No. 648,573. Patented May 1, 1900.

J. B. PATTERSON.

HEDDLE FOR CROSS WEAVING.

(Application filed June 9, 1899.)

(No Model.)

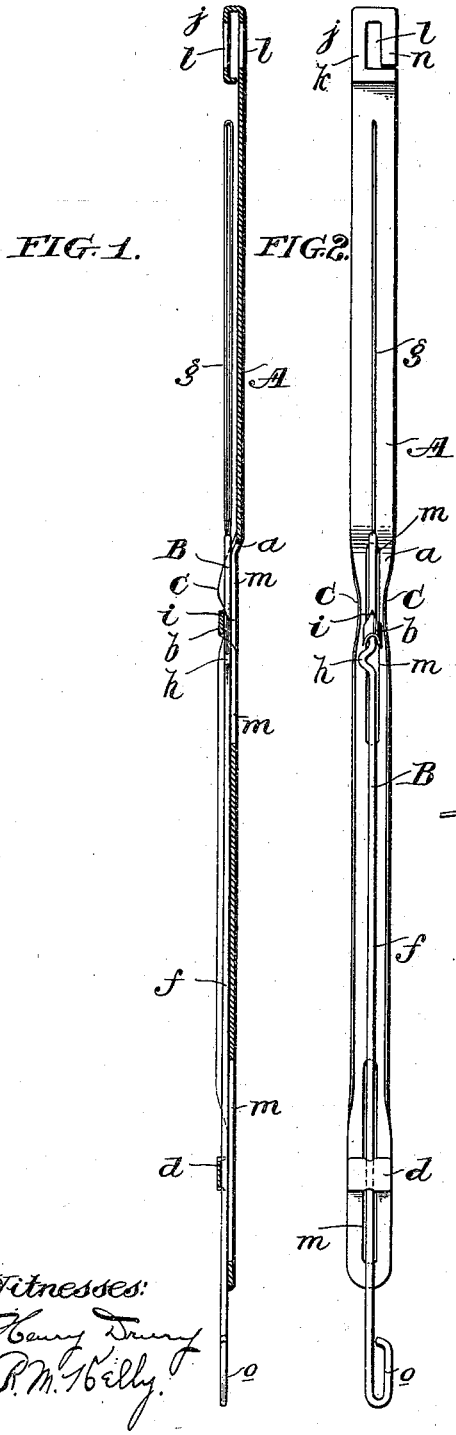

FIG. 1.

FIG. 2.

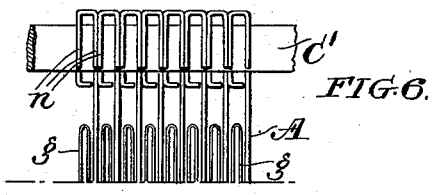

FIG. 6.

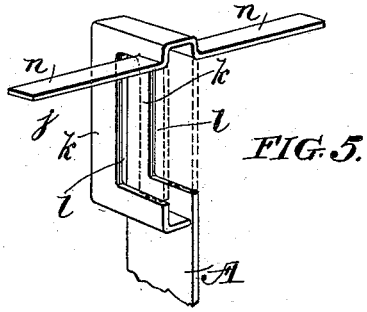

FIG. 5.

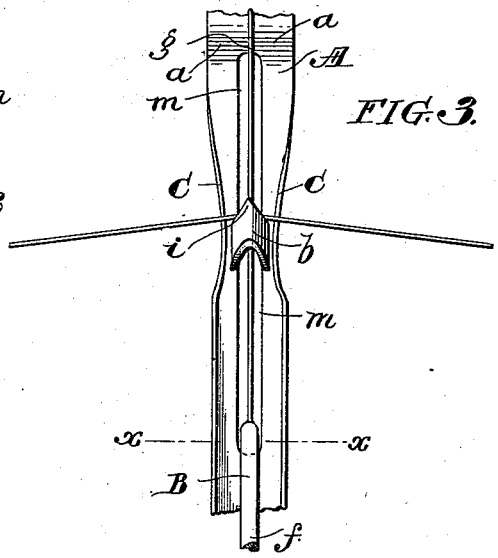

FIG. 3.

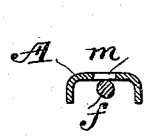

FIG. 4.

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JAMES B. PATTERSON, OF PHILADELPHIA, PENNSYLVANIA.

HEDDLE FOR CROSS-WEAVING.

SPECIFICATION forming part of Letters Patent No. 648,573, dated May 1, 1900.

Application filed June 9, 1899. Serial No. 719,865. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. PATTERSON, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Heddles for Cross-Weaving, of which the following is a specification.

My invention relates to heddles for cross-weaving; and it consists of certain improvements, which are fully set forth in the following specification and are shown in the accompanying drawings.

Much difficulty has been experienced in designing a satisfactory doup-heddle owing to the necessity of making the doup exceedingly small. As it is desirable that the doup-eye should be of considerable length, such eyes when made of fine material do not possess sufficient strength to hold the doup-thread against lateral movement, which is not only liable to displace the thread, but also to impose considerable strain on the light doup.

It is one of the objects of my invention to overcome this difficulty and to enable a very light and fine elongated doup-eye to be used with perfectly-satisfactory results. To this end I provide the heddle-strip by which the doup is guided with a thread-guard so arranged that the doup-thread will pass back of it when the doup is lowered relatively to the strip, and this thread-guard will thus hold the doup-thread against lateral movement and relieve the doup of strain.

My invention also embraces other improvements in the construction of the heddle-strips and the combination thereof with the doups.

Another object of my invention is to enable the heddle-strip to be easily applied to the heddle bar or wire or removed therefrom without dismantling the entire heddle. This object I accomplish by forming the end of the heddle-strip with a perforated loop adapted to receive the heddle bar or wire, with the metal of the loop on one side of the perforation severed at one end, so that it can be bent out to form a lateral opening or perforation in the loop.

My invention also embraces improvements in the construction of the doup whereby a more efficient movement thereof is obtained and a very fine and elongated doup-eye may be used. To this end I form the doup of a relatively-stiff shank provided at its end with an elongated and relatively very fine eye.

My invention also embraces improvements in the combination of the heddle-strip and doup which permit the heddle to be reversed when desired with the doup operating from above.

I shall now refer to the accompanying drawings for the purpose of more particularly describing my invention.

Figure 1 is a longitudinal vertical sectional view of a heddle-strip and doup embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged plan view of part of the same, illustrating the operation. Fig. 4 is a cross-sectional view on the line x x of Fig. 3. Fig. 5 is a perspective view, enlarged, of the top of one of the heddle-strips; and Fig. 6 is a front view of a portion of a heddle made up of my improved heddle-strips.

A is the heddle-strip, preferably composed of a flat strip of metal provided at one end with means for receiving the heddle-support C′. The strip A is bent slightly at about the middle, as at a, and is provided below this bend or offset with a guiding-eye b, in which the doup slides longitudinally. The sides of the strip A immediately adjacent to and above the eye b are bent forward or are otherwise provided with thread-guiding projections or wings C C, the object of which is to guide the free thread over or outside of the eye of the doup to effect the crossing of the threads. Heddle-strips of this general character and the operation thereof are fully described in my Letters Patent No. 613,392, dated November 1, 1898. The lower end of the heddle-strip A is provided with a guide or eye d for the lower end of the doup.

The doup B consists of a shank f, passing through the eyes b d and provided with an eye g, the latter being elongated and preferably consisting of a fine looped wire or thread connected with the head of the shank f. The shank f may be provided with an offset, lug, or enlargement h, adapted to strike the eye d and limit the descent of the doup.

To accomplish fine cross-weaving, it is necessary that the doup shall occupy a minimum lateral space, and for this reason I form the eye portion of very fine wire or looped thread; but the difficulty with such a doup is that it has not sufficient strength to withstand any lateral pull which may be exerted upon it by the doup-warp. This not only tends to permit the doup-warp to be thrown out of proper position, but in the case of a

wire eye tends to bend the eye or throw it out of alinement. To prevent this, I provide the heddle-strip with a small thread-guard *i*, arranged adjacent to the position occupied by the doup-thread when the doup descends and adapted to catch the doup-thread and hold it against lateral movement, and thus prevent it from imposing any lateral strain upon the eye of the doup. This projection is so arranged that it will not interfere with or catch the free warp which is moved outward by the guiding-wings *c*. I prefer to construct this guard *i* as a point upon the eye *b*, as shown in the drawings; but it may be otherwise constructed and arranged, if desired. In Fig. 3 I have shown the action of this guard *i* upon the doup-thread when the needle is lowered.

The doup may be readily applied to or removed from its strip A. For this purpose I provide each strip with slots *m m* adjacent to the eyes *b* and *d*. To withdraw the doup, it is moved longitudinally until the stop *h* reaches the upper portion of the slit *m*. The stop is then turned into the slit and withdrawn through it.

It is desirable that each heddle-strip should be separately removable from its heddle-frame and applicable thereto to permit of repairs in one or more heddle-strips and doups without dismantling the entire frame or stripping therefrom more strips than the ones sought to be replaced or removed. For this purpose the end of the heddle-strip which is bent over into a loop *j*, having two parallel sides *k k*, provided with perforations or openings *l l* to receive the bar C for the purpose of properly spacing the strips and holding them against displacement, as described in my Letters Patent No. 613,392, before referred to, has the opposite pieces *n n* of the parts *k k* on one side severed at one end, so that they may be bent out, as shown in Fig. 5, thus forming a lateral opening to the openings *l l* and enabling the strip to be applied laterally to the bar *c*, after which the parts *n n*, being flexible, may be bent down to close the openings and hold the strip in place, as shown in Figs. 1, 2, and 6. Any strip may be readily removed by opening out the parts *n n* and withdrawing the strip laterally.

While I have shown the heddle-strips and doups arranged with the strips to be lifted by the bar *c* and the needles to be returned by gravity, this arrangement may be reversed, in which case the strip and its needle would be turned about or reversed, and the needle B would be connected with the heddle-frame C. For this purpose the ends of the doups B are extended beyond the ends of the strips A and are provided with loops or eyes *o*.

My improved heddle-strip may, if desired, be used with an ordinary cotton-doup.

The details of construction shown may be varied without departing from my invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. A heddle-strip for cross-weaving provided with a thread-guard in combination with a doup guided by said heddle-strip, the thread-guard being arranged adjacent to the position occupied by the eye of the lowered doup and adapted to hold the doup-thread against lateral movement.

2. A heddle-strip for cross-weaving provided with a doup-guide formed with a projecting thread-guard adapted to engage the doup-thread and hold it against lateral movement, in combination with a doup extending through said doup-guide and guided thereby.

3. The heddle-strip, provided with a doup-guiding eye *b* formed with a projecting thread-guard *i*, substantially as and for the purposes described.

4. The heddle-strip, provided with a doup-guiding eye *b* formed with a projecting thread-guard *i* in combination with a doup guided by said eye *b*, substantially as and for the purposes described.

5. The doup consisting of the stiff shank *f*, and the relatively-fine elongated eye *g* carried by said shank.

6. The doup consisting of the stiff shank *f* having the stop *h*, and the relatively-fine elongated eye *g* carried by said shank.

7. The doup consisting of the stiff shank *f* provided with the eye *o*, and the relatively-fine elongated eye *g* carried by said shank.

8. The doup consisting of the stiff shank *f* and the eye *g* carried thereby and consisting of an elongated loop of fine wire.

9. The combination of a heddle-strip and a doup guided thereby and consisting of a stiff shank *f* and a relatively-fine elongated eye *g* carried by said shank.

10. A heddle-strip for cross-weaving provided with a thread-guard, in combination with a doup consisting of a stiff shank *f* and a relatively-fine elongated eye *g*, said thread-guard being arranged adjacent to the position occupied by the eye of the lowered doup and adapted to hold the doup-thread against lateral movement.

11. The heddle-strip for cross-weaving having one end bent into a loop *j* provided with openings *l*, and having the metal of said looped portion on one side of said openings severed to form flexible wings *n*, *n*, substantially as and for the purpose described.

In testimony of which invention I have hereunto set my hand.

JAS. B. PATTERSON.

Witnesses:
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