Feb. 9, 1937. A. B. GLOOR ET AL 2,070,164

HEDDLE FRAME

Filed July 25, 1935

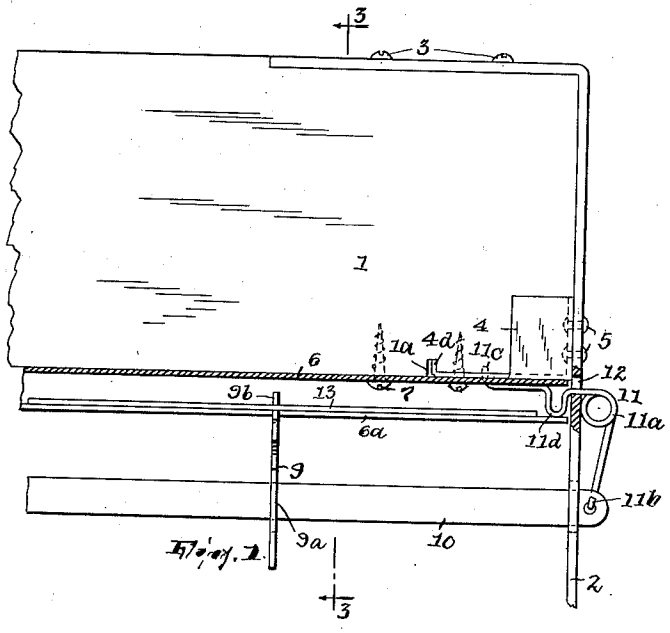


Fig. 1.

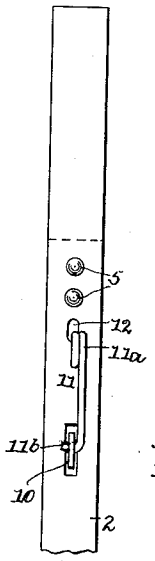


Fig. 2.

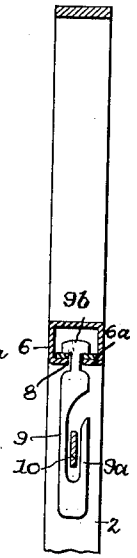


Fig. 3.

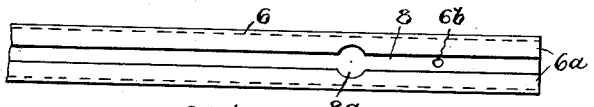


Fig. 4.

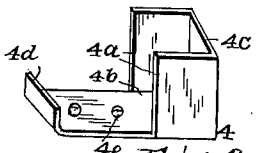


Fig. 6.

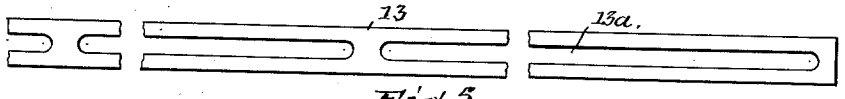


Fig. 5.

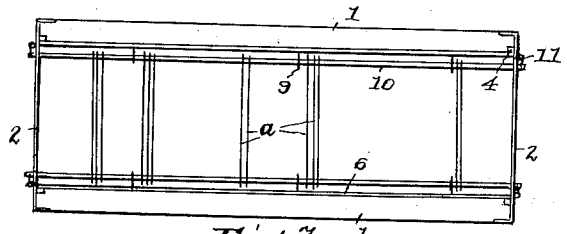


Fig. 7.

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Patented Feb. 9, 1937 2,070,164

UNITED STATES PATENT OFFICE

2,070,164

HEDDLE FRAME

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Application July 25, 1935, Serial No. 33,015

4 Claims. (Cl. 139—92)

In a well-known type of heddle-frame for looms the heddles are strung on thin flexible horizontal upper and lower heddle bars suitably held taut in the frame proper and kept from sagging under the load of the heddles by couplings, as hooks, which are penetrated by and thus strung on and freely slidable along horizontal rods each of which is usually mounted in screw-eyes attached to the adjoining horizontal top or bottom bar of the frame proper and is held against endwise displacement by the vertical or side bars of such frame proper. If due to wear or other incapacity a hook requires to be replaced by a new one this cannot be done without removing one side bar of the frame proper and withdrawing the rod on which the affected hook is strung until the rod at least clears such hook, incidentally unshipping one or more hooks from the rod unless the affected hook is the first one to be freed; and of course it is not practicable to perform these operations and the ensuing reassembling of the parts without removing the frame from the loom.

One object of this invention is to make it possible to remove or apply a coupling without disestablishing the frame proper or removing the heddle frame from the loom.

Other objects will appear hereinafter.

In the drawing,

Fig. 1 shows in front elevation, partly in section, the upper right-hand corner of a heddle frame constructed in accordance with this invention;

Fig. 2 is a side elevation of what is shown in Fig. 1;

Fig. 3 is a section on line 3—3, Fig. 1;

Fig. 4 is an underneath plan view of the channel member shown in Figs. 1 and 3;

Fig. 5 is a similar view of a slotted strip contained in said member;

Fig. 6 is a perspective view of the corner brace shown in Fig. 1; and

Fig. 7 is a front elevation of the heddle frame as a whole.

1 designates the usual wood horizontal rails having their ends formed at right angles to their longitudinal edges and 2 the metal vertical side bars of the frame proper, the bars abutting said ends of the rails and having their ends bent off and secured to the outer longitudinal edges of the rails by screws 3. Such screws being not sufficient to maintain the rails 1 against angular displacement out of the plane of the side bars it is usual to attach by screws to the inner edges of the rails clips which pass through holes in and outwardly engage the side bars. This construction however involves certain weakness in that the clip screws are likely to split the wood of the rails. Hence we include as a part of the frame proper reinforcing means as follows:

A sheet metal box-like brace 4 complete with only four walls, two of which, 4*a*, are parallel and spaced so as snugly to receive the inner corner of a rail 1 and the other two sides, 4*b* and 4*c*, of which are perpendicular to each other and the latter having an extension as shown, may be formed by a stamping operation. Such brace is spot-welded or, as shown at 5, riveted to the side bar and fitted over said corner of the rail, its extension having a tang 4*d* which engages a shoulder of a notch 1*a* of the rail and so holds the side bar from spreading away from the rail. The extension has a hole 4*e* to be referred to. Thus, without weakening the rail 1 materially, it is securely held against displacement in the manner indicated.

A part of the frame proper and forming with each rail what we term a horizontal rail structure is a channeled member 6 reaching from one to the other side bar, being held against the inner edge of such rail by screws 7 penetrating the base wall of the member, opposed to which are here two ledges 6*a* defining between them a slot 8 which is locally enlarged, as at 8*a*, to permit the heads of the screws to pass. This member incidentally reinforces the rail 1.

The couplings 9, having hook-portions 9*a* open toward the rail structure and receiving therein the flexible heddle bar 10 on which are strung the heddles *a*, have each a head 9*b* at the end adjoining the rail structure and received in member 6. The head is here T-shaped but what is material is that in the normal condition of the parts (the heddle bar received in the hook-portion of the coupling) the head is wider in a direction transverse of the slot 8 but is narrower in a direction lengthwise thereof, wherefore the coupling cannot be withdrawn from the slot without turning it around a vertical axis, as by first springing the heddle bar toward the rail structure to clear the coupling, it being understood that the heddle bar is usually held so taut that the coupling cannot be so turned otherwise. This construction makes it possible individually to remove or attach the couplings, which it will be understood prevent the heddle bar from sagging under the load of the heddles, without disturbing at all the frame proper.

Each end of each heddle bar penetrates a side bar and is engaged by elastic means which acts to maintain the heddle bar taut without weak-

ening or tending materially to bend the side bars and forms therewith what I term an elastic tension system. A wire spring 11 has a coil 11*a* adapted to bear against the outside of the side bar, such spring being in effect a spring-lever whose fulcrum is the coil. One extremity of the spring has a tang 11*b* engaged in a hole in the end of the heddle bar. The other extremity extends through a hole 12 in the side bar and into member 6 and has a tang 11*c* which may pass through a hole 6*b* in said member and the hole 4*e* in the extension of brace 4. In order to prevent the spring from falling away from the frame proper when it is detached from the heddle bar the second-named extremity is formed with an arched bend 11*d* inward of and adjoining the side bar. Formerly the heddle bar tensioning springs have been supported entirely by the side bar, having a tendency to bend the same. According to the present construction the spring is supported partly by the side bar and partly by the rail structure, its point of support on the side bar being close to the rail structure with consequent little tendency to bend it.

The couplings in a heddle frame should always be perfectly free to shift with the heddles as they shift their positions along the heddle bars. To insure this condition we provide within the channeled member 6 a strip 13 which is slotted at intervals, at 13*a*, to receive the headed ends of the couplings. This strip is free to shift somewhat lengthwise of the member 6 and also up and down so that in the action of the heddle frame it frees any coupling otherwise disposed not to slide freely lengthwise of said member.

Having thus fully described our invention what we claim is:

1. In a heddle frame, the combination of a frame proper including a horizontal rail structure and side bars, an elastic tension system connecting the side bars and including a substantially horizontal heddle bar, said structure having a longitudinal slot open toward, and at one side of the slot a ledge facing away from, the heddle bar, and a coupling having a hook-portion open toward said structure and receiving the heddle bar and an end portion penetrating the slot and formed with a head which in a direction transverse of the slot is wider, and in a direction lengthwise of the slot is narrower, than the slot, said coupling being normally confined by the heddle bar to a position in which the head stands with its greater width transverse of the slot.

2. In a heddle frame, the combination of a frame proper including a horizontal rail structure and side bars, an elastic tension system connecting the side bars and including a substantially horizontal heddle bar, said structure having a longitudinal slot open toward, and at one side of the slot a ledge facing away from, the heddle bar, a strip resting loosely on the ledge, a coupling having a hook-portion open toward said structure and receiving the heddle bar and an end portion penetrating said slot and formed with a head which overlaps the strip and in a direction transverse of the slot is wider, and in a direction lengthwise of such slot is narrower, than the slot, said coupling being normally confined by the heddle bar to a position in which the head stands with its greater width transverse of the slot.

3. The combination, with a frame proper including a horizontal rail, side bars and a channeled member secured to the relatively inner side of the rail and having its channel opening inwardly of a heddle bar parallel with said member and penetrating the side bars, and spring levers respectively fulcrumed between their ends on the side bars and each having one end penetrating the corresponding side bar and received in the channel of and bearing against said member and its other end engaged with the corresponding end of the heddle bar and coacting with the other lever to hold the heddle bar in tension.

4. In a heddle frame, the combination of a frame proper including a horizontal rail structure and side bars, a substantially horizontal elastic heddle bar, said structure having a longitudinal slot open toward, and at one side of the slot a ledge facing away from, the heddle bar, and couplings each having a hook-portion open toward said structure and receiving the heddle bar and an end portion penetrating the slot and formed with a head which in a direction transverse of the slot is wider, and in a direction lengthwise of the slot is narrower, than the slot, said coupling being normally confined by the heddle bar to a position in which the head stands with its greater width transverse of the slot.

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