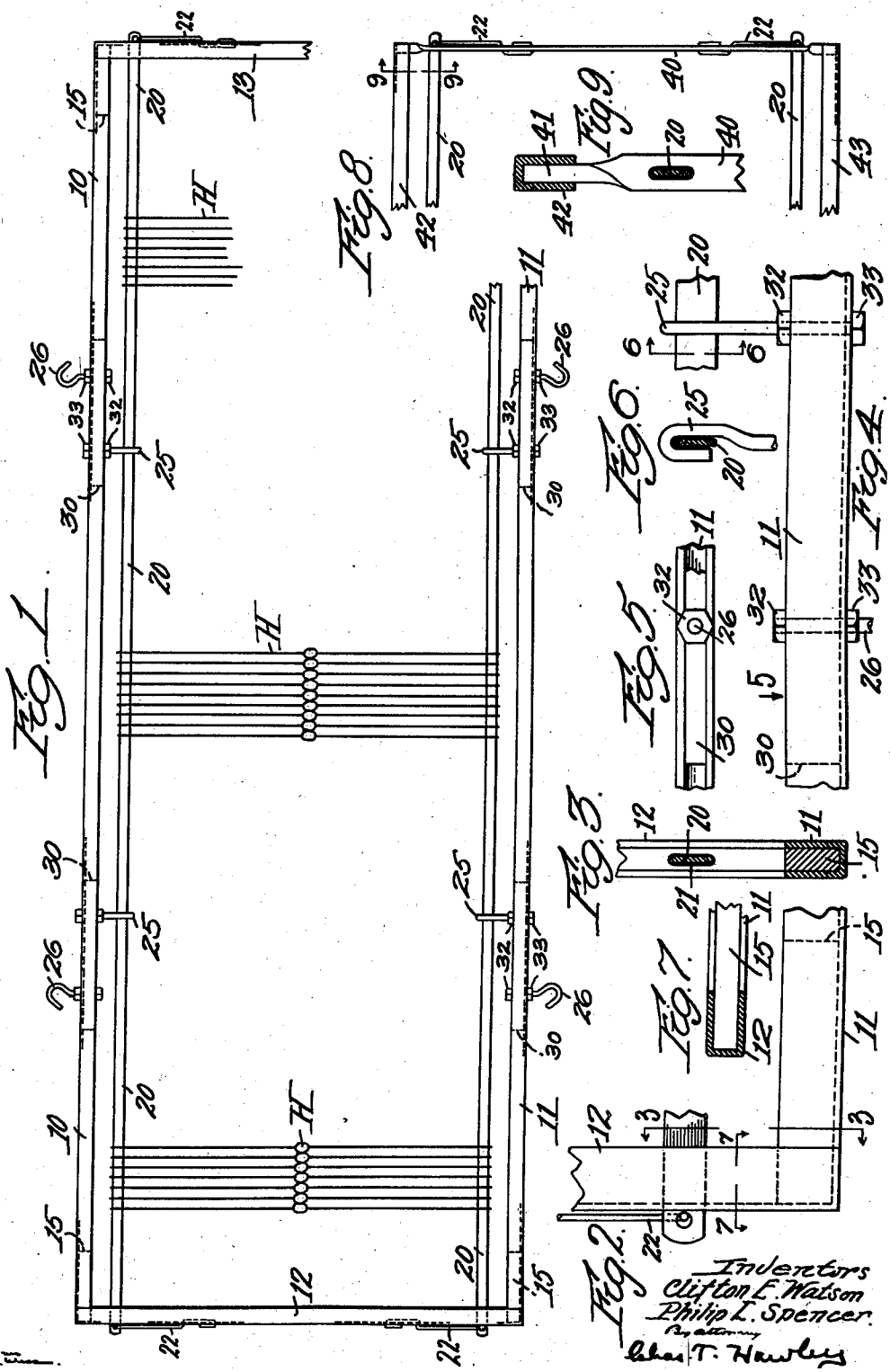
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HEDDLE FRAME

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HEDDLE FRAME

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This invention relates to frames used for supporting heddles in weaving looms. The more complex weaving designs require the use of a large number of such heddle frames, so that a weaver has more or less difficulty in reaching the warp threads behind the set of frames.

It is the general object of our invention to provide a heddle frame of an improved construction effecting reduced height and thickness, so that the space occupied by a set of frames will be substantially reduced, particularly in height.

A further object of our invention is to provide a heddle frame of reliable and economical construction and of exceptional wearing qualities.

Our invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

Preferred forms of the invention are shown in the drawing, in which

Fig. 1 is a front elevation of one form of our invention;

Fig. 2 is an enlarged front elevation of a corner portion of the frame shown in Fig. 1;

Fig. 3 is a detail sectional elevation, taken along the line 3—3 in Fig. 2;

Fig. 4 is an enlarged front elevation of another portion of the heddle frame shown in Fig. 1;

Fig. 5 is a detail plan view, looking in the direction of the arrow 5 in Fig. 4;

Fig. 6 is a detail sectional view, taken along the line 6—6 in Fig. 4;

Fig. 7 is a sectional plan view, taken along the line 7—7 in Fig. 2;

Fig. 8 is a partial front elevation of a modified construction; and

Fig. 9 is a sectional elevation, taken along the line 9—9 in Fig. 8.

Referring to Figs. 1 to 7, our improved heddle frame comprises a top bar 10, a bottom bar 11 and end bars 12 and 13. In this form of our invention all of these bars are of the U-shaped cross section shown in Figs. 3 and 7, with the open sides of the channels inwardly directed.

The top, bottom and end bars are permanently secured together at their adjacent ends to form an open rectangular frame. In the construction shown in Figs. 1 to 7, these parts are secured together by inserting filler strips 15 at each end of the top bar 10 and bottom bar 11, said strips extending beyond the ends of the bars 10 and 11 and projecting into the U-shaped channels of the end bars 12 and 13, as best shown in Fig. 7. The filler strips may be secured to their adjacent bars in any convenient manner, as by riveting or welding, and in either case a firm and rigid construction is attained, with the use of a minimum weight of metal.

Heddle bars 20 are provided for the heddles H and these heddle bars extend through openings 21 (Fig. 3) in the end bars 12 and 13 and are secured in position by wire clips 22 (Figs. 1 and 2).

It is desirable to provide positioning devices 25 for the heddle bars 20, and also to provide frame-supporting hooks 26 by which the heddle frames may be attached to the harness motions. In order to provide a firm and rigid attachment for the devices 25 and hooks 26, we insert filler strips 30 (Figs. 4 and 5) in spaced relation in the top bars and bottom bars 11, and permanently secure these strips 30 in position by welding or riveting, as previously described.

The devices 25 and hooks 26 are then inserted in vertical openings through the top and bottom bars and filler strips, and may be secured in position by nuts 32 and 33 engaging the inner and outer faces of the top and bottom bars respectively. To prevent loosening, the devices 25 and hooks 26 may be welded in position in the openings into which they are inserted, with or without the additional use of the nuts 32 and 33.

With the above described construction, we attain a heddle frame of substantially reduced height and also of reduced thickness, and our improved frame is of ample strength and of practically unlimited life.

In the construction shown in Figs. 8 and 9, the top and bottom frames, positioning devices and frame-supporting hooks are or may be the same as shown in Figs. 1 to 7, and may be similarly secured together.

The end bars 40, however, are shown as formed of flat wire rods having their ends twisted 90° as indicated at 41 in Fig. 9, said twisted ends being of such thickness as to fit snugly into the channels of the top and bottom bars 42 and 43 respectively. The heddle bars 20 and attaching clips 22 are all as previously described.

This form of our invention is of slightly less weight and correspondingly reduced cost but in both forms of our invention a strong and serviceable heddle frame is attained by the use of a very small weight of metal.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what we claim is:—

1. A heddle frame having metal top and bottom bars, metal end bars, means to secure said bars permanently together at their adjacent ends to

form an open rectangle, said top and bottom bars being of U-shaped cross section and having filler strips secured in spaced relation in the U-shaped channels thereof and abutting the closed outer edge portion thereof, and frame-supporting hooks rigidly secured to said bars and assembled with and extending through said filler strips.

2. A heddle frame having metal top and bottom bars and metal end bars, all U-shaped in section, and means to permanently secure said bars together at their adjacent ends to form an open rectangle, one bar at each corner having a filler strip permanently secured therein and projecting into and secured within the U-shaped channel of the associated bar.

3. A heddle frame having metal top and bottom bars and metal end bars, all U-shaped in section, filler strips permanently securing said bars together at their adjacent ends to form an open rectangle, additional filler strips permanently secured at spaced points in the U-shaped channels of said top and bottom bars, and frame-supporting hooks extending through and secured in said bars and filler strips.

4. A heddle frame having metal top and bottom bars and metal end bars, all U-shaped in section, filler strips permanently securing said bars together at their adjacent ends to form an open rectangle, heddle bars extending through said end bars and removably secured therein, positioning devices for said heddle bars, and filler strips in the U-shaped channels of the top and bottom bars, through which bars and strips said positioning devices extend and are secured.

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