

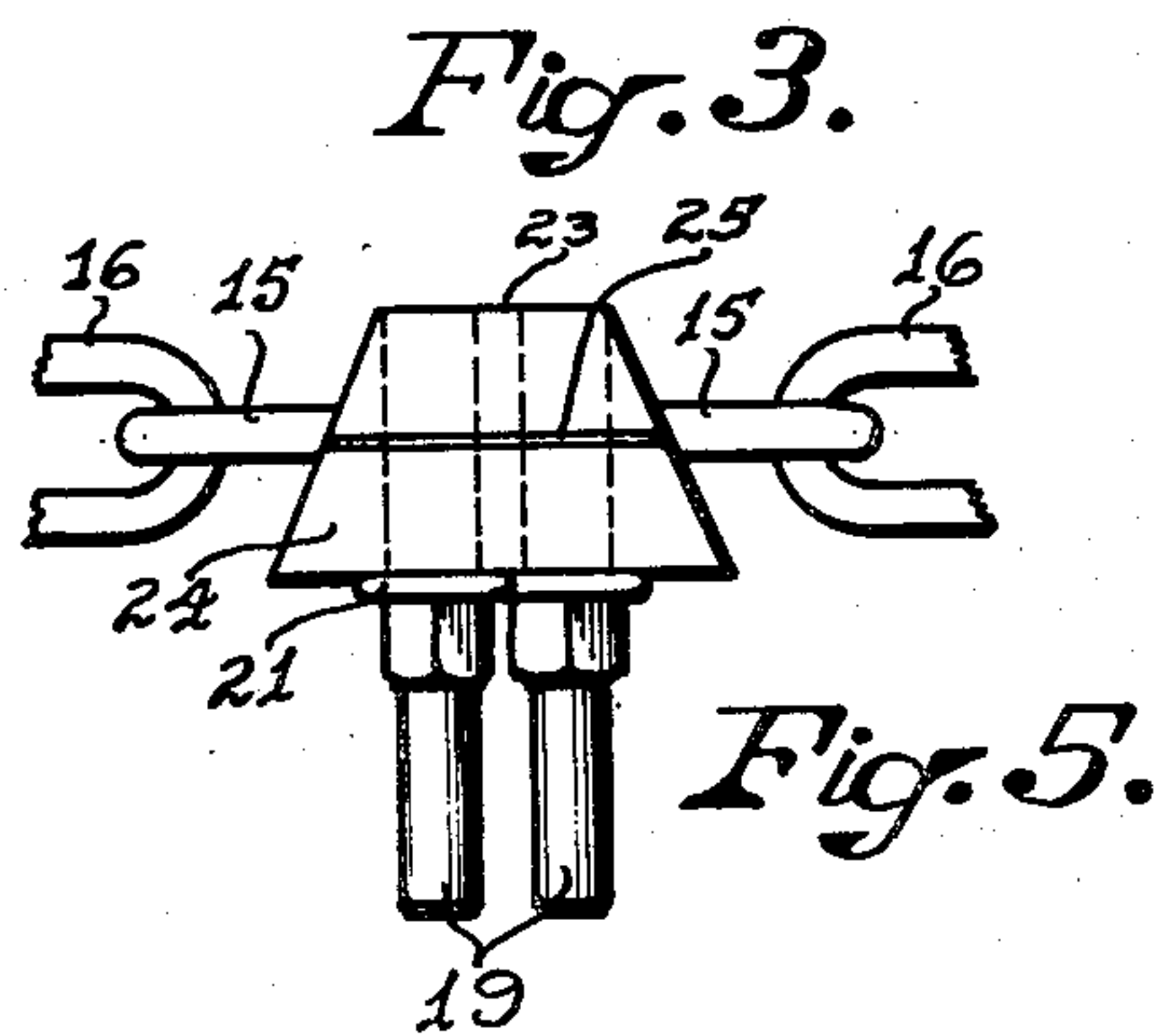
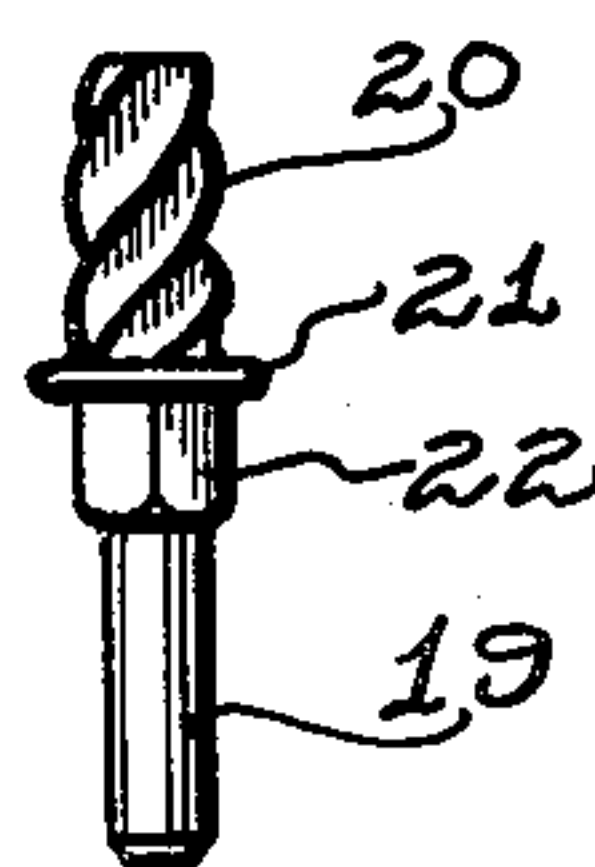
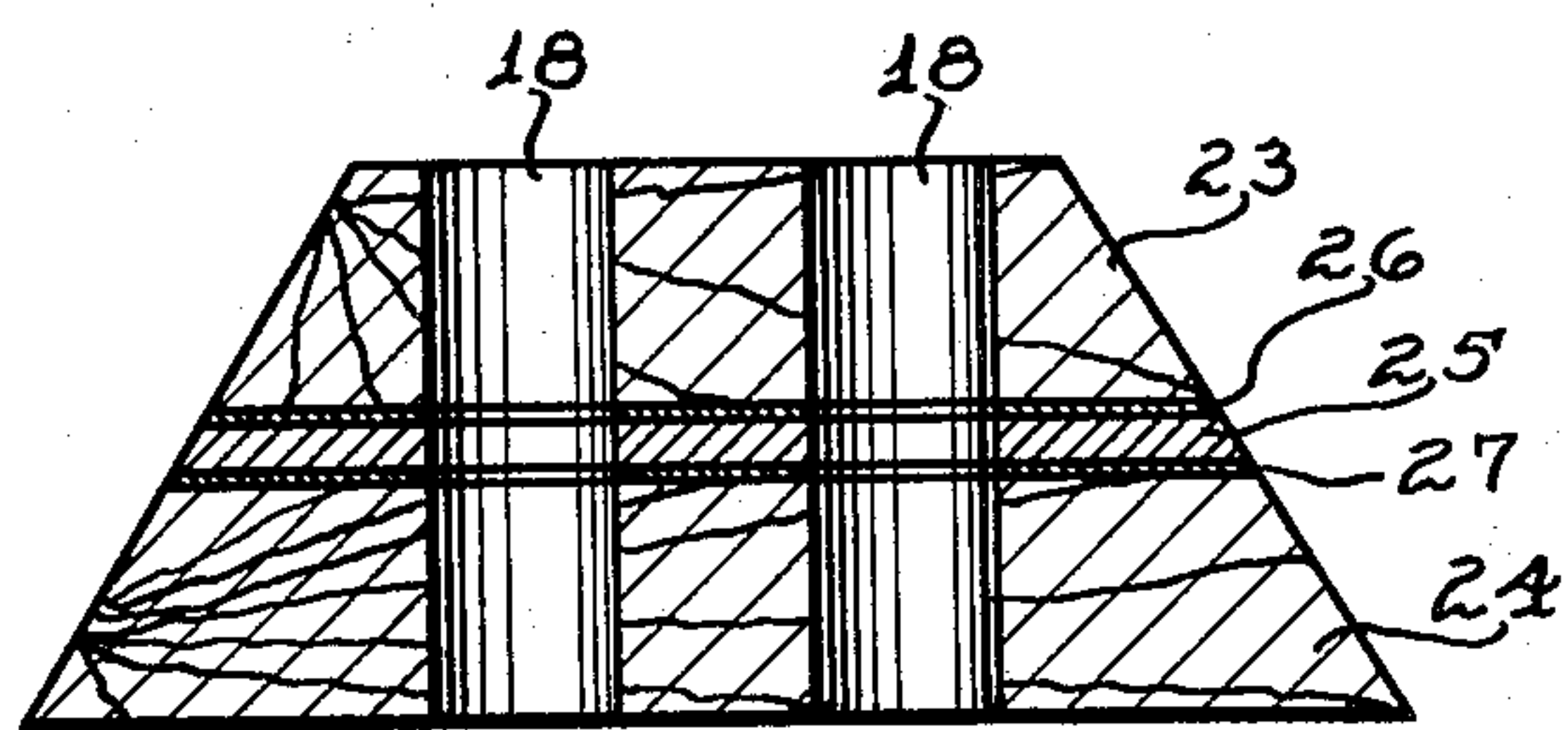
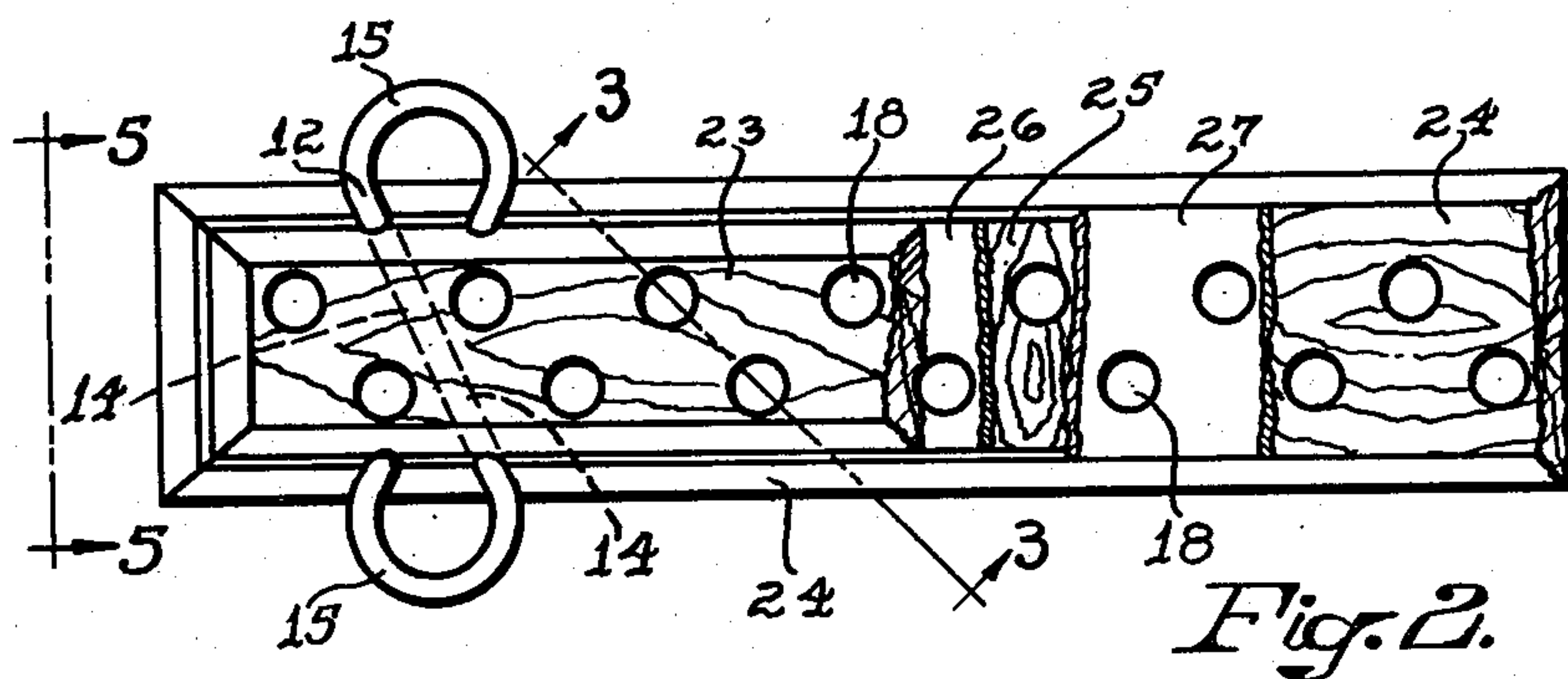
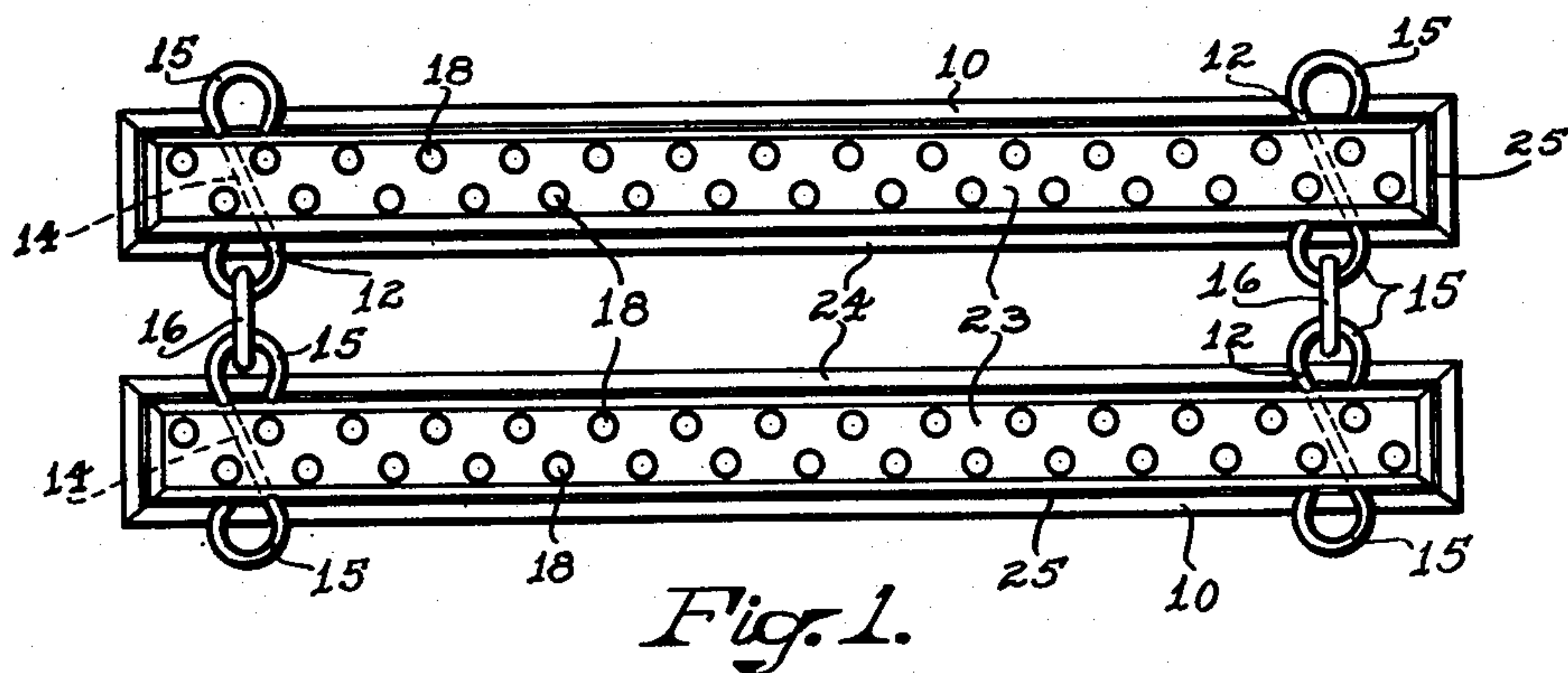
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DOBBY CHAIN

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DOBBY CHAIN

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4 Claims. (Cl. 139—334)

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This invention relates to dobby chains which are used in various types of looms for controlling the pattern of the cloth.

In accordance with my prior Patent No. 1,199,546 of September 26, 1916, a standard dobby chain comprises a series of parallel, wooden cross bars connected together by linkages and arranged to be passed over a driving cylinder shaped to interfit with the bars. Each bar is provided with one or more longitudinal rows of closely spaced holes arranged for holding slightly tapered, coarsely threaded metal pegs of the type shown in Fig. 4 herein. These control the pattern of the cloth and are, therefore, intended to be removed and inserted in new locations in order to change the pattern. The shape of the bar is fixed by the loom structure, and it is necessary that the holes extend throughout substantially the entire length of each bar so that the end holes, which are used largely, are very close to the ends of the bar. The holes are customarily drilled cylindrical in shape, and the peg must cut a thread therein. Hence, when the tapered peg is inserted for the first time, its wedging action tends to split the bar, and particularly at the end holes. Moreover, when the peg is inserted in another hole, it may not follow the original thread and so be obliged to cut a new thread and thus further pry laterally against the wood structure. The peg has a flange which must be set down tightly against the face of the bar, and this tightening of the peg imposes a further strain. The wooden bars are usually made of carefully selected straight grain stock, and such wood has become increasingly difficult to obtain. Hence, a serious disadvantage is had if a bar splits and must be replaced by a new one. These conditions coupled with the high speed of a modern loom thus require frequent and expensive replacements of the dobby bars in a loom rendered idle thereby.

The primary object of this invention is to overcome such disadvantages and to provide a dobby chain having a wooden bar which is so strengthened that it will not split readily and thus will give a long life of useful service. Further objects will be apparent in the following disclosure.

Referring to the drawings:

Fig. 1 is a plan view of a portion of a dobby chain embodying this invention;

Fig. 2 is a fragmentary enlarged plan view of a cross bar, broken away to show the various layers;

Fig. 3 is an enlarged cross section taken on the line 3—3 of Fig. 2;

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Fig. 4 is a side view of a dobby peg which is to be inserted in one of the holes of the bar shown in Fig. 2; and

Fig. 5 is an end view of the bar of Fig. 2 with two pegs in place.

In accordance with this invention, I propose to reinforce a wooden dobby chain bar with an internal layer of material capable of resisting lateral spreading or splitting of the wood of the bar. To this end, I make the bar of a laminated structure having preferably three layers secured together, and in which the two outer layers constituting the major portion of the bar are made of wood having a reasonably straight grain running lengthwise of the bar, and the inner layer is made of a material which is primarily strong or rigid transversely of the bar and reinforces it against the spreading or splitting of the outer layers as caused by the insertion or use of a dobby peg.

The dobby chain and its bars may be made in accordance with standard practice except as herein specified. As illustrated in Fig. 1, the chain comprises cross bars 10 shaped ordinarily as illustrated, which are connected by metal links 12 mounted in holes 14 drilled diagonally through the central portion of the bar. A straight metal piece of wire 12 is inserted through this hole, and then its ends are bent around to form the loops 15 which serve to support intermediate links 16 and thus connect the dobby bars together as a chain structure. In the form illustrated, two rows of holes 18 are drilled transversely through the bars and arranged in diagonally offset positions as shown. The center of each end hole is ordinarily located about $\frac{1}{8}$ inch from the end of the longer face of the bar and approximately $\frac{3}{4}$ inch from the shorter bar face, so that there is very little wood available for strength at the bar ends, where a split usually starts. The hole 14 for the wire 12 extends diagonally between the holes 18. The positions of the holes cannot be varied but are determined by the requirements of the loom. These holes are intended for the removable insertion therein of a dobby peg shaped as shown in Fig. 4. This peg is an iron body or pin having a cylindrical outer end 19 and a slightly tapered end 20 which is shaped to provide a very coarse thread of long pitch adapted to be inserted into the bar by rotation through one turn or less. A flange 21 limits the inward movement of the peg, and the latter is turned by the application of a suitable tool to the squared sides 22. The number of the pegs and their locations on the bar are determined by the cloth pattern to be woven.

The cross section of the bar is shaped as a trapezoid in both directions, or the bar has beveled or wedge shaped sides and ends. It is made of two pieces of wood 23 and 24 of a suitable strong, straight-grained wood, such as birch, which has the grain running lengthwise of the bar, as shown by the graining lines in Fig. 2. These wooden layers, which constitute the major thickness of the bar, are reinforced and separated by an intermediate layer 25 of a suitable cross strengthening material. That intermediate layer is cemented to the two outer wooden layers by a suitable, compatible cement 26, 27, shown exaggerated in thickness in the drawing for the sake of clarity of illustration, so that the three major layers of bar material are secured together strongly with considerable rigidity and low flexibility.

The reinforcing layer or strip 25 is made of material which insures adequate lateral strength of the bar and which does not interfere with the insertion of the thread 20 of the peg. Of the various available wood reinforcing materials, I prefer to use a thin strip of birch or other strong wood, which is arranged with its grain at substantially right angles to the grains of the outer strips 23 and 24. I may also use a wooden fibre board which has a haphazard intermatted fibre structure with the wood fibres running in all directions and securely held in place, so that this fibre board will also have that lateral strength required to prevent or hinder splitting of the wooden layers 23 and 24 of the dobby chain bar. I may also use certain strong plastic materials, such as cellulose acetate butyrate, known under the trade name of "Tenite," which are flexible and pliable and not brittle and which have sufficient moldability or cold flow under pressure to permit the metal screw to form a thread. Each of these materials is cemented to the wood by a compatible and suitable cement.

The outer strips 23 and 24 of wood may be secured to the inner wooden cross grain strip or the wooden fibre board 25 by a casein or other glue, such as the fish and hide glues of standard manufacture which are well-known in the woodworking industry. If the inner strengthening layer is made up of cellulose acetate butyrate, this layer may be cemented to the wood by means of an acetone solution of the same inner layer material, or by other suitable solvents or cements. The cement will depend on the nature of the inner layer. For example, I may use a polymerized phenol formaldehyde condensation product for the inner layer and the same material in alcohol or acetone solution for the cement, which may be set with the application of heat, or other suitable cements may be employed. The primary requisite of the inner layer and the cement is to impregnate and adhere to the outer wood strips 23 and 24 strongly and secure the inner strip firmly thereto so as to prevent or materially hinder splitting of the longitudinally grained wood strips. The cement should also be waterproof so as not to be affected by moisture that might be absorbed into the bar.

It is desirable that the strengthening layer be located inside of the bar and not on the outside, since a thin piece of wood having its grain running crossways of the bar, for example, would split at the surface and not serve to strengthen the longitudinally running grains of the main piece of wood. The strengthening layer is made very thin, and the two outer layers of lengthwise grained wood constitute the major thickness of

the body. For example, the bar may be about $\frac{1}{8}$ inch thick, irrespective of its length, and the central intermediate strengthening layer may be not over about $\frac{1}{16}$ inch and preferably about $\frac{1}{32}$ inch thick. This thickness of the intermediate bar depends on the nature of the reinforcement employed; but I prefer that the inner layer be not over $\frac{1}{8}$ and preferably about $\frac{1}{16}$ of the total thickness of the bar, so that the bar is made primarily of wood and has essentially those qualities which wood provides. The strengthening layer cannot split since this action is resisted by the wooden layers cemented thereto. Hence, each layer strengthens the adjacent layer. It is also desirable that a cross grain wood layer have a minimum thickness consistent with its strength, such as $\frac{1}{32}$ inch, since a thicker part would add no material strength to the bar and leave it too flexible for satisfactory use. The working strength of the bar lies primarily in the two outer layers, which have their grains running lengthwise, and any diminishing of their thickness decreases the rigidity and strength of the bar. Likewise, if a fibre board is used for the interior strengthening layer, this should be within the specified dimensions, and particularly since a too thick layer tends to absorb moisture and expand and thus to distort the bar. The bar, therefore, has all of the advantages of a single piece of birch wood in its strength and rigidity and general behavior in use, and it has the further advantage that it cannot split readily under lateral strain.

The dobby chain bar may be made by various methods. The two outer layers may be cut to their correct dimensions prior to assembly with a previously cut inner strengthening layer; or rectangular pieces of wood and a strengthening strip may be cemented together and then sawed or otherwise cut to the required shape. The holes may be made in the bar after the parts have been fully assembled, by means of a multiple drill. The diameter of the hole is such that the projecting screw threads of the tapered peg will engage the sides of the hole and form an internal thread in the wood, and preferably also in the inner layer.

Various modifications may be made in the construction and in the nature of the materials, and the above description is to be interpreted primarily as setting forth the principles of the invention and preferred embodiments thereof and not as imposing limitations on the appended claims.

I claim:

1. A dobby chain comprising a set of laminated cross bars having a set of transverse cylindrical peg holes extending throughout the length and close to the ends of each bar, a set of slightly tapered, threaded dobby pegs removably insertable in the holes, each of said holes being of such shape that the dobby peg may initially form a thread therein, and links connecting the bars, each bar being made of outer layers of wood having the grain running lengthwise and which constitutes at least four fifths of the bar thickness, an intermediate thin layer of strengthening and deformable material therebetween, and a cement which secures the intermediate layer to and between the wood layers, the transverse holes extending through the three layers and the intermediate layer being capable of having a thread formed therein by a dobby peg and serving to resist lateral splitting of the bar by the insertion of the tapered peg.

2. A dobby chain according to claim 1 in which each bar is made of two outer layers of wood

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having the grain running lengthwise of the bar and the intermediate layer is a thin layer of reinforcing wood veneer having its fibres and grain arranged transversely of the wood grain of the outer layers so as to resist splitting of the outer wood layers by a peg, and a reinforcing cement impregnating and securing the wood layers integrally together.

3. A dobby chain according to claim 1 in which the intermediate strengthening layer is a thin strip of moulded pliable plastic substance capable of having a thread formed therein by the dobby peg and comprising a cement impregnating the wood and adhering to both the wood and said substance.

4. A dobby chain according to claim 1 in which the intermediate layer is a woody fibrous body having its fibres arranged in a haphazard fashion and cemented in place by a water-proof cement.

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