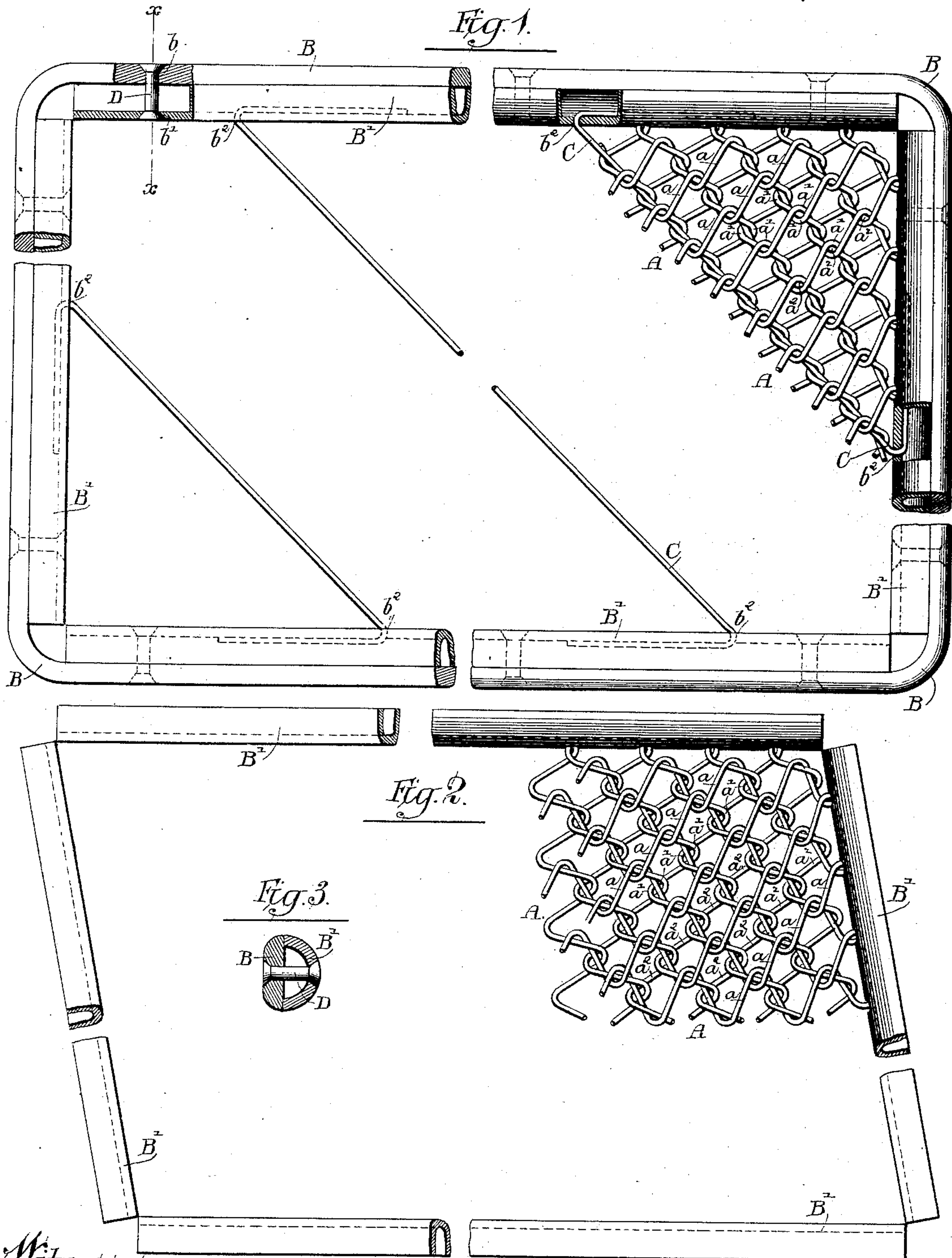


(No Model.)

F. L. BRYANT.  
WOVEN WIRE MAT.

No. 375,866.

Patented Jan. 3, 1888.



*Witnesses:*  
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# UNITED STATES PATENT OFFICE.

FRED L. BRYANT, OF CHICAGO, ILLINOIS.

## WOVEN-WIRE MAT.

SPECIFICATION forming part of Letters Patent No. 375,866, dated January 3, 1888.

Application filed April 15, 1887. Serial No. 234,907. (No model.)

*To all whom it may concern:*

Be it known that I, FRED L. BRYANT, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Woven-Wire Mats; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to woven-wire mats of that class consisting of a main part or body of woven fabric and a metal frame, to which the fabric is attached at the margins of the mat.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

The woven-wire fabric employed in a mat embracing my invention is of that kind consisting of two sets of spiral coils arranged at right angles to each other, and in which the spiral coils in each set are arranged parallel with and interwoven with each other, and are also interwoven with the coils of the other set. A fabric of this kind, as usually made, while sufficiently stiff or rigid to resist any considerable compression by force applied endwise to the spiral coils, is easily distorted, so as to throw the coils out of their position at right angles to each other by compressing the fabric in a direction oblique to both sets of coils. In other words, a rectangular piece of fabric, in which the axes of the coils run parallel with the sides of the rectangle, may be easily thrown into a lozenge shape, or parallelogram having unequal angles, by pressure applied to the corners of the fabric. Such shifting or distortion of the fabric will, however, take place to a limited extent only, and at a certain point the coils will bind upon each other and afford a rigid resistance to further change of shape in the fabric. I have discovered, in this connection, that by the use of coils of a certain size and pitch the limit of movement in one direction under diagonal pressure in the fabric may be made to correspond with a position of the coils at right angles with each other, so that a rectangular mat thus made, while it may be distorted or thrown out of shape by pressure applied at two opposite corners, cannot be changed in shape by force applied to the other two corners.

In a prior application, Serial No. 218,202, made jointly by Charles L. Ames and myself November 2, 1886, is shown and described a woven-wire mat the frame of which is braced by diagonal tie-rods to prevent distortion of the mat-frame, such tie rods being arranged at right angles with each other, so as to brace the frame in both directions. In the use of a fabric so made that the coils will become rigidly interlocked and held from further relative movement when such coils are at right angles to each other, such bracing or interlocking of the coils may obviously be relied upon to brace the mat-frame in one direction, and it therefore becomes necessary to use only one tie-rod or set of tie-rods to hold the frame rigidly in its rectangular shape.

My present invention therefore consists of a woven-wire fabric made to brace itself in one direction, as above set forth, combined with one set of oblique tie-rods, or other equivalent means for bracing the frame in a direction contrary to that in which it is braced by the fabric itself.

In the accompanying drawings, Figure 1 is a plan view of a mat constructed in accordance with my invention. Fig. 2 shows the fabric of the mat, illustrating the manner in which the said fabric may be thrown out of its rectangular shape. Fig. 3 is a sectional view, taken upon line *xx* of Fig. 1, of the mat-frame illustrated in the latter figure.

As shown in the said drawings, A is the woven-wire fabric, and B the mat-frame. The fabric shown is of that kind consisting of two sets or layers of spiral coils, each consisting of a series of parallel coils intertwined with each other, and in which the coils of one set are arranged transversely with relation to and are interwoven with the coils of the other set. A fabric of this kind is shown in a prior patent, No. 140,160, granted to J. W. C. Peters June 24, 1873. Said frame consists, as herein shown, of metal bars B' B' of U shape in cross-sectional form, and to which the fabric is secured by inserting the wires thereof through holes in the said bars, and bending or clinching the ends of the wires in the exterior grooves of the bars.

B<sup>2</sup> is an exterior frame extending around the mat outside of the bars B' B', and attached to the latter so as to cover the grooves thereof,



and thereby give a smooth finish to the edges of the mat.

C C are diagonal tie rods or wires, attached at their ends to the bars B' B', and extending 5 in one direction only. These tie-rods may be inserted through or in the body of the fabric in any desired manner; but preferably they are run through the spaces or interstices at the point at which the loops of the coils interlock 10 with each other, as clearly shown at the upper right-hand corner of Fig. 1. When thus located, the rods, if made of wire, as is usually preferred, are hardly distinguishable by the eye from the other wires of the mat, and the 15 fabric of a mat made with such wires appears practically uniform or without cross wires.

The fabric A of this mat is so made, or, in other words, the coils thereof are of such size and pitch, that when the marginal bars B' B', 20 to which the fabric is attached, are held in a rectangular shape, as shown in Fig. 1, the wires of the fabric will bind against each other in the manner above set forth. Fig. 2 shows the fabric and bars B' B' when the fabric is re- 25 laxed and allowed to assume its natural position. When the fabric is relaxed, the interlocking parts of all the coils are loosely intertwined, and the coils or loops *a a*, which interlock with each other in the manner shown and 30 extend in an oblique direction across the mat, are separated from each other at their parts *a' a'*, which are engaged with each other. When, however, the margins of the fabric are brought into rectangular shape, as shown in Fig. 1, the 35 said parts *a' a'* are brought into immediate contact with the parts *a<sup>2</sup> a<sup>2</sup>* of the coils which pass between them, thus holding the fabric from being stretched farther upon the diagonal along which said loops *a a* extend. It fol- 40 lows that the said loops *a a*, as clearly shown in Fig. 1, are interlocked with each other, in the manner of a chain, which serves as a tie or tension rod to hold the fabric from oblique extension in one direction, while the tie-rods 45 C C, running at right angles thereto, hold the fabric from oblique extension in the opposite direction. The mat is thus rigidly and strongly

braced in a manner to hold it in rectangular shape, with the use of but one tie-rod or set of tie rods. It will of course be understood that 50 one, or more than one, of the tie-rods C may be used, according to the size of the mat and other circumstances.

In the said prior application a mat-frame is shown consisting of inner bars, B' B', and an 55 outer continuous bar, B, bent or curved at the corners of the mat, the said bars B' B' and B being shown in said application as attached to each other by metal straps bent or wrapped about said bars. As herein shown, said bars 60 B and B' are provided with opposite holes, *b b'*, through which are inserted rivets D D, the holes being preferably countersunk and the rivets upset flush with the surfaces of the bars, so as to give a smooth finish to the frame. 65

In the particular construction shown the tie-rods C C are inserted through holes *b<sup>2</sup> b<sup>2</sup>* 70 in the bars B' B', and bent or clinched in the manner shown. Said tie-rods may, however, be attached to a marginal frame in any manner found convenient or desirable. It is to be understood, furthermore, that, as far as the novel construction in means for bracing the 75 mat is concerned, the frame of the mat may be made in any manner found desirable or convenient.

I claim as my invention—

A coiled-wire mat comprising interwoven coils arranged transversely to each other, with their interlocked coils in forcible bear- 80 ing against each other, a rectangular frame, to which the ends of both sets of coils are connected, and a diagonal brace or braces connected with said frame and retaining the coils at right angles with and in forcible bearing 85 against each other, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FRED L. BRYANT.

Witnesses:

C. CLARENCE POOLE,  
CHARLES T. LORING.