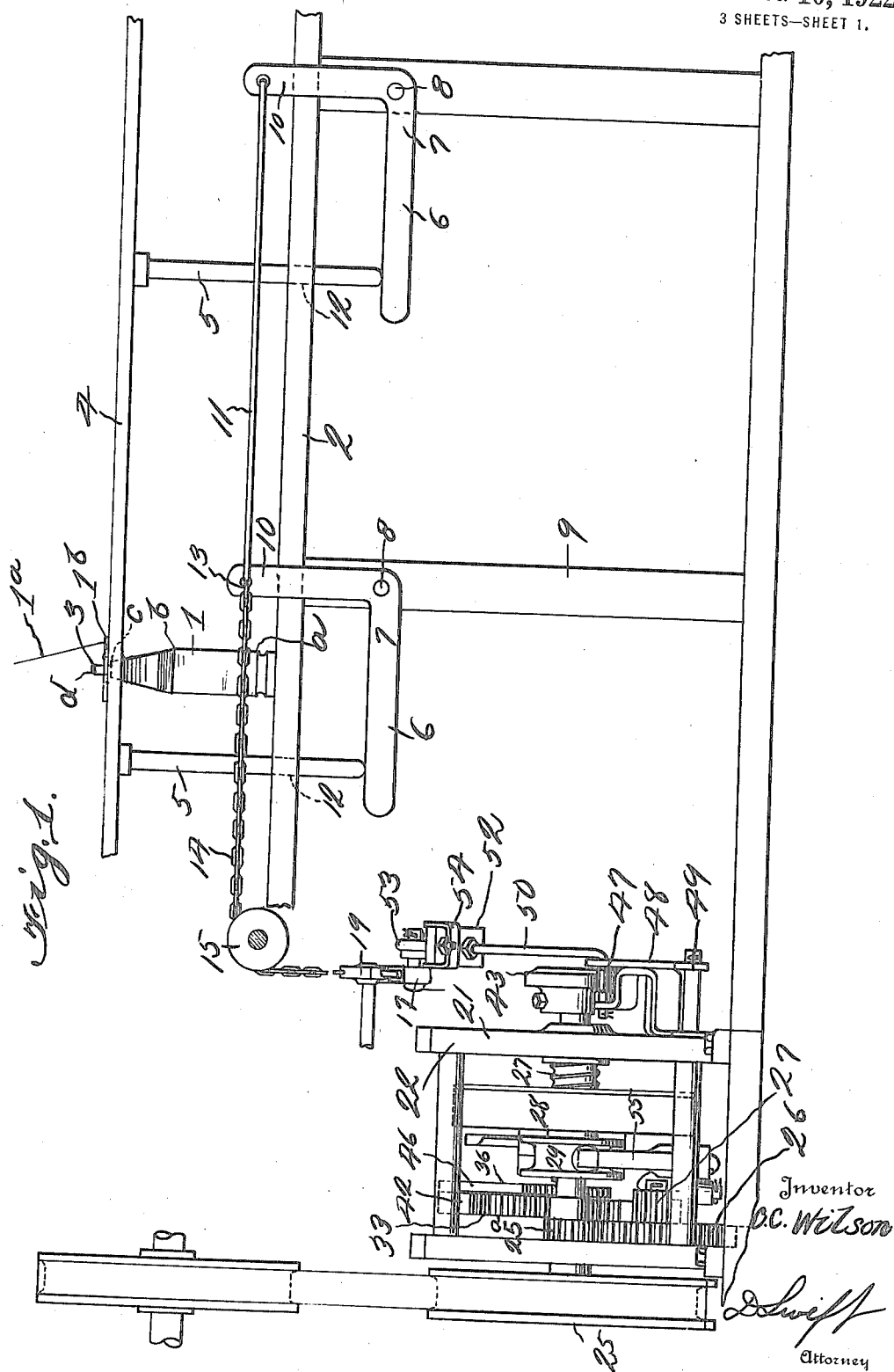


1,431,498.

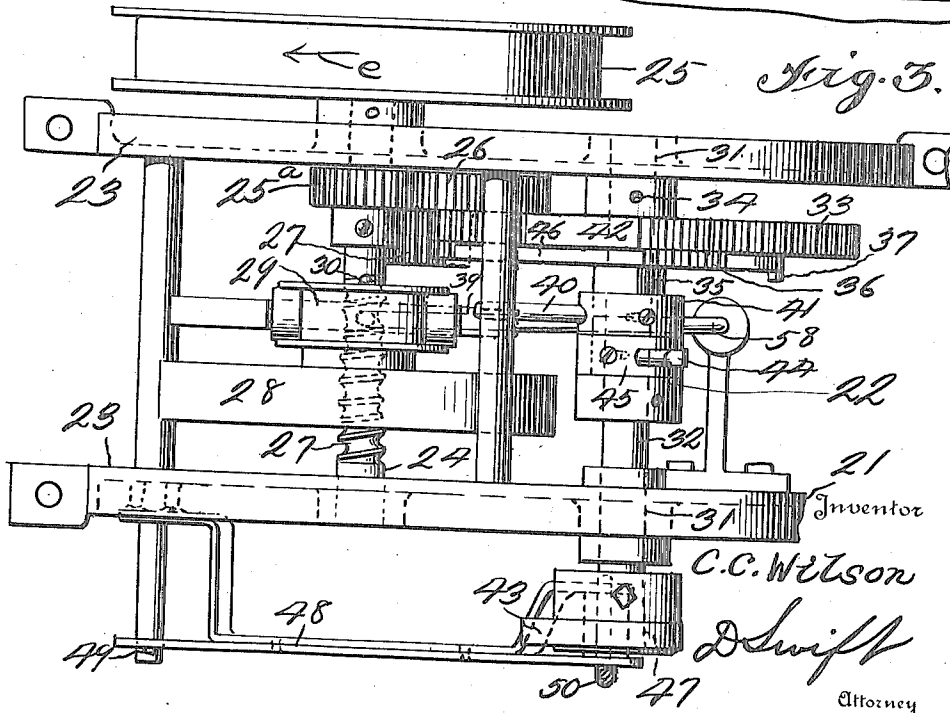
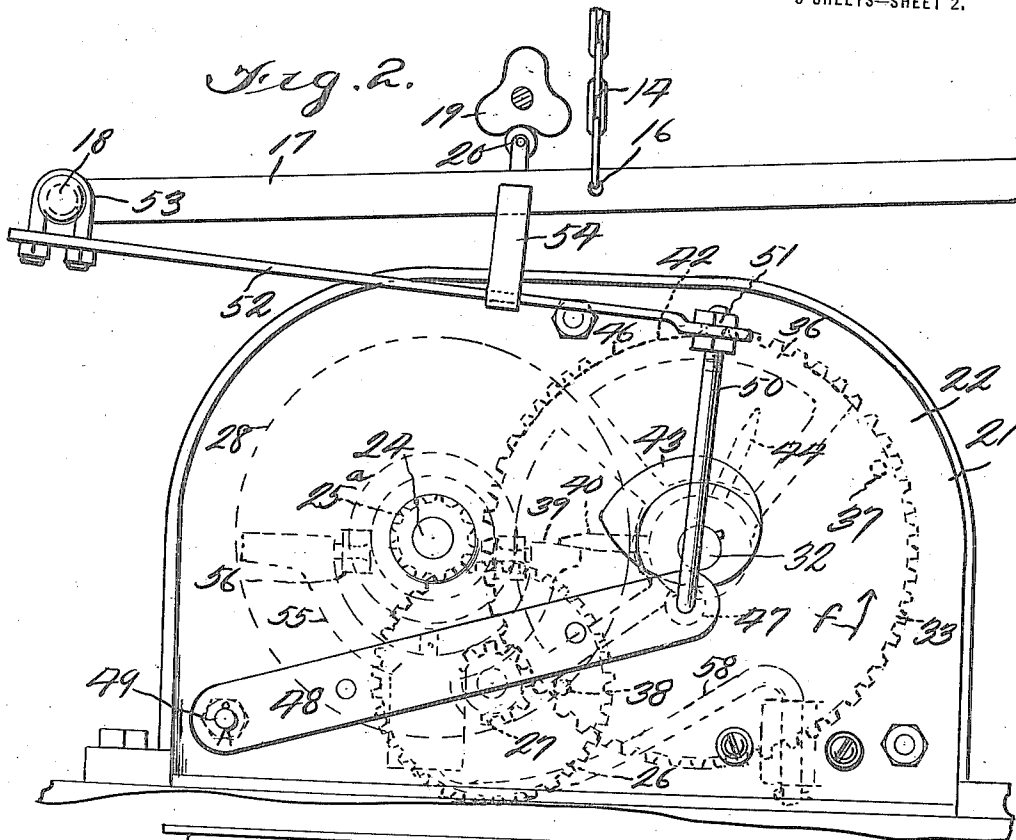
3 SHEETS—SHEET 1.



C. C. WILSON.
CONTROLLING DEVICE FOR RING RAILS.
APPLICATION FILED JULY 26, 1921.

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Patented Oct. 10, 1922.
3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 4.

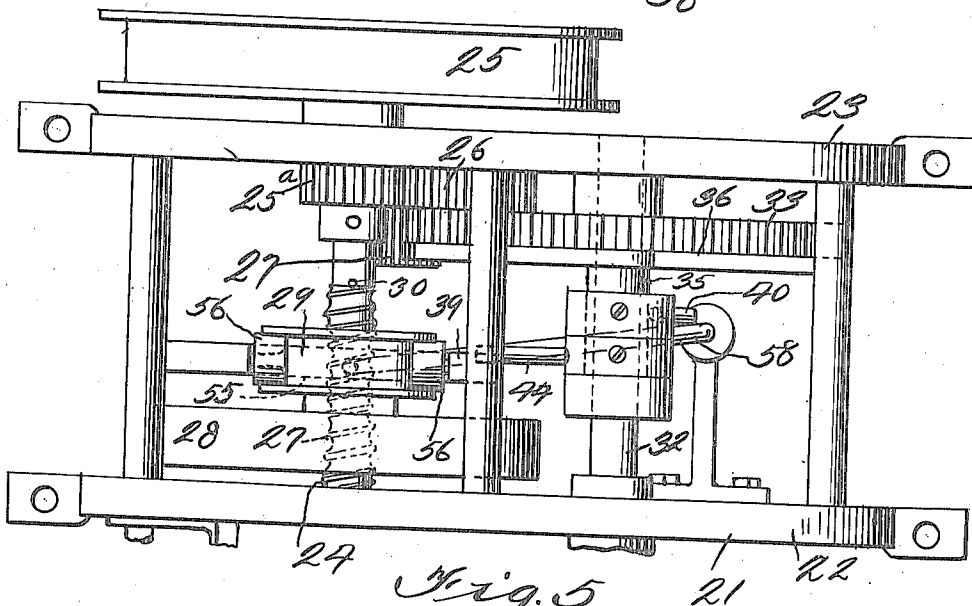
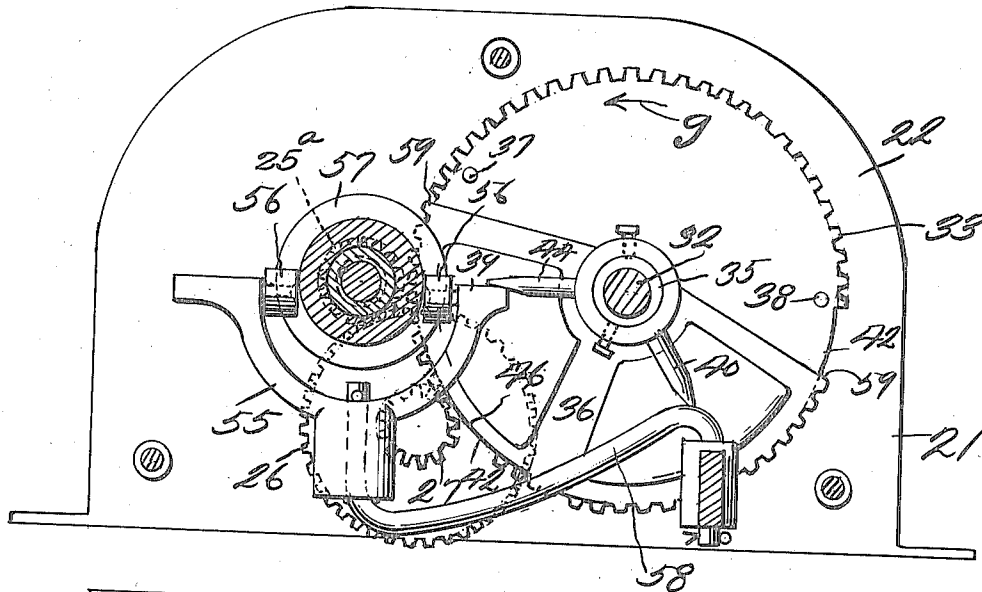


Fig. 5.

Inventor

C. C. Wilson

By

D. Luff

Attorney

UNITED STATES PATENT OFFICE.

CHARLES CLEVELAND WILSON, OF KINGS MOUNTAIN, NORTH CAROLINA.

CONTROLLING DEVICE FOR RING RAILS.

Application filed July 26, 1921. Serial No. 487,774.

To all whom it may concern:

Be it known that I, CHARLES CLEVELAND WILSON, a citizen of the United States, residing at Kings Mountain, in the county of Cleveland, State of North Carolina, have invented new and useful Controlling Devices for Ring Rails; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to controlling devices for ring rails of spinning and twisting machines, and has for its object to provide a device of this character whereby upon shutting off of the power which operates the machine, or if the machine is stopped from any other reason, such as breakage of the belt the ring rail will be automatically returned to what is known as the bottom change of the ring rail. It has been found that where machines of this character stop for any reason part of the ring rails are at or near the bottom change and the other half at or near the top change, therefore it is a primary object of the invention to provide a ring rail controlling mechanism which will restore the ring rails to what is known as the bottom change upon the stopping of the machine.

In the manufacture of yarn, especially filling there is considerable labor and waste incident to loss of power, such for instance as electric power being shut off for any purpose, at which time of sudden loss of power about one-half of the ring rails are at or near the bottom change, and the other half are at or near the top change, those at the bottom are full of yarn, and when the machine is again started, the yarn being out near the traveler which is disposed on said ring rail, said traveler will start off easily with the bobbin and not break the thread or cause extra labor or waste. The other half of machines stopping on or near top change, will, when they are again started incident to the bobbins being so small and so far from the ring, pull the thread almost to the center of said ring; under these conditions the traveler will not start off easily, and in most instances the thread will be broken, thus causing a lot of extra labor, loss of yarn, and decreased production. Therefore it is a further object of the invention to obviate the above difficulties.

A further object is to provide means whereby ring rails of spinning and twisting machines will, upon sudden shutting off of power be returned to bottom change position, said automatic returning of the ring rail being accomplished through mechanism actuated through the momentum of a fly wheel, and through a cam actuated lever connected to the ring rail through levers and chains.

A further object is to obviate the present practice of operators stopping off machines several minutes before noon and before quitting time in the afternoon as they find a ring rail at bottom change, thereby allowing them to start up the machine after noon or in the morning without breaking the yarn.

A further object is to provide in combination with a builder lever of a spinning and twisting machine, which builder lever controls the upward and downward movement of the ring rail, a momentum actuated mechanism, which mechanism will, no matter where the builder lever stops, return the builder lever to bottom change position and hold the same in said position until the spinning machine is again started, at which time the ring rails will be left entirely to the control of the builder lever.

With the above and other objects in view the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawings, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:—

Figure 1 is a front elevation of the controlling mechanism showing the same applied to a ring rail.

Figure 2 is an enlarged side elevation of the controlling mechanism showing the same in normal inoperative position.

Figure 3 is a top plan view of the controlling mechanism showing the same in inoperative position.

Figure 4 is a vertical longitudinal sectional view through the device showing the same in operative position for pulling downwardly on the builder arm.

Figure 5 is a top plan view of the controlling mechanism in operative position.

Referring to the drawings, the numeral 1 designates a bobbin, which bobbin is dis-

posed on a spindle rail 2 and carried by a spindle 3, the yarn 1^a being fed thereto in the usual manner from a ring rail ring 1^b carried by the ring rail 4. The traveler on the ring 1^b revolves as the yarn 1^a is wound on the bobbin and it will be seen that as the ring rail 4 approaches its upper end that the angle of pull will be nearer the axis of the spindle 3 than when the ring rail is further down, therefore the greatest strain on the yarn 1^a is when the ring rail is in the position shown in Figure 1. In bobbins of this character the distance from *a* to *d* is about six inches. The letter *a* designates the point where the ring rail 4 starts to lay the yarn on a fresh doff of quills. The ring rail 4 is designed to make a stroke of about one and one-half inches on the filling motion, however this may be varied in height as desired and controlled in any suitable manner. During the spinning and twisting operation the ring rail continues to travel the bobbin and during said running of the machine the ring rail 4 moves to the bottom change *b* and to the top change *c*. During the running of the machine if for any reason, for instance loss of power, the ring rails 4 will stop in various positions, therefore the mechanism hereinafter set forth is designed to return the ring rails 4 to bottom change *b* where the strain on the yarn 1^a will be reduced to a minimum when the machine is again started. The spindles 3 are carried on the spindle rail 2. Extending downwardly from the ring rail 4 are shafts 5, the lower ends of which rest upon arms 6 of bell crank levers 7, which bell crank levers are pivotally mounted at 8 to a portion of the spinning machine frame 9. Arms 6 are substantially horizontally disposed and the arms 10 of the bell crank levers 7 are connected together by means of connecting rod 11, by means of which connecting rod the bell cranks 7 will be simultaneously moved thereby simultaneously moving the shafts 5 vertically in their bearings 12 in the spindle rail. Connected at 13 to one of the arms 10 is a chain 14, which chain passes over a pulley 15 which may be secured to the frame in any suitable manner and thence downwardly and has its end connected at 16 to the builder arm 17 of the machine, said builder arm being pivoted at 18 and is rocked upwardly and downwardly by means of the star cam 19, which rides over a roller 20 carried by the builder arm 17. It will be seen that as the star cam 19 is revolved that the ring rail 4 will be moved upwardly and downwardly between the bottom *b* and the upper change *c*, thereby laying the yarn on the quill. The above mechanism is a conventional one, and it will be seen that the ring rail, when the machine is stopped for any reason, will be left at any position between the points *b* and *c*, and if left near the

point *c*, it is obvious that if the machine is started, that the quill is pulling from a point close to its axis and therefore greatly increasing the possibility of breakage of the yarn. The mechanism hereinafter set forth is designed to upon stoppage of the machine hold downwardly on the builder arm and return the ring rail to the bottom change *b*.

Disposed adjacent the spinning machine and preferably below the builder arm 17 is a frame 21 of the controlling mechanism 22. The frame 21 comprises spaced vertically disposed plates 23 in which plates a shaft 24 is rotatably mounted, said shaft has secured to one of its ends a pulley 25, which pulley may be driven from any point of the spinning and twisting machine, such for instance as from the spindle driving cylinder, not shown. The pulley 25 constantly rotates during the operation of the spinning and twisting machine. Secured on the shaft 24 is a gear 25^a which gear constantly rotates with the shaft. Gear 25^a meshes with a large idle gear 26, which idle gear is provided with a small idle gear 27, said small idle gear 27 and idle gear 26 constantly rotate with the drive pulley 25 at all times while the spinning and twisting machine is in operation. Shaft 24 adjacent one of its ends is provided with threads 27 and on which threaded portion of the shaft a fly wheel 28 is mounted, said fly wheel being provided with an integral collar 29 which moves therewith. During the operation of the spinning and twisting machine when the wheel 28 is rotating in the direction of the arrow *e* in Figure 3 the collar 29 engages the stop end 30 carried by the shaft 24 and prevents movement of the fly wheel 28 in the direction of the pulley 25. It will be seen that fly wheel 28 and its collar 29 during the rotation of the pulley 25 in the direction of the arrow *e* will rotate with the shaft 24, and will not modify or change the operation of the ring rail operating mechanism.

Rotatably mounted in bearings 31 of the side members 23 is a countershaft 32, on which countershaft a large drive gear 33 is secured at 34, and loosely mounted on said shaft is a sleeve 35, which sleeve carries a segmentally shaped gear 36. It will be seen that sleeve 35 is free to rotate on counter shaft 32 and that segmentally shaped gear 36 may play between the stops 37 and 38 carried by the main drive gear 33. Also that when the segmentally shaped gear passes beyond a vertical central line through itself that it will drop by gravity to one side of its axis.

If for any reason the machine is stopped the shaft 24 will be slowed down or stopped, however the fly wheel 28 which is threaded on a shaft will under the influence of its momentum continue to rotate. As the fly wheel 28 continues to rotate it will feed to

ward the end of the shaft, thereby feeding its collar 29 towards the outer end of the shaft, which action will move the stop lug 39 from under the stop finger 40, which 5 finger is carried by the collar 41 secured to the sleeve 35 of the segmentally shaped gear 36. This action allows the segmentally shaped gear 36 to drop until its lower corner engages the lug 38 and is in mesh with 10 the idle gear 27. However during this operation the portion 42 of the gear 33 which is without teeth is in registration with the idle gear 27, and as the shaft 24 continues to rotate by momentum of the spinning machine under the influence of the fly wheel 28 15 the large drive gear 33 is rotated in the direction of the arrow *f* by the engagement of the lower corner of the segmentally shaped gear 36 with the lug 38. The continued rotation of the fly wheel by the momentum of 20 the spinning machine, will revolve the segmentally shaped gear 36 and the main drive gear 33 until the cam carried by the end of the countershaft 32 is reversed in position 25 to that shown in Figure 2 which is its normal inoperative position, said cam being designated by the numeral 43. It will be seen that the stop 39 when moved out of registration with stop finger 40 is moved into 30 vertical alignment with a stop finger 44 carried by a collar 45 which is secured to the sleeve 35 of the segmentally shaped gear, therefore as the fly wheel 28 continues its rotation the stop finger 44 will engage the stop 35 39 as shown in Figure 5, at which time the segmentally shaped gear 36 will be held against further downward movement, however the large drive gear 33 will continue to rotate until the portion 42 thereof which is not provided with teeth will be opposite the gear 27 and as the segmentally shaped gear 36 during its movement has moved to a point 40 where its portion 46 which is not provided with teeth will also be opposite the gear 27, therefore the cam will have been moved to its downward position opposite to that shown in Figure 2 and will not be further rotated. As the cam 43 rotates it engages a roller 47 45 carried by a pivoted arm 48, which arm is pivoted to a frame 21 at 49, therefore the pivoted arm 48 is forced downwardly. The free end of the pivoted arm 48 is provided with an upwardly extending arm 50, the upper end of which is connected at 51 to a 50 pivoted arm 52, which arm is pivotally mounted by means of a T-shaped bolt 53 which extends over the member forming the pivotal point 18 of the builder arm 17. Arm 52 extends through a yoke 54 carried 60 by the builder arm 17 in such a manner that as the cam 19 rotates during a normal operation the yoke 54 will move downwardly without being interfered with by the arm 52. However upon a downward rotation of 65 the cam 43 the builder arm 17 will be pulled

downwardly and held downwardly, as the mechanism above set forth has moved through an operation incident to the stopping of a spinning and twisting machine and consequently the builder arm 17 has been 70 moved downwardly no matter where the cam has moved the same to at the time of stopping of the machine. When the builder arm 17 moves downwardly under the influence of the cam 43 a pull is imparted on the chain 75 14, which action rocks the bell crank levers 7 and moves in such a manner as to allow the ring rails 4 to move downwardly to bottom change position *b*, at which position it is necessary for the ring rails to be located 80 upon starting of the machine. It will be seen that no matter for what reason the spinning machine is stopped the ring rails will be normally positioned at the bottom change *b*. 85

The movable stop 39 is carried by a yoke 55, which yoke is movable with the collar 29 and is provided with guide rollers 56, which move in an annular channel 57 thereof, yoke 55 is pivoted on a pivoted arm 58, which 90 arm supports the yoke while it is being moved laterally during a stop shifting operation, therefore it will be seen that the stop 39 will move whenever the fly wheel 28 moves. 95

The spinning machine having been stopped it will be seen that the fly wheel 28 is in its outer position, however when the machine is started and the pulley 25 again revolved in the direction of the arrow *e*, 100 the fly wheel will be fed inwardly and the stop 39 also moved from under the stop finger 44 from the position shown in Figure 4. When the stop 39 moves from under the stop finger 44, the segmentally shaped gear 36 105 drops into mesh with the idle gear 27, and the continued rotation of the idle gear 27 will rotate the segmentally shaped gear 36 until its corner 59 moves into engagement with the lug 38, thereby causing the large 110 gear 33 to be rotated into mesh with the idle gear 27 which constantly rotates, which action will cause the large drive gear 33 to continue to rotate until the lug 37 moves downwardly in the direction of the arrow *g* 115 and engages the end 59 of the segmentally shaped gear 36 and lifts said gear against its own gravity until it is again positioned as shown in Figure 3, with its stop finger 40 again in engagement with the stop 39 which 120 has been moved into registration therewith, the blank space 42 in the gear 33 in registration with the idle gear 27 and the segmentally shaped gear 36 with its end 59 in engagement with the stop 58 having made part 125 of its movement by gravity and assumed the position shown in Figure 2. It will be seen that the cam has been restored to its normal upper position as shown in Figure 2, the above operation being repeated upon each 130

stopping and starting of the spinning and twisting machine. The gear 33 is provided with two places 42 where teeth are eliminated, however said spaces are utilized alternately during the two main operations of the device, that is the upper and lower stopping of the cam.

From the above it will be seen that a controlling mechanism for spinning and twisting machines is provided which is positive in its operation and one wherein the ring rail will be positively returned to what is known as the bottom change of the ring rail, which position is the one from which the machine must be started to prevent breaking of the yarn.

The invention having been set forth what is claimed as new and useful is:—

1. The combination with the controlling mechanism for traversing a ring rail between a bottom change and an upper change of a quill of spinning or twisting machine, of means whereby upon stoppage of the spinning or twisting machine said ring rail when stopped above the bottom change will be automatically returned to its bottom change position.
2. The combination with the controlling mechanism for traversing a ring rail between a bottom change and an upper change of a quill of a spinning or twisting machine, of means whereby upon stoppage of the spinning or twisting machine with the ring rail between its upper and lower limited traverse said ring rail will be automatically returned to its bottom change position, and means whereby upon starting of the spinning or twisting machine said ring rail will be allowed to traverse the quill.
3. The combination with the builder arm of a traverse controlling mechanism for a ring rail, said ring rail moving between bottom and upper change positions, of means connected to said builder arm whereby upon stoppage of the builder arm, said builder arm with the ring rail above the bottom change position will be automatically controlled for returning the ring rail in its bottom change position.
4. The combination with the builder arm of a traverse controlling mechanism for a ring rail, said mechanism being carried by a spinning or twisting machine, of means connected thereto that upon stoppage of the spinning or twisting machine with the ring rail between bottom and upper change positions said builder arm will be controlled in such a manner as to return and hold the ring rail at a predetermined point on the quill and means whereby upon again starting the spinning machine the ring rail will be automatically allowed to resume its traverse of the quill.
5. The combination with the builder arm of

a ring rail control mechanism of a spinning or twisting machine, of a controlling mechanism for pulling downwardly the builder arm upon stoppage of the spinning or twisting machine with the ring rail between the bottom and upper change positions, said mechanism comprising a rotatable threaded shaft constantly rotated with the spinning machine, a fly wheel threaded on said shaft and adapted to move axially thereon, a counter shaft located adjacent said threaded shaft, gears carried by said shaft and normally out of mesh with each other, said fly wheel forming means whereby upon stoppage of the threaded shaft the fly wheel will be moved axially the gears moved into mesh with each other and the countershaft rotated one third a revolution, and means carried by said countershaft and cooperating with the builder arm for moving said builder arm and holding the same downwardly.

6. The combination with the builder arm of a ring rail controlling mechanism of a spinning or twisting machine, of controlling mechanism for pulling downwardly on said builder arm and holding the same in downward position upon stoppage of the spinning or twisting machine with the ring rail between the bottom and upper change positions, said mechanism comprising spaced shafts, one of said shafts having threaded thereon a fly wheel, gears carried by said shafts and normally out of mesh with each other, a cam carried by the non-threaded shaft, a rockable arm disposed beneath said cam and forced downwardly thereby, an arm carried by said rockable shaft, the upper end of said arm being connected to the end of a lever carried by the builder arm, said lever being movable in a yoke carried by the builder arm, said fly wheel forming means whereby upon stoppage of the threaded shaft and the spinning or twisting machine the gearing will be moved into mesh, the cam rotated for forcing the rockable shaft downwardly and pulling downwardly on the builder arm, said cam holding the builder arm in its down position.

7. The combination with the builder arm of a ring rail controlling mechanism of a spinning or twisting machine, of controlling mechanism for pulling downwardly on said builder arm and holding the same in downward position upon stoppage of the spinning or twisting machine with the ring rail between bottom and upper change positions, said mechanism comprising spaced shafts, gear connections between said shafts and normally out of mesh, a fly wheel threaded on one of said shafts, the other shaft being provided with a cam cooperating with a rockable arm having a connection with the builder arm, mechanism con-

trolled by said fly wheel which revolves
after the stoppage of the threaded shaft
whereby said gears will be moved into mesh
and the cam carried shaft rotated one third
5 turn for forcing downwardly on the rocka-
ble arm and holding the same in down posi-
tion, said fly wheel forming means where-
by upon starting of the spinning or twist-
ing machine the cam will be rotated to its
10 normal position, the builder arm will re-

lease from control and the gear connections
between the shafts released.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

CHARLES CLEVELAND WILSON.

Witnesses:

H. W. ALLMAN,
W. H. CARPENTER.