

J. F. MUHEIM.  
 BUILDER MOTION IN SPINNING FRAMES.  
 APPLICATION FILED MAR. 1, 1909.

949,399.

Patented Feb. 15, 1910.

5 SHEETS—SHEET 1.

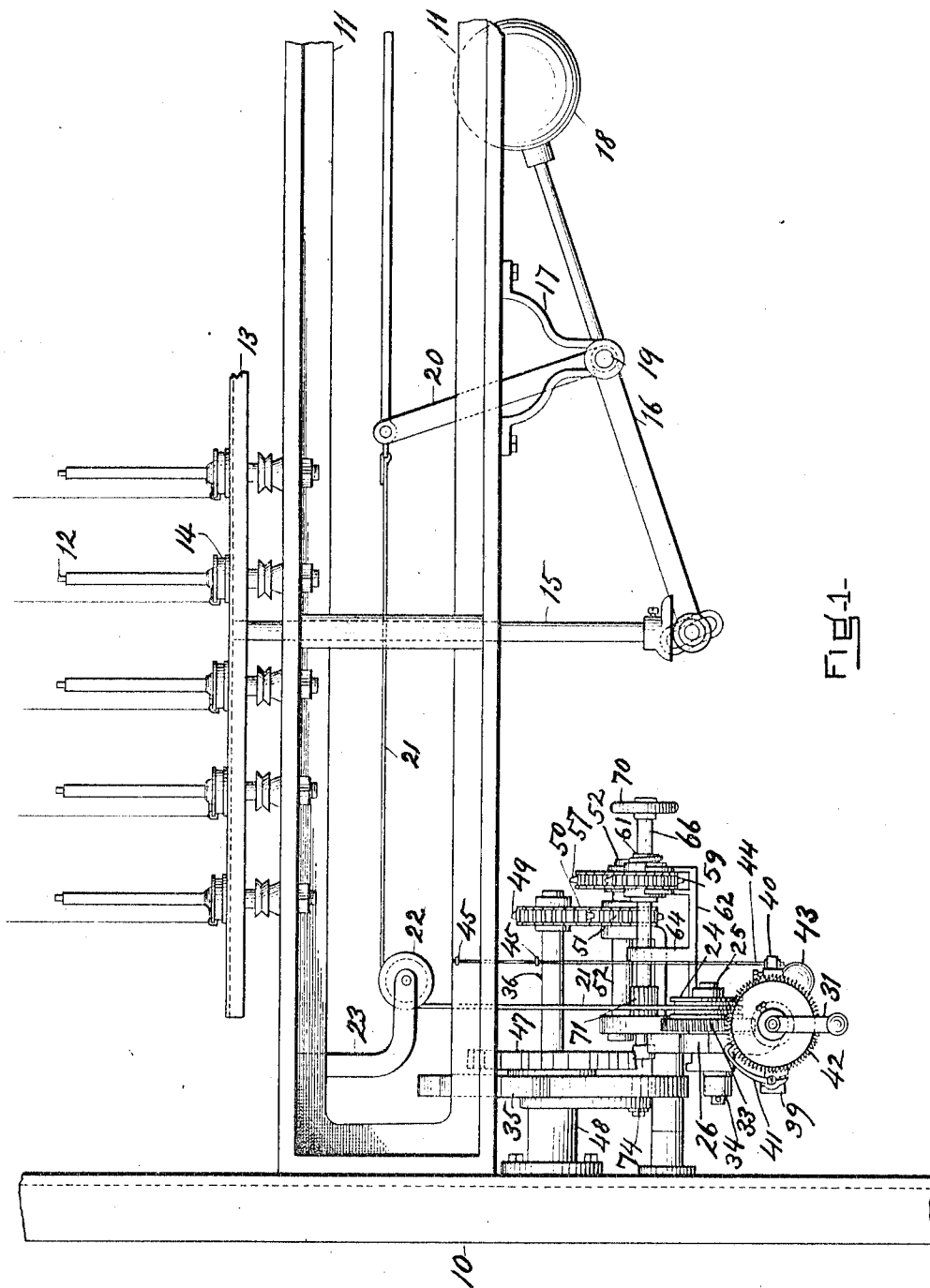


FIG. 1.

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 Frank B. Porter.

INVENTOR:  
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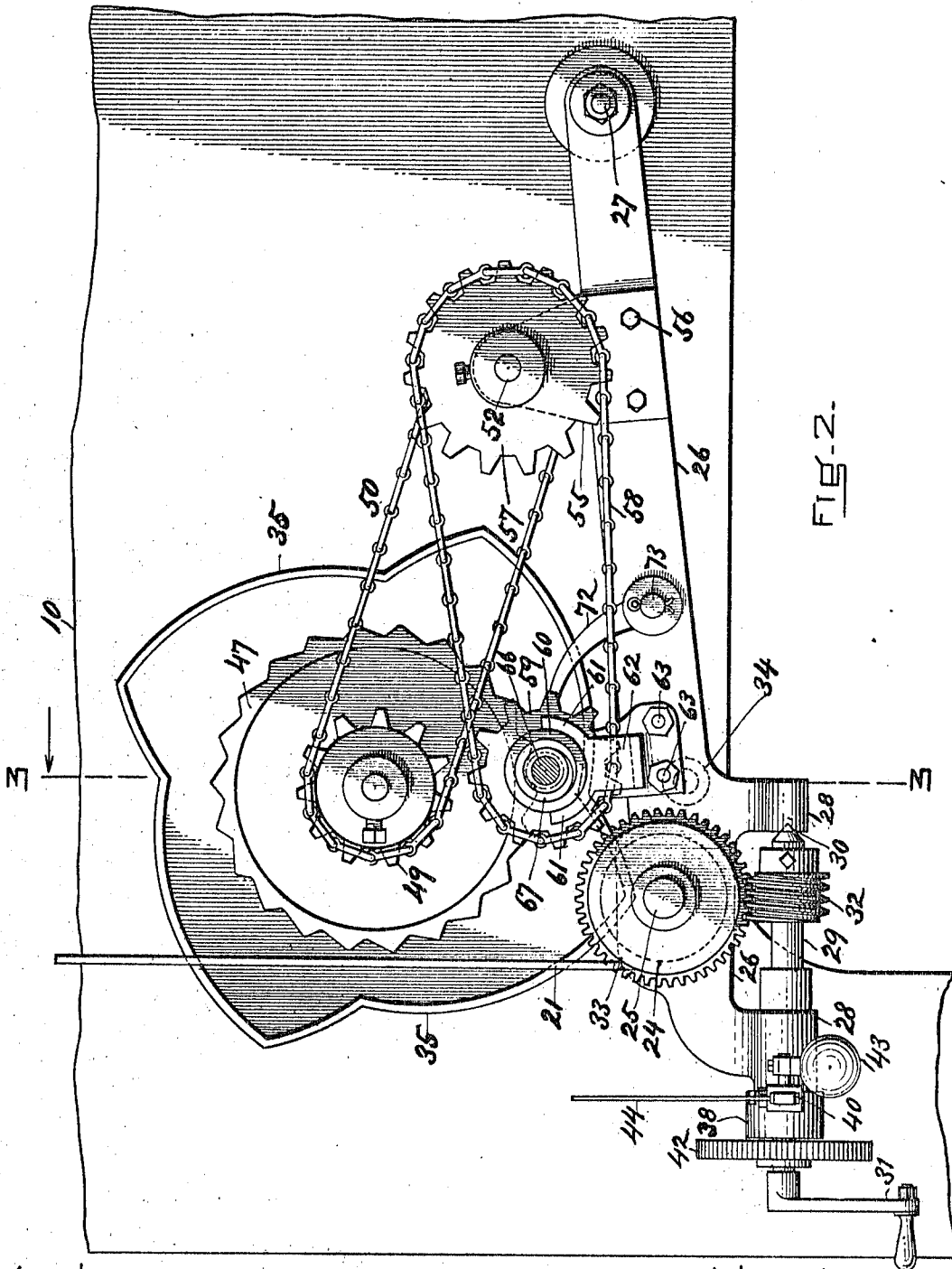


FIG. 2.

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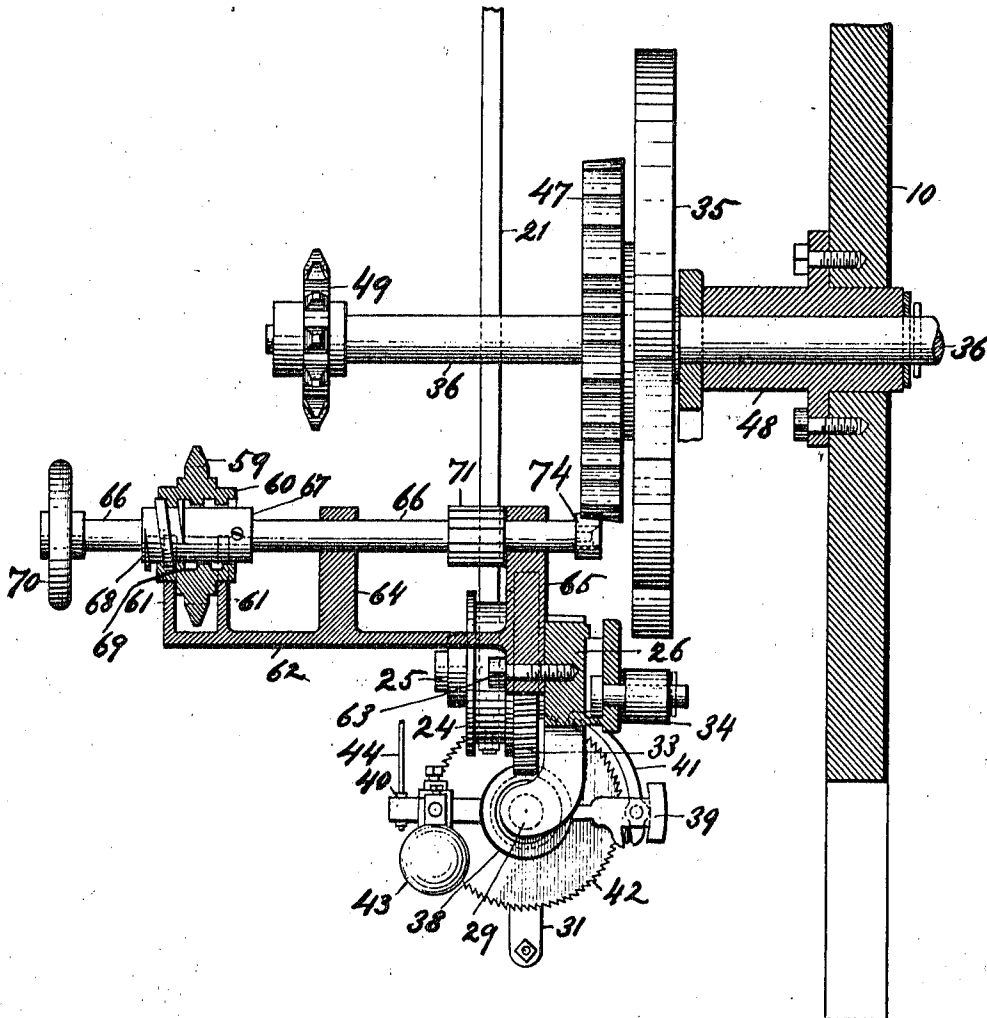


FIG. 3.

WITNESSES=  
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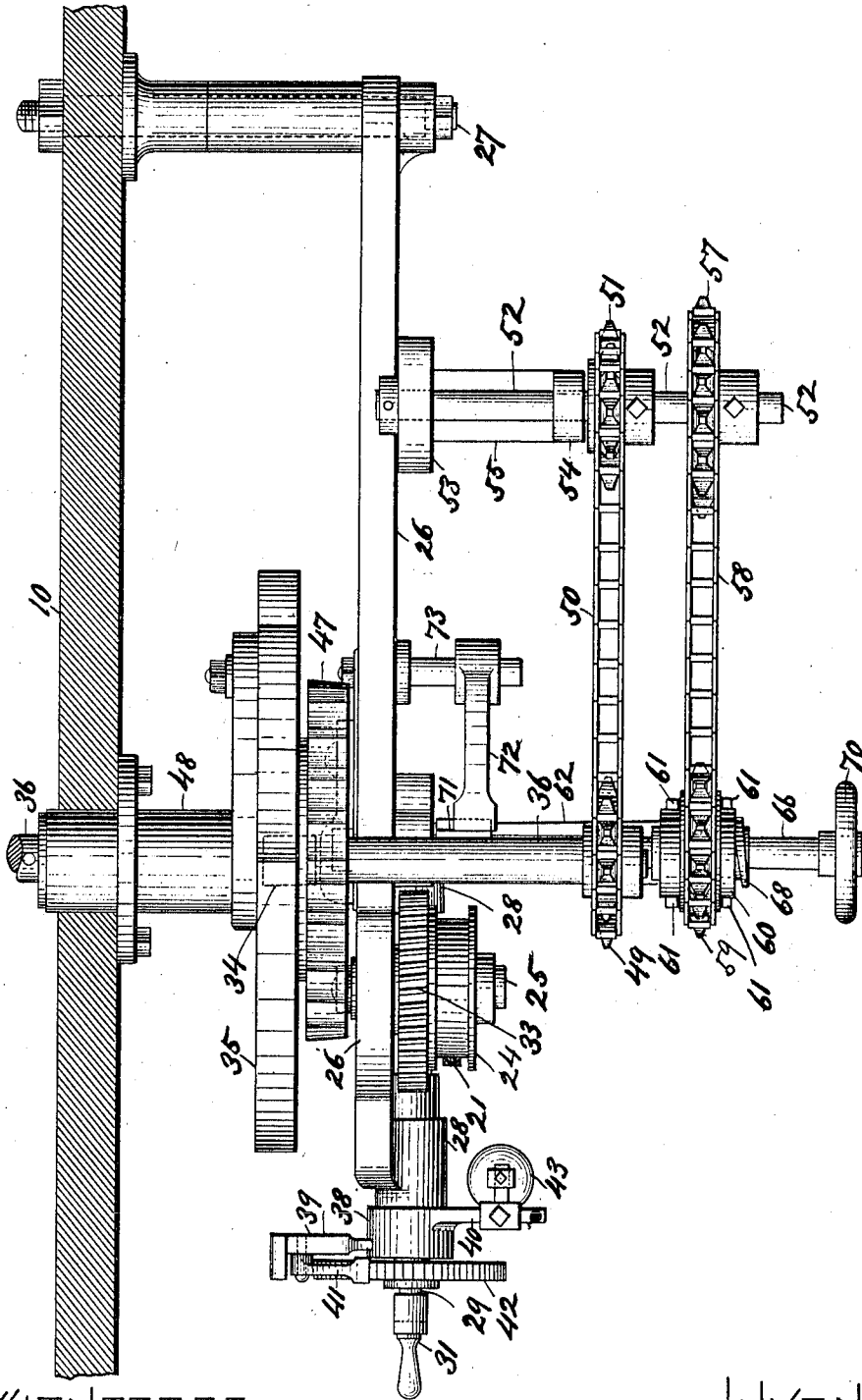


FIG. 4.

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5 SHEETS—SHEET 5.

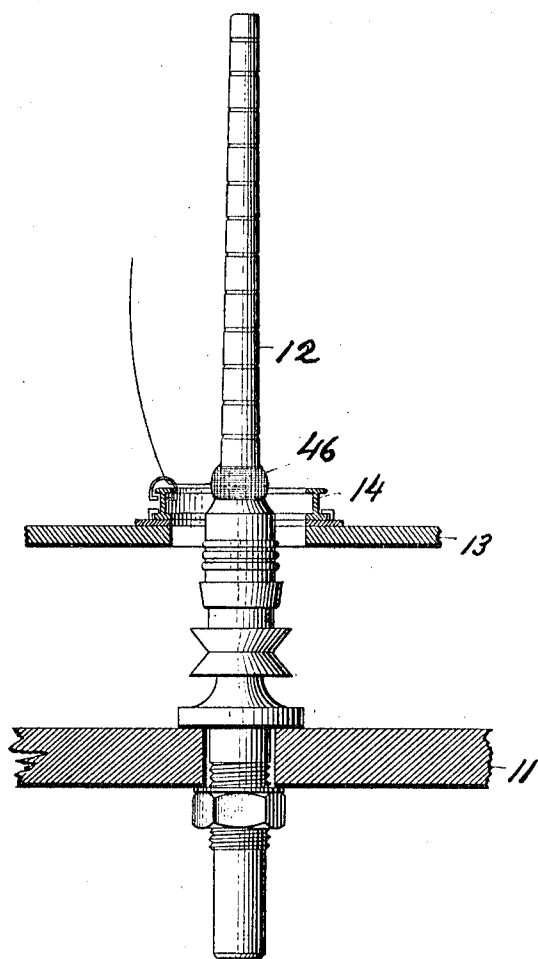


Fig. 5.



Fig. 6.

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# UNITED STATES PATENT OFFICE.

JOSEPH F. MUHEIM, OF WARREN, MASSACHUSETTS.

BUILDER-MOTION IN SPINNING-FRAMES.

949,399.

Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed March 1, 1909. Serial No. 480,766.

To all whom it may concern:

Be it known that I, JOSEPH F. MUHEIM, a citizen of the United States, residing at Warren, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Builder-Motions in Spinning-Frames, of which the following is a specification.

It is the object of this invention to provide a construction whereby a "bunch" may be formed on the bobbin near its lower end as it stands in the spinning-frame before the builder-mechanism operates to build up the main body of the filling or yarn on the bobbin. It will be understood that the function of the bunch is to be struck with a "feeler" operated by a feeler-mechanism which controls the action of the filling-replenishing mechanism, and, of course, the device is only useful in a machine where a feeler-mechanism is employed. As the operation of a feeler on a bunch or cone or other similar appliance on a bobbin is well known, no description of it is deemed necessary.

The ordinary method of winding thread on a bobbin for the purpose of producing a bunch is for the operator to lock the ring-rail while it is at its lowest point, as is the case just before the bobbins are to be doffed, and then apply new bobbins to the spindles and start the mechanism without unlocking the ring-rail, and run it until a sufficient amount of filling is wound at the lower end of the bobbin to produce the bunch. As the ring-rail is locked there is, necessarily, no traverse, and the bunches thus formed are soft, irregular and inadequately shaped to receive the blows of the feeler. By means of my improved mechanism the bunch is built solidly and accurately and of the desired shape to receive the blows of the feeler for a suitable length of time, the ring-rail during the operation of bunch-building traversing or reciprocating vertically. When the bunch has been built to the desired amount and extent, the ring-rail automatically begins to traverse in the ordinary way to wind the bobbin from a point just above the bunch to the upper end by means of well known builder-mechanism. By means of this invention therefore the machine first builds the bunch and then proceeds to build the main portion of the filling above and next to the bunch.

The nature of the invention is fully de-

scribed below, and illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a portion of a spinning-frame provided with a builder-motion and embodying my invention. Fig. 2 is an enlarged side elevation looking toward the left of the builder-motion with my improvement applied thereto. Fig. 3 is a section taken on line 3—3, Fig. 2. Fig. 4 is an enlarged plan view of the same, a portion of the frame being shown in horizontal section. Fig. 5 is a sectional detail illustrating the bobbin when the bunch has been completed but before the builder-motion has wound upon the bobbin the main portion of the filling. Fig. 6 is a view of the completely filled bobbin ready for doffing.

Similar numerals of reference indicate corresponding parts.

Reference-numeral 10 (Fig. 1) represents a portion of the frame of a spinning-machine, 11 is the spindle-rail, 12 the spindles, 13 the ring-rail, 14 the rings, 15 the lifter-rod, 16 the lifter-arm pivotally supported by a hanger 17 secured to the under side of the spindle-rail, and 18 the weight or balance, all constructed as usual. Rigid on the shaft 19 (which is rigid with the lifter-arm 16) is an arm 20 to whose upper end is secured a cord or chain 21 which extends over the pulley 22 supported by the bracket or hanger 23 to the flanged wheel or pulley 24 which makes a part of the builder-motion. This builder-motion is not new, and the one illustrated is well known, but I will describe it briefly inasmuch as my improvement has some relation to it, the builder-motion being adapted to operate as soon as my bunch-builder mechanism completes its work. Briefly therefore, the flanged wheel 24 (Figs. 1, 3 and 4) is freely supported by a stud or short shaft 25 extending horizontally from the swinging arm 26 pivotally supported at 27 by the frame 10. The swinging arm is provided with ears 28 which constitute bearings for the shaft 29 whose conical end 30 is sustained by the right-hand bearing (Fig. 2). On the left end of the shaft is the hand doffing-crank 31, which is operated when the bobbins are full and ready to be doffed. The shaft 29 is provided with a worm 32 which engages with a gear-wheel 33 integral or rigid with the flanged wheel or pulley 24 and operates to turn it. The free end of the

arm 26 supports a cam-roll 34 which is adapted to be brought into engagement by the weight 18, lifter-arm 16, arm 20, cord 21 and pulley 24, with the periphery of the cam-wheel 35 which is rigid on the driving-shaft 36 supported by the frame and driven by suitable mechanism connecting with the power. This, of course, vibrates the ring-rail, subject to certain regulating parts below mentioned, for the purpose of building the filling 37 (Fig. 6) on the bobbin, in the usual manner. The shaft 29 supports a hub 38 provided with oppositely extending arms 39 and 40, the arm 39 being provided with a pawl 41 lying on a ratchet-wheel 42 rigid on the shaft 29, and the arm 40 being provided with a weight or counter-balance 43. A regulating or limiting-rod 44 extends from the arm 40 up through the spindle-rail, and is provided with the usual nuts 45 on opposite sides of the rail. By means of the upward and downward movements of the arm 39 the ratchet-wheel 42 is intermittently rotated by the engagement of the pawl 41 (against the power of the weighted arm 40) thus rendering the movement of the shaft 29 intermittent, said shaft by means of the worm 32 transmitting similar movement to the gear-wheel 33 which is rigid with the flanged pulley 24, and this movement continues until the bobbins are full, when the arm is stopped by hand and the bobbins doffed in the ordinary manner. All the above-described builder-motion together with its operation is well known, and needs no further description.

I will now describe my new and improved mechanism for forming the bunch on the bobbin before the builder-motion applies the main portion 37 of the filling, said bunch being represented at 46 in Figs. 5 and 6. Mounted on the same driving shaft 36 which imparts rotation to the cam-wheel 35 (Figs. 2, 3 and 4) is a cam-wheel 47, its periphery being arranged with short cam portions of length to produce and build by means of connecting mechanism the layers in the short bunch 46. This cam-wheel has a slightly beveled periphery, the bevel being inward toward the right end of the machine, that is, toward the inner end of the shaft 36. Also mounted on this shaft near its unsupported end (the outer end of the shaft having bearings in a long box 48) is the sprocket-wheel 49 which is connected by a chain 50 (Figs. 2 and 4) with a sprocket-wheel 51 supported by a horizontal shaft 52 having its bearings in boxes 53 and 54 supported by a bracket 55 secured at 56 to the swinging arm 26. On this shaft 52 near its outer end is mounted a sprocket-wheel 57 which is connected by a chain 58 with a sprocket-wheel 59 whose hub 60 rests on and is supported by a yoke 61 which is integral with a horizontal bar 62, said bar 62 extending

from and being rigidly secured at 63 to the swinging arm 26. This bar has upward extensions 64 and 65 in which is mounted a horizontal shaft 66 which is provided with a sleeve 67 formed with a worm 68 which extends into a corresponding spiral groove or thread 69 on the inner surface of the hub 60 of said sprocket-wheel 59. On the outer end of this horizontal shaft 66 is a hand-wheel 70 and between its bearing points a ratchet-wheel 71 is rigid on the shaft, said ratchet-wheel being engaged by the upper end of a dog or pawl 72 which is pivotally supported at 73 by the arm 26 and lies in said wheel by gravity. By this means the shaft is held normally stationary. The inner end of the shaft is provided with a cam-roll 74, and by means of the worm 68 and the hand-wheel 70 this cam-roll may be moved horizontally into engagement with the periphery of the cam-wheel 47.

Each depression in the cam 47 represents one traverse or vibration over that part of the bobbin which receives the bunch, and, as is evident, the traverse represents the length of the bunch. When the cam-roll 74 has been brought into engagement with the cam-wheel 47 by rotating the handle 70 and moving the shaft 66 longitudinally in the threaded sprocket-wheel 59, 60, the traverse is produced solely by means of the cam-wheel 47, as the cam-wheel 35 and cam-roll 34 are out of engagement. As long as the cam-roll 74 remains in engagement the machine is confined to working on the bunch, and it remains in engagement with the cam 47 until the worm 69 has gradually drawn the shaft 66 (which is prevented from rotation by the dog 72) out far enough to disengage the cam-roll 74 from the cam 47. This withdrawal of the shaft is of course produced by the rotation of the internally threaded sprocket-wheel 59, 60, which is driven by the chain 58, sprocket 57, shaft 52, sprocket 51, chain 50, and sprocket 49, on the driving-shaft 36. When the cam-roll 74 has reached the point of disengagement, the bunch is built, and the regular builder-motion begins by reason of the cam-roll 34 being swung up into engagement with the cam-wheel 35 by the swinging arm 26. It will readily be seen that by means of the relative positions as to height of the cam-roll 74 and the cam-roll 34, the latter cam-roll 34 cannot reach the cam 35 until the cam-roll 74, which has been held up in engagement with the cam 47 is withdrawn from the periphery of said cam and swung up beyond its periphery by the bar 26. Of course this swinging bar is constantly being pressed upward by the action of the weight 18 through the mechanism 16, 20, 21, 24, and the bar 62 with the shaft 66 and cam-roll 74 must all be swung up at the same time. If therefore, the cam-roll 74 is in line with the cam it must as

its distance above the cam-roll 34 is greater than the distance between the peripheries of the cams 35 and 47, be swung into engagement with the cam 47, but when withdrawn horizontally from such engagement by the action of the threaded wheel 59, 60, and worm 68, there is nothing to prevent the cam-roll 34 which is also supported by the swinging arm 26 from being lifted into engagement with the cam 35. Hence the cam 35 immediately through the building mechanism begins to wind the filling and produce the main portion 37 in the ordinary manner, the short traverse produced by the cam 47 giving place to the long traverse produced by the cam 35. After doffing, the bunch-building mechanism is again placed in operation by swinging down the dog or pawl and turning the wheel 70 by hand.

By means of the beveled edge or periphery of the cam 47 the roll 74 is, when the shaft 66 is withdrawn by means of the worm 68, 69, moved up gradually, thus producing the taper on the bunch.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent is:—

1. In a spinning-frame of the character described provided with a builder-motion for building the main portion of the filling or thread on the bobbin said builder-motion including a driving-shaft and two cams thereon one of which is the bunch-building cam, a bunch-building mechanism comprising a shaft provided at one end with a cam-roll adapted to be engaged with the bunch-building cam on the driving-shaft and at the other end with a hand actuating device, a sleeve rigid on said shaft and provided near one end with a worm and with a portion of its surface plain, a sprocket-wheel on said sleeve adapted to engage with the worm, a ratchet-wheel rigid on said shaft, a pawl held by gravity in engagement with said ratchet-wheel, and mechanism intermediate of the driving-shaft and said sprocket-wheel for actuating the latter,

whereby the said cam-roll may be moved horizontally into engagement with the bunch-building cam by said hand actuating device before the machine is started, and after the machine is started the bunch is built while the sprocket-wheel on the sleeve is in engagement with the worm by the gradual outward movement of the shaft on which said wheel is mounted.

2. In a spinning-frame of the character described provided with a builder-motion including a driving-shaft and two cams thereon one of which is for building the bunch and the other for building the main portion of the filling, a bunch-building mechanism comprising a shaft adapted to be operated by hand and provided with a cam-roll adapted to be engaged with the bunch-building cam, a sleeve rigid on said shaft and with one portion of its surface plain and the rest provided with a worm, a sprocket-wheel on said sleeve adapted to engage with the worm, a ratchet-wheel on said shaft, a pawl adapted to be held in engagement with the ratchet-wheel, and mechanism intermediate of the driving-shaft and said sprocket-wheel for actuating the latter, whereby said cam-roll may be first moved into engagement with the bunch-building cam and after the machine has been started the cam-roll is held in engagement with the bunch-building cam while the sprocket-wheel on the sleeve is in engagement with the worm and is disengaged from the bunch-building cam by the outward movement of the shaft whereby the worm is disengaged from the sprocket-wheel and the smooth or plain portion of the sleeve is moved into the sprocket-wheel in place of the worm.

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

JOSEPH F. MUHEIM.

Witnesses:

HENRY W. WILLIAMS,  
M. A. ATWOOD.