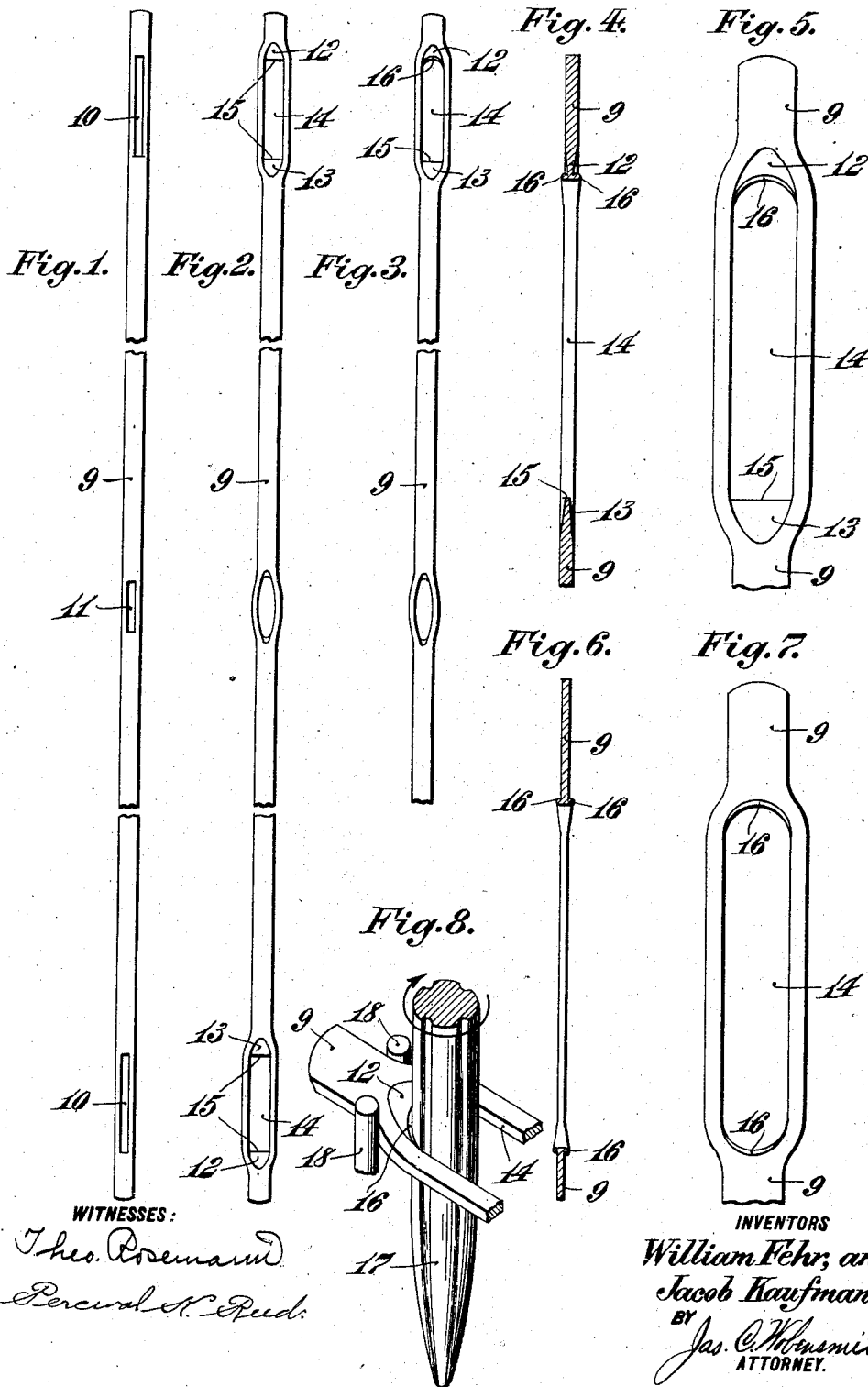


W. FEHR & J. KAUFMANN.
METHOD OF MAKING HEDDLES.
APPLICATION FILED JULY 23, 1908.

974,130.

Patented Nov. 1, 1910.



WITNESSES:

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WILLIAM FEHR AND JACOB KAUFMANN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO STEEL HEDDLE MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

METHOD OF MAKING HEDDLES.

974,130.

Specification of Letters Patent.

Patented Nov. 1, 1910.

Application filed July 23, 1908. Serial No. 444,875.

To all whom it may concern:

Be it known that we, WILLIAM FEHR and JACOB KAUFMANN, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly invented certain new and useful Improvements in the Method of Making Heddles, of which the following is a specification.

Our invention relates to a method of making heddles, and it relates more particularly to a method of forming the mortises through which the cross bars of the heddle-frame pass.

The principal object of our invention is to provide a method of forming the mortises of the heddles, whereby they will have increased bearing surfaces having certain characteristics, so that when in use, if the heddles be shifted out of their normal position on the heddle-frame rods, they will readily return to such normal position, thus preventing the formation of uneven weaves and the breaking of the warp thread. Our method also results in producing heddles having increased life due to the larger bearing surface provided at the point of greatest wear, and for this reason our method is particularly adapted to the manufacture of heddles from thin flat metal.

Our invention finds a valuable application in connection with that class of heddles, which while made of thin flat metal are still further reduced in thickness at the point of bearing on the cross rod of the heddle-frame, such for example as are shown and described in Letters Patent No. 748,713, granted to William Fehr, Jan. 5, 1904.

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

Figures 1, 2 and 3 are front elevations of a heddle in the process of manufacture according to the method of our invention; Figs. 4 and 5 are enlarged views in section and elevation respectively of the mortise end of a completed heddle as shown in Fig. 3; Figs. 6 and 7 are similar views showing a modified form of mortise; and Fig. 8 is a perspective view of one form of mechanism which may be employed at one stage of the method.

Referring to the drawings, 9 is a thin flat strip of metal which is first slitted as at 10, at points where the mortises will be located, and as at 11, where the warp eye will be located. Slits 10 and 11 are then expanded to form the mortises and warp eye respectively by a swaging or similar operation in a manner similar to that described in Letters Patent No. 749,725, granted to William Fehr, Jan. 19, 1904. By the swaging of the strip, fins 12 and 13 of compressed metal are formed at the respective ends of the mortises 14, these fins being so cut are swaged at their free margins as to have straight edges 15. The fins 12 adjacent the ends of the heddle are then manipulated to form lateral projections or extensions 16, which are slightly bent or rounded in an upward direction, in cross-section, forming bearing surfaces of greater lateral extent than the metal from which they are formed. The particular mechanism which we have found most efficient for this manipulation consists of a pin 17, (see Fig. 8) which is rapidly rotated against the free margin of the fin 12 while the shoulders of the mortise are supported by pins or stops 18, whereby the metal of the fin 12 is upset and curled on either face of the fin, thus forming the extensions 16. As a result of this operation the extensions 16 will have a curvilinear or arched shape outline as shown in Figs. 3 and 5 of the drawings, and in cross-section being thickest at the center and merging into the sides of the mortise at the point where the fin 12 terminates in the sides of the mortise. The extensions 16 may correspond in lateral extent to the thickness of the heddle proper or they may be of slightly greater or less extent as desired.

In Figs. 6 and 7 there is shown a modified form of heddle wherein the extensions 16 are formed so as to extend directly from the faces of the heddle proper. In carrying out our invention in the manufacture of this form of heddle the mortises may be expanded either by the swaging operation herein before described, in which case the fins 12 would be sheared or otherwise removed, or the rotating pin 17 may be used to simultaneously expand the mortise and form the extensions 16 by forcing said pin into the slits 10 shown in Fig. 1. While the mortises shown in Fig. 7 are shown as provided

with extensions 16 at both ends thereof, it will readily be understood that the same may be made with the extensions at only one (the outer) end thereof, if desired, in
5 which case the mortise would have a tapered outline instead of the sides being parallel as shown.

Our method therefore results in producing a heddle having bearing surfaces for
10 the mortises which is of greater lateral extent than the metal from which it is formed and which is characterized by the absence of sharp edges to the end that the heddles will not stick on the heddle-frame rods, but will
15 always return to their normal positions when displaced from any cause. Moreover, the increased bearing surface provided will reduce wear of the heddles at the points of greatest strain and thus materially prolong
20 the life of the same.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

25 1. The method of making heddles which consists in cutting slits in a thin flat strip of metal, then expanding the slits to form mor-

tises and subjecting the metal at the ends of the mortises to the action of a rotating pin to thereby form integral lateral extensions of curvilinear or arched shape outline. 30

2. The method of making heddles which consists in cutting slits in a thin flat strip of metal, then expanding the slits by swaging the metal adjacent the ends of the slits to form mortises having fins of swaged metal, 35 and then subjecting the metal of the fins to the action of a rotating pin to thereby form integral lateral extensions.

3. The method of making heddles which consists in cutting slits in a thin flat strip of 40 metal, and thereafter subjecting the metal at the ends of the slits to the action of a rotating pin to thereby form integral lateral extensions.

In testimony whereof we have hereunto 45 signed our names in the presence of two witnesses.

WILLIAM FEHR.
JACOB KAUFMANN.

Witnesses:

JAS. C. WOBENSMITH,
HOWARD S. OKIE.