

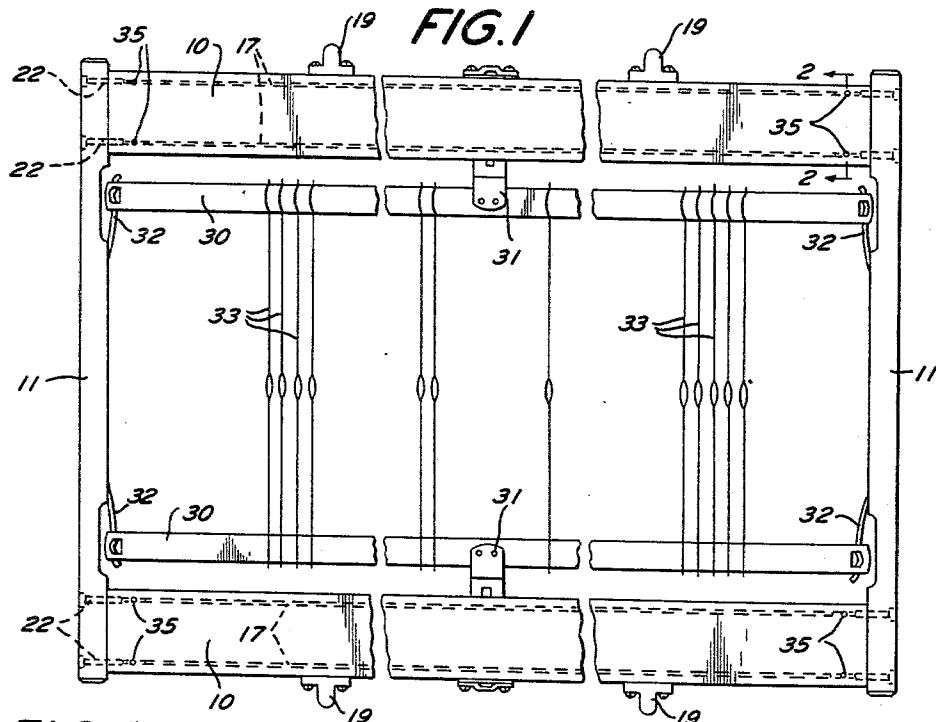
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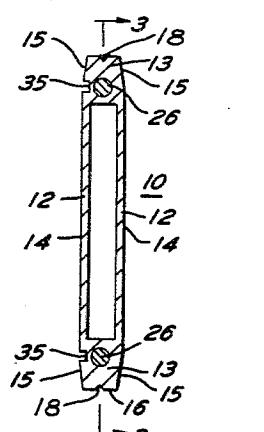
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LOOM HARNESS

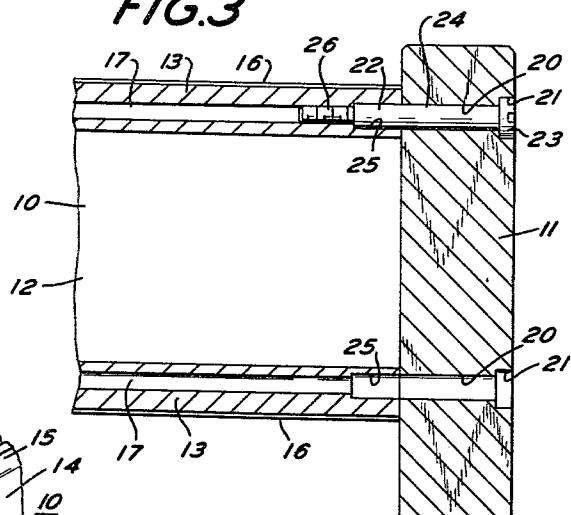
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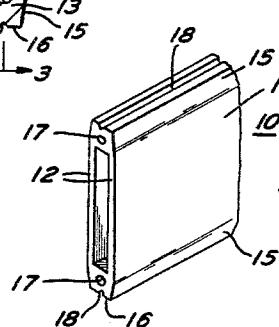
**FIG. 2**



**FIG. 3**



**FIG. 4**



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## 3,180,367 LOOM HARNESS

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This invention relates to loom harness for weaving and more particularly to harness frames for the mounting of heddles to separate the warp ends into successive sheds for the passage of the shuttle therebetween.

Various types of harness frames have heretofore been suggested including those in which the top and bottom rails were made of extrusions of light metal alloys. The metals employed are relatively soft and the modes of attachment of the side struts have not been satisfactory. The attaching screws as heretofore employed, have a tendency to loosen during the strain and vibration in service.

It is the principal object of the present invention to provide an improved heddle frame having top and bottom rails of metal and side struts attached thereto in a manner to obviate problems attendant upon use.

It is a further object of the present invention to provide an improved heddle frame in which the side struts are attached to the top and bottom rails in a simple but effective manner.

It is a further object of the present invention to provide a heddle frame having a modified form of rail with increased rigidity related to the provisions for attachment of the side struts.

It is a further object of the present invention to provide an improved heddle frame in which the side struts and top and bottom rails are in secured relation with simple but effective locking of the fastening elements.

Other objects and advantageous features of the invention will be apparent from the description and claims.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part thereof, in which:

FIGURE 1 is a front elevational view of a loom harness frame embodying the main features of the present invention;

FIG. 2 is a vertical sectional view, enlarged, taken approximately on the line 2—2 of FIG. 1;

FIG. 3 is a vertical sectional view taken approximately on the line 3—3 of FIG. 2, one of the retaining bolts being omitted; and

FIG. 4 is a view in perspective of a portion of one of the rails.

It should, of course, be understood, that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Referring now more particularly to the drawings, in which a preferred embodiment of the invention is illustrated, the top and bottom rails or shafts 10 of the harness frame are shown, and are connected, at their ends by side struts 11 of generally rectangular horizontal cross section, the ends of the rails 10 being in meeting or abutting relation to the side struts 11.

Each of the top and bottom rails 10 is preferably of an extruded metal shape preferably hollow to decrease the weight, provided with relatively thin side walls 12 and upper and lower, or outer, marginal portions 13 of considerably greater thickness than the side walls 12.

The rails 10 are shown as having opposite parallel flat outer side faces 14 from which opposite beveled or inclined faces 15 extend to opposite flat marginal faces 16.

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The marginal portions 13 are provided, extending inwardly from each end parallel to and spaced from the faces 16 and between the faces 15, with elongated openings 17, circular in cross section. The openings 17, if desired, can extend from end to end of the rails 10. The increased material at the marginal portions 13 contributes to increasing the resistance to bending with respect to a horizontal plane parallel to the faces 16 and longitudinal of the rail 10.

10 Each of the outer marginal portions 13 can be provided from end to end along the marginal faces 16 with a U-shaped groove 18. The groove 18 provides a gauge location and a guide for drilling, for mounting hooks 19 for the connection of actuating cords or straps (not shown) which are used for raising and lowering the frames in the loom in the well known manner.

15 Each of side struts 11 may be and preferably is made of wood. At locations in alignment with the openings 17 drilled holes 20 are provided with outer counterbores 21 of larger diameter.

20 The rails 10, at the outer ends of the openings 17 have end counterbores 25 of larger diameter than the openings 17 and the same as the holes 20.

25 In order to retain the side struts 11 in assembled relation to the rails 10, bolts 22 are provided having heads 23 for engagement within the counterbores 21, cylindrical shanks 24 for engagement in the end counterbores 25 in the openings 17, and self tapping threaded ends 26 on the shanks 24. The threaded ends 26 are preferably of a size and type to be self threading in the openings 17. The shear strength of the structure is enhanced by the 30 sliding engagement of the end portions of the shanks 24 in the counterbores 25. The counterbores 25 also facilitate the insertion of the threaded ends 26 at initial assembly. The solid metal construction increases the 35 strength of the frames at the meeting locations of the rails 10 and side struts 11.

30 The harness frame is preferably provided with heddle rods 30 supported intermediate their ends by hooks 31 of any preferred type and held at their ends in any desired manner such as by spring hooks 32 mounted on the side struts 11 and detachably engaging the heddle rods 30. The heddle rods 30 have heddles 33 thereon, of any preferred type, preferably one of the standard forms of flat 40 steel heddles such as are commonly employed for weaving.

45 While the structure shown is satisfactory for many purposes it has been found advantageous for some purposes to punch the metal of the rail 10 before or after the insertion of the bolts 22 at one or more locations along the threaded ends 26 of the bolts 22, and on either or both sides of the rail 10, by impact with the end of a circular or rectangular punch to provide depressed and compacted metal portions 35 which contribute to the retention of 50 the bolts 22 in their assembled and gripping positions.

I claim:

55 1. A loom harness frame comprising hollow metallic top and bottom rails and connecting end struts, with the ends of the rails in abutting relation thereto, each of said rails having upper and lower marginal portions with parallel longitudinal openings therein extending inwardly from each end thereof, said openings having enlargements at their outer ends, fastening members extending through said side struts and having shanks disposed in 60 engagement with said marginal portions in said enlargements, said fastening members having threaded end portions extending beyond said shanks and in direct threaded engagement with said marginal portions in said openings beyond said enlargements.

65 2. A loom harness frame as defined in claim 1 in which said openings are continuous from end to end of said rails.

70 3. A loom harness frame as defined in claim 1 in which

said end struts have openings aligned with the openings in the rails and said fastening members have said shanks disposed within said enlargements and said strut openings and in engagement therewith, and said fastening members have enlarged heads in engagement with said struts.

4. A loom harness frame comprising hollow metallic top and bottom rails and connecting end struts with the ends of the rails in abutting relation thereto, each of said rails having upper and lower marginal portions with parallel longitudinal openings therein extending inwardly from each end thereof, said openings having end enlargements, fastening members having heads in engagement with said end struts and having shanks extending through said end struts and into said end enlargements, said fastening members having threaded end portions extending beyond said shanks and in direct threaded engagement with said marginal portions in said openings and beyond said enlargements.

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