D. C. BROWN.

Wire Heddle and Frame.

No. 218,809. Patented Aug. 26, 1879.

Fig:1.

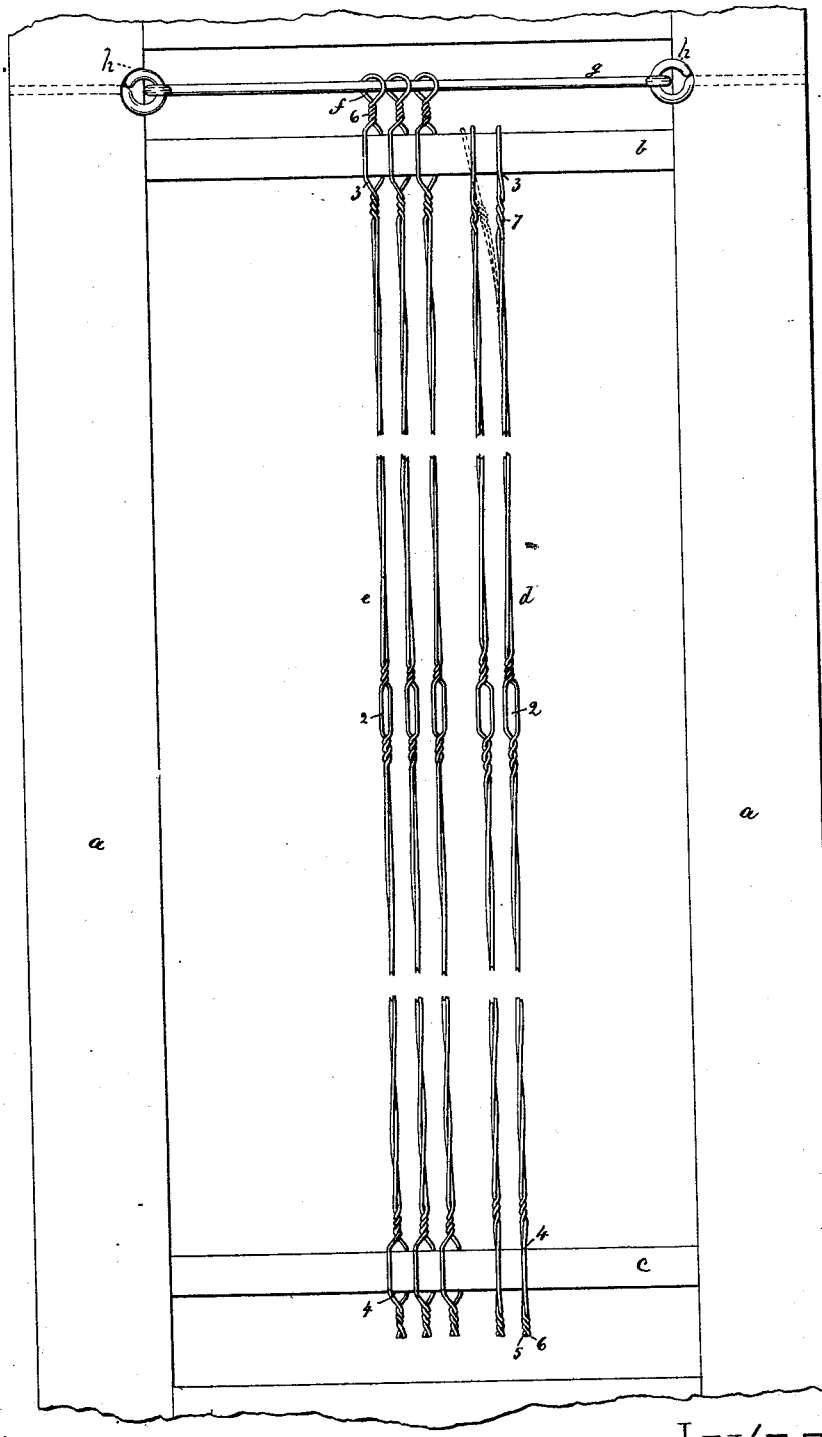

Fig:2.

Fig:3.

Witnesses.

L. F. Connor.

Jos. P. Livermore

Inventor.

Darius C. Brown

by Crosby & Gregory

Attys

UNITED STATES PATENT OFFICE.

DARIUS C. BROWN, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN WIRE HEDDLES AND FRAMES.

Specification forming part of Letters Patent No. **218,809**, dated August 26, 1879; application filed May 16, 1879.

To all whom it may concern:

Be it known that I, DARIUS C. BROWN, of Lowell, county of Middlesex, State of Massachusetts, have invented an Improvement in Wire Heddles and Frames, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to wire heddles; and consists in a heddle made from a single piece of wire, the said heddle, besides the usual warp-eye and two heddle-bar eyes, being provided at its upper end with a looped head or top, while the lower end of the heddle is made stub-short, as usual. This looped head, made at the center of the length of the wire composing the heddle and forming the upper end of the heddle, is formed in the wire next that eye which is entered by the uppermost heddle-bar of the heddle-frame, a twisted portion of both branches of the heddle-wire intervening. These looped heads at the top of the usual upper heddle-bar eye effectually prevent adjacent heddles overriding and catching one upon or within the eye of another as they rest upon the upper heddle-bar, which overriding gives much trouble to the weaver. I have so placed these looped heads with relation to the heddle-bar eyes contiguous to them that their openings are substantially at right angles with relation to each other, so that, by means of a controlling-rod, I am enabled to set the warp-eyes at a quarter or other desired turn, according to the number or size of the warp. Generally, the finer the warp and the nearer to the quarter-turn the warp-eye is placed the better; but for coarse warps the eye of the looped head and the upper heddle-bar eye may open in the same direction.

Figure 1 represents, in front elevation, a heddle-frame containing three of my improved heddles and two common heddles, the top and bottom of the said frame being partially broken away, and Figs. 2 and 3 different views of the upper end of one of my improved heddles.

The heddle-frame *a* has upper and lower heddle-bars, *b c*, all of usual construction. The wire heddles *d* are of the usual form. Each heddle *d* has a warp-eye, 2, and eyes 3 4, to be entered by the upper and lower heddle-bars. These heddles are made from a single piece of wire, the ends of which terminate at 5 6, where they are twisted together and form a so-called "stub-short."

The heddle *d* is supported by the upper heddle-bar, *b*, that enters the upper eye, 3, which is continuous or without twist except at the point 7, below the said bar. These eyes 3 during the operation of the loom are frequently caught one upon the other or overriding each other, as shown in dotted lines, which is a great evil.

Among other things, one object of my invention is to overcome this overriding or catching of adjacent heddles. I accomplish this by cutting the wire for my improved heddle *e* of sufficient length to provide for an extension beyond the usual eye 3, which is to be entered by the upper heddle-bar, *b*, and this surplus wire I hold in such position while the upper eye, 3, warp-eye 2, and lower eye, 4, are twisted and formed that a looped head, *f*, is formed above the usual eye 3, a twisted portion, 6, of the single wire intervening between the looped head *f* and eye 3, as shown in the drawings.

It will be obvious that these looped heads effectually prevent the possibility of the heddle-eyes 3 overriding or catching together, as in the old form of heddle *d*.

The part of the single wire forming the looped head *f* is the part grasped by the heddle-making machine when the wire is first folded or bent to determine the length of the heddle, and it is held fast while all the twists are put in to form all the eyes 2 3 4, and the heddle being finished, the looped head, yet grasped, is used as the means by which to draw the finished heddle from the heddle-machine.

For the successful manufacture of wire heddles in an automatic machine it is necessary to leave a loop or eye at the extreme end of the heddle by which to draw the completed heddle from the machine, and such loop can be formed only by folding or bending the wire about the device, which is to continue to hold the heddle until finished and discharged from the machine.

I am aware that several patents show wire heddles stub-shorted at each end, necessitating two wires; but such heddles, if any such were actually used in looms for weaving, did not in any manner act to hold the heddles so as to prevent heddles arranged closely to-

gether from turning axially upon the bar and presenting the open parts of the warp-eyes in different directions.

It will be noticed that heddles having looped heads above the eyes 3 will, when strung closely together on the heddle-bar *b*, so act, one against the other, as to prevent separate heddles from turning axially to the extent now common, as the eyes 3 do not fit the bar *b* closely. A stub-short end at either or both ends of the heddle would in no way act to prevent this axial motion of the heddle, which throws the warp-eye 2 in different positions and into constantly varying or changing positions, owing to the rapid jerk of the heddle-frames.

For fine warps it is very desirable, if not essential, that the warp eyes be held at the quarter-turn. To do this the looped heads *f* and bar-eyes 3 are substantially at right angles, as shown in the drawings, Figs. 2 and 3, which are views of the upper end of one of my heddles at the front and side. To insure the positive retention of these heddles having looped heads *f*, so that their warp-eyes will stand at the quarter-turn, I extend through the said looped heads a controlling-bar, *g*, which is shown connected with screw-eyes or with eye-rods *h h*, attached to the heddle-frame *a*, the said controlling-bar and upper heddle-bar being parallel and co-operating together to so hold the heddles at top that they will remain with their eyes set or directed as may be desired on the quarter-turn.

The looped head forms an eye, and it is only when it is formed as an eye that I consider it as within my invention.

In this application I have shown the looped heads as located at the top of the heddle-frame; but for the purpose of holding the said heddles on the quarter-turn it is obvious that it is immaterial which end of the heddle is placed uppermost.

I claim—

1. As an improved article of manufacture, a one-piece wire heddle provided with a warp-eye, heddle-bar eyes 3 4, and a looped head beyond one of the heddle-bar eyes, the said looped head being eye-formed, and being separated from the heddle-bar eye by a closely-twisted portion of wire, all substantially as described.

2. The one-piece heddle provided with a warp-eye, a lower and an upper heddle-bar eye, and a looped head of eye form next to one of the heddle-bar eyes, the said looped head forming the extreme end of the heddle, combined with a heddle-frame having heddle-bars and a controller-bar placed parallel with the heddle-bars and extended through the looped head, all substantially as described.

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

DARIUS C. BROWN.

Witnesses:

G. W. GREGORY,

L. F. CONNOR.