No. 647,656.

Patented Apr. 17, 1900.

F. M. GARCELON.

RING SPINNING MACHINE.

(Application filed July 31, 1899.)

(No Model.)

2 Sheets—Sheet 1.

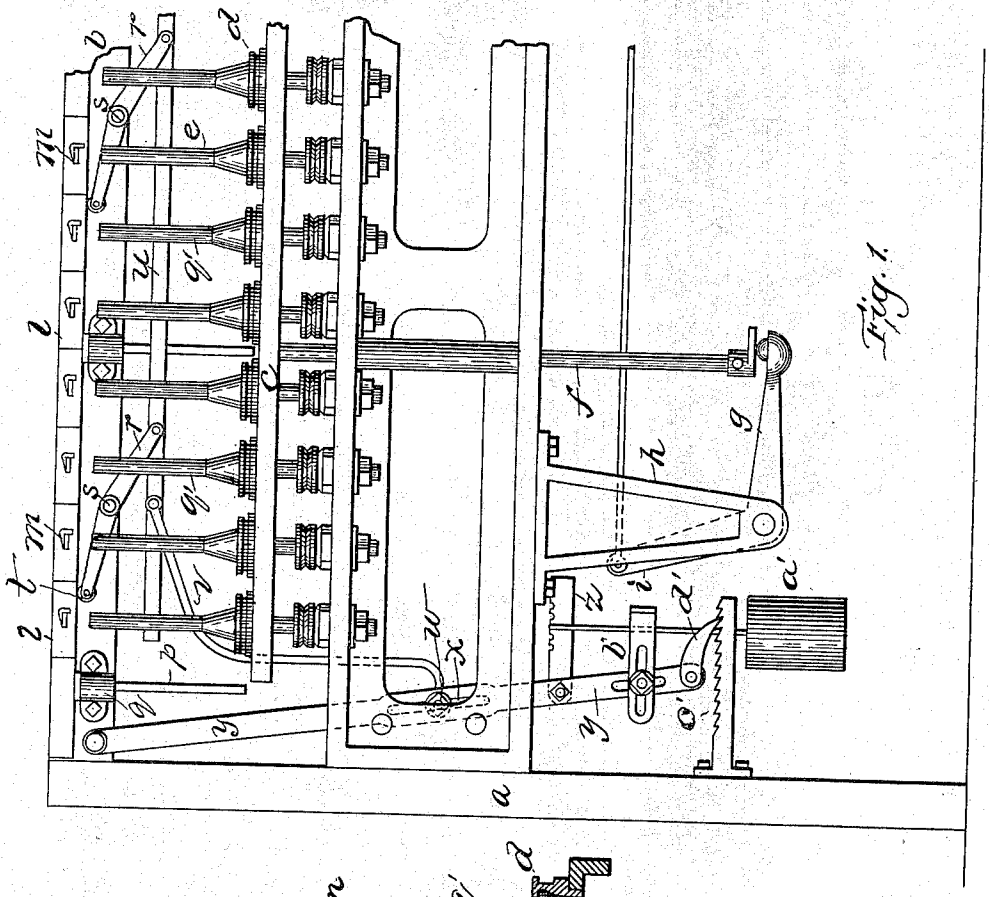


Fig. 1.

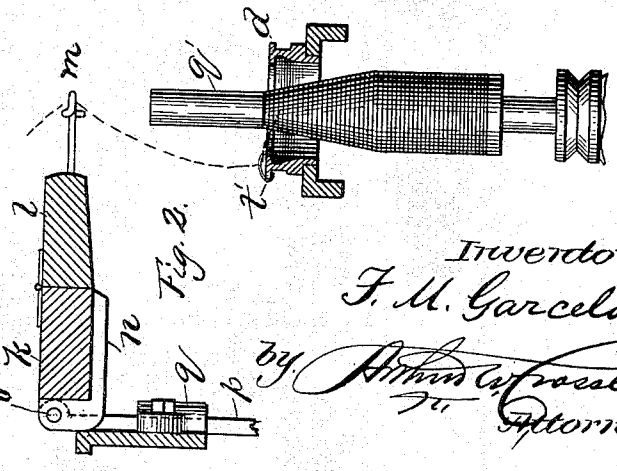


Fig. 2.

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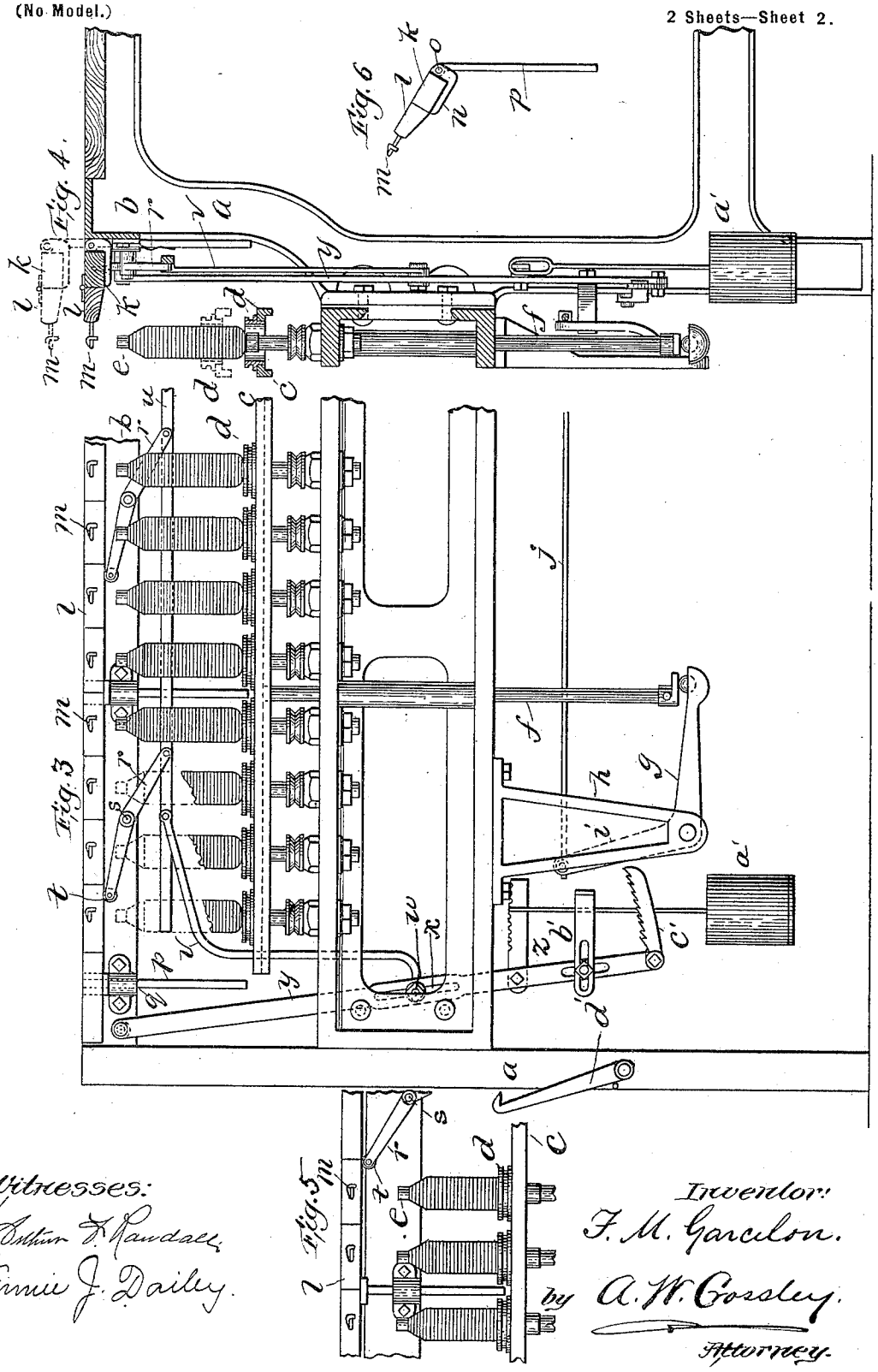
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UNITED STATES PATENT OFFICE.

FRED M. GARCELON, OF LEWISTON, MAINE.

RING-SPINNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 647,656, dated April 17, 1900.

Application filed July 31, 1899. Serial No. 725,690. (No model.)

To all whom it may concern:

Be it known that I, FRED M. GARCELON, of Lewiston, in the county of Androscoggin and State of Maine, have invented certain new and useful Improvements in Ring-Spinning Machines, of which the following is a description sufficiently full, clear, and exact to enable those skilled in the art to which it appertains or with which it is most nearly connected to make and use the same.

This invention has relation to that feature in the art of ring-spinning in which a vertical movement is imparted to the guide-eyes above the spindle or quill coördinately with the ring and traveler carried by the vertically-reciprocatory ring-rail in order to lessen the tension on the yarn and preserve it at an even degree, so that lighter travelers may be employed, and consequently softer yarns may be spun, while the ends are kept from "ballooning" to such an extent as to whip together and break down, avoiding the necessity of employing separators for the prevention of the said mischief.

It is the object of this invention to provide improved means for accomplishing the ends specified, the said means embodying simplicity and economy of construction and readiness, ease, and fineness of adjustment, while being adapted to perform its prime functions in the most efficient manner.

A form of means embodying the invention will be hereinafter described in detail and subsequently pointed out in the claims.

Reference is to be had to the annexed drawings and to the letters of reference marked thereon, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a front view of a portion of a ring-spinning machine for spinning filling or weft yarn which is wound upon so-called "quills" placed upon the spindles, the quills being represented as empty. Fig. 2 is a sectional detail view showing a quill as partially filled and the wire-board as slightly raised. Fig. 3 is a front view of a ring-spinning frame adapted to spin warp-yarn which is wound upon bobbins, the bobbins being shown as full and the ring-rail and wire-board as in lowered position. Fig. 4 is a sectional side or end view illustrating the operation of the invention as represented in Fig. 3. Fig. 5 is a front view of a part of a warp-spinning frame, showing the wire-board as slightly raised. Fig. 6 is a detail view showing the manner of hinging the wire-board and raising it on its hinge.

In warp-frames it will be understood that the rail moves up and down to an extent equal to the length of the bobbin, while in filling-frames the rail rises and falls to the extent of the conical layer wound on, the rail, however, rising gradually in order to build up the cop on the quill—that is, a fresh starting-point of the rail, a little higher up, is obtained at each lift. This fact is to be kept in mind in perusing this specification, since in the use of my invention on filling-frames, after the cop has been built up to a certain extent, the wire-board will be gradually raised coördinate with the building up of the cop and will not be allowed to fall, while in warp-frames, after the rail has been raised to a certain extent, at each "waive" the wire-board will then rise with it, and when the rail descends the wire-board will descend with it until the said wire-board reaches its position of starting.

In the drawings, *a* designates the frame of the machine.

b is the roll-beam.

c is the ring-rail bearing the rings *d*, through which the spindles *e* extend and upon and around which rings the travelers *f* move, as is well known to spinning artisans.

f designates the lifting-rods which raise the ring-rail, the lifting-rods being acted upon by the arm *g* of a bell-crank lever pivoted upon a bracket *h*, connected with the machine-frame. The other arm *i* of the bell-crank lever has a rod *j* connected with it, which rod is operated in the usual way to actuate the bell-crank lever.

k is the wire-board (sometimes called the "thread-board") to which the individual wire-blocks *l*, provided with the guide-eyes *m*, are hinged. The wire-board *k* is provided with hinge members *n*, pivoted upon a pintle-rod *o* or equivalent means extending the length of the machine, to which rod *o* vertically-arranged guide-rods *p* are connected, which slide in bearings or supports *q*, bolted to the roller-beam.

r designates levers pivoted or fulcrumed on pins or bolts s, connected with the roller-beam and provided at their upper ends with anti-friction-rollers t, resting against the under side of the wire-board, the said levers being pivoted at their lower ends to a horizontal bar u, so that as the said bar is moved from right to left, as viewed in Fig. 1, the levers will be actuated to raise the wire-board, and as the said bar is moved in the opposite direction the wire-board will be allowed to descend by its own gravity.

The bar u has one end of a link-arm v pivoted to it, the other end of the said link-arm being pivoted in a block or bearing w, adjustable vertically in a slot x, formed in a pendent lever y, pivoted at its upper end to the roller-beam.

Projecting laterally the pendent lever y is an arm z, upon which a weight a' is hung to counterbalance the bar u and its connections and render easy the operation of raising the wire-board. The weight is made adjustable on the arm z to adjust its counterbalancing effects.

b' designates an arm adjustable both horizontally and vertically on the pendent lever y, which arm extends inward into proximity to the arm i of the bell-crank lever, so that as the latter is actuated it will engage the arm b' and move it and the pendent lever back.

At its lower end the pendent lever y is provided with a horizontally-arranged rack-bar c', with the teeth of which a dog or pawl d', pivoted upon a stationary part of the frame, is adapted to engage.

In the operation of the invention, having reference first to Figs. 1 and 2, at the start of building up the bobbins the wire-board k will be at its lowest point—that is, on a level with the horizontal part of the roller-beam, as shown in Fig. 1, or it may be even lower, so as to bring the guide-eyes as near to the upper ends of the spindles or quills q' as desired. Then when the quill is filled to the desired point the arm b' will be adjusted so as to be struck by the arm i of the bell-crank lever at each rise of the ring-rail and so swing the pendent lever y back, operating upon the levers r through the medium of the link v and bar u to gradually raise the wire-board. (See Fig. 2.) The degree of speed at which the wire-board will be raised, it will be seen, will be coördinate with the rate at which the bobbin will be built up, or thereabout, so that the same relative distance between the guide-eyes m and the rings and travelers will be maintained. In Fig. 2 the cop is shown as built up to a slight extent beyond that at which the raising of the wire-board is begun, and under these circumstances as the said wire-board is raised it remains up until lowered after doffing.

The operation of the wire-board prevents the yarn from ballooning to an extent that will cause the ends to whip together and break down. Besides this, a substantially uniform and light tension upon the yarn is preserved so that lighter travelers may be employed, and softer yarn with an even twist may be produced. Moreover, by avoiding the striking together of the yarns being spun the necessity of using separator-blades between the spindles is avoided.

The teeth on the rack-bar c' may be made as long as desired, so that many or few actions of the arm i upon the arm b may take place to cause the pawl d' to catch a new tooth. By avoiding the catching of a new tooth by the pawl at each waive of the ring-rail the strain on the yarn at the point of reversal of the ring-rail from its upward to its downward motion will be lightened and the jerky action upon the yarn and its consequent disadvantages are obviated.

When warp-yarn is being spun and the yarn is wound upon a bobbin—that is, when the ring-rail is reciprocated each time to practically the full length of the bobbin, as indicated in Figs. 3, 4, and 5—the pawl d' may be thrown back, so as not to engage the ratchet-bar c', and hence when the ring-rail reaches a predetermined height the wire-board will be raised coördinately with it, and when the ring-rail falls the wire-board will fall to its point of starting, and this action will take place at each waive of the ring-rail.

By adjusting the lower end of the link v up or down in the slot of the pendent lever the extent of action of the latter upon the bar u will be lessened or increased, and by the vertical adjustment of the arm b' the action of the arm i thereon may be increased or lessened in extent. By adjusting the arm b' horizontally the arm i can be made to act thereon sooner or later in the building up of the cop.

The important features of the invention are its simplicity, ease of operation, wide range, and readiness of adjustment to suit it to varying requirements and conditions and its complete efficiency in the performance of its prime functions.

When the conditions are such that the tension on the yarn becomes too great—a thing that often occurs when the work runs light—it is necessary without an improvement such as is herein described to change the traveler to make it lighter in order to reduce the tension. By my invention the change of travelers is entirely obviated, and by the several adjustments, which are quickly and easily made at any time in the filling of the quill, the greatest control of the tension on the yarn and the ballooning of the same is secured.

If the tension or drag on the yarn should be too great or greater than could be sustained by the yarn, the operative by merely moving the pendent arm y to the left, as viewed in Fig. 1, may raise the wire-board to its highest point or as high as may be desired, where it will be held, which will instantly relieve the excessive drag, a thing that, so far

as I know, is not readily accomplished by any device or means at present in use. Again, when the yarn is heavy, as it often is, the tension thereon is too slight, and consequently the threads whip together and break down. Usually this is controlled by changing the travelers from lighter to heavier. By my device this change is rendered unnecessary.

It will be understood that by adjusting the arm b' to the left, as viewed in Fig. 1, so that the arm i will not strike it in any of the movements of the latter throughout the filling of the bobbin, the wire-board l will be allowed to remain down to its lowest position, thus causing more tension or drag on the threads and keeping them from whipping together. This may be resorted to when the threads or yarns are extremely heavy.

It will be seen that my invention is capable of such regulation and control as to control the ballooning of the yarn in warp-spinning frames where it is greater when the bobbin has attained its full diameter than when the building is just beginning.

In short my invention is capable of avoiding the use of separators, rendering unnecessary the changing of travelers, preventing "marriages" and breaking down of ends, and securing better yarn and wind of cops by keeping the tension on the yarn practically regular.

Having thus explained the nature of my invention and described a way of using the same, though without attempting to set forth all of the forms in which it may be constructed or all of the modes of its use, it is declared that what is claimed is—

1. A ring-spinning frame embodying in its construction a wire-board adapted to be raised and lowered, a ring-rail, means for reciprocating the ring-rail, a pendent lever, means intermediate of the pendent lever and the means for reciprocating the ring-rail to actuate the former, and operative means intermediate of the pendent lever and the wire-board for raising the latter.

2. The vertically-adjustable wire-board combined with the pendent lever, its connections with the wire-board, the arm b' vertically and horizontally adjustable on the pendent lever, and the bell-crank lever for acting upon the said arm.

3. The vertically-adjustable wire-board combined with the pendent lever, its connections with the wire-board, the arm b' vertically and horizontally adjustable on the pendent lever, and the bell-crank lever for acting upon the said arm, and the rack-bar and pawl for holding the pendent lever after it is moved by the bell-crank lever.

4. The ring-rail and means for reciprocating it, a vertically-adjustable wire-board, the pendent lever and its connections with the wire-board, combined with operative means intermediate of the pendent lever and the means reciprocating the ring-rail to actuate the said pendent lever, a stationary rack-bar, and a pawl connected with the pendent lever that may be made to engage the rack-bar or be disengaged therefrom.

In testimony whereof I have hereunto set my hand, this 15th day of July, 1899, in the presence of two subscribing witnesses.

FRED M. GARCELON.

Witnesses:
W. S. LIZOTTE,
EULALIE PARSONS.