E. F. PARKS.

LOOM HARNESS HEDDLE.

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1,014,771.

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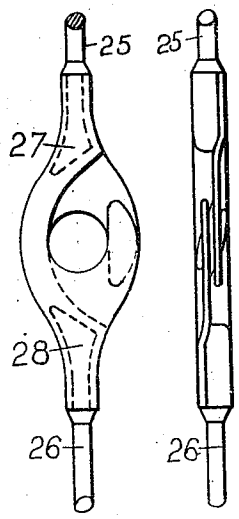

FIG. 10.

FIG. 11.

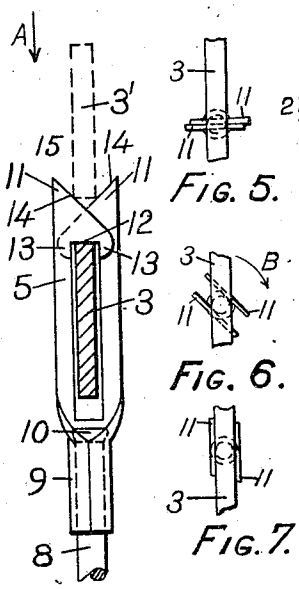

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

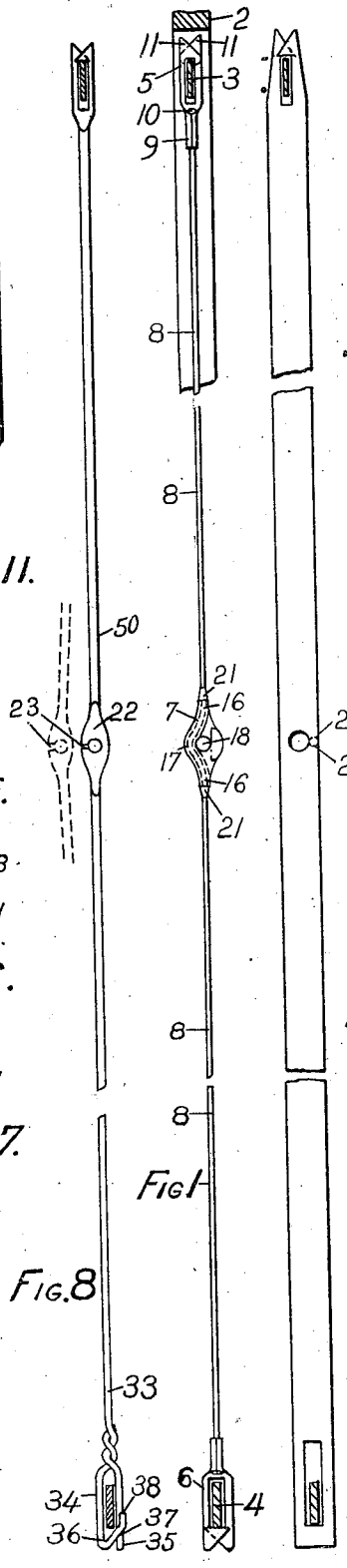

FIG. 1

FIG. 8

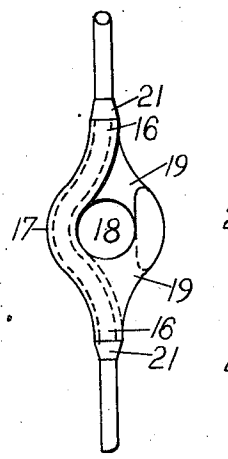

FIG. 2

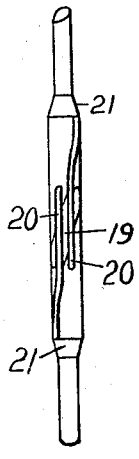

FIG. 3

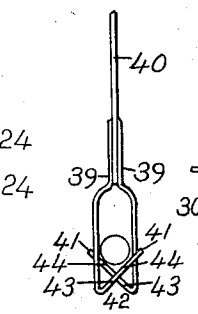

FIG. 13.

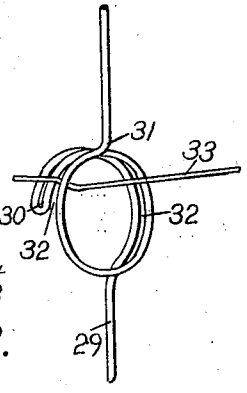

FIG. 12.

FIG. 9

WITNESSES:

J. J. McCarthy

INVENTOR:

Edward F. Parks

by Foster Freeman Watson & Coit

UNITED STATES PATENT OFFICE.

EDWARD F. PARKS, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO HERMAN J. WATERHOUSE, OF WARWICK, RHODE ISLAND.

LOOM HARNESS-HEDDLE.

1,014,771. Specification of Letters Patent. Patented Jan. 16, 1912.

Application filed October 1, 1908. Serial No. 455,706.

To all whom it may concern:

Be it known that I, EDWARD F. PARKS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Loom Harness-Heddles, of which the following is a specification.

My invention is an improvement in loom harness heddles, its purpose being to facilitate the removal and replacement of the heddles in the harness frame, and also facilitate the threading of the heddles in drawing in and piecing by avoiding the use of a reed hook as is usual.

The nature of my invention and of its embodiment and use are fully disclosed in the following specification and accompanying drawings which latter illustrate the invention as follows:

Figure 1, the preferred construction of my invention; Figs. 2, and 3, details of the eye; Fig. 4, a detail of the preferred form of suspension device; Figs. 5, 6 and 7, the mode of applying the heddle to the heddle bar; Figs. 8, 9, 10, 11, 12 and 13, modifications.

Referring to Fig. 1, the harness frame 2 and heddle bars 3 and 4 are of usual construction, the heddle bars being preferably metal strips of rectangular section, suitably secured to the frame 2, and in such manner and relation as to properly suspend the heddles.

The individual heddle comprises preferably a body element 8, suspension devices 5 and 6, one at each end of the body element, and an eye 7 intermediate the suspension devices.

The suspension devices are particularly designed for use with heddle bars of usual form and construction and without their modification. Each suspension member is formed with a socket 9—Fig. 4—to receive the end of the body member 8, which has its extremity enlarged, preferably into a head 10, to prevent its withdrawal from the socket 9. The suspension members are further formed with opposed prongs 11—11 each having a detent edge 12 to prevent the escape or accidental withdrawal of the heddle bar 3, the detent portion of one prong overlapping that of the other. Preferably, the prong has, besides the detent edge 12, a hook or abutment 13, against which the heddle bar may strike as the heddle shakes and chatters thereon under influence of the loom's jar and vibration. This brings the impact due to such jar or shake entirely on one prong instead of on two alternately, in which latter case, the impact tends to separate the prongs. The edges 14—14 of the prongs are inclined toward each other forming a clevical indent 15.

In applying the heddle to its heddle bar 3, it is brought against the bottom edge of the latter as indicated by Fig. 4, where 3′ indicates the heddle bar with its lower edge in the clevical indent 15. Fig. 5 shows the same relation in plan view, looking down in the direction of the arm A of Fig. 4. Pressure of the heddle against the heddle bar causes a twisting action in the direction of the arrow B—Fig. 6, which may be augmented by a positive twist of the heddle by hand as it is applied. As the heddle twists, or turns, the prongs 11—11 open, due to contact with the lower edges of the heddle bar, and finally lie flat against the heddle bar as in Fig. 7, when the heddle can be slipped over the heddle bar until it passes the hooks 13—13 of the prongs 11—11, when it will assume its normal position.

The eye 7 is preferably made from sheet metal, formed with necks 16—16 to take and hold the body wire 8. It is further formed with a solid or continuous wall 17 on one side of the yarn aperture 18 and with a divided wall opposite. The space between the divisions of the wall constitutes a yarn way inlet 19—Fig. 3, whereby the heddle is threaded. The divided wall consists in effect of two horns 20—20, preferably overlapping in such manner and to such extent that the inlet 19 is substantially in the same plane with the axis of the heddle. Therefore, while a slack yarn may be introduced into the yarn aperture 18 through the side of the heddle, a yarn that is taut or relatively so as run in a warp in weaving, can neither enter or leave the heddle.

The heddle eye 7 is prevented from displacement on the wire body 8, by the curvature of the latter where formed to pass the yarn aperture 18, but more particularly by the enlargement or shoulders 21—21 which though preferably formed integral with the wire 8 may be otherwise suitably formed or applied. These shoulders being conical or tapered perform the further function of

serving as a guide for the warp yarns so that as the harness travels up and down, those yarns which are adjacent the heddles may not catch on the ends of the eye.

It is to be further noted that in my preferred construction shown on large scale in Figs. 2 and 3 and also in the construction disclosed in Figs. 10 and 11, the closed wall of the eye indicated by 17 in Fig. 2, is substantially thicker than the open or inlet side of the eye so that as the heddles travel up and down with the harness, the adjacent warp yarns are kept away from the horns 20—Fig. 3 and cannot catch thereon.

The advantages incident to my improved heddle are distinct and of unusual merit. Where heddles of the usual known construction are employed, the threading or "drawing in," incident to preparing a new warp for weaving or piecing a broken end, is arduous and unnecessarily time consuming. The threading is accomplished by passing a reed hook through the heddle eye, catching a loop or bight of the warp yarn and then withdrawing the hook from the heddle eye, bringing with it the loop of warp yarn. It is obvious that where a large number of harness is used, the operation must require both skill and patience.

With my inlet eyed heddle, no reed hook need be employed, but the warp yarn can be inserted in the heddle eyes through its side with only the fingers, and much more easily and quickly than with a reed hook in the usual manner. A further advantage lies in the fact that the yarn aperture in my improved heddle can be smaller than is required to admit a reed hook thereby lessening the yarn play or back lash in the eye and increasing the effectiveness of the harness motion.

The improved suspension device of my heddle, permits ready removal and replacement of the heddle without removal of the heddle bars. Because the prongs overlap and open in the direction of extent of the heddle bar (or substantially perpendicular to their own planes of position) admitting the latter only by a twisting action on the part of the heddle, the latter cannot be displaced accidentally for there is no accidental tendency conceivable to twist and spring open the suspension device concurrently. Further, there is a distinct advantage in making the suspension devices and eyes, separately and individually. Thus made, material can be selected that is best adapted for the particular function of each element of the heddle and with particular consideration for substantial structure and effective operation. Made individually as described, the parts in question are susceptible of more economical treatment and better finished.

It is obvious that my invention may be embodied in other forms than those described. Fig. 8 shows a form of heddle, the eye 22 of which is made integral with the body 50 by flattening the latter. The yarn inlet in this case is a straight slit 23 through one side of the eye. By springing the heddle into the position indicated by the dotted lines, the slit 23 is opened to admit a yarn.

Fig. 9 illustrates an embodiment of my invention in a heddle made from flat wire. Here the yarn inlet is formed by slitting or splitting the heddle at one side of the yarn aperture, and then peening or drawing out the extremities 24—24 so they overlap in the same fashion as in Figs. 2 and 3.

Fig. 10 and Fig. 11 show a construction in which the heddle body is made in separate portions 25 and 26, each of which has an enlarged end 27 and 28 respectively, to prevent its withdrawal from the eye.

Fig. 12 shows an eye formed of round wire, the body 29 being bent through about three quarters of a circle to 30, where it is bent back upon itself and then formed round for about a turn and a quarter to 31, where it is bent into alinement with the portion 29. The turns are in such relation that an opening 32 is left between adjacent coils for a yarn inlet. The yarn is entered at 31 and is represented by 33 as it is nearly within the yarn aperture.

The suspension member is likewise susceptible of modification. While preferable that the spring prongs be formed with opposed hook or abutment portions as indicated by 13 in Fig. 4, it is not essential, as is indicated at the top of Figs. 8 and 9 and at the bottom of Fig. 1 where no such opposed abutments are indicated. As indicated in Fig 8, at the bottom, the suspension device may be formed in part by the body member and in part by an attached element 34. In this case as illustrated, the body member 33 is round wire which is twisted together with the element 34, also a round wire. As indicated by Fig. 8 it is not essential that both prongs have inclined edges to form the clevical indent. Here the prong 35 is straight and the prong 36 is formed with an incline 37 and a hook or abutment 38. The mode of application to the heddle bar is identically as above described.

Fig. 13 shows still another form of suspension device where the two prongs are separate members 39—39 attached to a body member 40. Here each prong is formed by a sharp return bend of its extremity 41 at an acute angle with its main portion. The clevical indent 42 is formed by the opposed outer inclined surfaces 43—43 while the inner surfaces 44—44 act as abutments. Further, the form of heddle bar is not limited to any particular shape or proportion, Fig. 13 showing a round bar, while elsewhere I have shown a rectangular bar of usual form.

This is a matter of distinct advantage however, my improved heddle is applicable to any usual form of heddle bar.

Therefore without limiting myself as to the exact form or arrangement I claim:

1. In a loom harness, the combination with the harness frame and a heddle bar, of a heddle having spring prongs that normally are perpendicular to the direction of extent of the heddle bar, and open by separation in the direction of extent of the heddle bar as described.

2. In a loom harness, the combination with the harness frame and heddle bar, of a heddle having spring prongs separable in a direction substantially at right angles to the planes of said prongs and with edges inclined to cause a twisting motion of the heddle in its application to the heddle bar.

3. In a loom harness, the combination with the harness frame and heddle bar, of a heddle having spring prongs separable in a direction substantially at right angles to their respective planes and having edges inclined to form a clevical indent to receive the edge of the heddle bar and to cause a twisting movement of the heddle in its application to the heddle bar.

4. The combination with a harness frame and heddle bar therefor, of a heddle having a spring prong with an inclined outer edge overlapping another portion of the heddle to engage the heddle bar and by co-action with said other portion to cause turning of the heddle bar to spring the prong to admit the bar to the heddle, and a hooked interior edge to retain the bar after it has been admitted.

5. An eye for a harness heddle with necks to receive the heddle body and overlapping horns to form an inlet to the yarn aperture of the eye.

6. A heddle for a loom having an eye, and an opened thread passage through the side of the heddle, leading to the eye.

7. The combination in a harness heddle with a body, of attached suspension members and an attached eye with a thread passage leading within the same.

8. The combination with a harness heddle having transversely overlapped spring prongs separable in a direction perpendicular to the planes of the prongs, of an attached eye.

9. An eye for a harness heddle having a yarn aperture, a thin wall at one side of the aperture through which is an inlet to the yarn aperture, and a relatively thick, solid wall opposite the inlet.

10. An eye for a harness heddle having a yarn aperture, overlapping horns at one side of the yarn aperture to form an inlet thereto and opposite the horns, a relatively thick portion to deflect passing yarns away from the horns as described.

11. In a harness heddle for looms, the combination with an attached eye, of a body portion having tapered shoulders abutting the eye to secure the latter and prevent obstruction to adjacent yarns as described.

12. A heddle for a loom having an eye, an open-ended thread passage leading to said eye, and a device to retain a warp thread in said eye.

13. A heddle having an eye and a thread passage leading to said eye, and means to prevent the thread from entering the thread passage from the eye.

14. As a new article of manufacture a heddle having an eye formed therein for the thread, some part of the material which forms such eye being split at right angles to the axis of said eye.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD F. PARKS.

Witnesses:

FRANK D. BABCOCK,

GRACE W. BROWN.