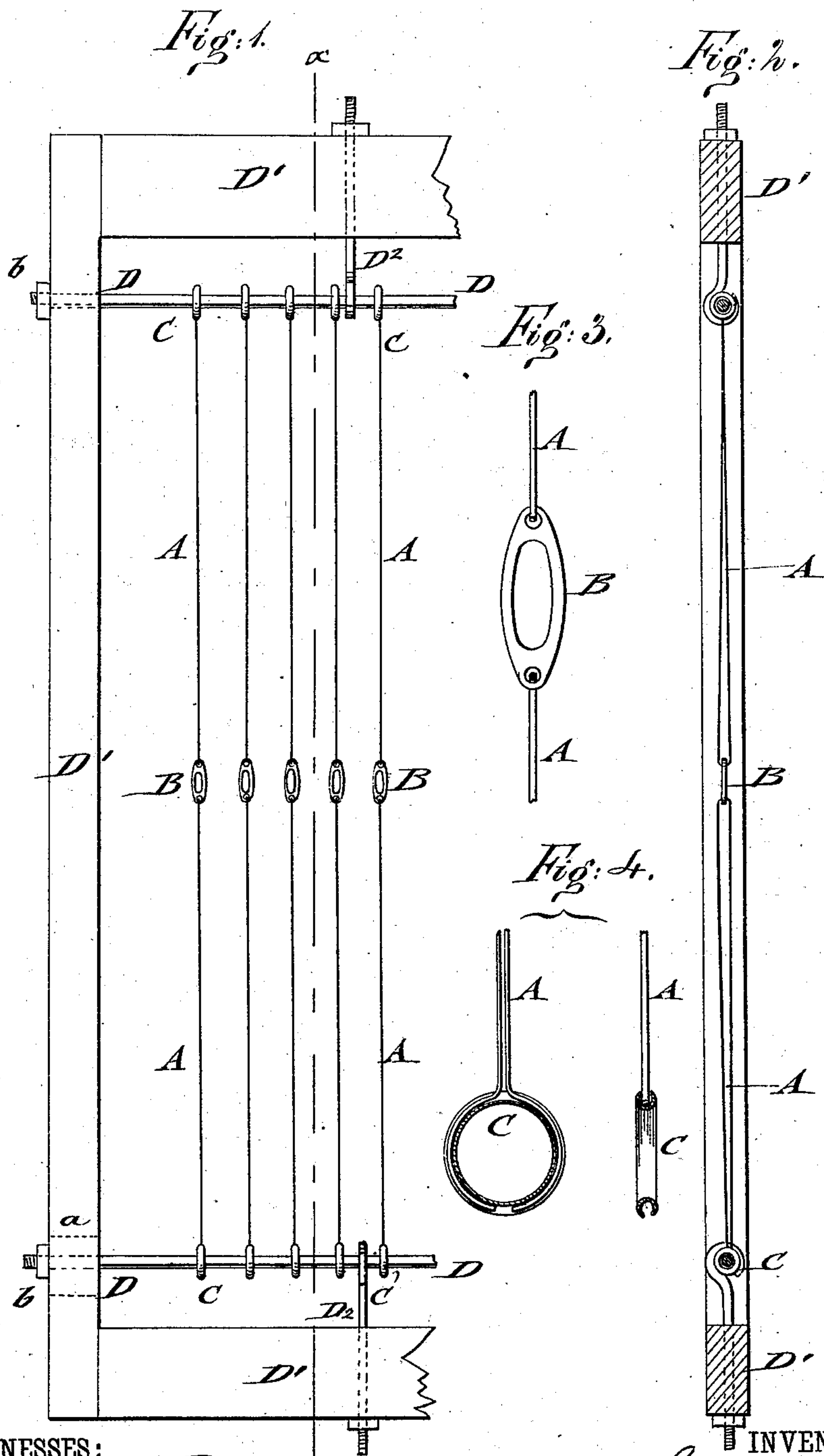


E. SCHÖPP.
Heddles for Looms.

No. 224,797.

Patented Feb. 24, 1880.



WITNESSES:

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EDUARD SCHÖPP, OF COLOGNE, GERMANY, ASSIGNOR TO MARX & SON, OF
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HEDDLE FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 224,797, dated February 24, 1880.

Application filed September 10, 1879. Patented in Germany, October 2, 1877.

To all whom it may concern:

Be it known that I, EDUARD SCHÖPP, of Cologne, in the Empire of Germany, have invented certain new and useful Improvements in Heddles for Looms, of which the following is a specification.

In the accompanying drawings, Figure 1 represents a front elevation of my improved heddle; Fig. 2, a vertical transverse section of the same on line *x x*, Fig. 1. Fig. 3 is a detail front view of the heddle-eye, and Fig. 4 a sectional front and side view of the metallic rings or eyes at the ends of the loops.

Similar letters of reference indicate corresponding parts.

The heddles at present in most general use are made of looped linen, cotton, or woolen cords or threads, in which the heddle-eyes are formed either directly by the intermeshing of the loops or by the employment of small oval and perforated steel plates. These heddle constructions have the following disadvantages:

First, a lack of durability. The heddles, especially in power-loom, wear out very rapidly, and require, therefore, frequent repairs.

Second, they can only be used for the special fabrics for which they are made up, each fabric or material requiring a separate heddle.

Third, the heddle-cords, even when carefully varnished, are not smooth enough for the unimpeded passage of the warp-threads, and cause the entangling of the loops, by which faults are produced in the fabrics.

To overcome these objections the heddle-cords have been made of twisted wire with an eye formed at the center by an interruption of the twist. Experience, however, has shown that these wire leaves are not better than the common cords, but even less effective, as the eye is imperfect and cuts the warp-threads, and as the cords are too rigid and become uneven by bending.

Heddle-loops with metallic eyes bent of wire or stamped out of metal have also been used heretofore, said loops being made of a continuous piece of wire that passed through the eyes and over the hangers or bars of the heddles. This construction, however, cannot easily be repaired, owing to the continuity of the wire.

My invention is designed to remove entirely

the objectionable features described; and it consists of loops of flat steel wire which are passed through central steel eyes or mails. The flat-wire loops are clasped at the ends by sheet-metal rings or eyes, which are placed loosely on detachable transverse rails, of which the lower is adjustable, so as to impart a greater or less tension to the heddle-loops.

By reference to the drawings, *A A* are the heddle-loops, which are made of thin flat and smooth steel or other wire that is lightly rounded off at the edges. The wire loops *A* are passed through holes of the central steel eyes, *B*, the elongated holes of which serve to guide the warp-threads. The ends of the wire loops *A* are clasped and firmly held by sheet-metal eyes or rings *C*, which are shown clearly in Fig. 4.

The required number of heddle-loops are strung up by their end rings on transverse steel rods or rails *D*, which are supported by the wooden heddle-frame *D'*. The upper rail, *D*, is supported on screw-hooks *D²*, and passed through holes of the frame, while the lower rail is guided in slots *a* of the frame and drawn down or let up again by lower screw-hooks, *D²*.

The wire loops *B* are made by machinery, so that they are all of the same size. They can therefore be all stretched to the proper tension at the same time, leaving no loose loops, which, in the common heddles, can never be altogether avoided, and which exert an injurious influence on the even texture of the fabric.

The wire loops, as well as the steel eyes, are of perfect smoothness, so that the passage of the warp-threads is not in the least obstructed. The loops cannot get entangled, as the metal eyes embrace closely the guide-rails. As the proper tension is given to the loops by the adjustment of the lower rail there is but little wear of the same.

My improved heddle can, furthermore, be used for weaving different fabrics, as the number of loops can be increased or decreased at pleasure. The rails are for this purpose made removable from the frame by being threaded at the ends and secured by nuts *b*. The loops slide on the rails and adapt themselves readily to the division of the reeds.

The steel eyes can also be made of larger or smaller size, with round or oval holes, as they are manufactured independently of the cords.

Injured or worn-out loops can be readily replaced by new ones on removing the rails from the heddle-frame.

When the heddles are exposed to moist air, as is frequently the case when the weaver works at home, the steel wire has to be galvanized to prevent corrosion.

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

1. The combination of the wire leaves or loops A and of connecting steel heddle-eyes with sheet-metal eyes or rings, which clasp the ends of the loops, substantially as and for the purpose described.

2. The combination of the steel heddle-eyes B, and of the wire loops A A, having end guide rings or eyes C, with the adjustable and removable cross-rails D, slotted heddle-frame D', and screw-hooks D², for adjusting the tension of the wire loops, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 8th day of August, 1879.

EDUARD SCHÖPP.

Witnesses:

FRITZ LISSING,
JEAN RÜTTE.