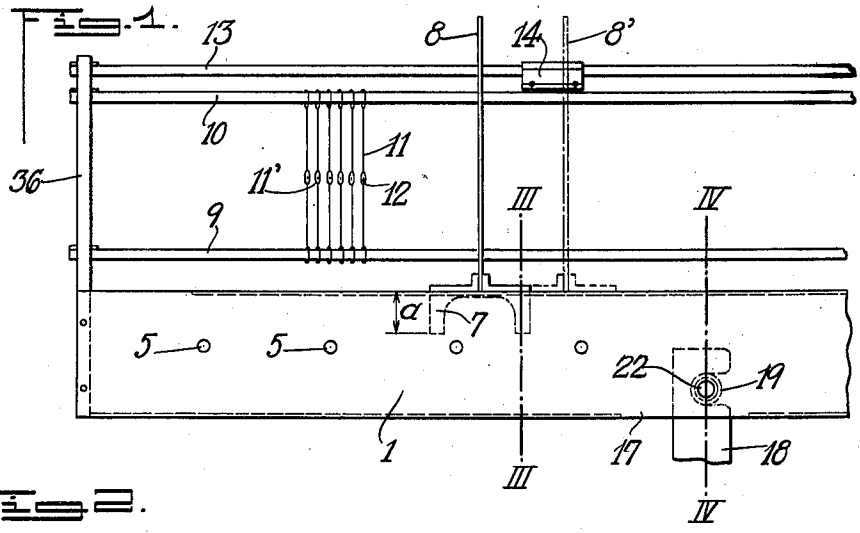
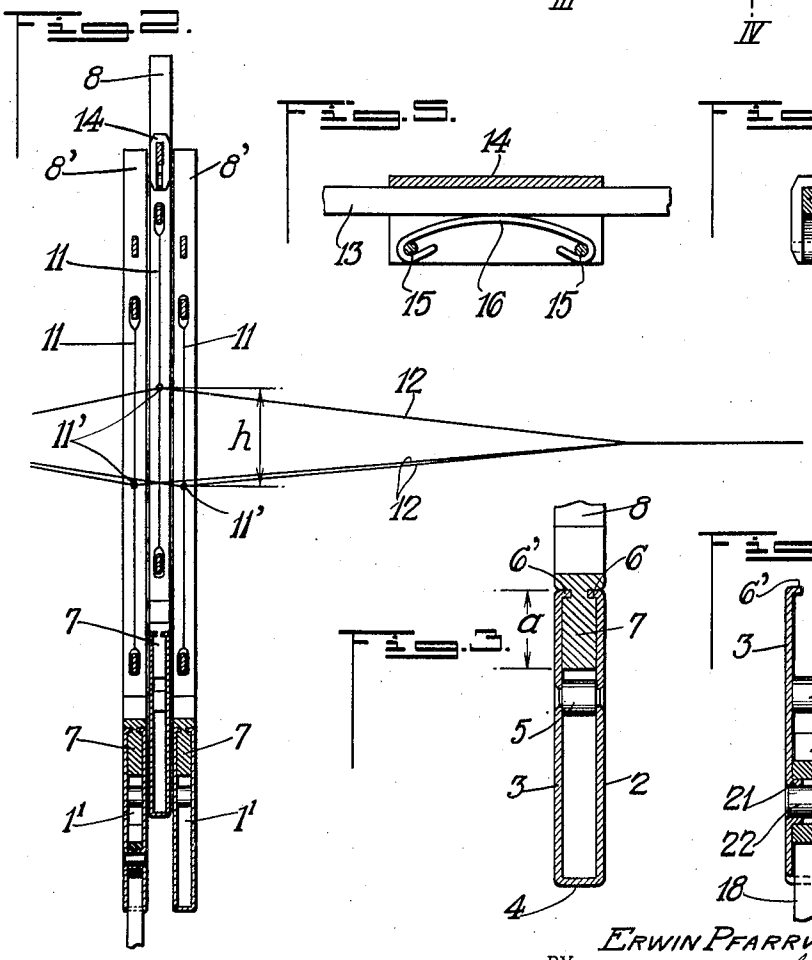
Sept. 23, 1941. E. PFARRWALLER 2,256,572

HEALD FRAME

Filed Feb. 20, 1939 2 Sheets-Sheet 1





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HEALD FRAME

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FIG. 7.

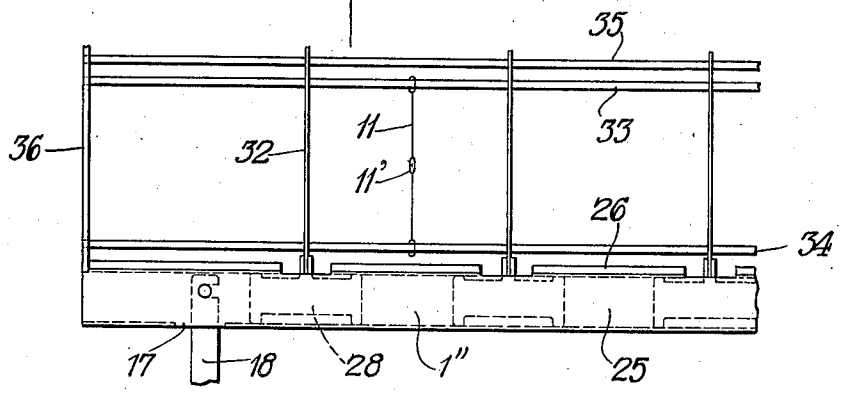


FIG. 8.

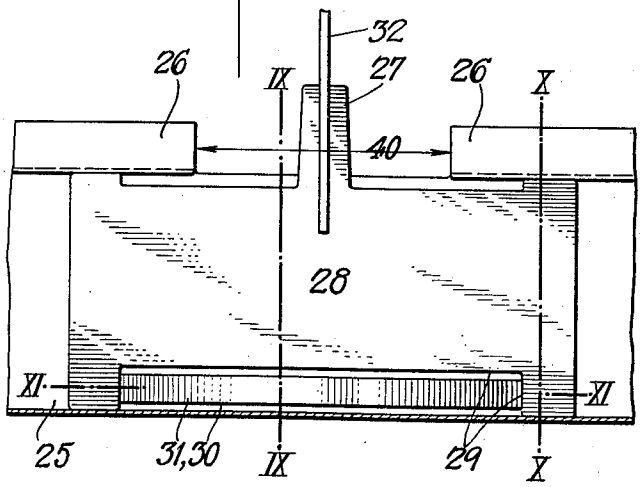


FIG. 9.

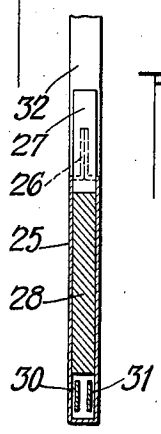


FIG. 10.

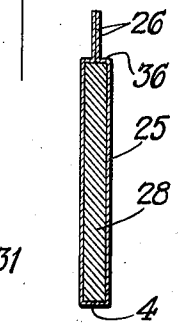
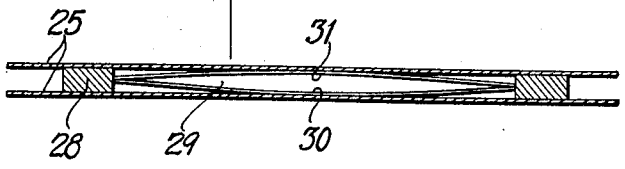


FIG. 11.



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HEALD FRAME

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Tefag Textil-Finanz A. G., Winterthur, Switzerland

Application February 20, 1939, Serial No. 257,368
In Switzerland March 5, 1938

15 Claims. (Cl. 139—92)

The present invention relates to heald frames for looms for weaving, particularly to frames which are operated from below to reciprocatingly move up and down and in which the distance of the rails for filing the healds is definitely maintained by means of posts which upwardly extend from specially designed shafts and which are displaceable in the direction of the longitudinal extension of the heald frames.

It is an object of the present invention to provide heald frames of the type set forth which are particularly thin. If such thin frames are driven from below and designed in conventional manner the upper part has no guide and, due to its small mass, has a very small moment of inertia in the direction of the warp threads. Conventional frames are therefore subject to vibrations which may become so great that safe operation of the frames is impossible. Guide means proposed so far interfere with the visibility of the warp and shed.

Frames have been proposed in which there is no upper shaft. The filing rails in this case are supported by means of posts which are rigidly connected with the lower shaft. Such rigidly connected posts and rails make it necessary to exactly determine the number of warp threads in between two posts. Faulty warping causes friction between warp threads and posts and damage to the threads.

In the heald frames, according to the present invention, above the uppermost rail or cross bar for filing the healds or heddles, an additional guide rail may be provided which is equipped with guide elements which are held to said guide rail by spring pressure and which are displaceable along said additional rail. The posts extend above the additional rail by a length which is at least equal to the height of the shed. The posts of one frame can thus rest against the guide elements of the next adjacent frame. The guide elements preferably have the same width as the shaft. The shaft from which the posts extend is hollow and the foot part of the posts extends into and is guided by the shaft for at least one fourth of the height of the shaft.

The shaft itself, according to the present invention, may be made of sheet metal and be open on top and have a cross section in the form of a U. It may be closed and have an O shaped cross sectional configuration. In case of the shaft being open on top, inwardly bent rims may be provided for partly closing the top and preventing the posts which have recesses cooperating with said rims, from falling out of the shaft. In the case of the open shafts rivets may be provided for interconnecting the side walls of the shaft.

At at least one end of the shaft no bent over rims are provided so that there remains an opening through which the posts can be inserted. In the case of a closed hollow shaft openings are provided on top and on the bottom through which the posts and the hooked frame support and actuating members project respectively. In order to provide for interconnecting the side walls of the shaft, for example by means of butt welding, special rims may be provided.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and shown in the drawings which, by way of illustration, show what I now consider to be a preferred embodiment of my invention.

In the drawings:

Figure 1 is a front view of a heald frame according to the present invention.

Figure 2 is a cross sectional view of three adjacent heald frames.

Figure 3 is an enlarged cross sectional view of a heald shaft according to the present invention taken along line III—III of Fig. 1.

Figure 4 is an enlarged cross sectional view of a heald shaft according to the present invention taken along line IV—IV of Fig. 1.

Figure 5 is a longitudinal sectional view of a guide element according to the present invention.

Figure 6 is a side view of the guide element shown in Fig. 5.

Figure 7 is a front view of a modified heald frame according to the present invention.

Figure 8 is an enlarged front view of a part of the heald frame shown in Fig. 7.

Figure 9 is a cross sectional view of a heald shaft according to the present invention and taken along line IX—IX of Fig. 8.

Figure 10 is a cross sectional view of a heald shaft according to the present invention and taken along line X—X of Fig. 8.

Figure 11 is a longitudinal sectional view of a heald shaft and foot piece of a post according to the present invention and taken along line XI—XI in Fig. 8.

The heddle shaft 1 shown in Fig. 1 is operated from below and made of sheet metal. As is obvious from Fig. 3 it has two walls 2 and 3 which are connected at the bottom by means of wall 4. Side walls 2 and 3 may be connected by means of rivets 5 and be provided on top with

inwardly bent rims 6, 6'. The channel which is formed by the row of rivets 5 and the rims 6 and 6' slidably holds the guide or foot members 7. The guide pieces 7 can be slidably displaced in the direction of the longitudinal axis of the heddle shaft 1. Each guide piece 7 carries a post 8 which posts support the filing rails 9, 10 and exactly maintain the distance between said rails. No inwardly bent rims are provided at at least one end of shaft 1 and for at least the length of one foot member 7 for permitting insertion into the shaft and removal of the posts 8 from the shaft.

The heddles or healds 11 are filed on the rails 9 and 10 and are individually provided with mails 11' for carrying the warp threads 12. The posts 8 may carry a third rail 13 above the upper rail member. This third rail is provided with guide elements 14 which are slidable on rail 13 and are pressed thereto by means of springs 16. The width of guide elements 14 as well as of the posts 8 preferably conforms with the width of the heddle shaft 1. As is obvious from Fig. 2 the posts 8' which are carried by the heddle shafts 1' which are adjacent to shaft 1 are adapted to lean laterally against the guide elements 14. It is advisable to make the posts 8 so long that the projection above the top rail 13 is as great as the height *h* of the shed. This assures that all heddle frames engage one another and form a heavy unit which has great resistance against lateral movements and transverse vibrations.

The bottom 4 of the heddle shaft 1 is provided with a plurality, usually two, recesses or openings 17 through which the hooked driving members 18 extend which members are driven from below and disposed between the side walls 2 and 3. For providing a rest for the hooks 18 bushings 19 are placed between the walls 2 and 3 and held thereto by small rims 20 and 21 which are produced when the rivet 22 is applied. The drive hooks 18 extend partly around the bushing 19 and carry the shaft 1 and transmit thereto an up and down movement.

In the embodiment of the present invention according to Figs. 1 to 4 the guide or support means 7 extend into the shaft 1 by the distance *a*. This distance is preferably greater than one quarter of the total height of the shaft so that means 7 and posts 8 are well secured against movement in the direction of the warp threads.

Figures 7 to 11 illustrate an embodiment of the present invention in which the guides or supports 28 are secured over the whole height of the heddle shaft 1''.

The shaft 1'' which is reciprocatingly moved from below by means of the hooked members 18 is made of the sheet metal 25 and has a rectangular cross section. On top rims 26 are provided which permit butt welding or other rigid connections so that a box is formed. The rims 26 as well as the upper wall 36 of said box are interrupted at certain intervals so that openings are formed through which the noses 27 of the guide members 28 extend. The main bodies of members 28 fill the interior of the shaft 1'' which may be termed to be of O shaped cross section in contradistinction to the U shaped cross section of the shaft according to Figs. 1 to 6. Members 28 are movable in the direction of the longitudinal extension of shaft 1''. A breaking effect on the movement of members 28 may be caused by the provision of springs 30, 31 in suitable recesses 29 of members 28 which springs frictionally engage the interior of the shaft sheath 25 and cause a restraining effect with respect to movement in the direction of the warp threads.

Posts 32 are rigidly connected with the noses or projections 27 of the members 28. These posts carry the rails 33 and 34 for filing on the healds or heddles 11. An additional rail 35 is provided which corresponds to rail 13 in the embodiment shown in Figs. 1 to 6. This additional rail relieves and protects the heddles and filing rails and assists in making the framework more rigid.

In both embodiments of the invention described above posts 36 are provided at the extreme ends of the heald frame which end posts are rigidly connected with the heald shafts 1 or 1''.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. In a loom for weaving, a plurality of adjacent heald frames, each frame comprising a heald shaft, healds, a plurality of filing rails for filing said healds thereon, a plurality of posts uprightly connected with said shaft and being displaceable in the direction of the longitudinal axis of said shaft and laterally displaceably carrying and definitely maintaining the distance between said filing rails, and an additional rail disposed above the uppermost of said filing rails and carrying a plurality of guide members which are displaceable in the direction of the longitudinal axis of said frame and slidingly contact the posts of the adjacent heald frames.

2. In a loom for weaving, a plurality of adjacent heald frames, each frame comprising a heald shaft, healds, a plurality of filing rails for filing said healds thereon, a plurality of posts uprightly connected with said shaft and being displaceable in the direction of the longitudinal axis of said shaft and laterally displaceably carrying and definitely maintaining the distance between said filing rails, and an additional rail disposed above the uppermost of said filing rails and carrying a plurality of guide members which are resiliently pressed to said additional rail and are displaceable in the direction of the longitudinal axis of said frame and slidingly contact the posts of the adjacent heald frames.

3. In a loom for weaving, a pularilty of adjacent heald frames, each frame comprising a heald shaft, healds, a plurality of filing rails for filing said healds thereon, and a plurality of posts uprightly connected with said shaft and being displaceable in the direction of the longitudinal axis of said shaft and laterally displaceably carrying and definitely maintaining the distance between said filing rails, said posts projecting above the uppermost of said rails by a distance which is at least equal to the height of the shed.

4. In a loom for weaving, a plurality of adjacent heald frames, each frame comprising a heald shaft, healds, a plurality of filing rails for filing said healds thereon, a plurality of posts uprightly connected with said shaft and being displaceable in the direction of the longitudinal axis of said shaft and laterally displaceably carrying and definitely maintaining the distance between said filing rails and an additional rail disposed above the uppermost of said filing rails

and being adapted to slidingly engage the posts of the adjacent heald frames, said posts projecting above said additional rail by a distance which is at least equal to the height of the shed.

5. In a loom for weaving, a plurality of adjacent heald frames, each frame comprising a heald shaft, healds, a plurality of filing rails for filing said healds thereon, a plurality of posts uprightly connected with said shaft and being displaceable in the direction of the longitudinal axis of said shaft and laterally displaceably carrying and definitely maintaining the distance between said filing rails, and an additional rail disposed above the uppermost of said filing rails and carrying a plurality of guide members which are as wide as said shaft and are displaceable in the direction of the longitudinal axis of said frame and slidingly contact the posts of the adjacent heald frames.

6. A heald frame for looms for weaving comprising a heald shaft of substantially U shaped cross sectional configuration with inwardly bent rims at the upper ends of the legs of the U, a plurality of posts having support means at their lower ends and being inserted in said shaft and having recesses for accommodating said rims and being displaceable in the direction of the longitudinal axis of said shaft.

7. A heald frame for looms for weaving comprising a heald shaft of substantially U shaped cross sectional configuration, posts having support means at their lower ends and being inserted in said shaft, inwardly bent rims at the upper parts of said shaft and extending substantially over the whole length of said shaft minus a length which is at least equal to the length of said support means for providing space for insertion of said posts into said shaft, and recesses in said posts for accommodating said inwardly bent rims and permitting displacement of said posts in the direction of the longitudinal axis of said shaft.

8. A heald frame for looms for weaving comprising a heald shaft of substantially U shaped cross sectional configuration, connecting means interconnecting the legs of the U, and a plurality of posts uprightly inserted in said shaft above said connecting means and being displaceable in the direction of the longitudinal axis of said shaft.

9. A heald support for looms for weaving consisting substantially of one only power driven heald shaft, said shaft being of oblong substantially rectangular cross sectional configuration and being in upright position and having, in its upper narrow side, a slot opening and a cavity adjacent thereto, a plurality of post members inserted and being slideably displaceable in said slot opening and cavity and freely extending uprightly from and solely supported by said shaft.

10. A heald support as claimed in claim 9 in which the two outermost of said posts are undisplaceably but otherwise in the same manner connected with said shaft as are the displaceable posts and in which all said posts are as wide as said shaft is thick whereby the front and rear edges of said posts are in the same planes as are the front and rear sides of said shaft.

11. A heald support for looms for weaving consisting substantially of only one power driven heald shaft, said shaft being of oblong substantially rectangular U shaped cross sectional configuration and having two lateral wall portions in vertical upright position and, in its upper narrow side, a slot opening and a cavity adjacent thereto, a plurality of post members inserted in said slot opening and clamped and slideably displaceable between and compressed by said wall portions and freely extending uprightly from and solely supported by said shafts.

12. A heald support for looms for weaving comprising one only heald shaft adapted to be power driven from below, a plurality of post members having foot portions slideably engaging said shaft, guide means associated with said shaft and with said foot portions and being so constructed that said foot portions and posts associated therewith are free for movement in the direction of the longitudinal extension only of said shaft and that said foot portions are definitely permanently held to said shaft in any other direction.

13. A heald support for looms for weaving comprising one only power driven hollow heald shaft, a plurality of post members, a foot means permanently rigidly connected with the lower end of each of said post members, said foot means being positioned in the interior of said hollow shaft and being freely slideably displaceable therein in the direction of the longitudinal extension of said shaft, said post members extending vertically upward from said foot means and said shaft.

14. A heald support for looms for weaving comprising one only power driven hollow heald shaft having openings in the upper portion thereof, a plurality of post members, a foot means permanently rigidly connected with the lower end of each of said post members, said foot means being completely positioned in the interior of said hollow shaft and being freely slideably displaceable therein in the direction of the longitudinal extension of said shaft, said post members extending vertically upward from said foot means and individually through said openings in said shaft.

15. A heald support as claimed in claim 13 in which said foot means comprise resilient means slidingly engaging the interior of said shaft for maintaining resilient frictional engagement of said foot means and said shaft.

ERWIN PFARRWALLER.