-threads in conjunction with these inner weft-threads, so that three weft-threads are tightly bound together in each shed of the binding-warp, the object of this construction being to pinch the pile-warps between the three wefts between each crossing of the binder-warps, so that the pile when cut will be firmly bound in the back, preventing the pulling out. When the pile-warps 10 and 11 are not to appear in the pile during several consecutive picks, said warps are passed alternately above and below the weft 12, as seen in Figs. 1 and 3.

The pile is cut in the usual way during the process of weaving, or this may be done out of the loom with specially-constructed machine for that purpose, so that two distinct fabrics are produced when the cutting is effected.

It will be evident that various changes may be made by those skilled in the art which will come within the scope of my invention, and I do not, therefore, desire to be limited in every instance to the exact form herein shown and described.

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

1. In a double-pile fabric, outer and inner weft planes in each fabric and a combined pile and binding warp lying between the planes of weft-threads of one fabric in a portion only of its extent when not making pile.

2. In a double-pile fabric, a plurality of rows of weft-threads forming an upper and a lower cloth in combination with a pile-warp crossing from one cloth to the other and engaging with an inner row of wefts of the upper and lower cloth and an outer row of wefts upon one side only of one of the cloths.

3. A double-pile fabric having in each single fabric two weft planes, warp-threads passing from one fabric to the other to form the pile, and when not thus disposed passing to the back of the single fabrics where they are interwoven with the wefts of the outer plane.

4. In a double-pile fabric, upper and lower weft planes, body-warps between the wefts in said planes, and pile-warps engaging with

the outer weft of one plane and the inner wefts of both planes to serve both as figure-warps and binding-warps.

5 5. In a double-pile fabric having in each single fabric two weft planes, a pile-warp passing alternately above and below the weft of one of the outer rows when not in the pile and when in the latter engaging with the inner rows of wefts for a predetermined number of picks, pile-warps passing alternately
10 above and below each weft of the other outer row and binding-warps passing alternately over one of the outer rows of wefts and under two of the inner rows of wefts.

15 6. In a pile fabric, inner and outer planes of wefts and a combined pile and binding warp forming a plurality of double passages of pile between binding positions.

20 7. In a pile fabric, inner planes of weft-threads, an outer plane of weft-threads and a warp-thread alternating around wefts of opposite inner planes and also above and below successive wefts of the outer plane.

25 8. In a double-pile fabric a plurality of inner and outer planes of weft-threads and a warp continuously binding the threads of an outer plane of wefts together and intermittently uniting threads of opposite inner planes.

30 9. In a pile fabric, a plurality of planes of outer warps, a plurality of planes of inner warps each having its threads a multiple of those of the corresponding outer plane, a combined pile and binding warp making cloth
35 with the wefts of an outer plane and a binding-warp uniting the wefts of this outer plane to the wefts of its inner plane in the multiple relation existing between the threads of the planes.

40 10. In a double-pile fabric, outer and inner planes of weft-threads, a combined pile and binding warp uniting the wefts of the outer plane upon one side at all times and extending through and around the inner wefts

of the opposite side to form pile for a portion 45 of the double fabric, and a combined pile and binding warp upon the opposite side uniting the wefts of the outer plane upon this opposite side and forming pile for another portion 50 of the double fabric.

11. In a double-pile fabric, inner and outer weft-threads, a pile-warp passing around inner wefts in both planes throughout a portion of the fabric but passing at intervals outside of outer weft-threads and independent 55 binding-warps uniting inner and outer weft-threads.

12. In a double-pile fabric, inner and outer weft-threads upon each side of the fabric, a combined pile and binding warp acting as a 60 pile throughout one portion of the fabric and as a binder upon one side of the fabric throughout a succeeding portion of the fabric and an independent binding-warp uniting the wefts upon the side of the fabric united by the com- 65 bined pile and binding warp.

13. In a double-pile fabric, inner and outer weft-threads upon each side of the fabric, a combined pile and binding warp acting as a 70 pile throughout one portion of the fabric and a binder upon one side of the fabric throughout the succeeding portion of the fabric, and an independent binding-warp uniting the wefts upon the side of the fabric united by the combined pile and binding warp and an 75 independent binding-warp upon the opposite side of the fabric.

14. In a double-pile fabric, inner and outer weft-threads upon each side of the fabric, combined pile and binding warps binding in suc- 80 cessive portions of the fabric and forming pile at intervals, and an independent binding-warp uniting the inner and outer weft-threads throughout the successive sections.

JOHN ZIMMERMAN.

Witnesses:

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C. D. McVAY.