J. H. CROWELL.

Heddle Eye Openers.

No. 139,875 Patented June 17, 1873.

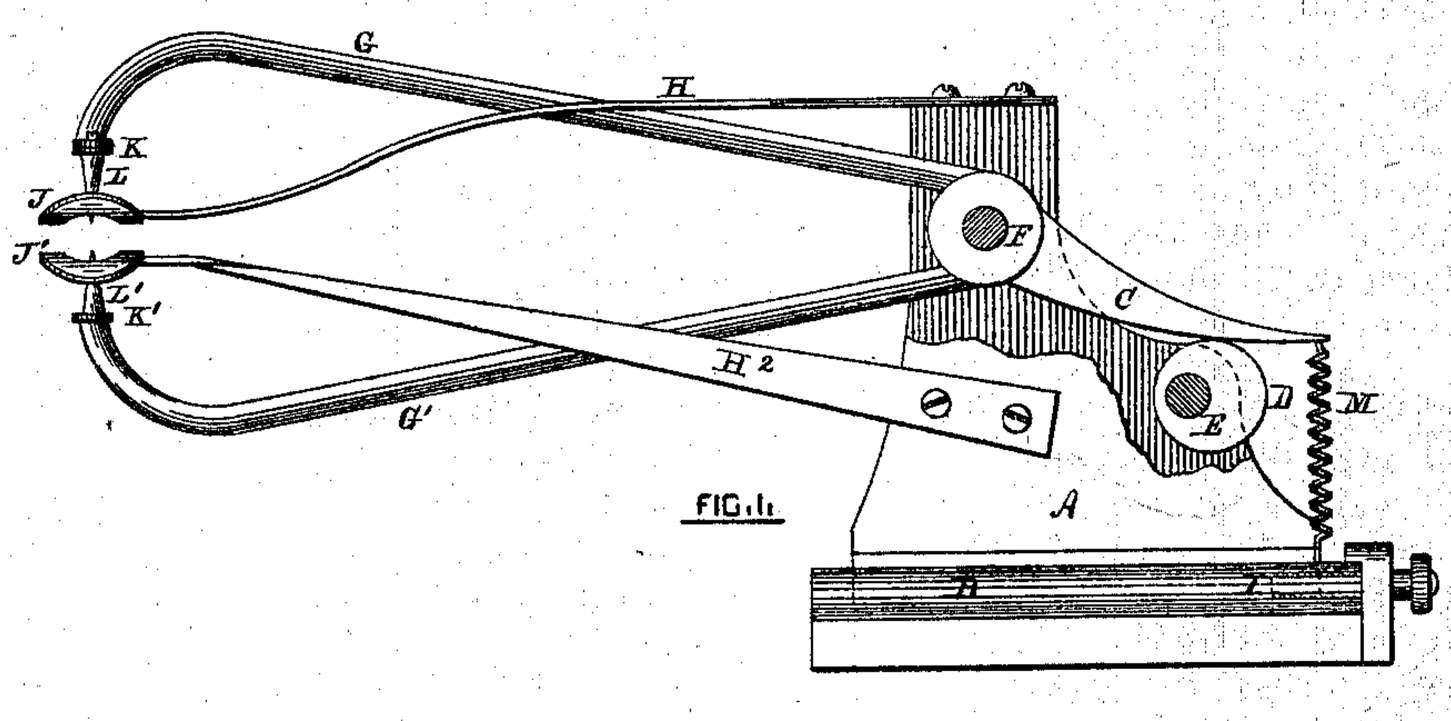

FIG. 1.

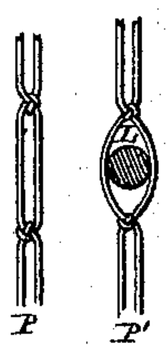

FIG. 4.

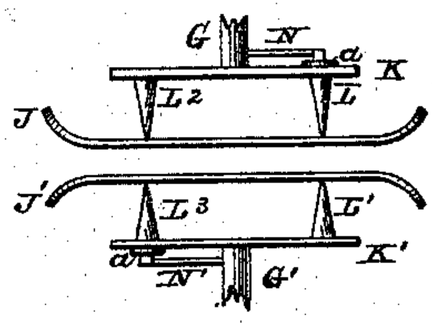

FIG. 2.

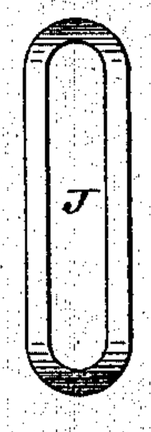

FIG. 3.

WITNESSES.

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JOHN H. CROWELL, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENT, TO JOHN KENDRICK, JOSEPH H. KENDRICK, AND JOHN H. CROWELL, OF SAME PLACE.

IMPROVEMENT IN HEDDLE-EYE OPENERS.

Specification forming part of Letters Patent No. **139,875**, dated June 17, 1873; application filed May 5, 1873.

To all whom it may concern:

Be it known that I, JOHN H. CROWELL, of the city and county of Providence, in the State of Rhode Island, have invented a new and Improved Machine for Opening the Eyes of Heddles of Weavers' Harness; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same is a full, clear, and exact description thereof.

Figure 1 is a side elevation. Fig. 2 is a transverse section in a plane through the openers L. Fig. 3 is a plan of the stripper-plate. Fig. 4 exhibits a heddle-eye before and after it has been opened.

Weavers' harness are knit both by hand and by machinery by concatenating twine so as to form heddles, each heddle having an eye or central opening, through which, when the harness is mounted in a loom, a warp-thread is to pass. The office which a set of harness performs is, as is well understood, to open the shed of the warp to permit the passage of the shuttle.

It is necessary to size and varnish harnesses to render them smooth and durable, and after they have been so finished it is required before the harness can be mounted to pick open and enlarge the eye of each of the heddle, otherwise the mill-operative cannot properly insert the warp-threads.

To provide a mechanical means for performing this hitherto tedious and tiresome work is the object of my invention.

A is one of the two standards of the machine, which is secured in any convenient way to a bench or table. H H^2 are arms secured in any suitable way at their rear ends to the standards A of the frame, and which at their front ends support, respectively, slotted-plates J J′, shown in plan at Fig. 3, whose office is hereinafter described. A shaft, F, mounted in journals in the framing, carries two arms, G G′, each of which is furnished at its front end with a transverse bar, K K′, upon which are set in a straight row pointed spurs or eye-openers L L^1, whose diameters at their bases are as great as it is desired the sides of the eye at the central points between the ends shall be apart when opened. The arms G G′, with their respective series of eye-openers, vibrate by means of the revolving-cam D, cam-lever C, and spring M, and the arrangement of such openers with reference to the slotted-plates J J′ is such that the planes in which they vibrate shall be within the central elongated opening in the plates J J′ Fig. 3.

In the operation of the machine the operator takes a harness and causes it to be presented between the plates J J′ in such relation that the openers L L^1 will, as they vibrate, enter the eyes and pick them open, and it will be found upon moving the harness steadily and slowly from end to end through the machine over the supporting-table J′, that almost every eye has been entered and opened. The offices which the plates J J′ perform are alternately that of a table for the harness to rest against while the eye-openers are entering the eyes, and a stripper to clear the eyes from the openers. Thus the plate J acts as a table while the lower series of openers L^1 L^3 are entering the eyes, and the plate J′ acts in conjunction therewith to strip off the eyes upon the return vibration of the arm G′, and these same plates, with respect to the openers L L^1, act vice versa.

It is advisable to set the eye-openers L so that they will be yielding, in order to enable them, in case their points strike upon the knots at the ends of the eyes, to slide bodily sidewise and enter the eyes of the harness. Accordingly, I prefer to set the shanks of the openers in transverse slots in the supporting-plates K K′, and hold them by means of washers *a*. Springs N N′ are applied to such shanks as shown with reference to L L^3, (Fig. 2,) which hold the openers in a central position, but will nevertheless permit the openers to move sidewise in their slotted-seats, instead of the flat-springs N N′, arranged as shown. The sockets in the plates K K′ for the eye-openers may be made of larger diameter than the shanks of the openers, and be bushed with a ring of vulcanized rubber or other elastic material. This would allow the openers to

have a slight lateral movement bodily in all directions.

For the purpose of adjusting the machine to the line of the eyes of different harnesses I set the standards A upon a bed-plate, so that they can slide thereon in guides, and by means of a screw and nut, I, adjust the position of the machine with reference to the bed. This capacity of adjustment will be especially convenient in case the harnesses are stretched upon a traveling-carriage made to run upon a fixed horizontal track, which is set parallel with the lines of eye-openers, and disconnected from the machine.

While I prefer to employ two vibrating arms G G′, attached to a single shaft, F, and a set of spur-points or eye-openers appropriate to each vibrating arm, and two plates J J′, which, in combination with the eye-openers, act alternately as supports and strippers, as before explained, I wish it to be understood that a machine which has one or more vibrating eye-openers in combination with a support for the harness, while the eyes are being opened, and a stripper-plate to remove the eyes from the openers, is claimed as within my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of one or more vibrating eye-openers, L, a holder or support, J′, while the eyes are being opened, and a stripper, J, to remove the eyes from the openers, substantially as described.

2. A machine for picking open the eyes of weavers' harnesses, composed of the dual vibrating arms G G^1, armed with spur-points or eye-openers L L′, and the devices J J′, acting alternately as supports and strippers, all in combination, substantially as described.

3. The combination of the eye-openers L L^3 with their supporting-plates K K′, and springs N N′, or other yielding device, substantially as described.

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Witnesses:

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