No. 847,621. PATENTED MAR. 19, 1907

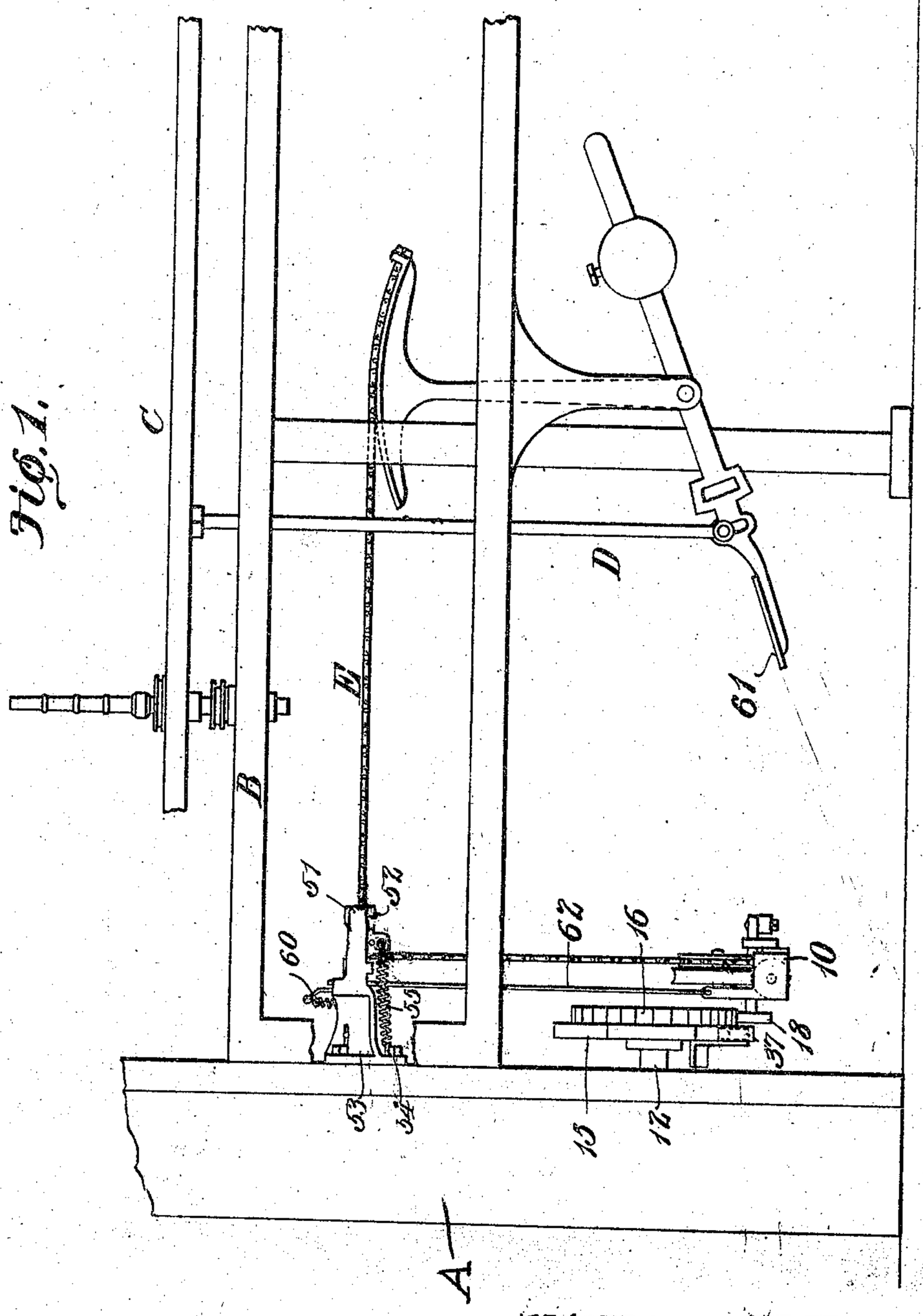
W. J. THOMPSON.

SPINNING FRAME.

APPLICATION FILED MAR. 21, 1906.

2 SHEETS—SHEET 1.

FIG. 1.



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2 SHEETS—SHEET 2.

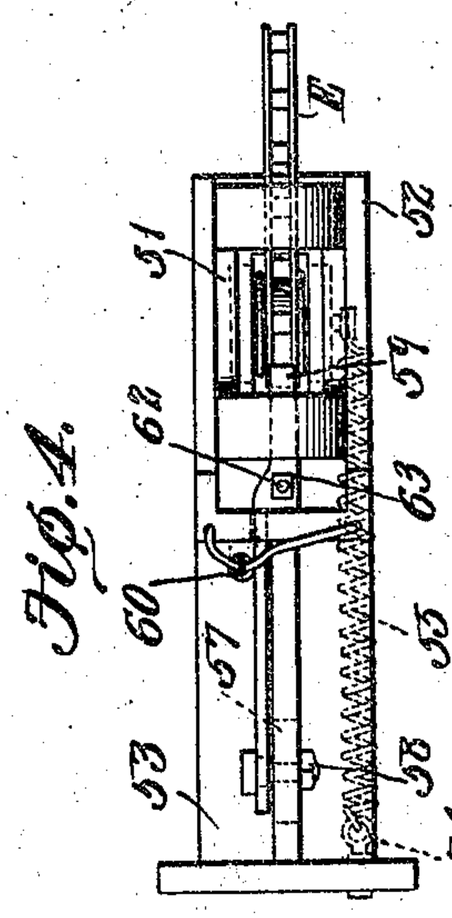

Fig. 4.

Fig. 2.

Fig. 3.

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WILLIAM J. THOMPSON, OF DUKE, NORTH CAROLINA.

SPINNING-FRAME.

No. 847,621. Specification of Letters Patent. Patented March 19, 1907.

Application filed March 21, 1906. Serial No. 307,225.

To all whom it may concern:

Be it known that I, WILLIAM J. THOMPSON, a citizen of the United States, residing at Duke, in the county of Harnett and State of North Carolina, have invented a new and useful Spinning-Frame, of which the following is a specification.

This invention relates to ring-spinning frames, and has for its principal object to provide an improved means whereby a bunch may be wound on the cop or quill for use in feeler-looms where the loom is stopped or an empty quill thrown out and a new quill inserted by the action of a feeler-finger which bears against the quill.

In looms of this class it is desirable to retain sufficient thread on the quill or cop to make one or two shots after the feeler has moved to operative position in order to avoid a thin place in the cloth. To accomplish this, a so-called "bunch" is wound on the cop or quill at the beginning of the winding operation, the bunch being usually arranged near the base of the cop at a point beyond the plane of movement of the feeler-finger, this bunch containing several yards of thread, so that two or more shots may be made after the feeler assumes operative position.

The principal object of the invention is to so arrange and construct a ring-spinning frame that the bunch may be readily formed at the proper point, and after a sufficient quantity of thread has been wound to form the bunch the traverse mechanism is automatically adjusted to permit the ordinary winding.

A further object of the invention is to provide an attachment which may be applied to existing spinning-frames for this purpose.

A still further object of the invention is to provide for the adjustment of the traverse mechanism, so that the ring-rail may be lowered to the proper position to form a bunch.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is an elevation, partly in section, of a portion of a spinning-frame arranged and constructed in accordance with the invention. Fig. 2 is a detail perspective view of the lower portion of the mechanism, showing particularly the construction and mounting of the builder-arm and the means for automatically shifting the builder-arm roller from engagement with the buncher-cam into engagement with the builder-cam. Fig. 3 is a sectional elevation of the mechanism for taking up the slack and traverse-chain to adjust the ring-rail to the lowest position for the formation of the bunch. Fig. 4 is a plan view of the mechanism shown in Fig. 3.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In the drawings, A represents the end frame, and B the spindle-rail, of an ordinary form of spinning-frame. The ring-rail C is operated in the usual manner through lifter-rods D and the traverse mechanism, which includes the usual chain E, the lower end of the chain being connected to a builder-arm 10, that is fulcrumed on a stud 11, carried by the frame.

In the frame of the machine is supported a cam-shaft 12, carrying a builder-cam 15 of the ordinary construction, this cam serving to depress the builder-arm 10 for the purpose of operating the traverse mechanism. In the present instance the builder-cam carries a buncher-cam 16, which in the present instance is in the form of a disk, the periphery of which is divided into a plurality of cams 16′, each designed to impart slight vertical movement to the builder-arm 10 for the purpose of moving the ring-rail in a vertical path during the winding of the bunch, the lift of each cam being such that the ring-rail traverses from top to bottom of the bunch at each movement, and the bunch is therefore formed of crossed threads, which present a relatively hard surface on which the main winding may take place without danger of the yarn being pressed between or caught by the yarn forming the bunch, thus avoiding the breakage of the yarn, which frequently occurs where the bunch is formed of simple uncrossed turns.

The builder-arm 10 is provided with a transversely-disposed opening carrying a stud 17, on the outer end of which is mounted

an antifriction-roller 18, which is arranged to be operated upon by the buncher-cam 16 until the bunch is formed and then is automatically shifted to be operated upon by the builder-cam 15 during the further and ordinary winding of the cop or quill. In order to facilitate the transfer of the roller 18 from one cam to the other, it will be noted that the deepest indentations between the projections of the builder-cam are arranged in alinement with indentations formed between the buncher-cams 16′, so that the roller may readily move from one to the other, and there will be no danger of the buncher-cam interfering with the proper movement of the roller by the builder-cam in case said roller is not moved to the fullest extent. The stud 17 is connected to one end of a lever 19, that is pivoted to a bracket 20, carried by the builder-arm, and said lever is engaged by one end of a tension-spring 21, that tends normally to move the lever in such manner as to force the roller 18 from engagement with the buncher-cam into engagement with the builder-cam. This movement, however, is resisted or prevented by a locking mechanism which holds the lever 19 until the bunch has been wound and then releases it, allowing the spring to act and the roller to move into engagement with the builder-cam to complete the regular winding of the cop or quill.

At the outer end of the builder-arm is arranged the usual mechanism for gradually taking up the traverse-chain in building the cop; but this mechanism requires for its operation the full stroke of the builder-arm, and the limited stroke imparted by the buncher-cam is not sufficient to bring it into play, so that the traverse-chain is not taken up until after the bunch is formed and the roller 18 passes under the control of the builder-cam.

Rigidly secured to the hub or collar of the builder-arm is a locking-bar 22, carrying one or more guides 23 for the reception of a longitudinally-movable bar 24, the outer end of which is pivotally connected to the lever 19. The inner end of the bar 24 has an outwardly-extended arm 26, and from the inner face of this arm extend yoke-like guides 27, in which a vertically-movable rack 28 is mounted, the position of the rack at the starting of operations being determined by a pin 30, which may be placed in any one of a number of openings 31, that are formed in the rack, the pin then resting on top of the upper guide 27. The rear face of the rack-bar is provided with small teeth or serrations 33, that engage against the pointed end of the bar 22, and as the rack-bar is moved upward step by step the successive serrations are entered by the point of the bar and the rack-bar is held in the position to which it is elevated. The rack-bar is operated by a pawl 34, that is hung at one end of a lever 35, pivoted on a bracket 36 and bearing at its opposite end a small roller 37, that is arranged in the path of movement of the builder-cam 13 and is engaged and operated thereby.

The stroke of the pawl 34 is controlled by a perforated bracket 38 and an adjustable pin 39, the pin being moved into any one of the openings of the bracket, and thus affording an adjustable recess which limits the downward movement of the pawl. The pawl-carrying end of the lever 35, together with the pawl, is heavier than the opposite end, so that the pawl and this end of the lever will move down by gravity. In this manner the rapidity with which the rack-bar is moved to release position may be accurately adjusted, and by thus adjusting the length of time which the roller 18 is allowed to remain in engagement with the buncher-cam the quantity of yarn wound to form a bunch may be adjusted. Further adjustment may also be accomplished by altering the position of the pin 30 so that the rack will be raised to a greater or less distance before released.

The bar 24 is provided with guides 40 for the reception of a slidable bar 41, the outer end of which is pivoted to a hand-operated lever 42, that is pivoted on a bracket 43, projecting from lever 19. The hand-lever is forced outward from the lever 19 by means of a small compression-spring 44. At the inner end of the bar 41 is a plate 45, that is arranged to engage with the pawl 34 in order to prevent the latter from remaining in contact with teeth of the rack-bar while the parts are being adjusted to position for the formation of a fresh bunch. In the operation of this portion of the mechanism the pawl 34 is reciprocated until the end of the rack-bar is above the bar 22, whereupon the spring 21 acts to pull out the bar 24 and bar 41, together with the rack-bar, and the latter will move away from the pawl, while the opposite end of lever 19 moves in the direction of the builder-arm and carries the stem 17 over until the roller 18 moves into contact with the builder-cam 15.

In effecting readjustment of the parts the operator grasps the handled lever 42 and the end of the lever 19, and by pressing them together the bar 41 is forced inward until plate 45 holds the engaging end of the pawl well out of contact with the teeth of the rack-bar, so that said rack-bar when pushed beyond the pointed end of the bar 22 may fall by gravity to its lowest position in readiness for another operation

In order to place the bunch in proper position on the cop or quill, it is necessary that the ring-rail be depressed to the proper point at the beginning of the operation. For this purpose the traverse-chain E is led over a roller 50, that is carried by a frame 51, having approximately cylindrical end portions, mounted in guides 52, that are formed at the outer end of a bracket 53, the latter being secured to the inner face of the end frame of

the machine. This slidable frame 51 is connected to a fixed eye 54 on the bracket by means of a helical tension-spring 55, that tends normally to pull the frame 51 to the left, and thus move the traverse-chain and rocker-arms and depress the lifter-rods D. This movement, however, is resisted by the counterweights of the lifter-rods, and the spring 55 is not strong enough to overcome the resistance thus offered, so that the traverse-chain is held under stress and is moved, as usual, in one direction by the builder-arm and in the other direction by the counterweights of the lifter-rods.

The bracket 53 is provided with a slot 57, in which a pivot-pin 58 may be locked, and on the pivot-pin is mounted a hook 59, that is held upward by a spring 60, said hook serving to engage with the frame 51 and lock the same in the position shown in Fig. 3 in case said frame 51 is moved to the left. To accomplish this, the rocker-frame of the first lifter rod is provided with a pedal 60, which may be depressed by the operator, thus removing the influence of the counterweight from the traverse-chain, and as soon as this is done the spring 55 draws the frame 51 to the left, and the hook 59 immediately engages and locks said frame in its adjusted position, after which the hook may be removed and the counterweight again will be allowed to act. The adjustment of the roller 50 takes up a portion of the traverse-chain and pulls down the ring-rail to the proper point for the formation of the bunch, and as the small buncher-cams 16′ move over the roller 18 the builder-arm will be oscillated through a short arc, and the movement will be transmitted through the traverse-chain to the ring-rail during the formation of the bunch.

The hook 59 is provided with an opening for the passage of a vertically-movable rod 62, the lower end of which is connected to the builder-arm, and on the upper end of the rod is an adjustable nut 63, that is designed to engage with the hook after the roller 18 has been transferred to a position in alinement with the builder-cam.

At the beginning of each operation the pedal 60 is depressed in order to allow the frame 51 to move to the left, and as soon as the frame is locked by the hook 59 the downward pressure of the pedal is relieved, and the other parts being adjusted with the roller 18 in alinement with the buncher-cam the operation proceeds. The builder-arm is raised and lowered very slightly, but to an extent sufficient to traverse the ring-rail the full height of the bunch at each operation, so that the tread is crossed and a relatively hard bunch is formed on which the subsequent winding may proceed without danger of the yarn catching in the bunch-yarn. As the operation progresses each time the builder-arm is moved down the builder-cam will also engage the roller 37 and rock the lever 35, this movement being transmitted through the pawl 34 and the rack-bar being raised one or more teeth, in accordance with the distance through which the lever 35 moves. As soon as the lower end of the pawl-bar is level with the top of the bar 22 the spring 21 acts to pull the bar 24 and the rack-bar outward, lever 19 being moved for the purpose of adjusting the position of the roller 18 and the latter moving from the buncher-cam into engagement with the builder-cam, after which the traverse mechanism proceeds to effect the usual winding of the cop or quill.

The builder-cam of course depresses the builder-arm to a much greater extent than the buncher-cam, and as a result the rod 62 is held down until nut 63 engages the hook 59 and pulls the latter out of engagement with the arm 51, and as the counterweights of the lifter-rods are now tending to pull the traverse-chain to the right the frame 51 will move outward against the stress of the spring 55, and the parts will assume the ordinary positions and proceed with the ordinary winding in the usual way.

With a device constructed in accordance with this invention a relatively hard bunch may be formed at the proper point, and the shifting of the traverse mechanism from bunch-forming to ordinary winding positions is entirely automatic requiring no attention whatever on the part of the attendant.

I claim—

1. In a spinning-frame, the combination with a builder-arm, of a builder-cam, a buncher-cam, a roller supported by the builder-cam and arranged to be operated upon first by the buncher-cam, and then by the builder-cam, and means under the control of the builder-cam for shifting the position of said roller from the buncher-cam to the builder-cam.

2. In a spinning-frame, the combination with a builder-arm, of a roller supported thereby, a buncher-cam and a builder-cam with which the roller successively engages, and means under the control of the builder-cam for automatically shifting the roller from engagement with the buncher-cam into engagement with the builder-cam.

3. In a spinning-frame, the combination with a builder-arm of a builder-cam, a buncher-cam, an antifriction-roller arranged to engage first the buncher-cam and then the builder-cam, a longitudinally-movable stud supported by the builder-arm and carrying said roller, a spring-actuated lever pivoted to the builder-arm and connected to the stud, a toothed locking-bar for holding said lever from movement, a pawl engaging said locking-bar for effecting step-by-step movement thereof, and means operated from the builder-cam for actuating said pawl.

4. The combination with a spinning-

frame, of a builder-arm, a buncher-cam, a builder-cam, an antifriction-roller for engaging first the buncher-cam and then the builder-cam, a longitudinally-movable stud carried by the builder-arm and supporting said roller, a spring-actuated lever engaging the stud, a slidable bar connected to said lever and having guiding-yokes at one end, a toothed locking-bar guided in said yokes, a fixed stop against which the locking-bar is held, a builder-cam-actuated pawl engaging the teeth of said bar, a manually-adjustable lever, and a slidable plate connected thereto and serving to disengage the pawl from the teeth of the locking-bar during readjustment of the parts to initial position.

5. In a spinning-frame, the combination with a builder-arm, of a buncher-cam, a builder-cam, a roller for successively engaging said cams, a roller-supporting stud slidably mounted on the builder-arm, a lever pivoted to the builder-arm and having one end connected to the stem, a spring for moving said lever in one direction, a slidable bar connected to the lever and having guiding-yokes at one end, a lock-bar mounted in said yokes and provided with ratchet-teeth, a fixed stop-bar with which the rear of the locking-bar engages, the latter being serrated to retain it in position against the stop-bar, a pawl engaging the ratchet-teeth, a lever carrying the pawl and having one end in the path of movement of the builder-cam, an adjustable means for limiting the movement of the pawl-carrying lever in one direction, a slidable plate for disengaging the pawl from the ratchet-teeth, and a manually-operable lever connected to said pawl.

6. In a spinning-frame, a builder-motion including a builder-arm, and a traverse-chain, a roller for guiding the traverse-chain, a slidable frame supporting said roller, a spring tending to draw said frame to a position to take up the traverse-chain, a hook or catch for retaining said frame in adjusted position, and a rod extending from the builder-arm to said hook and receiving slight motion during the formation of the bunch, said rod serving at the beginning of the main winding operation to engage with and release the hook and permit movement of the traverse-chain to normal position.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM J. THOMPSON.

Witnesses:
E. P. DAVIS,
R. H. KNIGHT.