

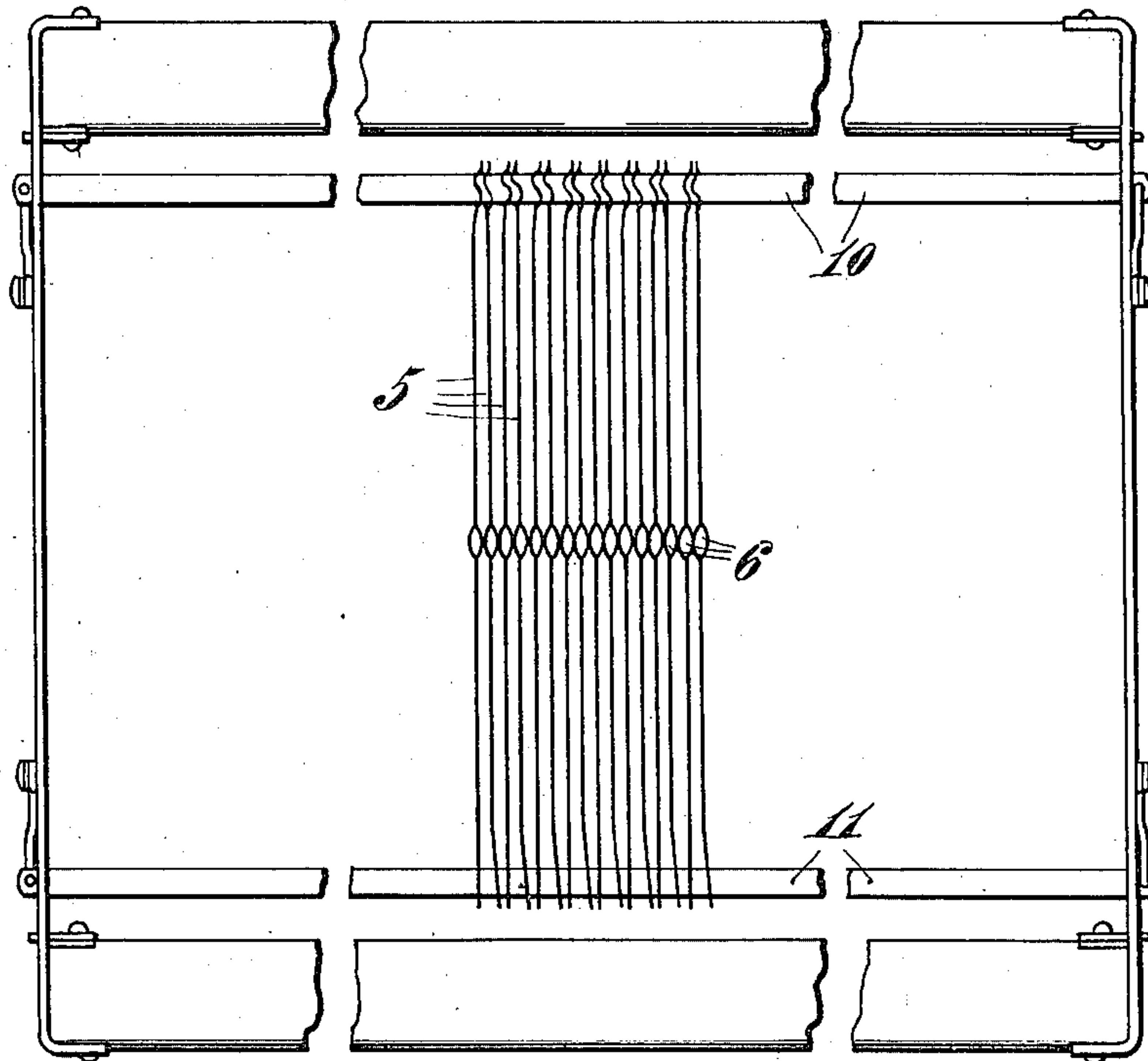
J. KAUFMANN.  
HEDDLE.

APPLICATION FILED APR. 29, 1910.

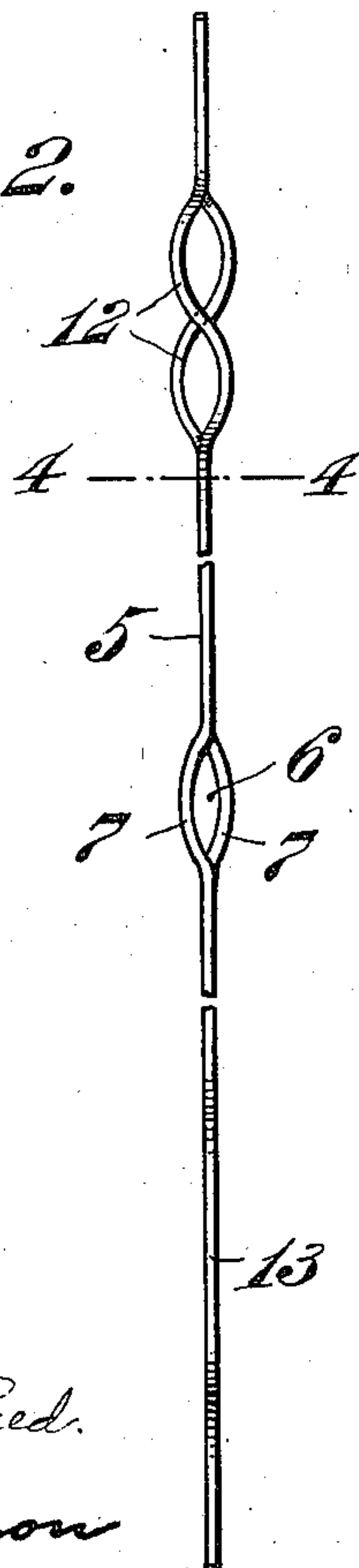
996,650.

Patented July 4, 1911.

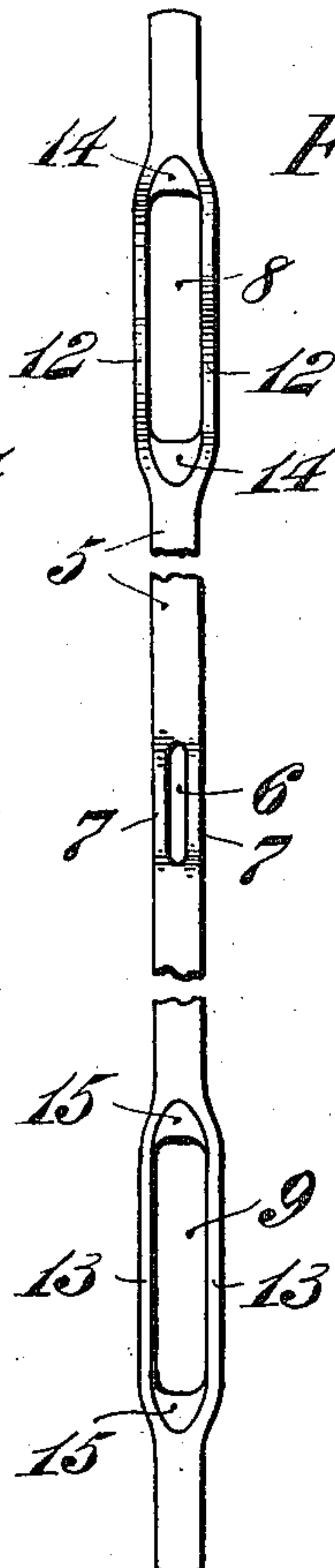
*Fig. 1.*



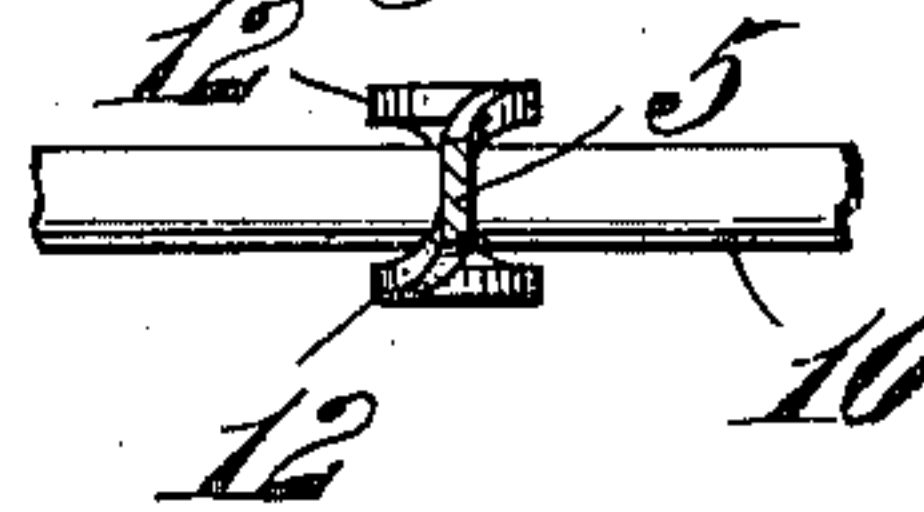
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

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## HEDDLE.

996,650.

Specification of Letters Patent.

Patented July 4, 1911.

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*To all whom it may concern:*

Be it known that I, JACOB KAUFMANN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Heddles, of which the following is a specification.

My invention relates to heddles and in such connection it has particular relation to the type of heddles made from a thin flat strip of metal or wire.

The principal object of my invention is to provide a heddle of the aforesaid type with means to prevent turning of the heddles about their longitudinal axis while mounted on the rods of the harness frame.

In connection with the foregoing my invention also contemplates means for preventing the improper mounting of the heddles in the harness frame in order that the warp-eyes will all face the same way and properly nest together.

The nature and characteristic features of my invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof in which:

Figure 1 is an elevation of a harness frame having heddles embodying the main features of my invention mounted therein. Fig. 2 is an enlarged edge view of a heddle embodying the main features of my invention, detached from the frame. Fig. 3 is a face view thereof, and Fig. 4 is a section thereof taken on the line 4—4 of Fig. 2 with a portion of the heddle frame rod shown in connection therewith.

In the particular embodiment of my invention shown in the drawings, 5 is a heddle made from a thin flat strip of metal or wire having a warp-eye formed by first slotting the strip at or near the center thereof and then expanding or bending the shanks of the slotted portion out of the main plane of the heddle proper, as clearly shown in Figs. 2 and 3 of the drawings. It will, of course be understood that the shanks of the warp-eye may also be expanded laterally to extend beyond the side edges of the strip, as is well known to those skilled in the art. The heddle is also provided at its upper end with a mortise 8 and at its lower end with a mortise 9 for mounting the heddles in the

harness frame on the usual heddle rods or bars 10 and 11. The mortises 8 and 9 may if desired be first formed in the manufacture of the heddles in the manner shown and described in Letters Patent No. 748,713 granted to William Fehr, September 18, 1903, by first slotting the strip from which the heddle is formed near the ends thereof and thereafter expanding the respective shanks 12 and 13 laterally by swaging the metal adjacent the ends of the slots as at 14 and 15. The shanks 12 of the mortise 8 at the upper end of the heddle are then formed into a sinuous conformation so as to provide each shank with bearing portions extending some distance on each side beyond the plane of the heddle proper, which bearing portions will serve to prevent rotation of the heddle about its longitudinal axis when the same is in use and subject to the tension of the warp threads passing through the central warp-eyes.

It should be noted that the preferred form of each of the shanks 12 of the upper mortise 8 is of a shape approaching an elongated letter S so that the heddles when mounted in the frame will readily nest together to thereby permit a large number of heddles to be mounted on the rods in close relationship, and further that while each shank of said mortise is of the same shape they are complementary but not parallel with each other. It should also be noted that the warp-eyes 7 will nest together in a similar manner, providing the proper ends of the heddles are mounted on the proper upper and lower rods 10 and 11. In other words, in the type of heddles made from a thin flat strip of metal or wire with the warp-eyes formed as aforesaid the warp-eyes will always properly nest together if the upper end of the heddle be mounted on the upper rod of the frame it being otherwise immaterial which face of any particular heddle is presented to the next adjoining heddle in the frame; but if however, the heddles be turned end for end, the warp-eyes will not then properly nest as will be readily understood by an inspection and consideration of Fig. 2 of the drawings. To prevent the aforesaid improper mounting of the heddles in the frame, one mortise 8 only is preferably made of the peculiar conformation contemplated by the present invention



and the mortise 9 at the other end thereof is left in its plane condition so that any attempt to mount the heddles on the rods with the wrong end uppermost will be readily apparent. It should be understood however that the shanks of both upper and lower mortises may be formed as herein described without departing from the main purpose of my present invention.

10 Having thus described the nature and characteristic features of my invention, what I claim as new and desire to secure by Letters Patent is:

15 1. A heddle made from a thin flat strip of metal or wire having a mortise for mounting the heddle on the harness frame rods, the shanks of said mortise extending out of the plane of the strip in both directions in

sinuous form and of opposite curvature on either side.

20 2. A heddle made from a thin flat strip of metal or wire having mortises for mounting the heddle on the harness frame rods, the shanks of one of said mortises lying in the plane of the heddle proper, and the 25 shanks of the other extending out of the plane of the strip in both directions in sinuous form and of opposite curvature on either side.

In testimony whereof, I have signed this specification in the presence of two witnesses.

JACOB KAUFMANN.

Witnesses:

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