2 Sheets—Sheet 1.

J. E. & E. ATWOOD.

SPINNING FRAME AND METHOD OF UNITING THE ENDS OF BANDS THEREOF.

No. 296,377. Patented Apr. 8, 1884.

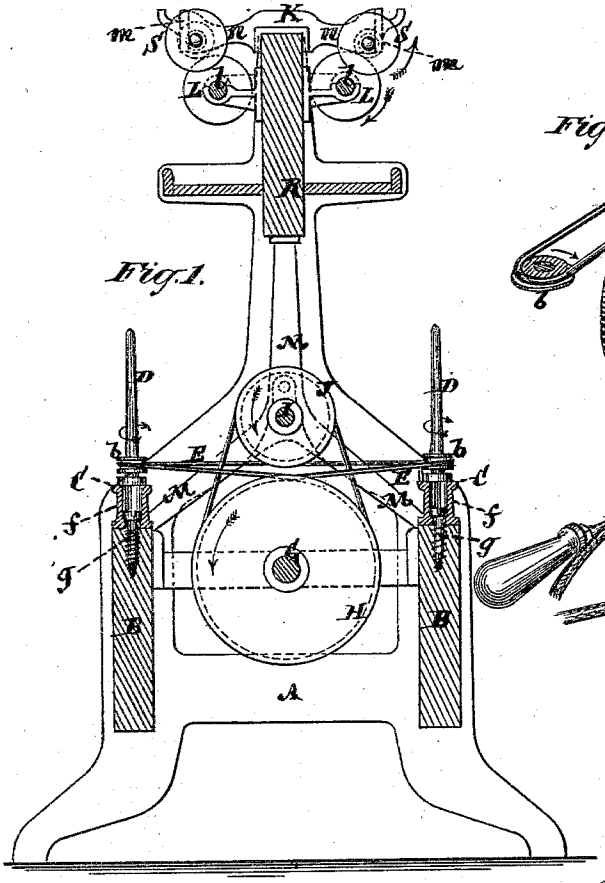


Fig. 1.

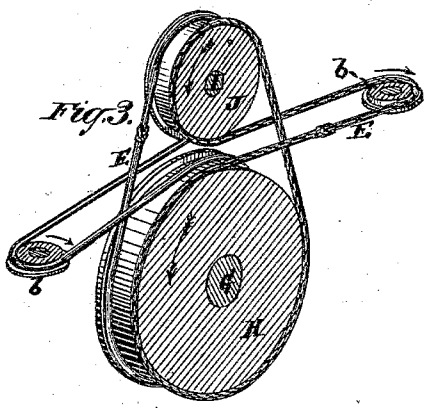


Fig. 3.

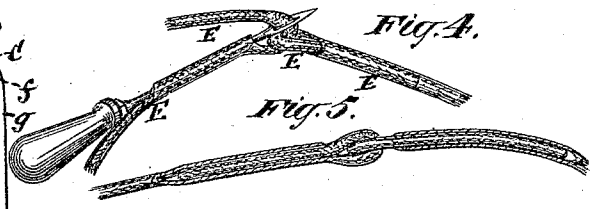


Fig. 4.

Fig. 5.

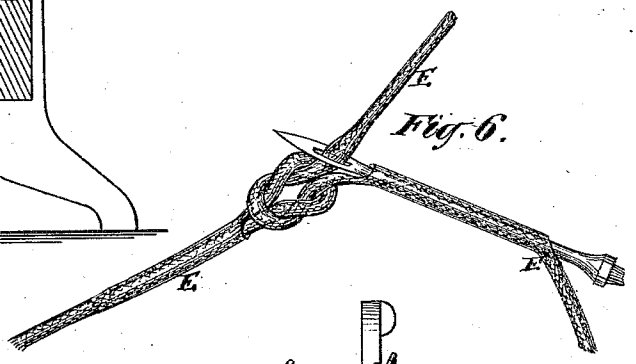


Fig. 6.

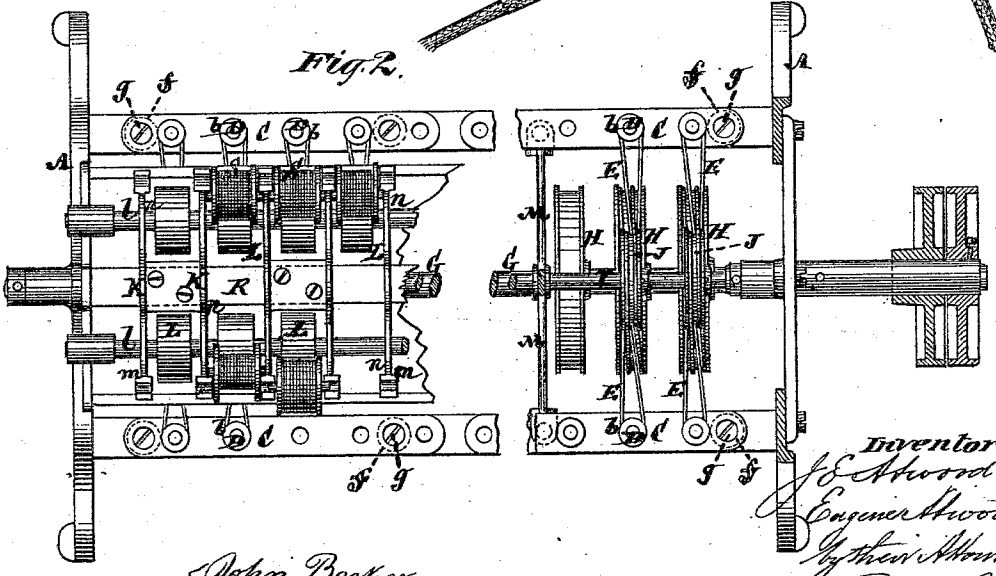


Fig. 2.

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2 Sheets—Sheet 2.

J. E. & E. ATWOOD

SPINNING FRAME AND METHOD OF UNITING THE ENDS OF BANDS THEREOF.

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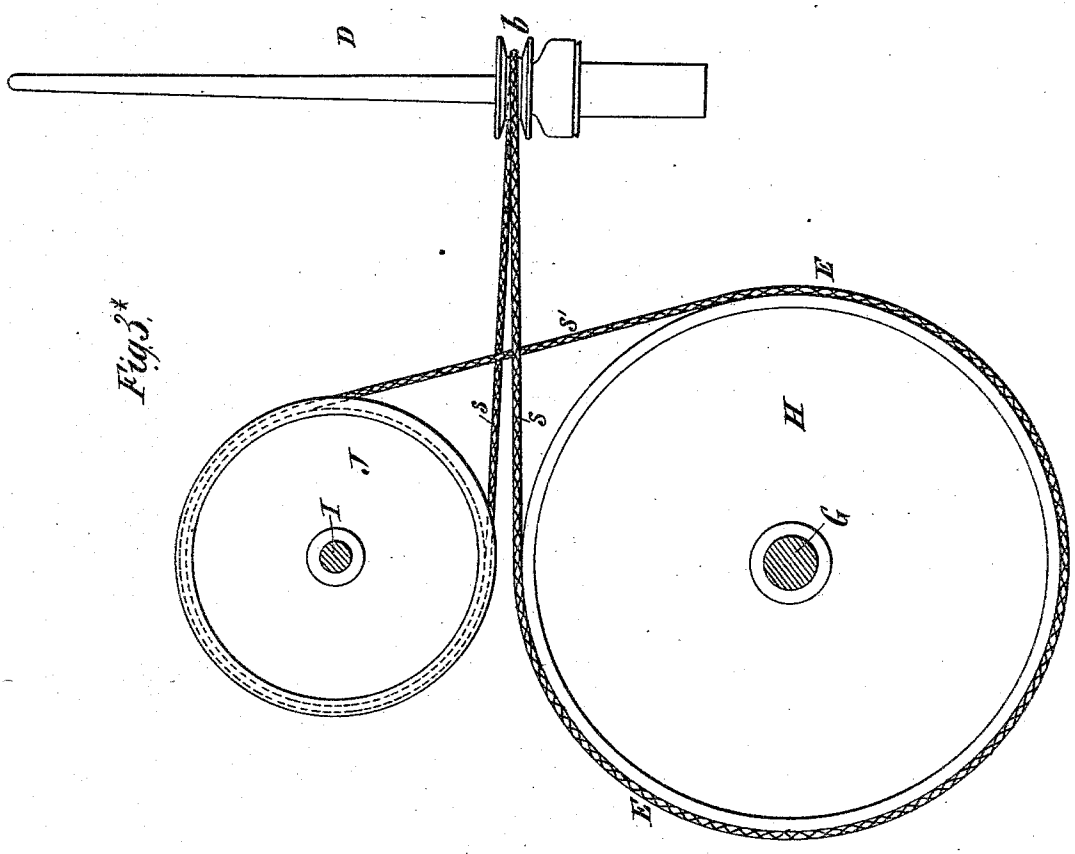


Fig. 3.*

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by their Attys,
Brown & Brown

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN E. ATWOOD AND EUGENE ATWOOD, OF STONINGTON, CONNECTICUT.

SPINNING-FRAME AND METHOD OF UNITING THE ENDS OF BANDS THEREOF.

SPECIFICATION forming part of Letters Patent No. 296,377, dated April 8, 1884.

Application filed July 19, 1879.

To all whom it may concern:

Be it known that we, JOHN E. ATWOOD and EUGENE ATWOOD, both of Stonington, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Spinning-Frames and in the Method of Uniting the Ends of Bands for Driving the Spindles Thereof, of which the following is a specification.

An important object of our invention is to provide, in an extremely narrow spinning-frame having a row of spindles on each side, for driving each spindle with a separate and independent driving-band, which shall have sufficient length to give it durability, and all parts of which shall be free from liability to rub and chafe against each other while running.

To this end the invention consists in the combination of a driving-pulley and a guide-pulley having parallel axes and arranged one over the other, a spindle arranged at one side of said pulleys with its whirl in a horizontal plane about midway vertically between said pulleys, and a driving-band encircling both of said pulleys and said whirl, and comprising two portions extending horizontally between the whirl and adjacent sides of the two pulleys, and a portion extending directly from one pulley to the other and passing between the said horizontal portions, as more fully hereinafter described.

The invention also consists in the combination, with the two pulleys arranged as above described, of two spindles arranged on opposite sides of the two pulleys, with their whirls in a horizontal plane about midway vertically between said pulleys, and two driving-bands, each encircling both said pulleys and the whirl of a spindle, and each extending as above described.

The invention also consists in providing the guide-pulleys above described with flanges, whereby the portion of each driving-band which passes from one pulley directly to the other is prevented from rubbing and chafing against the two horizontal portions between which it passes, as more fully hereinafter described.

The invention also consists in a novel method of uniting the ends of the bands for driving the spindles, which consists in looping the end portions into each other, so as to lock or engage each with the other, and then sheathing the ends each within the portion of the band from which it proceeds, as more fully hereinafter described.

In the accompanying drawings, Figure 1 represents a transverse sectional elevation of a silk-spinning frame, in part, having the invention applied; and Fig. 2, a half-sectional broken plan view of the same. Fig. 3 is a view in perspective of a system of bands and pulleys for driving the spindles of the frame. Fig. 3* is an elevation of a single spindle, its driving-band, and the driving-pulley and guide-pulley around which it passes, on a larger scale, in order to show the course of the band more clearly; and Figs. 4, 5, and 6 are views in perspective illustrative of our improved method of uniting the ends of the bands which drive the spindles.

A A indicate the end supports or standards of a silk-spinning frame, and B B the longitudinal side pieces or stringers of said frame, on which are mounted the rails C C, that carry the spindles D D on opposite sides of the frame. Each spindle D is fitted with the usual whirl, *b*, which is rotated by an independent band, E—that is, a separate band for each spindle.

G is the shaft carrying the pulleys H for driving the spindles, and occupying the usual position centrally between the spindles on opposite sides of the machine. Above this shaft G, in suitable bearings, is a second shaft, I, parallel with G, for carrying the guide-pulleys J, which are situated directly over and but a short distance above H. These guide-pulleys are each placed directly between a spindle on one side and an opposite spindle on the other side of the machine. They are flanged on each side, and the width of the space between their flanges, though affording ample room for two driving-bands—viz., one of the bands of each of two opposite spindles—is less than the diameter of the whirls of the spindles. It will be observed that the whirls *b* of the spindles D are in a horizontal plane about midway vertically between the pulleys H and J—that is, about midway between the adjacent faces or sides of said pulleys. Each band E encircles both pul-

leys H and J, and the whirl *b* of a spindle. Each band E, as shown in Figs. 3 and 3*, after leaving the pulley H, and before passing around the pulley J, passes around and from the whirl *b* on the respective spindle in a nearly horizontal plane, while another portion passes from the pulley J to the pulley H in a nearly vertical plane between the horizontal portions. The passage of the band E, as above described, forms portions S S, which extend horizontally between the whirl and adjacent sides of the pulleys H J, and a portion, S′, extending directly from one pulley to the other, and passing between the portions S S, all as best shown in Fig. 3*. Owing to the two spindles, whose bands pass around the same guide-pulley, J, being on opposite sides of the guide-pulley and driving-pulley, one band tends to run toward one side of the driving-pulley and guide-pulley and the other toward the other side thereof, as shown in Fig. 3; and therefore there is no tendency of the two bands to interfere with each other, but both have a natural tendency to keep apart. There would, however, be a tendency of the portions S′ of each band to run against and chafe with the nearest of the horizontally-running portions S S of the same band, were it not that the space between the flanges of the guide-pulley is less than the diameter of the spindle-whirls, and hence the said flanges cause said portions S′ to swerve from the lines in which they would come in contact with the horizontal portions. The bands E are made of the hollow braid commonly employed, and each has its ends fastened or united, not by splicing or sheathing each end into the portion other than that from which it proceeds, which affords but little security against the slipping or unsheathing of the ends, and renders it difficult to fix the length of the band, but is fastened by looping its end portions into each other, so as to lock or engage one with the other, and afterward turning back its ends and sheathing them in the parts of the band from which they respectively proceeded.

Fig. 4 shows the end portions of the band E as in the act of being looped to engage one with the other by simply lacing each one singly through the other. Fig. 5 shows the ends in section after they have been so looped or engaged and turned or doubled back and sheathed in the portions of the band from which they respectively proceeded; and Fig. 6 shows the end portions of the band as being each looped double through the other, having one of its ends turned back and sheathed in the portion of the band from which it proceeded.

An eye-pointed tool, as illustrated in Figs. 4 and 6, may be used to effect the sheathing of the ends of the band, said tool being entered within and along the interior of the band, and after the end of the band to be sheathed has been passed through the eye of the tool, said instrument is drawn back, thereby doubling the end of the band and sheathing it within the portion of the band from which said end proceeded. By looping the ends of the band together before sheathing them it is easy to give to the band the exact length required for it, and the sheathing of the ends of the band beyond the loop keeps said ends from flying loose and wearing off to scatter fluff, and by wearing away down to the loop causing the band to become untied. The sheathing of the ends of the band, too, in the portion from which they proceeded tapers the band up to the loop, thus preventing the loop from forming an abrupt projection from the band.

The spindle-rails C C are supported by hollow pillars *f*, secured to the side rails or stringers B B by screws *g*.

R is the upper stringer, which carries the spool supports or fingers K and drivers L L, on which the take-up spools S S rest, and by which they are rotated. The upper stringer, R, is supported and connected to the side pieces B B by braces M. The fingers K perform their usual function of directing the take-up spools S S onto the rotating drivers L L of said spools with freedom for the latter to rise and fall to bring the silk or spun material on them in contact with said drivers, the spools being driven by friction consequent on such contact, as usual, and the shafts *l l* of the drivers L L being operated by the ordinary or any other suitable mechanism.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of a driving-pulley and a guide-pulley having parallel axes, and arranged one over the other, a spindle arranged at one side of said pulleys, with its whirl in a horizontal plane about midway vertically between said pulleys, and a driving-band encircling both of said pulleys and said whirl, and comprising two portions extending horizontally between the whirl and adjacent sides of the two pulleys, and a portion extending directly from one pulley to the other and passing between the said horizontal portions, substantially as described.

2. The combination of a driving-pulley and a guide-pulley having parallel axes, and arranged one over the other, two spindles arranged on opposite sides of said pulleys, with their whirls in a horizontal plane about midway vertically between said pulleys, and two driving-bands, each encircling both of said pulleys and the whirl of a spindle, and each comprising two portions extending horizontally between the whirl around which it passes and the adjacent sides of said pulleys, and a portion extending directly from one pulley to the other and passing between said two horizontal portions, substantially as herein described.

3. The combination of the driving-pulley H and the flanged guide-pulley J and their shafts, arranged parallel with each other and one over the other, the spindle D and its whirl *b*, arranged as described, and the driving-band E, encircling both of said pulleys and said whirl,

and comprising the horizontally-extending portions S S and the portion S', passing between the portions S S, all substantially as herein described.

4. The method of uniting the ends of the bands, which consists in looping the end portions into each other so as to lock or engage each with the other, and then sheathing the ends each within the portion of the band from which it proceeds, substantially as herein described.

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