No. 674,379. Patented May 21, 1901.

C. H. HARD.

METALLIC TRUSS FOR WOVEN WIRE MATTRESSES AND METALLIC BEDSTEADS.

(Application filed Mar. 8, 1900.)

(No Model.)

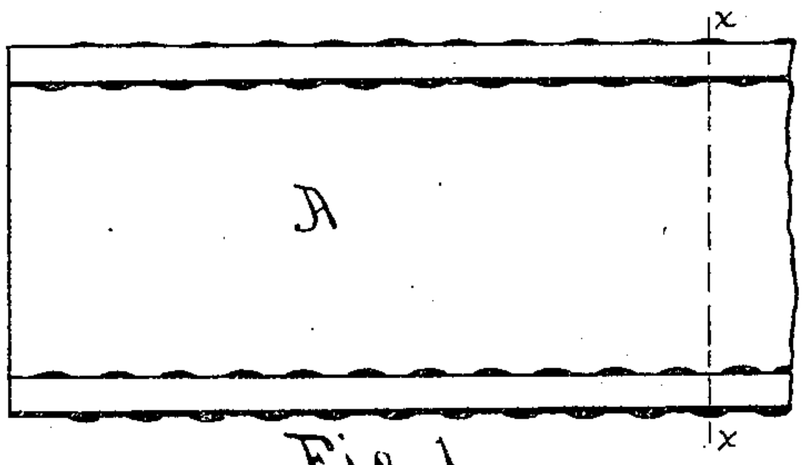

Fig. 1

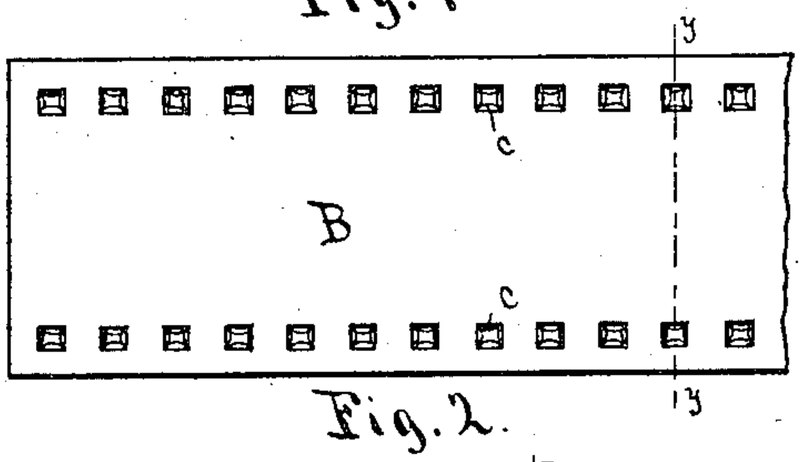

Fig. 2.

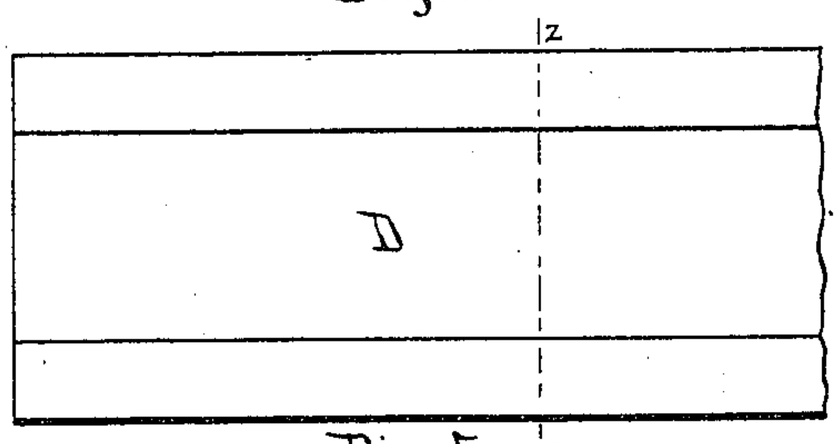

Fig. 5.

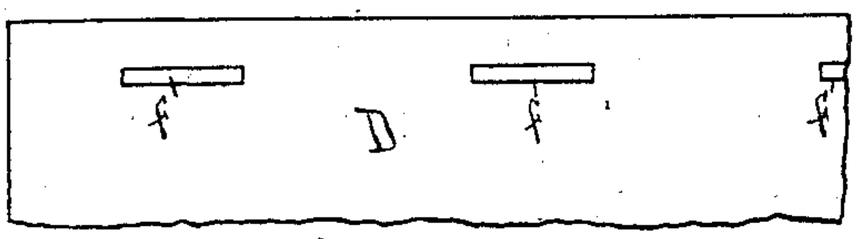

Fig. 7.

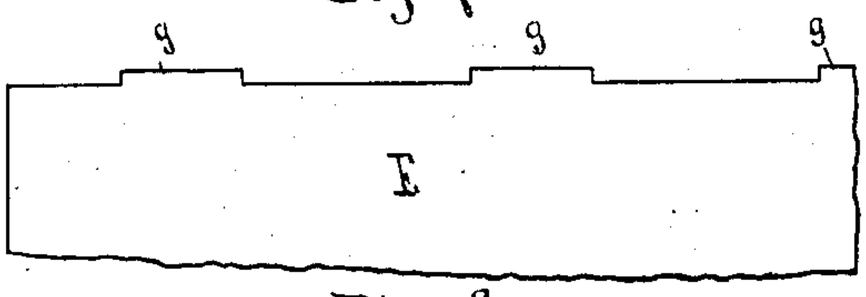

Fig. 8.

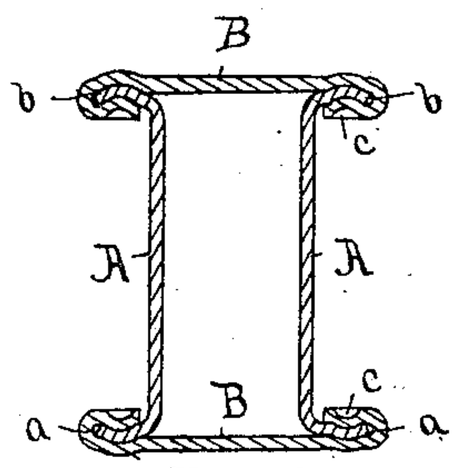

Fig. 3.

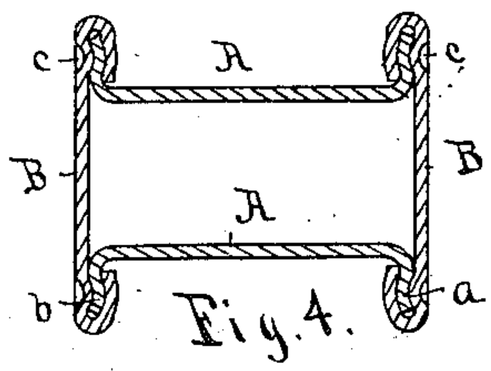

Fig. 4.

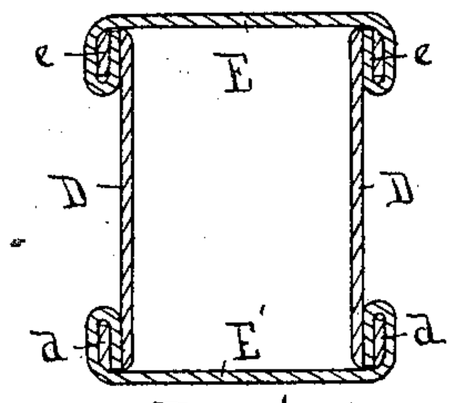

Fig. 6.

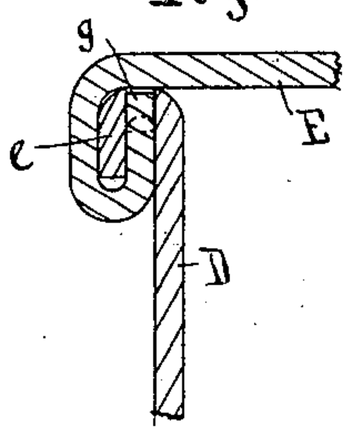

Fig. 9.

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UNITED STATES PATENT OFFICE.

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METALLIC TRUSS FOR WOVEN-WIRE MATTRESSES AND METALLIC BEDSTEADS.

SPECIFICATION forming part of Letters Patent No. 674,379, dated May 21, 1901.

Application filed March 8, 1900. Serial No. 7,807. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. HARD, a citizen of the United States, and a resident of the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Metal Rails for Mattresses and Bedsteads, of which the following is a full, clear, and exact description.

My invention relates to the construction of those metal rails which are employed in the manufacture of woven-wire mattresses and metal bedsteads.

The object of my invention is to do away with the use of wood for the side rails for woven-wire mattresses and the heavy angle-irons used in metal bedsteads, in order, first, to reduce the weight of the frame; second, to obtain a rail which is absolutely rigid; third, to produce a rail which shall preserve absolute uniformity of tension in the wire mattress; fourth, to do away with the use of wood for the side rails, and thus render them lighter and less awkward to handle; fifth, to provide a rail which shall be cheaper than the ordinary wooden rail now used for the purposes aforesaid, and, sixth, to provide side and end rails for metal bedsteads in place of the ordinary angle-iron which is commonly used and which is expensive, heavy, and liable to bend or become displaced.

My rail may be used with the same advantage in the manufacture of metal bedsteads that would be gained in the manufacture of wire-mattress frames.

To this end my invention consists in a rail for mattresses and bedsteads comprising four plates of thin sheet metal, one pair of plates constituting the sides and the other pair of plates constituting the top and bottom of the rail, each pair of plates being flanged to the other pair of plates to provide a hollow I-beam rail by means of outwardly-bent parts of the one pair over which the edges of the other pair are folded, the said outwardly-bent parts of the one pair being joined by a series of individual interlocking unions with the folded-over parts of the other pair to prevent longitudinal movement in the joint, and consequent torsional action of the rail.

Referring to the drawings herewith, consisting of one sheet, in which like letters refer to like parts, and in which I have represented two forms of construction of my metal side rail, I shall describe my invention as applied to woven-wire mattresses.

Figure 1 is a side elevation of a section of one form of construction of my side rail. Fig. 2 is a top plan view of the same form of construction of my side rail as shown in Fig. 1. Fig. 3 is a vertical section taken at right angles to Fig. 1 on the line $x\,x$ of Fig. 1. Fig. 4 is a vertical section taken at right angles to Fig. 2 on the line $y\,y$ of Fig. 2. Fig. 5 is a side elevation of another form of construction of my rail than that represented in Figs. 1 to 4, inclusive. Fig. 6 is a vertical section taken at right angles to Fig. 5 on the line $z\,z$ of Fig. 5. Fig. 7 is a view of a small part of one of the four plates of my side rail represented in Fig. 5 and showing a part of the slot-lock construction of this form of side rail. Fig. 8 is a view of a small part of one of the four plates of my side rail and represents the part of the slot-lock mechanism not shown in Fig. 7. Fig. 9 is a detailed sectional view, on a large scale, showing the manner and form of union of the slot-lock mechanism represented in Figs. 5 to 8, inclusive.

Referring now more particularly to Figs. 1 to 4, inclusive, I will describe one form of construction of my metal side rail. This rail is of I shape and formed with a hollow rectangular body for lightness and is made up of four flat sheet-metal plates, which I have indicated as A and B. The plates A, which are the vertical plates, at the upper edge and also at the lower edge are bent outwardly to provide single flanges at the sides, and the plates B, which are the horizontal plates, are first bent downwardly and thence inwardly, so that they will form doubled flanges at the sides, providing a grip and union with the bent edges of the plates A. These unions I have represented at a and b. After being thus bent and the said four plates joined I indent or countersink the unions a and b at a short distance inside from their edges, so that the plates B and A are firmly pressed and interlocked against each other by means of indentations or countersinks, which may be alternate or otherwise at their unions b and a throughout the length of my side rail, as clearly shown in Figs. 3 and 4. These in-

dentations or countersinks I prefer to make alternately rather than continuously and at some distance from the edge of the flange, inasmuch as if the same are made continuously or clear to the edge of the flange throughout the length of the rail the unions are very liable to slide away from each other and the rigidity of the rail is impaired. By making the said indentations or countersinks alternately and at a little distance from the edge, as described, the rail holds itself rigidly in position and will not give or twist when subjected to a torsional strain or other strain or pressure of any degree. It will be readily understood by one skilled in the art that the strain having the greatest leverage upon a rail in the uses indicated is a torque and that such strain can be overcome in a built-up rail by securing the plates against any longitudinal movement. By thus indenting or countersinking the said four plates B and A at their unions, as described, they become firmly united and securely flanged together and form and constitute a rigid rectangular rail, which may be constructed in any size to accommodate the size of the mattress or of the bed-frame desired. The various indentations which I have thus described are represented at *c*. This form of sheet-metal rail is constructed as now described. The vertical plates A are first bent outwardly. The horizontal plates B are then bent downwardly and then inwardly. The four plates are then assembled around a stay-rod. The stay-rod simply serves to hold a mandrel in place. The assembled plates of the rail are then pushed along over the mandrel, which tends to press the four plates together in their flange-unions. The parts are caught by rollers which are placed on the machine outside the rail and which engage with the lower flange-union, one roller being below the union and the other roller being above the union. Corresponding rollers on the other side of the machine engage the union opposite that engaged by the first-mentioned rollers. These rollers are smooth, and two pairs of rollers carry the rail along until the upper flange-unions are engaged by another set of rollers whose function is to compress the upper unions together. As the rail moves along the lower unions then engage with still another set of rollers, which rollers are provided with sharp-pointed projections which form indentations on the lower flange-unions, the indentations thus formed being made from both the top and lower portion of the flange-union. As the rail passes farther along the upper flange-unions are then engaged by a similar set of rollers, and they are indented on the upper and under side by means of sharp-pointed projections. After the rail has left the last pair of rollers it is free from the mandrel and is a completed rail.

Referring now more particularly to Figs. 5 to 9, inclusive, I will now describe another form of construction of my metal side rail. This side rail is also made up of four sheet-metal plates, which I have indicated as D, E, and E′. The plates D, which are vertical plates at the upper edges, are bent outwardly and then downwardly, and the said plates D at the lower edges are bent outwardly and then upwardly. The plate E, which is the top horizontal plate, is bent downwardly, then inwardly, and then upwardly. The plate E′, which is the bottom horizontal plate, is bent first upwardly, then inwardly, and then downwardly. The four plates D and E and E′ thus described being united form a grip and flange union with each other. These unions I have represented at *e* and *d*. Unless the plates thus described are in some way secured firmly to each other, they will give and twist away from their flange-unions, and in order to prevent such giving and twisting I employ a simple manner of locking the four plates firmly together. This locking device I will describe: At regular intervals throughout the length of the plates D, I provide mortises *f*, which are placed in the said plates D near their edges, as plainly shown in Fig. 7. At regular intervals along the plates E and E′ I have provided tenons *g*, in such places along the edges of the plates E and E′ so that when the four plates D, E, and E′ are united the tenons *g* will fit into the mortises *f*, and thus tend to firmly lock the plates E, D, and E′ securely together. The tenons *g* are plainly shown in Fig. 8. The horizontal plates E E′ and the vertical plates D being bent at their edges, as shown herein, are then united and the flange-unions *e* and *d* are formed by joining the bent edges of the four longitudinal plates together and interlocking them by means of the mortise-and-tenon device hereinbefore described. The plates E and E′ are provided with the tenons *g* and the plates D are provided with the mortises *f*. When the four plates are united, the tenons *g* fit into the mortises *f* and a stable union is formed. This form of sheet-metal rail is constructed as now described. The vertical plates D are bent first outwardly on a line coincident with the outside line of the mortises *f*. The horizontal plates E E′ are bent first downwardly on a line located at a suitable distance inside of the tenons *g*. All the plates D, E, and E′ are then assembled. After assembling the edges of horizontal plates E and E′ are bent inwardly until their tenons *g* pass into the mortises *f* of the vertical plates D. A mandrel is then inserted inside the assembled plates, and the mandrel presses the four plates of the rail into unions and forms the four flanges. The four flanges are then bent together at right angles until the flange-unions, as shown and described, are created. In actually using these side rails I have discovered that unless the said plates are in some way firmly secured together at their flange-unions the flange-unions will not hold fast, but the plates will twist when subjected to torsional strain or other pressure, and eventually under such unequal strain or

pressure they twist away from their flange-unions. It is evident that the above-described means for interlocking and securing these unions firmly together by means of indentations and by means of the mortise-and-tenon device described are but two of a number of other methods that could be used, and I do not desire to limit myself to the specified manner of constructing the side rail absolutely rigid, as described.

It will be observed that my rails are formed of very light material, so that the flanges thereon act as stiffening-ribs at the corners the whole length of the rail.

With the forms of construction above described it will be evident that I provide a side rail which is easy of construction, absolutely rigid, and much lighter in weight than wood or angle-iron, such as is commonly used at the present time.

It is of course possible to use the rail described by making the horizontal plate B, as shown in Fig. 3, or the horizontal plates E and E′, as shown in Fig. 6, the vertical or side plates rather than the horizontal or top plates. I prefer, however, to use the plates named as the horizontal plates for the reason that being thus used the construction results in a greater degree of rigidity upon the lines required than if used as the side or vertical plates. The construction described, therefore, is preferable.

It will be apparent to any one skilled in the art that the forms of construction of the rail described can be used with but slight, if any, modification interchangeably for either a rail for a woven-wire mattress or side and end rails for a metal bedstead.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. An I-shaped side rail for bedsteads and mattresses composed of a pair of parallel flat thin sheet-metal plates having a single outbent flange at each edge, a pair of parallel flat thin sheet-metal plates having inbent flanges at each edge and lapping the single outbent flanges for providing a hollow rectangular body having corner flanges and interlocking means formed in the flanges whereby the individual members of each of the flanges are connected together for preventing endwise movement of the plates under torsional strain.

2. A rail for mattresses and bedsteads, consisting of four plates of thin sheet metal, one pair of plates having flanges and the other pair of plates having flanges folded over the flanges of the first-named pair of plates to provide a hollow I-beam and a series of individual interlocking unions on the flanges whereby the flanges are joined together to prevent longitudinal movement in the joints, and consequent torsional action of the rail.

3. A rail for mattresses and bedsteads, consisting of four plates of thin sheet metal, one pair of plates having flanges and the other pair of plates having flanges folded over the flanges of the first-named pair of plates to provide a hollow I-beam and indentations formed in the flanges at a short distance from the edges thereof whereby the flanges are joined together to prevent longitudinal movement in the joints and consequent torsional action of the rail.

In witness whereof I have hereunto set my hand this 2d day of March, 1900.

CHARLES H. HARD.

Witnesses:
D. B. TUTTLE,
E. A. DRAKE.