This invention relates broadly to textile spinning frames and more particularly to mechanism for automatically operating spinning frames in a desired cycle of operation.

An object of the invention is to provide mechanism in the nature of an attachment unit for existing or new spinning frames, operable in conjunction with the conventional builder motion and electrical components including timer means to cause the spinning frame to build the bobbins, apply the tip bunch to the bobbins and lower the ring rail to the dofing position in a controlled manner and at a predetermined desired rate, all automatically.

Reference is made to our prior copending application Serial Number 137,102, filed September 11, 1961, for Automatic Tip Bunch Building Mechanism for Spinning Frames, and to prior copending application Serial Number 110,150, filed May 15, 1961, for Ring Rail Lowering Mechanism for Textile Spinning Frames, Harry R. Kennedy and Charles J. Andersen, inventors, which applications contain subject matter common to the present application.

In order to facilitate the operation of lowering the ring rail of a textile spinning frame for the purpose of dofing full bobbins, it is desirable to lower the ring rail at a rate which will not break the spun yarn and yet wind a minimum number of yarn wraps around the full bobbin. In the conventional, present-day spinning frames, the power to the spinning frame is either manually or automatically cut off when the bobbins are full. Next, the frame must be started manually and the ring rail is lowered manually while power is being applied. When the ring rail is depressed to its lowest position, it is locked in place and the spinning frame is then ready to have the full bobbins dofing.

With the above-described manual operation, it is possible to wind an excessive amount of yarn upon the bobbin, thereby, creating waste and making the bobbins difficult to use. This manual operation may also cause yarn to be broken and, therefore, cause a loss in production. In placing up the yarn so that it will again spin onto the bobbin. The aforementioned manual operation of the machine is not only laborious, but requires some degree of skill on the part of the operator. In many instances, it is necessary to resort to a "jogging" operation of the spinning frame to properly lower the ring rail for dofing.

According to the present invention, the above difficulties incident to the lowering of the ring rail are fully overcome by the provision of simplified electro-mechanical means driven by the front draft roll of the spinning frame to first automatically release the ring rail at its normal top position and after building of the bobbins so that the ring rail may shift upwardly to build the tip bunch and secondly lower the ring rail to the dofing position at the desirable rate and in a controlled manner and to automatically stop the operation of the spinning frame as required.

A further object of the invention is to provide automatically releasable connecting means between the existing builder motion and the existing ring rail lifter mechanism for releasing the lifter mechanism from the influence of the builder motion at a predetermined point to effect the building of the tip bunch upon the tops of the full bobbins.

Another object is to provide novel and simplified means for releasably locking the ring rail in the lowered or bobbin dofing position.

Another object is to provide limit switch means for regulating the operation of timer mechanism employed in connection with and coordinating the operation of the other elements of the invention.

A still further and more general object is to provide mechanism of the mentioned character for operating spinning frames which will result in the production of more uniform bobbins, reduce the time necessary to build the bobbins, build the tip bunch, reduce yarn breakage and wastage during lowering of the ring rail and generally increase the overall efficiency of operation of the spinning frame.

Other objects and advantages of the invention will be apparent during the course of the following detailed description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same.

FIGURE 1 is a partly diagrammatic fragmentary front elevation of a spinning frame equipped with the operating or control mechanism according to the invention.

FIGURE 2 is an enlarged central vertical section through the ring rail operating and control unit forming an important part of the invention.

FIGURE 3 is a vertical section taken on line 3—3 of FIGURE 2.

FIGURE 4 is a wiring schematic showing the electrical circuitry employed in connection with the invention.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, attention is directed first to FIGURE 1 showing in part conventional components of a spinning frame which need not be dealt with in great detail herein. Briefly, the conventional spinning frame embodies the usual fixed horizontal spindles 10 upon which a multiplicity of spindles 11 is mounted for rotation in unison, the spindles carrying the well-known bobbins 12. A vertically shiftable horizontal ring rail 13 is employed to guide the yarn onto the bobbins 12, and this ring rail is bodily supported by a plurality of vertically shiftable lifter rods 14 having guided engagement at 15 with the fixed spindle rail 10. Upward movement of the lifter rods 14 is controlled by the usual lifter arms 16 having counterweighted extensions 17 which bias the ring rail 13 upwardly. Conventional quadrants 18 mounted upon the rock shafts 19 of lifter arms 16 are linked together for operation in unison as at 20, and the several quadrants and lifter arms are under the influence of a simple flexible cable or chain 21 secured to a take up pulley 22 which turns on a vertical axis as will be further described in detail.

The numeral 23 designates the usual front draft roll of the spinning frame, connected at one end with gearing 24 adjacent to one frame end 25 of the spinning machine. A short horizontal drive shaft 26 carrying a miter gear 27 is journalled upon the frame end 25 and driven continuously by the gearing 24 during the operation of the spinning frame.

A ring rail control or operating unit 28, FIGURES 1 and 2, forming the heart of the present invention is suitably fixedly mounted upon the frame end 25 of the spinning machine near one end of the spindle rail 10. With continued reference to the drawings, the unit 28 embodies a rectangular housing 29 having upper and lower chambers 30 and 31, FIGURE 2, separated by a horizontal wall 32. The housing 29 has a top wall 33 carrying an upstanding tubular boss 34, receiving ball bearings 35 having a spacer ring 36 therebetween. A rotary clutch shaft 37 is journalled within the ball bearings 35 and held against axial displacement by snap rings 38, or the like. The upper end of clutch shaft 37 has
a miter gear 39 secured to it for constant meshing engagement with the miter gear 27 of drive shaft 26. The shaft 26 and gear 27 are driven in direct proportion to the rotation of the front draft roll 23 through the gearing 24. An electro-magnetic clutch 40 of a conventional type has its input rotary portion 41 secured at 42 to the shaft 37 to be turned thereby. The output rotary part 43 of the clutch 40 is likewise rigidly secured to 44 to a rotary pulley shaft 45, separate from the shaft 37 and having its end portions journaled for rotation in ball bearings 46 and 47, respectively in aligned openings in the intermediate wall 32 and a bottom wall 48 of the housing 28. Snap rings 49 engage the shaft 45 above and below lower ball bearing 47 to prevent endwise movement of the shaft 45. When the clutch 40 is energized by means to be described, rotation of the shaft 37 is transmitted directly to the shaft 45, whereas when the clutch is de-energized or inactive, the shaft 37 may rotate continuously without imparting rotation to the pulley shaft 45.

The previously-mentioned take up pulley 22 is suitably rigidly secured to the lower end of shaft 45 below housing wall 48, FIGURE 2, and this take up pulley is secured at 50 to the flexible element 21 leading to quadrant 18, and which flexible element may be a cable or chain. The flexible element 21 of predetermined length engages a cylindrical face on the take up pulley 22, which face is of such diameter that when the pulley is turned with shaft 45, it and the flexible element wound thereon will cause the ring rail 13 to be lowered at a rate which is in direct proportion to the speed of movement of the front draft roll 23. Take up pulleys of different diameters may be employed upon the shaft 45 to vary the rate of movement of the ring rail as found most desirable for various makes of spinning frames.

Means are provided to reeasolvably lock the shaft 45 and pulley 22 against further rotation when the ring rail 13 is at the lowermost or doffing position. Such means comprises a locking disc 51 having a radial notch 52 formed therein for interlocking engagement with a pin extension 53 of a radially shiftable cylindrical plunger 54, slidable mounted within a sleeve 55, secured to the vertical side wall of housing 28, FIGURE 2. Plunger 54 is urged inwardly by a compressible coil spring 56 within the bore of sleeve 55 and surrounding an outer reduced stem 57 of the plunger. The stem 57 carries a hand knob 58 to be used for retracting the plunger outwardly against the force of spring 56. This spring urges the plunger 54 constantly inwardly so that pin extension 53 rides on the circular periphery of disc 51 and is adapted to enter the locking notch 52 whenever the same moves into radial alignment with the plunger 54. The disc 51 is rigidly secured to shaft 45 as at 59 by a set screw or the like.

Also rigidly secured to the pulley shaft 45 for rotation therewith is a miter gear 60 constantly meshing with a companion miter gear 61, keyed to a short drive shaft 62. The miter gear 60 is disposed beneath locking disc 51 in the lower chamber 31 of the unit. Rigidly mounted at 63 to the side wall of housing 28 in lower chamber 31 is bearing housing 64 receiving ball bearings 65 therein having a spacer ring therebetween. Shaft 62 is journaled within these ball bearings and held against axial movement by snap rings 66 or the like.

The outer end of shaft 62 carries a builder motion pulley 67 connected to the shaft 62 for rotation therewith during controlled time periods by ball locking means to be described. Rigidly secured to shaft 62 and rotating therewith is a collar 68 which is located in a slot. The inner end of a relatively heavy clock-type coil spring 69 surrounds the collar 68 and the spring 69 is anchored to the inner face of builder motion pulley 67 as at 70. The spring 69 is tensioned prior to connecting the flexible cable or chain 21 to the pulley 22 so as to exert a constant pull or tension on the pulley and cable to prevent the same from developing slack or becoming tangled during operation.

The outer end of shaft 62 is bored and houses a compressible coil spring 71 and a tapered bolt 72. The spring 71 presses the bolt 72 against the anchor of a solenoid 73, holding a ball 74 in a keyway 75 in the pulley 67, thus locking the pulley 67 and forcing the shaft, the miter gears 61 and 60, the shaft 45 and the pulley 22 to turn with the builder motion pulley 67.

When solenoid 73 is actuated, its anchor 76 moves the tapered bolt 72 against spring 71, thus releasing ball 74 from the keyway 75. The ball drops into the slot 77 in shaft 62, unlocking the connection between pulley 67 and shaft 62. The pulley 67 thus turns freely on the outer end of shaft 62 when solenoid 73 is energized. The pulley is locked rigidly to the shaft 62 when solenoid 73 is de-energized.

A flexible element 78 such as a chain or cable of predetermined length is wound upon the cylindrical face of pulley 67 and has one end anchored thereto at 79. The pulley 67 is of such diameter that when turned, also turning shaft 62, gears 60 and 61, shaft 45 and pulley 22, the rate of rotation of the ring rail 13 will cause the ring rail 13 to be lowered at a rate and in a direction necessary to build the bobbins 12 in a controlled and efficient manner. In this connection, builder motion pulleys of different diameters may be employed upon the shaft 62 to vary the rate of movement of the ring rail as found desirable for various makes of spinning frames.

The other end of flexible element 78, FIGURE 1, leads to and is connected with linkage means of a conventional builder motion 80 to oscillate therewith. The builder motion 80 can be of any conventional or well known design which does not affect the proper function of the invention, and the builder motion is well shown in the art and need not be further described herein.

As shown in FIGURE 1, a limit switch 81 for limiting the upward travel of ring rail 13 is suitably mounted in any preferred manner close to one end of the ring rail with its actuator in the path of travel of the ring rail. A second switch 82, preferably a roller actuated microswitch is fixedly secured to the forward side wall of casing 28 within the lower chamber 31 thereof. The switch 82 has an upright plunger 83 carrying an actuating roller 84, spring loaded upwardly to bear against locking pin extension 53 and by the roller 84 actuated, the plunger 83, when such plunger moves inwardly under influence of spring 56, as when the pin extension 53 enters the locking notch 52 in disc 51. The switch 82 is normally closed, whereas, the switch 81 is normally open and closes for a short period only to start the motor of electrical timer 86. While the ring rail 13 is moving upwardly, the timer to be described has a built-in holding switch which maintains the timer motor running after limit switch 81 re-opens automatically. Solenoid 73, the main spinning frame motor and electro-magnetic clutch 40 are switched in a preset timing by the timer 11. When the shoulder 85 of plunger 54 engages the roller 84 of switch 82, the same will open to de-energize the solenoid 73 at the moment when the pin extension 53 and disc 51 lock the ring rail 13 in the lowermost or doffing position as will be further described.

With reference to FIGURE 4, a transformer 87 is provided to step down 550-volt current to 110 volts. A suitable rectifier 88 is connected to the second winding of transformer 87 by wires 89 and 90 which are fused as shown. Connected to contact 91 of the transformer secondary are contact 92 of limit switch 81 by wire 93, contact 94 of timer motor holding switch by wire 95, contact 96 of outer end of the spring 69 and the timer motor by a wire 100, contact 101 of solenoid timer switch by a wire 102. Contact 103 of timer motor is connected to contact 104 of timer motor holding switch by a wire
105 and to contact 106 of switch 81 by a wire 107. Contact 108 of solenoid timer switch is connected to contact 109 of solenoid 73 by a wire 110. Contact 111 of secondary rectifier side is connected to contact 112 of clutch timer switch by a wire 113. Contact 114 of clutch timer switch is connected to contact 115 of electro-magnetic clutch 40 by a wire 116. Contact 117 of the clutch is connected to contact 118 of microswitch 82 by a wire 119. Contact 120 of switch 82 is connected to contact 121 of secondary rectifier side by a wire 123. Contact 123 of start motor timer switch is connected to contact 124 of start button 125 by a wire 126 and to spinning motor starter by a wire 127. Contact 128 of spinning motor timer switch is connected to contact 129 of stop button 130 by a wire 131. Contact 132 of start button 125 is connected to spinning motor starter by a wire 135.

The operation of the invention is as follows:

With the spinning frame started for spinning the yarn and building the bobbins, 13, the ring rail 13 rises oscillating to a position where the bobbins are filled. This is the initial position of the ring rail 13 in FIGURE 1. The motion of the ring rail 13 for building the bobbins 12 is transmitted thereto from the conventional builder motion 80 by flexible element 78, pulley 67, shaft 62, miler gears 61 and 60, shaft 45, pulley 22, flexible element 21, quadrant 18, lifter arms 16 and lifter rods 14, FIGURE 1. The front draft roll 23 revolves continuously as does the drive shaft 26 carrying miler gear 27. The clutch shaft 37 is also revolving continuously due to the meshed engagement of miler gears 27 and 39. The limit switch 81 is open prior to the ring rail 13 reaching the uppermost limit of its normal travel during the building of the bobbins, and the clutch 40 is de-energized and no rotation is imparted to the shaft 45 by the clutch. However, the shaft 45 oscillates because the solenoid 73 is de-energized and the both 72 pushes the ball 74 into the keyway 75 of builder motion pulley 67 and this pulley and the shaft 62 are locked together.

When the bobbins 12 are full, the ring rail 13 is at the upper-most position shown in full lines in FIGURE 1 and its end engages the actuator of normally open switch 81 and immediately closes this switch to complete the circuit 91—93—92—106—107—103—121—100—98, starting the timer motor which rotates the timer 86. The timer controls the motor holding switch completing the holding circuit 91—93—95—94—105—103—99—100—98 keeping the timer motor energized after switch 81 reopen.

At the same time, with timer motor holding switch, the timer 86 closes the solenoid time switch completing the solenoid circuit 91—97—96—109—119—108—90—91—109—98, energizing solenoid 73. The anchor 76 of solenoid 73 now pushes tapered bolt 72 inwardly, releasing ball 74 and unlocking the connection between pulley 67 and shaft 62. The shaft 62, miler gears 61 and 60, shaft 45, pulley 22, flexible element 21 and quadrant 18 are now free of control by the builder motion 80. The counterweighted arms 17 through the medium of lifter rods 14 now push the ring rail 13 upwardly to the tip buncch applying position shown in broken lines in FIGURE 1 slightly above the full line position of the ring rail 13. After a preset time, the timer 86 closes the clutch timer switch completing the circuit 111—113—112—115—114—116—117—119—118—120 (closed switch 82) 122—121, energizing clutch 40. The upper portion 41 of clutch 40 revolving with the shaft 37 and gears 39 and 27 engages the lower portion 43 of the clutch and imparts identical rotation to the shaft 45, pulley 22, flexible element 21 and quadrant 18. Rotation of pulley 67 now winds up flexible element 21 in a controlled manner and at the desired rate, causing quadrants 18 to swing counterclockwise upon their pivots 19 against the action of the counterweights 17. This effects the controlled lowering of the ring rail 13 at precisely the desired rate of speed, and which rate is predetermined by the chosen diameter of the working face of pulley 22. When the ring rail 13 is at its lowermost position, the locking notch 52 in disc 51 is aligned with and receives locking pin extension 53 of plunger 54 and the ring rail is positively locked in the dollying position.

The shoulder 85 of plunger 54 actuates normally closed switch 83 to open the same as the pin extension 53 enters the locking notch 52. At this instant; the clutch 40 is de-energized and no further rotational effect from the shaft 37 is imparted to the shaft 45. The conventional builder motion 80 is now manually reset to the starting position and the complete cycle of operation is ready to repeat itself. Simultaneously with the complete lowering and locking of the ring rail 13, the timer 86 opens contacts 136 and 137 which breaks the circuit to the spinning frame motor.

It is now apparent that the mechanism according to this invention effects substantially a completely automatic and controlled operation of the spinning frame from start to finish and with no manual operations other than the resetting of the builder motion at the end of the complete cycle.

Initially, with the spinning frame motor in operation, the bobbins are built normally while the clutch 40 and solenoid 73 are both de-energized and while the shaft 45 and associated elements including flexible element 21 are influenced by the builder motion. When the building of the bobbins is complete and the ring rail reaches the top of its normal travel and closes the limit switch 81, the solenoid 73 is energized but the clutch 40 remains de-energized. This removes the flexible element 21 and associated parts from the influence of the builder motion 80 and allows the counterweights to shift the ring rail upwardly to the tip bunch position where it remains long enough to complete the application of the tip bunch. At this time, the solenoid 73 remains energized and the clutch 40 becomes energized and rotation is imparted by the shaft 37 to the shaft 45 for lowering the ring rail automatically by the action of the flexible element 21 and the pulley 22 and associated parts. When the ring rail is fully lowered, it is locked in the dollying position by the pin extension 53 and disc 51 and the clutch 40 is de-energized and the spinning frame motor is stopped and the solenoid 73 is again in de-energized so that the bolt 72 and ball 74 can lock the pulley 67 to the shaft 62 prior to the next cycle of operation. As soon as the builder motion 80 is manually reset and the spinning frame motor re-started, the automatic cycle of operation repeats itself to build the new set of bobbins, apply the tip bunch thereto and lower the ring rail again to the dollying position.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claims.

Having thus described our invention, we claim:

1. Mechanism for operating a spinning frame, said spinning frame having a movable ring rail to guide the yarn onto the bobbins, movable supporting means for the ring rail, a builder motor and a continuously rotating front draft roll, said mechanism comprising transmission means connected with and continuously operated by the front draft roll, an electro-magnetic clutch having a first rotary part continuously driven by said transmission means and a second rotary part driven only when the clutch is energized, a shaft connected with the second rotary part of the clutch and intermittently driven by, a take-up pulley secured to said shaft, a flexible element connected with said pulley and also connected with said movable supporting means for the ring rail, mechanical means associated with said shaft to positively lock the same against rotation subsequent to rotation of the shaft
under influence of said clutch, a second pulley, a second shaft carrying the second pulley, gearing interconnecting the first-named shaft and second shaft so that the same will turn in unison, solenoid operated locking means connected with the pulley and second shaft and operable to lock the pulley to the second shaft when the solenoid is energized, and a flexible element interconnecting said builder motion and second pulley.

2. Mechanism for controlling the operation of essential spinning frame elements comprising transmission means driven by a draft roll mechanism of the spinning frame, an electrically operated clutch connected with said transmission means and driven thereby, a pulley shaft connected with said clutch and driven thereby when the clutch is active, means connected with said pulley shaft including a pulley and flexible element and connected with a ring rail to lower the same automatically and at a desired rate when the clutch is active, means to lock the ring rail in the fully lowered position and substantially simultaneously rendering the clutch inactive, a second pulley connected with a builder motion of the spinning frame and under influence of the same, gearing connecting the second pulley and said pulley shaft so that the same may turn in unison, electrically operated means to lock the second pulley with said gearing and to release the pulley from said gearing so that the gearing may operate freely without the influence of the builder motion, and electrical means actuated by the elevating of the ring rail to energize said electrically operated means for unlocking the second pulley and subsequently rendering such clutch active.

3. In a spinning frame, a fixed spindle rail, a movable ring rail to be raised and lowered relative to the spindle rail, a plurality of spindles mounted upon the spindle rail for production, bobbins carried by the spindles, draft roll means, a builder motion, counterweighted rockable lift means for the ring rail normally biasing the same upwardly, gearing connected with and driven by said draft roll means, a part thereto an electrically operated clutch connected with and driven by said gearing, one part of said clutch engaging only when the clutch is energized, mechanical latch means to lock said one part positively against rotation, switch means operated by said latch means to deenergize the clutch when said one part is locked, pulley means connected with and driven by said one part and including a flexible element secured to said counterweighted rockable lift means for shifting the same in a direction causing lowering of the ring rail, transmission means connected with and driven by said one part of the clutch and including a pulley, electrically operated means for disconnecting said pulley from the transmission means so that the pulley may turn relative thereto and for unlocking the pulley to the transmission means, a flexible element interconnecting said pulley and builder motion, and limit switch timer means actuated by the elevation of the ring rail to energize said electrically operated means and to hold such means energized for a predetermined length of time.

4. A control and operating unit for spinning frames comprising a casing for attachment to a structural member of the spinning frame, a first shaft journaled upon the casing, gearing connected with and driving a first shaft continuously and connected with a front draft roll of the spinning frame, an electrically operated clutch including a first rotary part secured to said first shaft and a second part which rotates only when the clutch is energized, a second shaft journaled upon the casing and secured to said second part of the clutch, a pulley secured to the second shaft to turn therewith, a flexible element of predetermined length having one end secured to said pulley and its other end secured to ring rail lifter means of the spinning frame, a disc secured to the second shaft to turn therewith and having a peripheral locking notch, a reciprocatory locking plunger mounted upon the casing radially of the disc and having a part to enter said notch, when aligned therewith to positively lock the second shaft, a third shaft journaled upon said casing for rotation, gearing interconnecting the second and third shafts for rotation in unison, the third shaft disposed substantially at right angles to the second shaft, a pulley carried by the third shaft, solenoid operated detent means for releasably locking the last-named pulley to the third shaft, resilient means connected with the second-named pulley to resist rotation thereof in one direction, a flexible element interconnecting the second-named pulley and a builder motion of the spinning frame, and electrical switch and timer means to effect the energizing and de-energizing of the clutch and solenoid operated means in proper sequence, whereby a ring rail may first build the bobbins, then apply the tip bunch and then be lowered to the docking position and locked in such position.

5. In a spinning machine, a movable ring rail to guide yarn onto bobbins, a builder motion to control the traversing movement of the ring rail, counterweighted lift means carrying the ring rail and biasing it upwardly, transmission means operatively interconnecting the builder motion and said lift means and including a rotary pulley, electrically operated detent means for locking the pulley with the second pulley and actuating the tip rail therefrom so that the pulley may idle relative to the transmission means, said counterweighted lift means then being free from the influence of the builder motion and shifting the ring rail upwardly to the tip bunch applying position, a continuously rotating electrical clutch element driven by the spinning frame, a companion clutch element driven by said continuously rotating element when the clutch is energized and connected with the transmission means, electrical means to energize the clutch when the tip bunch is fully applied to the bobbins to effect the lowering of the ring rail to the bobbin docking position and means to then de-energize the clutch and lock the ring rail in said docking position.

6. Operating and control mechanism for a spinning machine comprising an electrical clutch having a first part driven continuously by the spinning machine and a second part driven only when the clutch is energized, transmission means connected with the second part of the clutch and including first and second pulleys, a flexible element connected with the first pulley and leading to and connected with counterweighted ring rail lifter means of the spinning machine, a second flexible element connected with the second pulley and leading to and connected with a builder motion of the spinning machine, electrically operated lock means for the second pulley to positively connect the same with the transmission means or to disconnect it therefrom, and electrical timer means for operating said clutch and lock means in proper sequence during the cycle of operation of the spinning machine.

7. The invention according to claim 6, and wherein said electrical timer means includes a limit switch in the path of movement of the ring rail and closed by the ring rail when the building of the bobbins is complete to effect the unlocking of the second pulley.

8. The invention according to claim 6, and mechanical means to lock the transmission means when the ring rail is fully lowered, and switch means then operated by said mechanical means to de-energize the clutch.

9. Automatic control and operating mechanism for a conventional spinning frame comprising means under control of the spinning frame builder motion for locking the ring rail to build the bobbins, electrically operated escapement means to free the ring rail from the influence of the builder motion and allow it to shift upwardly to the tip bunch applying position subsequent to the building of the bobbins, electrically operated transmission means driven by the spinning frame and unlocking the clutch at a desired rate to the bobbin docking position, and means to lock the ring rail in the bobbin docking position and to then render inactive said transmission means.
10. Automatic control and operating mechanism for a spinning frame of the type having a movable ring rail which is biased upwardly by a counterweight means, said mechanism comprising means to produce traversing of the ring rail over bobbins to gradually build said bobbins, means operable when said bobbins are fully built to release the ring rail from the control of the first-named means and allowing shifting of the upwardly biased ring rail upwardly to a tip bunch applying position near upper tips of said bobbins, means to automatically lower the ring rail to a bobbin doffing position after application of said tip bunch to said upper tips of the bobbins, and means to releasably lock the ring rail in said bobbin doffing position.