

(No Model.)

H. TOPHAM.
HEDDLE FOR CROSS WEAVING LOOMS.

No. 472,412.

Patented Apr. 5, 1892.

FIG. 1.

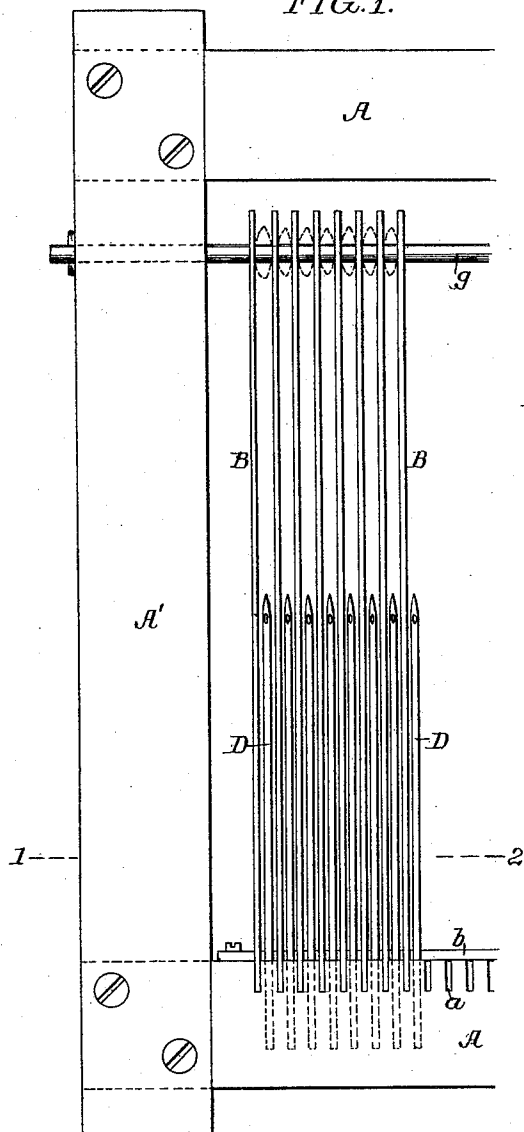


FIG. 4.

FIG. 3.

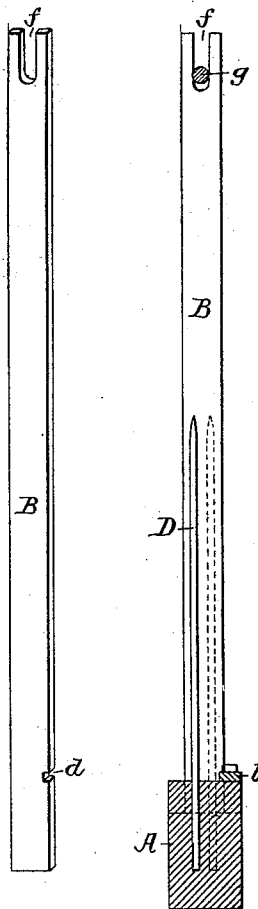


FIG. 5.

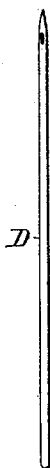
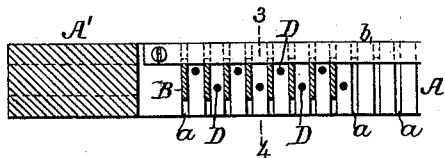


FIG. 2.



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UNITED STATES PATENT OFFICE.

HENRY TOPHAM, OF PHILADELPHIA, PENNSYLVANIA.

HEDDLE FOR CROSS-WEAVING LOOMS.

SPECIFICATION forming part of Letters Patent No. 472,412, dated April 5, 1892.

Application filed September 23, 1891. Serial No. 406,988. (No model.)

To all whom it may concern:

Be it known that I, HENRY TOPHAM, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Heddles for Cross-Weaving Looms, of which the following is a specification.

My invention relates to that class of heddles for cross-weaving looms which consist of a frame carrying upright bars somewhat similar to those of a reed and having in the spaces between the bars needles for receiving the warp-threads, two of these heddles being ordinarily used in a loom, the threads which pass through the eyes of the needles of one heddle passing through the spaces between the bars of the other heddle, and lateral movement being imparted to one or both of the heddles before each shedding movement, so that the threads controlled by each needle of one heddle will rise and fall first on one side and then on the opposite side of the corresponding needle of the other heddle, whereby the crossing of the warp-threads is effected.

The object of my invention is to so construct a heddle of this character as to prevent excessive chafing or abrading of the warp-threads, due to their bearing against the heddle-bars or to confinement between the bars and needles as said threads rise and fall in the shedding operation; and this object I attain, mainly, by permitting a slight lateral movement of the bars of the heddle when the threads bear sidewise upon the same, a special disposition of the needles in respect to each other and to the bars of the heddle also aiding in the accomplishment of the desired result.

In the accompanying drawings, Figure 1 is a front view of part of a heddle for cross-weaving looms constructed in accordance with my invention. Fig. 2 is a sectional plan view of the same on the line 1 2, Fig. 1. Fig. 3 is a vertical section on the line 3 4, Fig. 2. Fig. 4 is a perspective view of one of the bars of the heddle. Fig. 5 is a perspective view of one of the needles of the same.

A A represent the top and bottom bars, and A' one of the end bars, of the wooden frame of the heddle.

B are the metal bars of the heddle, and D the needles interposed between said metal bars. Said needles D have their butts driven

into the lower bar A of the heddle-frame, so that the needles will project above said bar to the desired extent and the eyes of all of the needles will be in line horizontally. The eyes of the needles are pierced from front to back, so that the warp-threads will pass straight through the same and so that the warp ends can be easily drawn in. The bars B are let into transverse grooves or slots *a* in the lower bar of the heddle, and are confined vertically to said bar by means of a strip *b*, secured to the bar and engaging with notches *d*, formed in the front edges of the bars B, as shown in Fig. 4. The upper ends of the bars B, however, are not rigidly confined laterally, but have vertical grooves *f* for the reception of a rod *g*, which extends across the heddle-frame beneath the upper bar A of the same, so that each bar B is free to yield laterally at its upper end whenever a warp-thread bears upon the bar sidewise with sufficient force to cause such yielding movement. Hence there is much less abrasion of the threads, due to their contact with the bars or to their movement between the bars and needles, than if said bars were rigidly confined as regards lateral movement at both top and bottom, as usual. To further aid in the attainment of this object, the needles D are staggered instead of being arranged in line longitudinally, as usual—that is to say, the first, third, fifth, seventh, and so on are in one longitudinal plane and the second, fourth, sixth, eighth, and so on are in another longitudinal plane somewhat in advance of the first, so that that portion of each bar B which is adjacent to one needle may yield laterally without coming in contact with the next needle—and ample space is thus provided for the passage of the warp-threads between the bars and needles, even though the heddle is of very fine gage.

The object of my invention would be attained in a measure even if the heddle-bars B were not unconfined laterally at one end so long as they were unconfined vertically. For instance, even if filling-blocks were inserted between the bars, as shown by dotted lines in Fig. 1, the vertical freedom of the ends of the bars would permit them to bend when subjected to the sidewise pressure of the warp-threads.

It should be understood that although I have

shown the heddles with the needles projecting from the bottom bar and with the bars B unconfined at the top one of the heddles as used in the loom occupies a reverse position.

5 Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination, in a heddle for cross-weaving looms, of the frame, the upright needles, and the upright bars located between said
10 needles, said bars being loosely confined at one end, whereby lateral pressure of a warp-thread shedded between a bar and an adjoining needle causes said bar to yield laterally and prevents confinement of the warp-thread
15 between the bar and needle, substantially as specified.

2. The combination, in a heddle for cross-weaving looms, of the frame, the upright needles, and the upright bars located between said
20 needles, said bars being unconfined laterally at one end, whereby lateral pressure of a warp-thread shedded between a bar and an adjoining needle causes said bar to yield laterally and prevents confinement of the thread be-
25 tween the bar and needle, substantially as specified.

3. The combination, in a heddle for cross-weaving looms, of the frame, the upright bars, and the interposed needles, said bars being
30 grooved or slotted at one end and said heddle-frame having a transverse rod adapted to the grooves in the bars, so that while the latter are prevented from moving in the line of

the warp they are loosely confined at one end and can yield in a direction transversely to the warp, substantially as specified. 35

4. The combination, in a heddle for cross-weaving looms, of the frame, the upright bars loosely confined at one end, and the interposed needles arranged in a zigzag or staggered line,
40 substantially as specified.

5. The combination, in a heddle for cross-weaving looms, of the frame, the upright bars unconfined laterally at one end, and the interposed needles arranged in a zigzag or stag-
45 gered line, substantially as specified.

6. The combination, in a heddle for cross-weaving looms, of the frame having a slotted bar and cross-rod, the upright needles, a retaining-bar secured to the slotted frame of the
50 heddle, and the upright bars adapted at one end to the slotted bar of the heddle-frame and having at the opposite end slots for the reception of the cross-rod of said frame, each of
55 said upright bars also having in the front near one end a notch for the reception of the retaining-bar which is secured to the slotted frame of the heddle, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of
60 two subscribing witnesses.

HENRY TOPHAM.

Witnesses:

EUGENE ELTERICH,

HARRY SMITH.