2 Sheets—Sheet 1.

E. T. LANPHEAR.

Ring-Spinning Frame.

No. 217,389. Patented July 8, 1879.

Fig. 1.

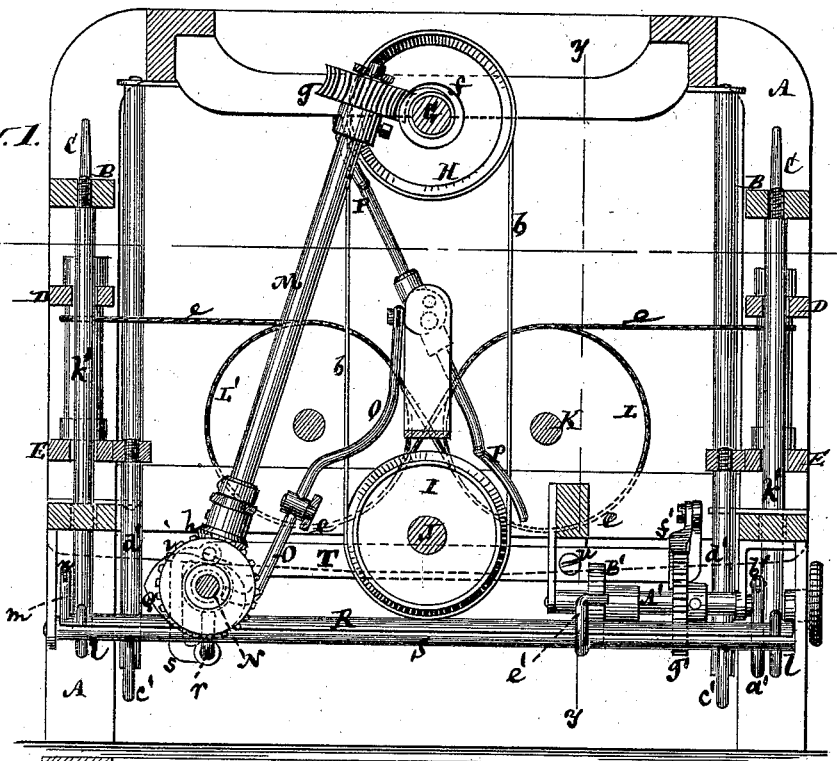
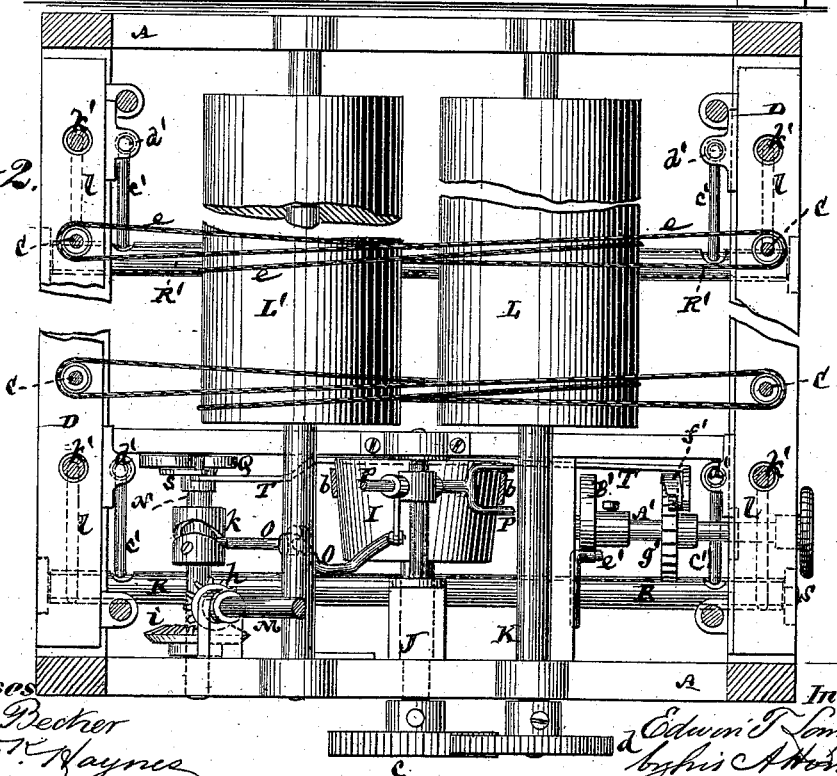


Fig. 2.



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2 Sheets—Sheet 2.

E. T. LANPHEAR.

Ring-Spinning Frame.

No. 217,389. Patented July 8, 1879.

Fig. 3.

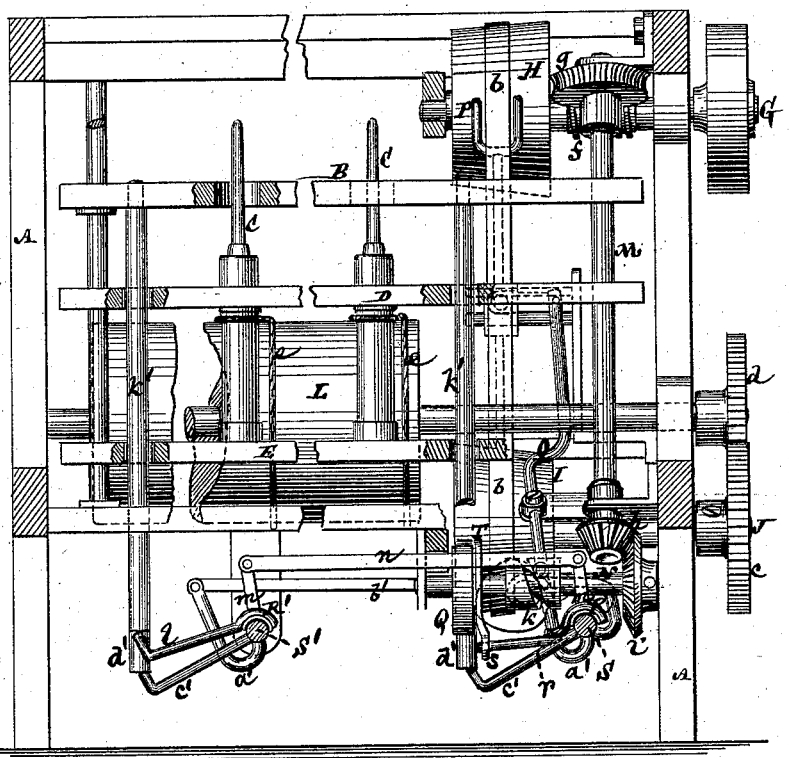
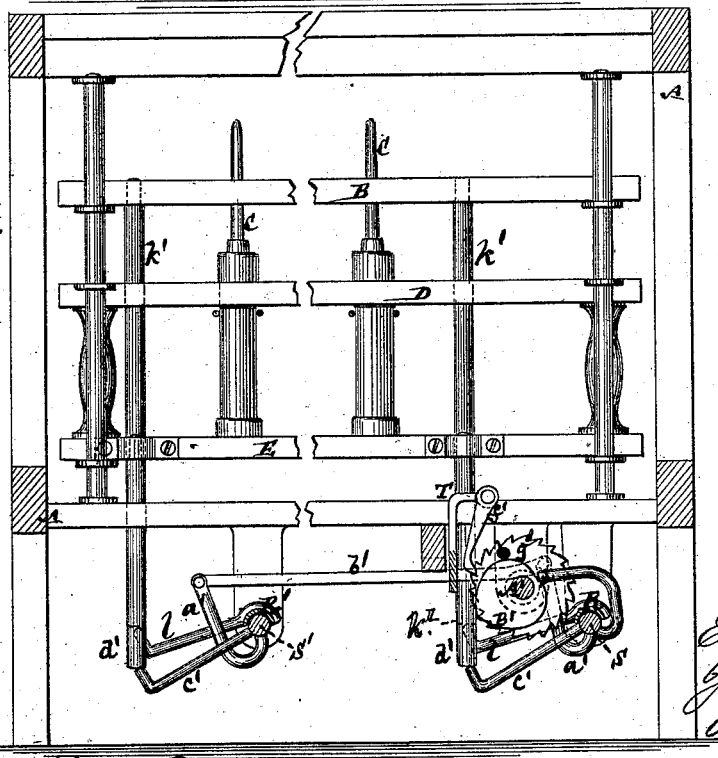


Fig. 4.



Witnesses { John Bentley Fred K. Haynes

Inventor E. T. Lanphear by his Attorneys Roome & Wooster

UNITED STATES PATENT OFFICE.

EDWIN T. LANPHEAR, OF PHENIX, RHODE ISLAND.

IMPROVEMENT IN RING-SPINNING FRAMES.

Specification forming part of Letters Patent No. **217,389**, dated July 8, 1879; application filed March 1, 1879.

To all whom it may concern:

Be it known that I, EDWIN T. LANPHEAR, of Phenix, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Ring-Spinning Frames, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The invention consists in a combination, in a ring-spinning frame having a traverse mechanism to wind the yarn in cone-shaped layers, of a ring-rail having a rising-and-falling motion equal to the traverse, spindles having a downward-building movement at the end of each successive traverse, and mechanism for independently operating the ring-rail to give to it the traverse motion, and the spindles to give them their separate building movement, whereby a widely-varying and extreme strain upon the yarn, consequent upon a varied and extended distance of the ring-rail from the drawing-rollers, is avoided, and there is no objectionable lifting of the spindles and their rails at each end of the traverse, but only a lifting of the spindles and rails at the end of each complete building movement, and a proper relative automatic traverse motion and building movement are obtained.

The invention also consists in a combination, with the rising and falling ring-rails and longitudinally moving and rotating cop or bobbin spindles, of rock-shafts having arms or lifters for lifting the ring-rails, and rocking sleeves or shells arranged to encompass or receive within them said rock-shafts, and mechanism for imparting to said rock-shafts and sleeves the necessary reciprocating movement, and whereby the raising and lowering of said spindles and their rails is effected.

In the accompanying drawings, Figure 1 represents a sectional end elevation of a ring-spinning frame, in part, having my invention applied; Fig. 2, a horizontal section of the same on the line *x x;* Fig. 3, a partly-sectional side view thereof, and Fig. 4 a vertical section of the same on the line *y y* in Fig. 1.

In said drawings only such parts of a ring-spinning frame are shown as are necessary to explain my invention. The drawing-rollers, which may occupy the usual position, and the usual or any suitable devices for approximately counterbalancing the spindles carrying the cops or bobbins, and the rails which support and guide said spindles, the ring-travelers, and various other devices not necessary here to be shown, are omitted.

A represents the main frame, and B B the ring-rails, of a ring-spinning frame. C C are the spindles which carry the cops or one-headed bobbins, on which the yarn is wound in cone-shaped layers. D D are the guide-rails of the spindles, and E E the step-rails thereof, both of which rails and their spindles are suitably balanced, or nearly so.

G is a main driving-shaft, on which is a conical or tapering pulley, H, that serves to give motion, by means of a reversely-tapering pulley, I, and band *b*, to a shaft, J, on the outer end of which is a spur-wheel, *c*, which gears with a spur-wheel, *d*, on a shaft, K. This shaft K carries a drum, L, by which and a corresponding drum, L′, arranged in parallel relation with it, and bands *e e*, arranged in suitable relation with the drums L L′, and with elongated whirls upon the spindles C C on both or opposite sides of the machine, said spindles are rotated.

Upon the shaft G is a screw, *f*, which serves to give motion to a worm-wheel, *g*, upon a shaft, M, which is here shown to occupy an oblique position relatively to the horizon. This shaft M gears by a bevel-pinion, *h*, with a bevel-wheel, *i*, upon a shaft, N, which carries a spirally-grooved cam, *k*, that by means of a belt-shifter, which may consist of a lever, O, and sliding double fork P, serves to shift the band *b* along the tapering pulleys H I to vary the speed of the spindles C C, to compensate for the variations in diameter of the cone-shaped layers on the bobbins or spindles, and so to insure a uniform draft and twist; but this forms no part of the present invention.

The ring-rails B B, which only move up and down the length of the traverse, are operated in timely relation with the alternately increasing and diminishing rotary motion of the spindles, which takes place as the cone-shaped layers increase or diminish in diameter by means of a heart or other suitably shaped cam, Q, on the shaft N. Thus the ring-rails B, which are free to fall by weight, rest, by means

of guide-rods k', on lifters l, attached to a pair or series of rocking shells or sleeves, R R', arranged along and over parallel rock-shafts S S', and are connected, by means of arms m, fast to said shells and connecting-rods n, so as to move in concert. Fast to one of these shells R is an arm, r, which is attached by a rod, s, to a lever, T, which has its fulcrum at u, and rests at its one end on the cam Q, so that as said cam is rotated by the shaft N it serves to give the lift to and control the drop of the ring-rails B B to an extent or length of movement which is equal to the traverse, and in timely relation with the alternately accelerating and diminishing rotary motions of the spindles C C.

The rock-shafts S S', which are connected by arms a' and rods b' to move in concert, and are provided with lifters e', on which the rails carrying the spindles C C rest by means of rods d', attached to the step or bolster rails E E, serve to control the longitudinal or building movements of the spindles. Said shafts S S' are operated or have their motion controlled for this purpose by an independent shaft, A', on which is a heart or other suitably shaped cam, B', that when the shaft A' is suitably turned acts against an arm, e', attached to the one rock-shaft, S, and raises the spindles C C and their rails D E to their greatest elevation for starting on the building movement. This may be done by hand by turning the shaft A' till the highest point of the cam B' passes from under the arm e', after which the spindles and their rails are free to drop by any suitable controlling mechanism the thickness of a layer at each end of the traverse motion effected by the up-and-down movement of the ring-rail, a pawl, f', on the end of the lever T, and arranged to engage with a ratchet-wheel g' on the shaft A', being used, if desired, to control the movement of the cam B'. Thus the longitudinal motion of the spindles C C is restricted to the building of the cop, and it is unnecessary to lift the spindles at every traverse, which lifting of the spindles and their rails, although said devices are approximately balanced, as usual, is laborious, on account of the friction consequent upon the weight to be moved, and which the balance-weights add to. Furthermore, the ring-rail having only the traverse motion to make, a nearly uniform distance of the rings from the drawing rollers, as hereinbefore observed, is obtained, and the spindles having a variable motion, as described, allow of the drawing-rollers running uniformly at the highest velocity at which it is safe to spin without breaking the yarn. Again, the arrangement of the rock-shafts S S' and rocking sleeves or shells R R', one within the other, insures great compactness of the devices for giving the necessary traverse and building movements, respectively, to the ring-rails and spindles carrying the cops or bobbins.

I claim—

1. The combination, in a ring-spinning frame having a traverse mechanism to wind the yarn in cone-shaped layers, of a ring-rail having a rising-and-falling motion equal to the traverse, spindles having a downward-building movement at the end of each successive traverse, and mechanism for independently operating the ring-rail to give to it the traverse motion, and the spindles to give them their separate building movement, substantially as and for the purpose or purposes specified.

2. The combination, with the rising and falling ring-rails and longitudinally moving and rotating cop or bobbin spindles, of rock-shafts having arms or lifters for lifting the ring-rails, and rocking sleeves or shells arranged to encompass or receive within them said rock-shafts, and mechanism for imparting to said rock-shafts and sleeves the necessary reciprocating movement, whereby the raising and lowering of said spindles and their rails is effected, essentially as described.

EDWIN T. LANPHEAR.

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