Sept. 1, 1942. N. S. HARTER 2,294,368

REED FOR LOOMS

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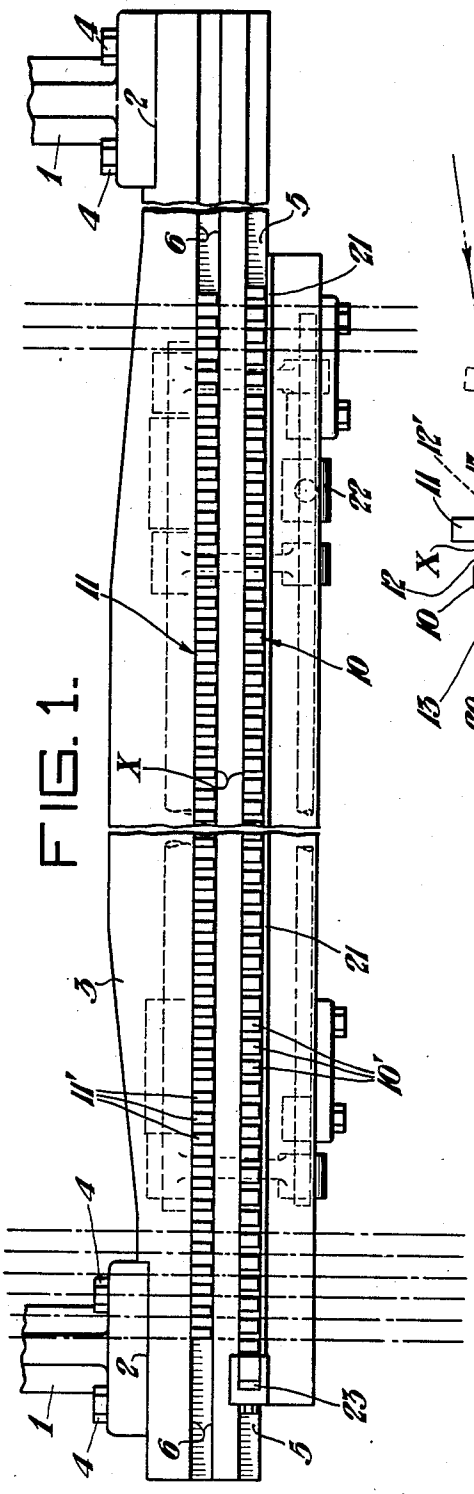


FIG. 1.

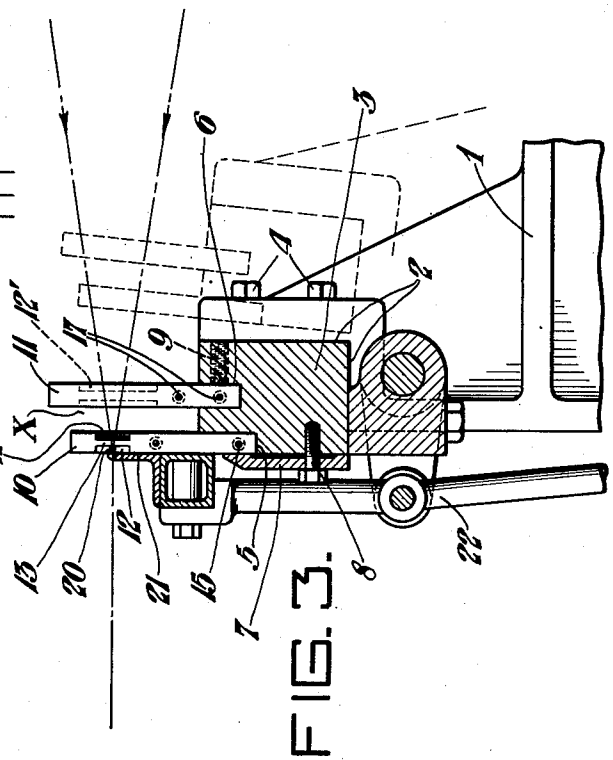


FIG. 3.

Inventor:
NOAH S. HARTER,
by: John E. Jackson
his Attorney.

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FIG. 2.

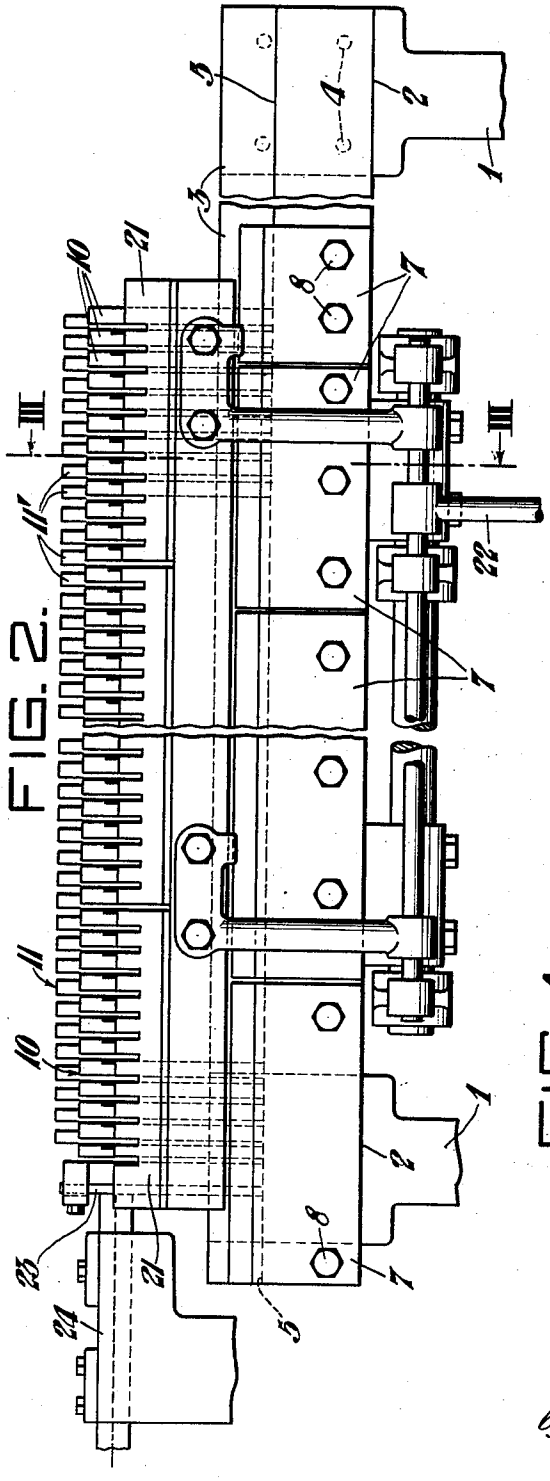


FIG. 5.

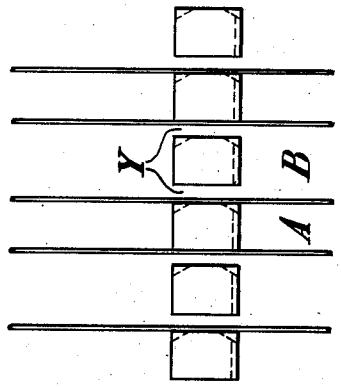
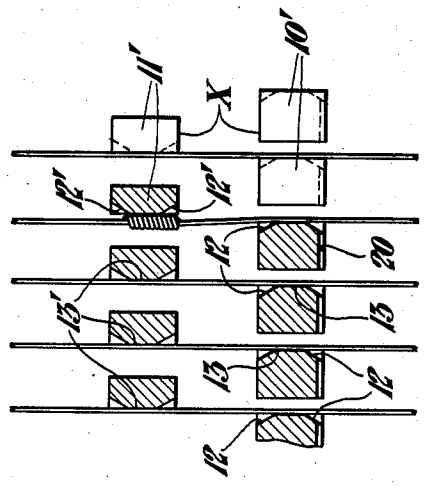


FIG. 4.



Inventor:
NOAH S. HARTER,
by: John E. Jackson
his Attorney.

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FIG. 6.

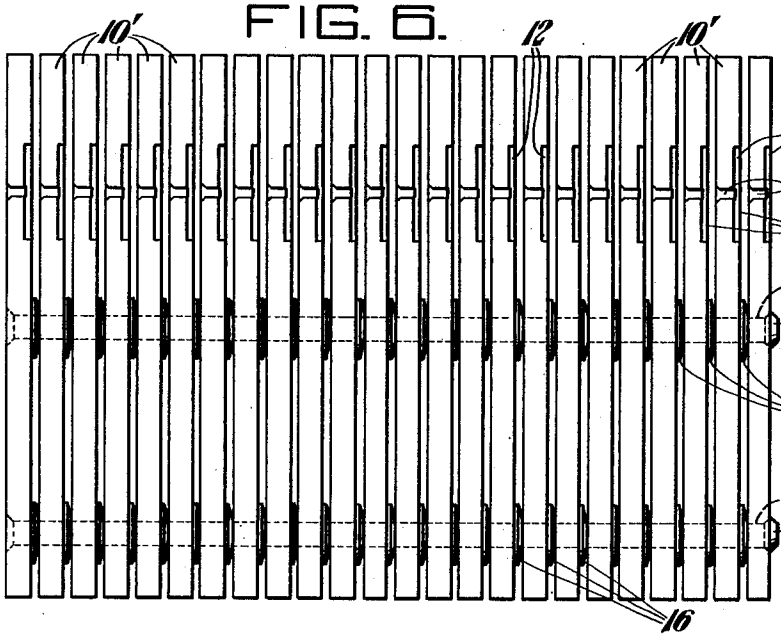


FIG. 8.

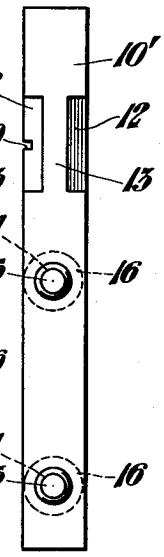


FIG. 7.

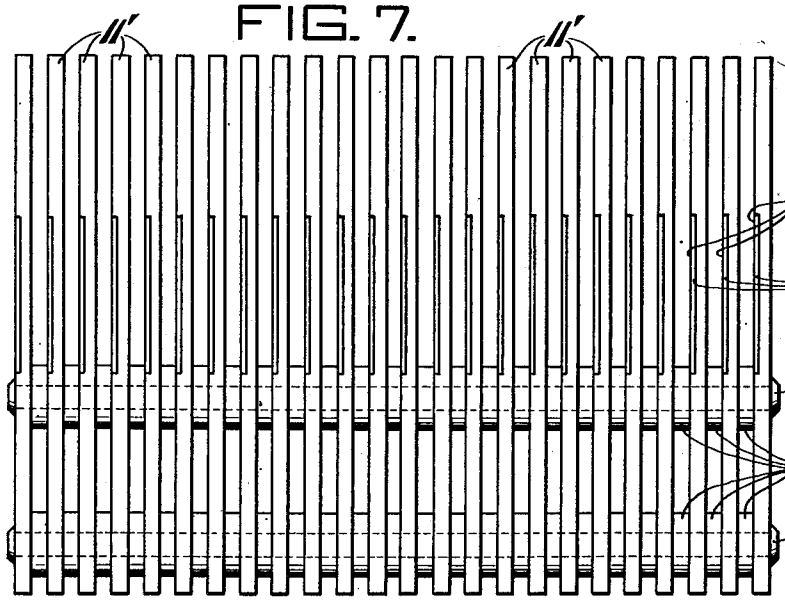
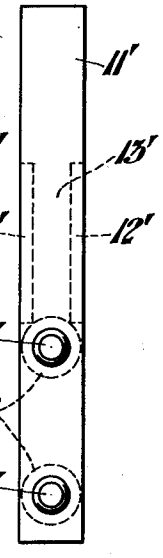


FIG. 9.



Inventor:
NOAH S. HARTER,
by: John E. Jackson
his Attorney.

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2,294,368

UNITED STATES PATENT OFFICE

2,294,368

REED FOR LOOMS

Noah S. Harter, Waukegan, Ill., assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey

Application September 25, 1940, Serial No. 358,346

2 Claims. (Cl. 139—192)

This invention relates to looms for weaving fabrics, and particularly to the weaving of metallic wire, although not limited thereto.

Heretofore, reeds for use in looms have been constructed of a plurality of individual comb elements called "dents," mounted in a rectangular frame so as to provide a plurality of vertically extending slots for the accommodation of warp elements, the slots being closed at the tops and bottoms thereof. The warp elements are passed through the slots in the reed thus constructed, and heddles are provided to form a shed in the warp, through which weft elements are passed in front of the reed. The reed is then oscillated forwardly so as to push the weft element into the points of convergence of the shed of the warp elements.

Reeds constructed in accordance with the foregoing have been open to the objections, first, that the warp elements had to be threaded through the slots, necessitating the availability of a free end of the warp strands for this purpose and, further, that because of the necessity for accurately spacing the warp strands, difficulty was encountered in passing the tied or spliced portions of the warp strands through the slots. In wire practice, spliced portions of the warp wires represent portions at least twice the diameter of the individual wires, and the reed slots had to be made sufficiently large to pass these splices. If of sufficient size to do this without difficulty, the accurate spacing between adjacent warp wires could not be maintained, thus giving rise to the production of "spacy" fabric. By making these slots within the closest practicable limits, difficulty was encountered in the breaking of the warp wire at the splice as it passed through the reed slots.

This latter condition is considerably aggravated by virtue of the fact that the reed must pass back and forth across a splice several times before the splice advances beyond the sphere of action of the reed into the fabric. For example, if a reed has a six inch cycle of oscillation in the production of rectangular mesh fabric having four wires to the running inch, a reed will pass back and forth across the warp wire splice about twenty-four times before that splice will have passed beyond the reed's range of action.

In my pending application, Serial No. 234,853, filed October 13, 1938, for "Hardware and screen cloth machines," I have disclosed an improved design of reed wherein many of the difficulties herein discussed have been obviated. The present invention constitutes further improvement in these directions, and also constitutes a modified construction of reed wherein new and unrelated improvements and advantages are realized.

In my copending application, above referred to, I disclosed the principle of constituting the reed of dents of special design, whereby offset wire bearings are provided so as to confine the warp wires against lateral displacement when under tension, but in which a sufficient amount of clearance is provided to by-pass splices or other enlarged portions present in the warp wires. This principle has worked out satisfactorily, but by virtue of the fact that the cooperating wire bearings in such dents are spaced so closely together in directions longitudinally of the warp wires, there is still a tendency to mutilate the splices or break the wires when the reed is passed backwards and forwards thereover.

It is the principal object of the present invention to provide a reed construction wherein the wire bearings are so placed as to permit the passage of splices in the warp elements without mutilation while at the same time affording accurate spacing between the latter.

It is another object to provide an improved form of reed in which the warp elements may be introduced thereto in a simplified manner without the necessity of threading a free end of each warp strand through closed slots.

Other objects and advantages will become apparent hereinafter when the following specification is read with the accompanying drawings, in which:

Figure 1 represents a plan view of a preferred form of my invention;

Figure 2 represents a front elevational view of the construction illustrated in Figure 1;

Figure 3 represents a sectional view taken along line III—III in Figure 2;

Figure 4 is a fragmentary plan view of one form of the present invention showing the relation of the wire bearings on the dents to warp wires passing therethrough;

Figure 5 illustrates conventional types of reeds, showing the difficulties attendant thereupon as compared with the construction of Figure 4;

Figure 6 represents a primary reed section, according to one form of the invention, as viewed in front elevation;

Figure 7 is a view corresponding to Figure 6 of a secondary reed section; and

Figures 8 and 9 are side elevational views of the dents shown in the constructions of Figures 6 and 7, respectively.

Referring now more particularly to the draw-

ings in which like reference characters refer to like parts throughout, I have illustrated in Figures 1, 2 and 3 my improved reed construction associated with a beater frame assembly.

In Figures 1 through 3, the reference numeral 1 indicates a pair of oppositely disposed side frames, which are adapted to carry the reed assembly, and to oscillate it backwards and forwards in the weaving operation. The side frame elements 1 are provided with bearing portions 2 on which is seated cross member 3, which is suitably bolted thereto as shown at 4.

The cross member is provided with an offset portion 5 along its front face, and a slot or way 6 extending parallel and coextensive with the offset portion 5, and spaced a substantial distance therefrom toward the rear of the assembly.

A plurality of dents 10, shown in greater detail in Figures 6 through 9 are stood on end upon the offset portion 5 at the front face of the cross member 3, in which position they are held by clamps 7, suitably anchored in position by bolts 8. A secondary assembly of dents 11 is arranged in the way or slot 6 by bolts 9, shown in broken lines in Figure 3.

Inasmuch as it is sometimes necessary to replace the reed elements because of wear or failure of parts, I prefer to construct the reed of the present invention in sections, as shown in Figures 6 and 7 by way of example, so that should replacement become necessary, this can be effected as to the parts concerned without dismantling the entire reed. Accordingly, the reeds are made of a plurality of sections comprised of dents 10' in the case of the primary reed shown in Figures 6 and 8. Each dent is an elongated solid of substantially rectangular section, having wire guiding portions 12 upon opposite edges thereof and a wire bearing portion 13. A plurality of openings 14 are provided in the lower portions of the reed to receive tie rods 15, upon which a plurality of dents are impaled with spacing means such as cup washers 16 interposed therebetween. The tie rods 15 may be upset at their ends to lock the dents in position.

The secondary reed sections are illustrated by Figures 7 and 9. These comprise a plurality of dents 11' secured together, as in the case of the primary reed, by tie rods 17. The dents 11' are slightly smaller in section than the dents comprising the primary reed, and the spacing washers 18 afford greater clearance between the dents of the secondary reed 11 than do the cup washers 16 between the dents of the primary reed 10. As will be seen from Figure 9, the dents of the secondary reed are provided with chamfered portions 12', corresponding to the wire guiding portions of the dents 10' in Figure 8, and wire bearing portions 13', likewise corresponding to the primary dent portions 13.

Referring to Figures 1 and 3, it will be perceived that the primary and secondary reed panels are mounted so as to afford a considerable spacing X therebetween. By reference to Figure 4, the value of this spacing will be readily apparent. The wire bearing portions 13—13' of the primary and secondary reeds are so disposed in relation to each other as to support warp wires securely against lateral displacement when the latter are lying therebetween in straight lines under tension. Nevertheless, it will be seen that the distance between the bearing 13 and the bearing 13', as is afforded by the clearance X, is sufficiently great as to permit the accommodation of bulky portions in the warp wires, such as the spliced ends thereof, in passing therethrough.

The slots formed by adjacent dent elements in both the primary and secondary reeds are of sufficient size to pass splices, etc., without mutilation. In Figure 5 there is illustrated an old type of reed in which the individual slots Y have to be of sufficient width to pass splices, etc. Thus, there often results the condition illustrated herein; namely, that the spacing A between the left-hand warp wires is less than the spacing B between the right-hand warp wires, as viewed in this figure. This gives rise to the condition known as "spacy" fabric, which is overcome by the improved reed construction of the present invention.

As is best seen in Figures 2 and 3, the reed assembly in its preferred form does not provide for the closing of the warp wire slots, but, rather, these latter are left open in order that the wires may be laid into position without regard to a free end thereof, as is necessary in threading up the old types of reeds.

It will, of course, be understood that by virtue of the deflection caused by the shed, as is shown in Figure 3, it is preferable that the secondary reed 11 be carried sufficiently high so as always to maintain the warp wires within the confine of its slots when in retracted position, as shown in broken lines in Figure 3. Thus I have illustrated the secondary reed panel as standing higher than the primary reed panel, although so long as the above condition is satisfied, they may obviously be of the same length.

In order that the reed may be adapted to the needs of the loom illustrated in my copending application above referred to, I have shown the dents of the primary reed panel 10 as being provided with slots 20 extending transversely between the wire bearing portions of adjacent dents. When the dents are assembled, these slots 20 align to constitute a guideway longitudinally of the reed panel through which weft wires may be passed. As is explained in my application aforementioned, the weft guide 20 is provided with a suitable closure 21, and an operating mechanism 22, which, because they form no part of the present invention, will not be described in greater detail here.

Similarly the left-hand end reed section of the beater frame, as viewed in Figure 2, is provided with a shear blade 23, which is assembled in parallel relation to the dents 10, and might, in fact, be comprised of one of them. The shear blade cooperates with a stationary weft wire guide 24 through which lengths of weft wire are introduced into the weft guide slot 20 from an endless supply. As the reed is oscillated in the performance of the weaving operation, the end dent or shear blade 23 cooperates with the stationary guide 24 to shear the weft wire at this point, all as explained and described in my copending application above identified. The opposite or right-hand end of the reed panels will likewise be provided with suitable end dents, which will depart slightly from the design of the intermediate dents, as are shown in Figures 6 through 9. However, these differences are slight mechanical adaptions intended to provide suitable terminal portions upon the reed panel, and require no further elaboration or description.

From the foregoing, it will be seen that I have provided an improved reed construction in which disadvantages of the prior art, as discussed in my copending application, have been overcome,

and in which I have furthered the improved reed design disclosed therein. Similarly, I have provided a reed into which the warp wires may be introduced without regard to the free ends of the wires, as has heretofore been the case; a feature which greatly facilitates the threading-up and initial operation of the machine.

It will be obvious from the foregoing that many modifications may be made in the exact construction and design of parts, herein set forth for purposes of illustration only, without departing from the spirit of the invention as is apprehended in and by the appended claims. For instance, it will be appreciated that the primary and secondary dents 10 and 11 may be made in one piece, as shown in Figure 10 of my copending application. This could be effected in accordance with the present invention by making each pair of primary and secondary dents of a cast or forged body having a relatively heavy section, providing the offset bearings 13 and 13' in the same relative position, as is shown in Figure 4, whereby there would be but one dent between adjacent warp wires. Similarly, this could be effected by sheet metal dents disposed between adjacent warp wires, which dents would have a reversed curvature or S bend, whereby the requisite spacing longitudinally of the wire could be had, and, at the same time, the necessary confining effect transversely of the wires realized when the latter were properly tensioned.

I claim:

1. A reed for wire fabric machines, comprising a primary and a secondary set of dents arranged in spaced relation longitudinally of warp wires to be associated therewith, each of said dents being of less dimension transversely of the warp wire than the spacing between adjacent warp wires, one primary dent and one secondary dent being disposed between each adjacent pair of warp wires, and being offset in directions longitudinally of the latter so that each primary dent bears against the relatively rightward warp wire, and each secondary dent bears against the relatively leftward warp wire.

2. A reed for wire fabric machines, comprising a primary and a secondary set of dents arranged in spaced relation longitudinally of warp wires to be associated therewith, each of said dents being of less dimension transversely of the warp wires than the spacing between adjacent warp wires, one primary dent and one secondary dent being disposed between each adjacent pair of warp wires and being offset in directions longitudinally of the latter so that each primary dent bears against the relatively rightward warp wire, and each secondary dent bears against the relatively leftward warp wire, and means for guiding weft elements across the reed carried by said primary set of dents.

NOAH S. HARTER.