J. W. FRIES.

Warping-Mill.

No. 132,959. Patented Nov. 12, 1872.

Fig: 1.

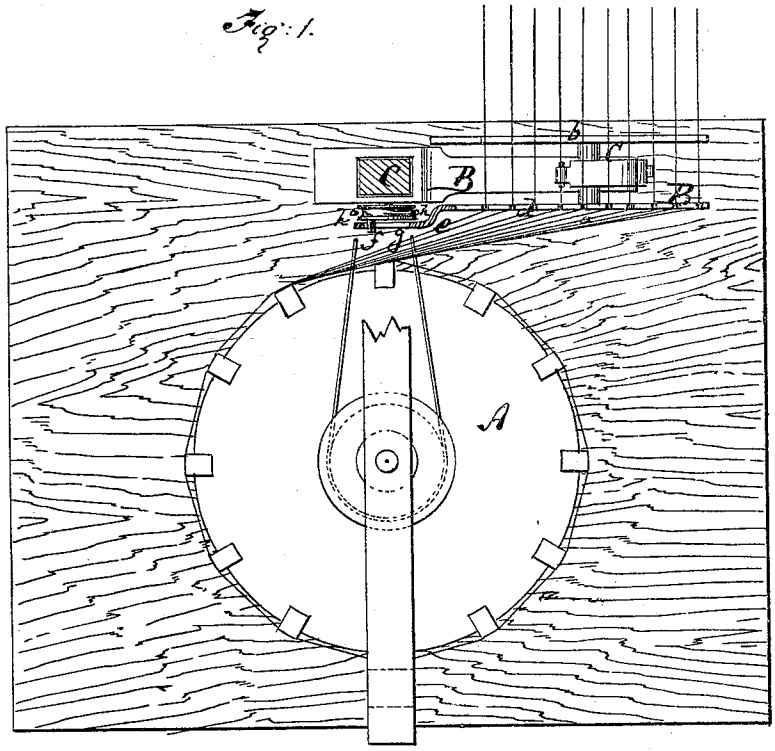
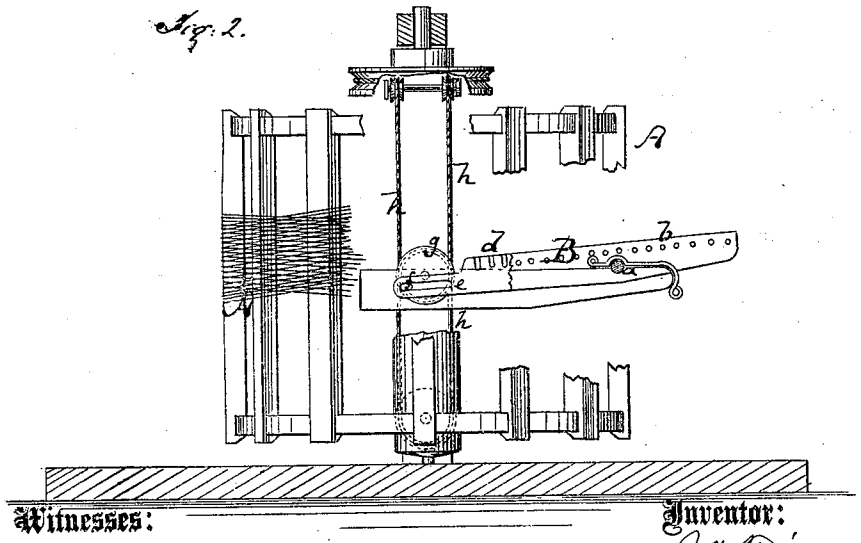


Fig: 2.



Witnesses:

Chas. Nida

Chaquieres

Inventor:

J. W. Fries

Per Munn & Co

Attorneys.

UNITED STATES PATENT OFFICE.

JOHN W. FRIES, OF SALEM, NORTH CAROLINA.

IMPROVEMENT IN WARPING-MILLS.

Specification forming part of Letters Patent No. **132,959**, dated November 12, 1872.

To all whom it may concern:

Be it known that I, JOHN W. FRIES, of Salem, in the county of Forsyth and State of North Carolina, have invented a new and Improved Warping-Mill, of which the following is a specification:

Figure 1 is a top view, partly in section, of my improved warping-mill. Fig. 2 is a side elevation, partly in section, of the same.

Similar letters of reference indicate corresponding parts.

This invention has for its object to so arrange the heck of a warping-mill that the yarn wound upon the warp-cylinder will not become entangled while being dyed or prepared after its removal from the mill. The invention consists in applying to the heck a vibratory motion, whereby the threads are laid diagonally, so that the threads of the same layers will not be quite parallel and those of overlying thicknesses will cross each other and not be parallel, thus preventing their becoming entangled.

In the accompanying drawing, the letter A represents the warp-cylinder, of suitable style and size. B is the heck, pivoted at *a* to a post or standard, C, of the warp-machine. Through its apertures or slots the several threads of the yarn are drawn before they reach the warp-cylinder. A slotted arm, *e*, extends back from the heck B, and connects with a crank-pin, *f*, of a disk, *g*, which is rotated by a belt or band, *h*, from the cylinder A, or otherwise. The rotation of the disk *g* causes the heck to be oscillated in the desired manner. The threads of each thickness or layer on the warp-cylinder, being on the heck at unequal distances from the pivot *a* thereof, are laid on A at varying angles and not quite parallel to each other. This is also advantageous, and prevents the threads from becoming entangled. The threads that cover each other on the cylinder will be crossed. The motion of each slot of the heck being increased with its distance from the pivot, the threads tend to increase in length the further they are from the heck-pivot; but the ordinary length of the heck makes no appreciable difference in the length of threads applied.

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

A warping-mill provided with a vibrating heck, substantially as and for the purpose herein shown and described.

JOHN W. FRIES.

Witnesses:

B. DE SCHWEINITZ,

C. T. PFOHL.