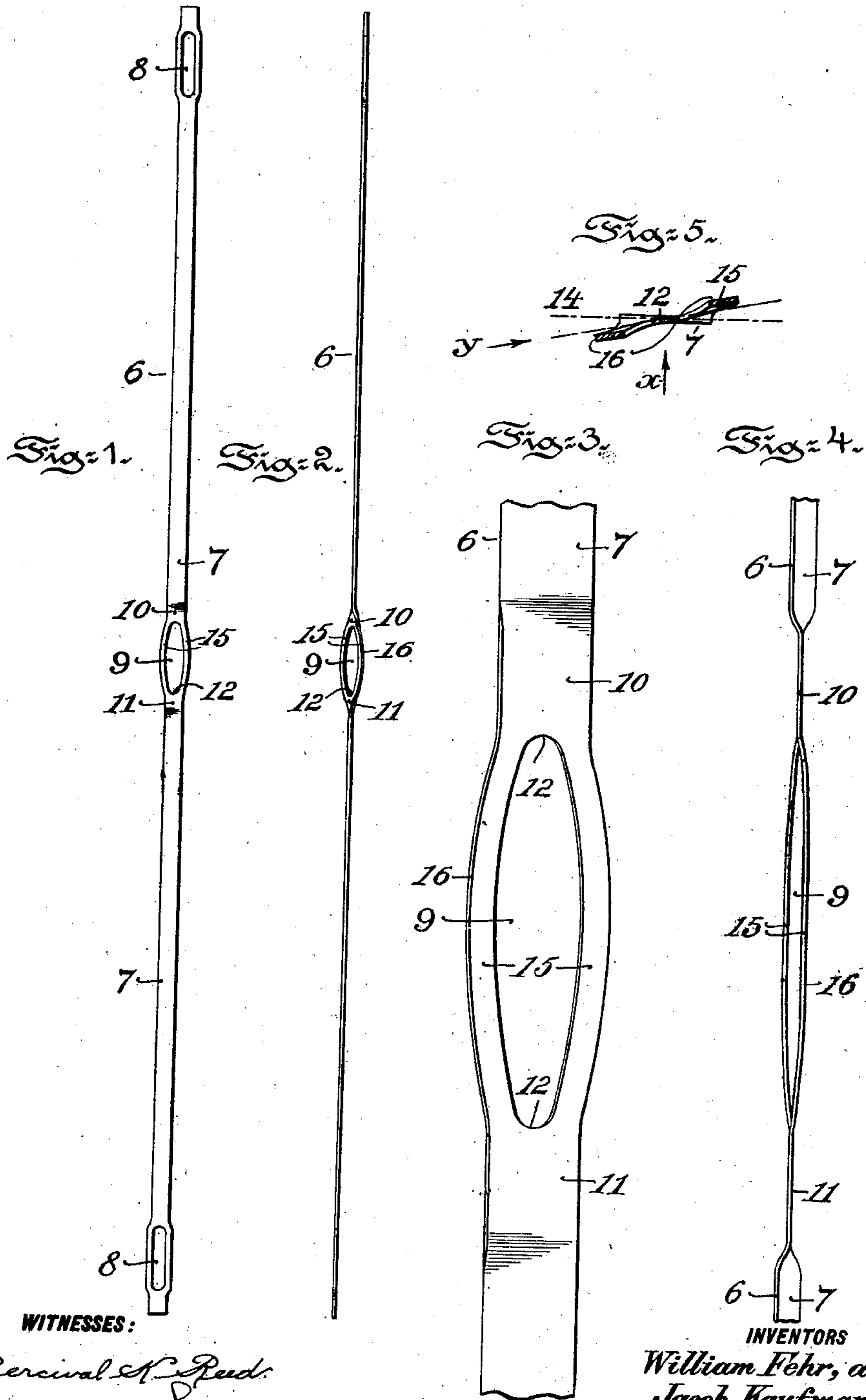


W. FEHR & J. KAUFMANN.
HEDDLE.

APPLICATION FILED JULY 11, 1908.

997,283.

Patented July 11, 1911.



WITNESSES:

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WILLIAM FEHR AND JACOB KAUFMANN, OF PHILADELPHIA, PENNSYLVANIA. ASSIGN-
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HEDDLE.

997,283.

Specification of Letters Patent.

Patented July 11, 1911.

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To all whom it may concern:

Be it known that we, WILLIAM FEHR and JACOB KAUFMANN, both citizens of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly in-
vented certain new and useful Improve-
ments in Heddles, of which the following is
a specification.

Our invention relates to heddles for loom
harness and in such connection it has par-
ticular relation to the formation of the warp
eye thereof in that type of heddles which
are made from a thin flat strip of metal or
wire.

The principal object of our invention is
to provide an improved form of warp eye
for that class of heddles which are made
from a thin flat strip of metal or wire, the
formation of the warp eye of our improved
heddle being such as to result in compar-
atively large and rounded bearing surfaces
at the respective ends of the eye whereby a
free and even passage of the warp, as well
as knots therein, is assured. By the em-
ployment of our invention a much larger
eye is secured without excessive bending of
the shanks of the same as has heretofore
been necessary.

A further and quite important object of
our invention is to reduce as far as possible
the interference with the warp threads
which pass between adjacent heddles in a
frame and which are controlled by the other
harness frames and which are constantly be-
ing operated up and down past the protrud-
ing shanks of the warp eyes.

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

Figures 1 and 2 are respectively face and
edge view of a heddle embodying the main
features of our invention; Figs. 3 and 4 are
detail views, enlarged, of the eye portion of
the heddle, taken respectively in the direc-
tion of the arrows x and y of Fig. 5; and
Fig. 5 is a horizontal medial section of the
eye shown in Fig. 3.

Referring to the drawings, in the particu-
lar embodiment of our invention there
shown, 6 represents the heddle which is
made from a thin flat strip of metal or wire

and provided at its respective upper and
lower ends with the usual mortises 8 for
mounting the heddles on the harness frame
rods, not shown. Intermediate the mortises
8 the heddle is provided with the warp eye
9, the conformation of which is the subject
matter of this invention. The shanks 15 of
the eye 9 are each bent slightly outward
from the general plane of the eye portion 10
in opposite directions to each other as clearly
shown in Fig. 4, and the shanks 15 of the
eye 9 may if desired, be expanded laterally
as shown in Figs. 1 and 3, but the ends of
the eye 9 however are interiorly rounded as
at 12. The eye portion 10 is twisted to occupy
a position at a slight angle to the main plane
of the heddle, the twist occurring immedi-
ately above and below the eye 9 and being
in the same angular direction as the bend or
offset of the shanks 15. By this arrange-
ment the rounded ends 12 of the eye 9, al-
though the shanks 15 thereof are only
slightly bent out of the plane of the eye por-
tion, will nevertheless be in such position,
due to the angular arrangement of the eye
portion 10 as to present relatively large and
broad bearing surfaces which will permit
of the ready passage of the warp and of
knots therein through the eye 9, as will be
readily understood by an inspection of Figs.
2 and 5, the line 14 of Fig. 5 indicating the
direction of the warp in its passage through
the eye, and no abrupt shoulders will occur
in the outer margins 16 of the warp eye.

It should be understood that in the manu-
facture of heddles from a thin flat strip of
metal or wire as contradistinguished from
those made by punching from sheet metal,
on account of the limited amount of cross
section of the material which is available,
certain difficulties arise in order to secure
the proper conformation of the warp eye,
which difficulties it is the purpose of the
present invention to overcome. Heretofore
when it has been required to make a rela-
tively large or wide eye in a heddle made
from a thin narrow flat strip, if the shanks
were bent out of the plane of the heddle in
a smooth even curve, a sharp notch would
occur at the top and bottom of the eye which
would tend to bind the warp and prevent
the free and easy passage of the same there-
through, while if this objection was over-
come by bending the shanks abruptly at the

top and bottom, a distinct shoulder would occur on the exterior margins of the heddle at the top and bottom of the eye which would interfere with the free up and down movement of the warp threads which lie between adjacent heddles in a frame and which threads are controlled by the other harness frames of the loom.

By twisting the eye portion immediately above and below the eye to a slight extent only and by bending the shanks of the eye slightly, in opposite directions to each other and in the same direction as the twist out of the plane of the eye portion as hereinbefore set forth, the aforesaid objections are effectively overcome, the eye being thus sufficiently enlarged, the top and bottom being provided with enlarged and rounded bearing portions for the passage of the warp, and the exterior margins of adjacent heddles offering no abrupt obstructions to the free movement of the warp threads which lie therebetween.

Having thus described the nature and characteristic features of our invention what we claim as new, and desire to secure by Letters Patent is:—

1. A heddle made from a thin flat strip of

metal or wire having a warp eye formed by bending the shanks thereof out of the plane of the eye portion in opposite directions to each other, the eye portion being twisted immediately above and below the bent shanks thereof in the same angular direction as the offset of the shanks, and the interior end margins of the eye being rounded to form large bearing portions for the warp which passes through the eye.

2. A heddle made from a thin flat strip of metal or wire having a warp eye formed by expanding the shanks thereof laterally and bending the same out of the plane of the eye portion in opposite directions to each other, and the eye portion being twisted immediately above and below the bent shanks thereof in the same angular direction as the offset of the shanks.

In witness whereof, we have hereunto set our hands in the presence of two subscribing witnesses.

WILLIAM FEHR.
JACOB KAUFMANN.

Witnesses:

JAS. C. WOBENSMITH,
PERCIVAL K. REED.