

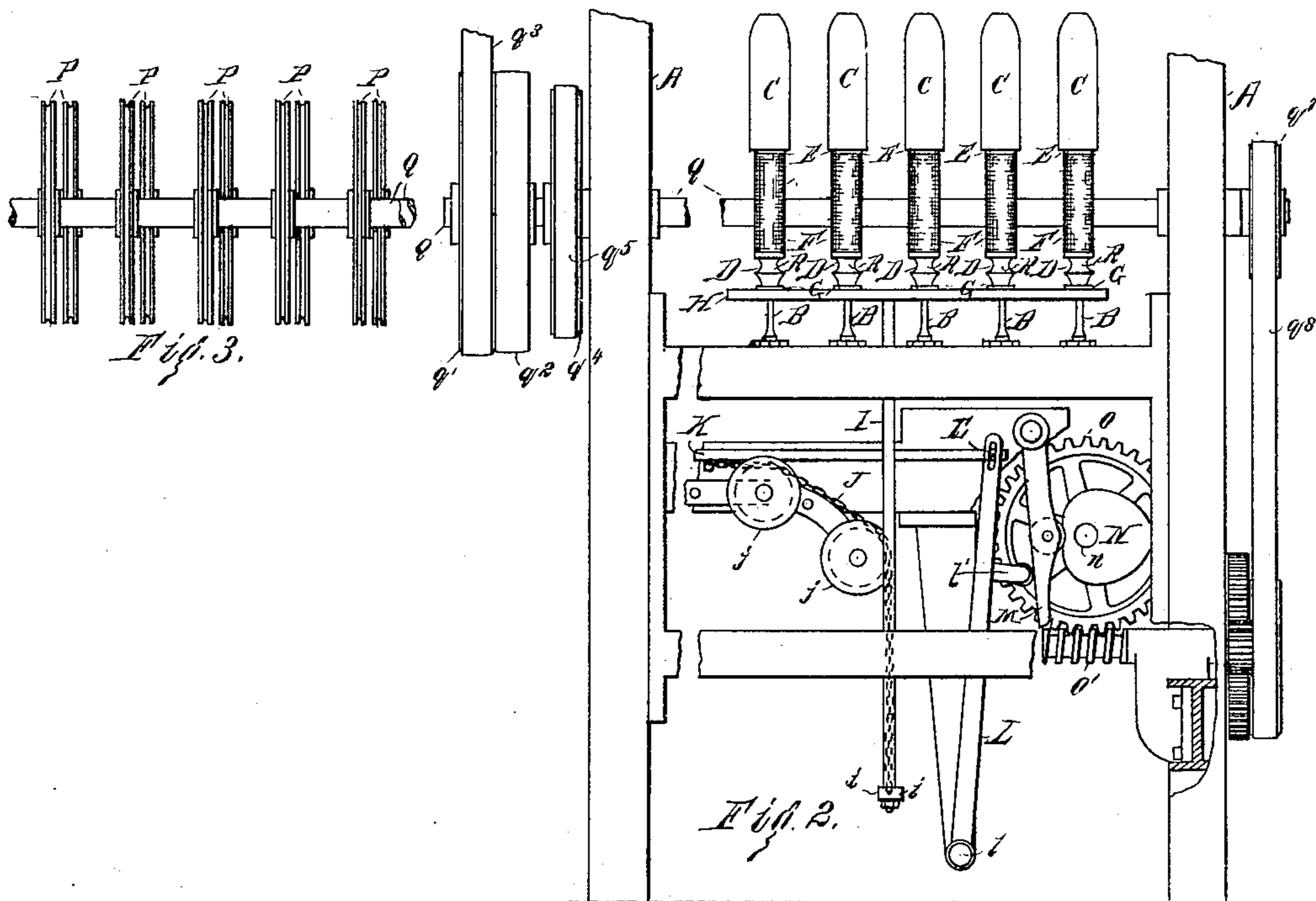
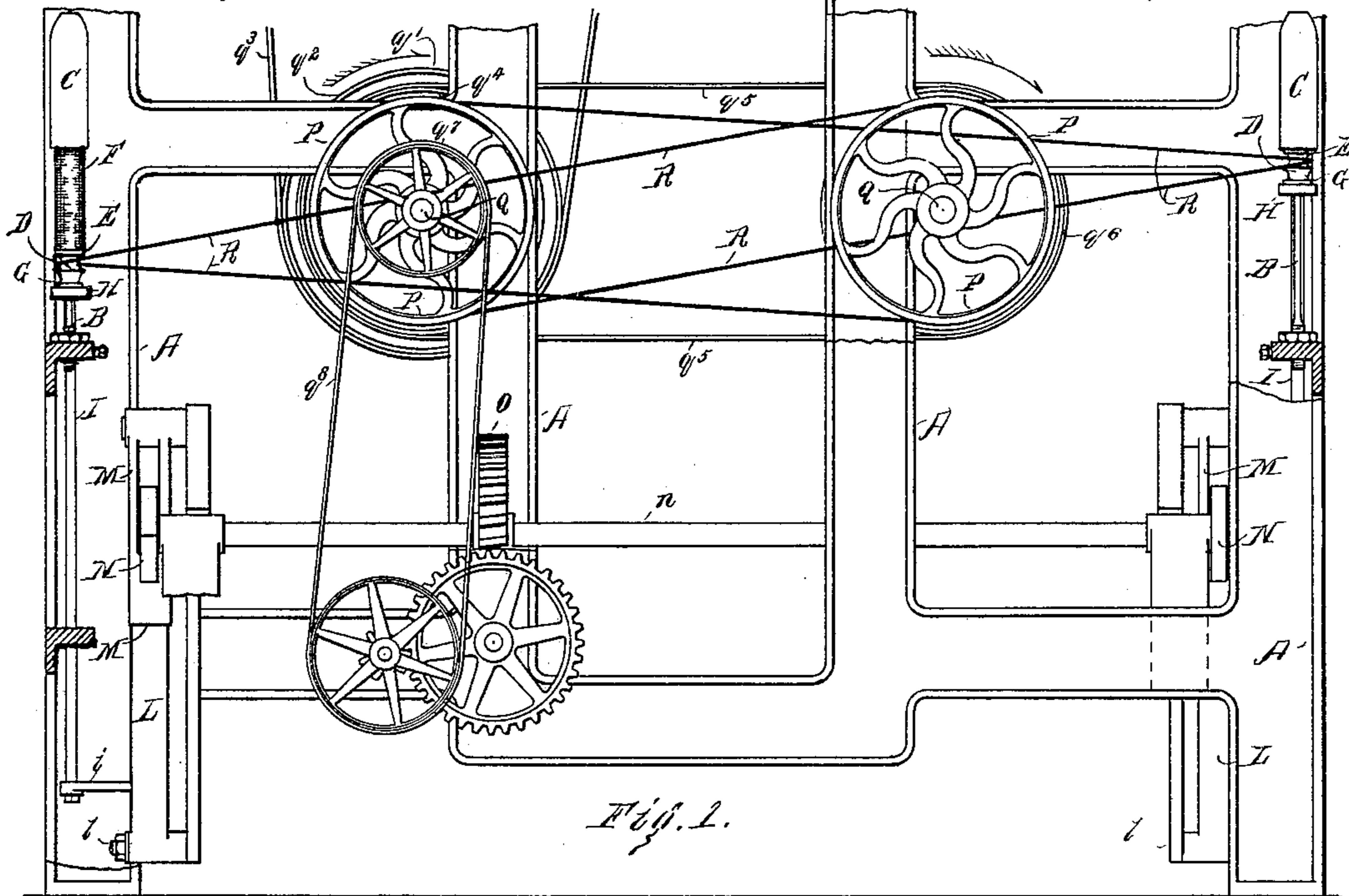
(No Model.)

W. RILEY.

CAP SPINNING AND TWISTING MACHINE.

No. 335,385.

Patented Feb. 2, 1886.



Witnesses—

Wiskley Hyde.
Gertrude M. Day.

Inventor—
Walker Riley,
By Albert M. Moore,
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UNITED STATES PATENT OFFICE.

WALKER RILEY, OF LOWELL, MASSACHUSETTS.

CAP SPINNING AND TWISTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 335,385, dated February 2, 1886.

Application filed October 1, 1885. Serial No. 178,703. (No model.)

To all whom it may concern:

Be it known that I, WALKER RILEY, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Cap Spinning and Twisting Machines, of which the following is a specification.

My invention relates to cap spinning and twisting machines; and it consists in the improved means, hereinafter described, of driving the whirls and bobbins or spools of the same.

In the accompanying drawings, Figure 1 is an end elevation of as much of a cap-spinning machine provided with my improvement as is necessary for understanding said improvement, the upper part of the frame being broken away, and the corner parts of the frame being broken away to show the lifting mechanism, the spindles, spools, whirls, and caps; Fig. 2, a side elevation of a part of the frame and the driving and lifting mechanism, with spindles, whirls, spools, and caps; Fig. 3, a side elevation of a part of the band-pulleys and their shafts.

A is the frame of the machine. B B are vertical stationary or dead spindles; C C, stationary caps or tubes having closed upper ends and resting upon the tops of the spindles, the caps usually having conical holes in their upper ends, which receive the tapering upper ends of the spindles; D D, whirls, which support the bobbins or spools E E (warp-spools are represented in the drawings) and rotate the same; F F, cops on said spools; G G, washers surrounding the spindles loosely and supporting the whirls; H H, horizontal lifter-plates, one on each side of the machine, on which the washers G G rest, and which being raised or lowered raise or lower said washers, whirls, spools, and cops, when raised carrying the spools and cops up into the caps, the friction or drag of the yarn on the caps causing twisting of the yarn, the lower end or edge of the caps guiding the yarn onto the spool, and causing it to be wound evenly between the heads of the same; I I, vertical-lifter rods, (of which there are several on each side of the machine,) the upper ends of which are secured to the lifter-plates H H, and the lower ends

of which are provided with horizontal arms *i i*, to each of which is attached one end of a lifter-chain, J, (there being as many chains J as rods I, one being shown in Fig. 2,) which chain J, being carried over pulleys *j j*, is attached at the other end to a horizontally-sliding rod, K, (there being one such rod at each side of the machine,) the lifter-lever L having a fulcrum, *l*, at its lower end, and at its upper end connected to said rod K and provided with a projection, *l'*, against which another lever, M, (pivoted at its upper end,) is pushed by the revolution of the heart N, to slide the rod K and lift the whirls and spools. The heart or cam N, secured on the same shaft *n* with the worm-gear O, and caused to rotate by the worm O', are all of the usual construction and operation, except as hereinafter stated.

The spindles, bobbins, whirls, and caps are commonly arranged in two rows, as shown—one row at each side of the machine—and the whirls and bobbins are caused to rotate by bands (a separate band for each whirl) connecting said whirls and a band-cylinder which runs from end to end of the machine, near the middle thereof, and serves to drive all of said whirls and spools. As the band-cylinder rotates around a stationary horizontal axis, the rising and falling of the whirls stretches the driving-bands, the tension of these bands being least at the middle of the traverse. When the whirl is at the top of its traverse, the tension of the driving-band is so great as to bend the dead-spindles with their caps toward the band-cylinder. It will be seen that the common construction of the whirl-driving mechanism causes the spools and whirls to traverse in an arc instead of in a straight line, requiring more power to drive the whirls and spools, and greatly limiting the length of the traverse; in other words, limiting the length of the spool, and therefore limiting the capacity of such spool for holding yarn, the length of the traverse being the distance between the heads of a spool. It is desirable that the spindles should stand vertically, in order that the friction of the yarn on the cap may be the same on every side of the cap during the entire traverse. The defects complained of might be remedied by making the spinning-frame

wider, and so making the distance between the spindles and the band-cylinder greater; but this would make the machine more bulky and cause it to occupy more floor-space. I attain
 5 the same or a better result by dispensing entirely with the band-cylinder, and using instead thereof two series of grooved band-driving pulleys, P, having about the same diameter as the ordinary band-cylinder. The
 10 grooved pulleys P are secured on two shafts, Q, placed as near as conveniently may be to the rows of spindles, and the whirls of each row are revolved by bands R, which pass around them and around the grooved pulleys
 5 P farthest from them, above and below the shaft of the other series of grooved pulleys and in the intervals between said last-named pulleys. The greater the distance between the whirls and the band-pulley the more nearly
 10 uniform will be the strain of the driving-band throughout the entire traverse, because the arc described by the whirl, connected by a driving-band to the band-pulley, and perfectly
 5 free to move in an arc about the axis of said pulley, would be more nearly straight for a given length of traverse the greater the distance between said whirl and axis. The distance, however, to which one series of band-pulleys may be set from the whirls driven by
 10 them is limited by the fact that the driving-bands of the other series of whirls must be free to rise and fall without striking the shaft of the first-named series of band-pulleys. One of the
 5 shafts Q is driven just as the band-cylinder is usually driven, being provided with a loose pulley, q' , and a fast pulley, q^2 , and is driven by a belt, q^3 . This shaft has another pulley secured to it, q^4 , which is connected by a belt, q^5 , to a similar pulley, q^6 , on the other shaft Q. The
 10 first-named shaft Q serves as the main shaft of the machine, and is provided with another fast pulley, q^7 , from which a belt, q^8 , drives the lifting mechanism, just as said mechanism is commonly driven from the band-cylinder.

With the above-described arrangement and
 45 construction bobbins and spools may be made twice as large, or, in other words, the traverse may be twice as long, with less wear and tear of the bands. The effect of using twice
 50 as large spools or bobbins is, that less piecing of the yarn is required, and there will be fewer knots in the yarn, the cloth made from the yarn will be more free from broken picks, the spinning-machine will need to be stopped less frequently for doffing, the loom will require to
 55 be stopped less frequently on account of bad work, and the production of the mill will consequently be greatly increased.

The improvement above described causes less wear of the bands of the flanges of the
 60 whirls, and the increased length of the bands gives them greater elasticity and makes them less liable to draw the spindles and caps out of position.

The invention above described is equally
 65 useful for driving filling-bobbins.

I claim as my invention—

A spinning-machine having two parallel rows of dead-spindles on opposite sides thereof, whirls free to turn on said spindles and
 70 to rise and fall thereon, and to engage with and to rotate spools or bobbins surrounding said spindles, two series of band-pulleys, two parallel shafts arranged between said rows of
 75 spindles, to each of which shafts is secured one of said series of pulleys and two series of driving-bands, each series of such bands passing around the whirls of one row and around the band-pulleys of the series farthest from
 80 such whirl, and above and below the shaft of the series of band-pulleys nearest such whirl, and between the pulleys of said last-named series, as and for the purpose specified.

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Witnesses:

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