

(No Model.)

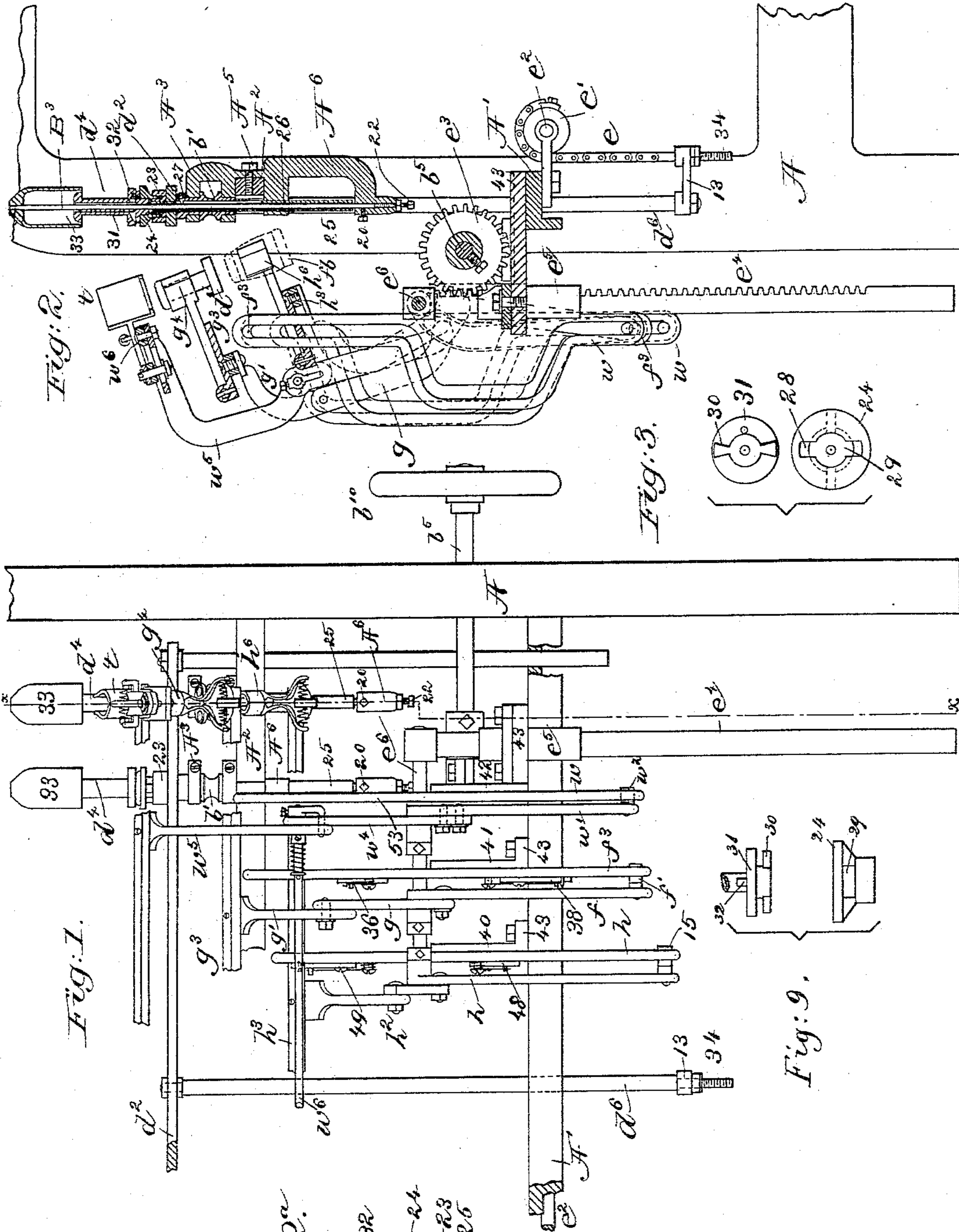
J. MARJERISON.

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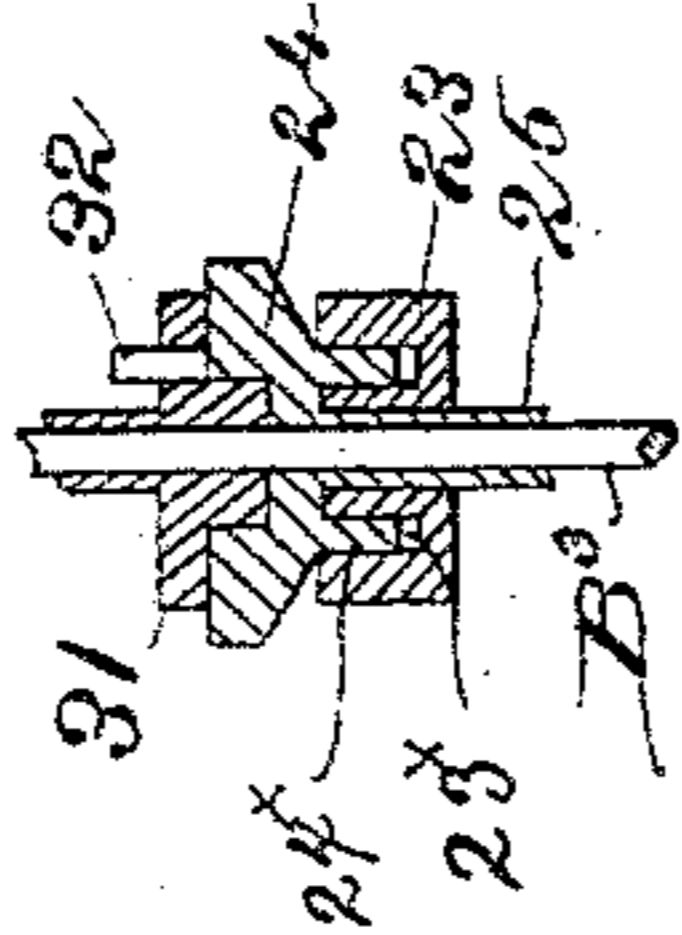
SPINNING MACHINE.

No. 381,567.

Patented Apr. 24, 1888.



Witnesses.  
H. B. L. L.  
John F. C. Prentiss



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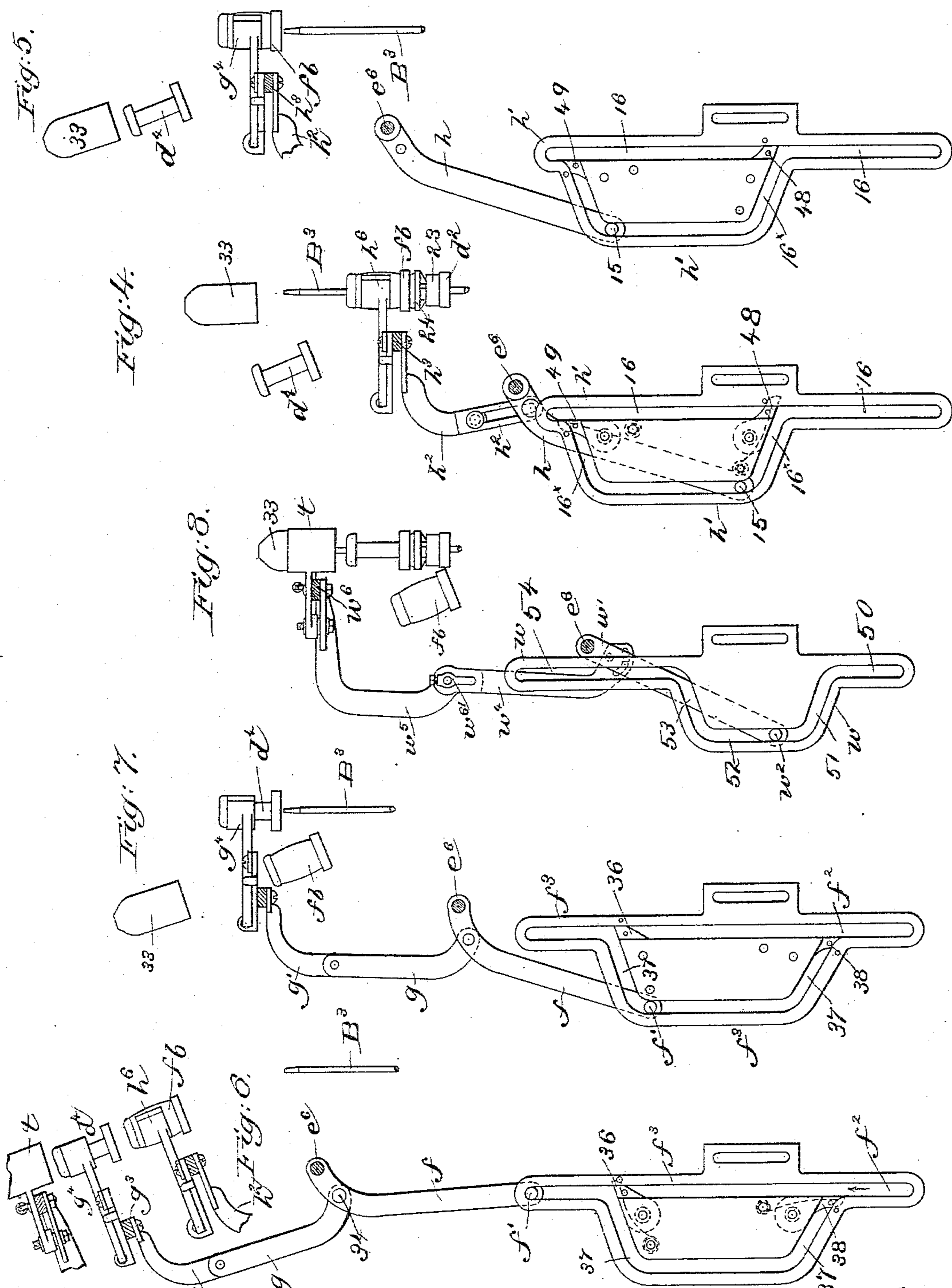
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SPINNING MACHINE.

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Witnesses.  
Howard F. Eaton.  
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In witness  
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# UNITED STATES PATENT OFFICE.

JAMES MARJERISON, OF LAWRENCE, MASSACHUSETTS.

## SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 381,567, dated April 24, 1888.

Application filed August 26, 1887. Serial No. 247,930. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MARJERISON, of Lawrence, county of Essex, and State of Massachusetts, have invented an Improvement in Spinning-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is an improvement on that described and shown in my application, Serial No. 192,057, filed February 15, 1886, to which reference may be had, the object of my invention being to adapt the machine therein described to cap rather than to flier spinning.

To effect this improvement in my said machine, I have added an additional set of clamps and arms to operate them, whereby the said clamps, when full bobbins are to be doffed from the spindles, are made to move upward and forward to grasp the caps, remove them from the upper ends of the dead-spindles, and hold the said caps until the full bobbins are removed from and empty bobbins are supplied to the spindles in their place.

I have also provided novel means for connecting the bobbin-carrying tube with a sleeve, which is made vertically movable within the whirl used to rotate the said sleeve. I have also provided means for oiling the bearings in which the whirl rotates.

Figure 1 in front elevation shows a sufficient portion of a cap spinning frame, which, taken in connection with my application referred to, will enable one conversant with the art of spinning to understand my invention; Fig. 2, a section thereof in the line *x*, Fig. 1. Fig. 2<sup>a</sup> is an enlarged sectional detail showing the oil-cup 23, which receives in it an annular projection from the lower side of the head 24 of the sleeve; Fig. 3, a detail showing the lower end of the bobbin and the top of the head of the sleeve. Figs. 4 to 8 represent details showing the positions of the parts at different stages of the doffing operation, and Fig. 9 is a side elevation of the parts shown in Fig. 3.

In this my improved machine the apparatus for applying and removing the empty and full bobbins is substantially the same as in my said application, except that I have elongated the upper arms of the rock-shaft for moving the clamps that control the empty bobbins and

shortened the arms of the rock-shaft having the clamps for the full bobbins, as I find it more convenient in this present case to have the empty bobbin-controlling clamps above the full bobbin-controlling clamps.

In the details Figs. 4 to 8 I have omitted some of the parts shown in Figs. 1 and 2 and common to my said application, the said detail figures being chiefly to represent the different relative positions of the full and empty bobbins and caps at different stages of the doffing operation. In this present invention the collar-rail has attached to it or depending from it a series of yoke-like supports, which act not only as guides for the tubes, to be referred to, but also serve to support the lower ends of the dead-spindle. Herein I have done away with the necessity of raising and lowering the step-rail, as in my application referred to.

The frame-work A, the cross-beam A', the rail A<sup>2</sup>, the collar-rail A<sup>3</sup>, secured to it by screws A<sup>5</sup>, the builder-rail A<sup>2</sup>, its lifting-rods A<sup>6</sup>, the lugs or ears 13, the chain *e*, drum *e'*, builder-shaft *e'*, the doffing-shaft *b'*, its gear *e'*, the toothed rod or rack *e'*, engaged by it, the guides *e'* therefor, the rock-shaft *e'*, carried in the bearings or boxes at the upper ends of the rack *e'*, the hand wheel or pulley *b'*, to move the doffing-shaft *b'*, the arms *f*, having studs *f'*, the rail *g'*, the empty bobbin-clamp *g'* thereon, the rail *h'*, and the full bobbin clamp or jaws *h'* are all substantially as in my said application, Serial No. 192,057, filed February 15, 1886, with the exception of slight material differences in the shape of the clamps or jaws referred to, and in the fact that the jaws *g'* are herein shown as made to occupy a position above the clamps or jaws *h'*, such change necessitating only slight alterations in the length of the arms supporting the said rails and their jaws.

Herein the collar-rail A<sup>3</sup> has a depending yoke-shaped portion, A<sup>6</sup>, a part of which serves as a steadying-bearing for the sleeve 25, surrounding the dead-spindle B<sup>3</sup>, while another part receives the foot of the said dead-spindle, it being held in place by a set-screw, 20, the vertical position of the dead-spindle being secured by means of an adjusting-screw, 22. (See Fig. 2.)

Herein the lifting-rail  $d^2$  is arranged above the whirls  $b'$ , and resting upon the top of the said lifting-rail and about each spindle is an oil-cup, 23, (shown separately in Fig. 2<sup>a</sup>,) the said oil-cup having an annular chamber, 23<sup>x</sup>, to receive snugly an annular projection, 24<sup>x</sup>, at the under side of the head 24 of the bobbin-carrying sleeve 25, the said projection running in the oil in the said annular groove as the sleeve is rotated. This sleeve 25 is extended down through the raised center of the oil-cup, through the lifting-rail, the sleeve-whirl, and the bearing 26, and the weight of the sleeve is supported by the lifting-rail. The sleeve 25 is slotted at one side to receive in it a key, 27, (see Fig. 2,) extended through the upper end of the whirl  $b'$  above the upper bearing of the collar-rail  $A^3$ , the rotation of the whirl thus rotating the sleeve and head 24 in unison with it, the said slot in the sleeve permitting the latter to be raised by the builder-rail  $d^2$  at the same time that the whirl is rotating the sleeve.

The head 24 (see Figs. 3 and 9) has at its upper side a slot shaped as shown at 28, and below its top the head is cut away, leaving an open space, as 29, the said slot and space being for the reception of the foot 30 of the bobbin-driving tube 31, the said foot, as herein shown, having two projections or ears and being in cross-section of substantially the same shape as the slot 28. When the foot passes down into the slot so that the head of the bobbin-driving tube rests upon the top of the head 24, the said lugs, by the partial rotation of the bobbin-driving tube, will be caught under the upper flange of the said head in the space 29, thus locking the bobbin-driving tube in position with relation to the head and sleeve 25, so that the bobbin-driving tube partakes of the motion given to the sleeve, thus causing the said bobbin-driving tube to not only rotate, but rise and fall upon the dead-spindle  $B^3$ .

The head 24 of the bobbin-driving tube has a pin, 32, which enters in usual manner a space in the head of the bobbin  $d^4$ , causing the bobbin to be rotated with it.

The upper end of the dead-spindle  $B^3$  is tapered in usual form to receive upon it a metal cap, as 33, the said cap being of usual shape—such as commonly employed in cap-spinning frames—the cap remaining stationary while the bobbin is being rotated within it, the yarn passing from the usual guide-eye (not shown) to the bobbin, traveling about the cap and passing across its lower end to the bobbin, in the usual manner.

By employing an independent sleeve, 25, between the whirl  $b'$  and the dead-spindle  $B^3$  I am enabled to not only keep the dead-spindle stationary—that is, not raise and lower it—but I am also enabled to keep the whirls in the same vertical position, so that the said whirls do not rise and fall with the builder-rail.

The rising and falling of the whirl with the builder-rail causes the bands extending from the whirls to the usual tin drum for driving

them to be alternately slackened and made taut, as is well understood, which is a very serious objection to the steady uniform rotation of the bobbins, the difference in tension upon the bands resulting in materially affecting the twist, making it harder and softer at different portions of the yarn.

The cams, to be described, for operating the different arms for imparting motion to the bars carrying the clamps or jaws are somewhat modified from the construction shown in my said application.

Referring to the drawings, the rock shaft  $e^6$ , common to my said application, has, as herein shown, fast upon it an arm,  $f$ , provided with a roller or other stud,  $f'$ , the said arm and stud being substantially as in my said application.

The arm  $f$  has fastened to it at 34 a second arm,  $g$   $g'$ , which supports a bar,  $g^3$ , on which are mounted the clamps or jaws  $g^4$ , adapted to hold and apply the empty bobbin  $d^4$  to the dead-spindle  $B^3$ , and thence down upon the bobbin-driving tube. The shaft  $e^6$  has a rising-and-falling motion imparted to it by the rising and falling of the rack  $e^4$ , as in my said application, and as the rod rises the roller or other stud,  $f'$ , travels in the straight part of the irregular groove  $f^2$  of the cam-plate  $f^3$ , starting from the bottom thereof and rising in a straight line to substantially the top thereof, in the position indicated in Fig. 6; but when the shaft  $e^6$  is lowered then the roller-stud  $f'$ , arrested by the switch 36, is made to travel about the branch groove 37, as in Fig. 7, and down again into the bottom of the groove  $f^2$ , a switch, 38, located at the bottom of the branch groove, preventing the roller-stud  $f'$ , when rising, from entering the lower end of the branch groove 37.

The detail Fig. 6 is intended to represent the bobbin-holding jaws  $g^4$  as in their uppermost position, with an empty bobbin,  $d^4$ , ready to be applied to the dead-spindle as the shaft  $e^6$  is lowered, the clamp  $g^4$  at such time being moved to the right (see Fig. 7) in position to place the hole in the bobbin  $d^4$  immediately above the top of the spindle  $B^3$ . The detail Fig. 6 also shows the jaws  $h^6$ , to grasp and remove the filled bobbin  $f$   $b$ , Fig. 4 showing more fully the arms carrying them, both figures showing a full bobbin in the clamp. When the shaft  $e^6$  is elevated, the jaws  $h^6$  are moved in toward and made to grasp the full bobbin  $f$   $b$  and remove it from the tube 31 and spindle; but prior to that the cap-clamping jaws  $t$  (best shown in Fig. 8) rise or are moved by or through the parts carrying them, to be described, and made to grasp the cap 33 and lift it from the spindle. The cam-plates  $f^3$ ,  $h'$ , and  $w$  are all fixed, respectively, to stands 40, 41, and 42, erected upon suitable extension plates, as 43, secured to the rail  $A'$ . The cam-plate  $h'$  has a straight groove, 16, and a branch groove, 16\*, the said groove 16 being crossed by a switch, 48, the branch groove being crossed by a switch, 49. The groove 16, as the rod  $e^6$

starts to rise, receives in it the roller or other stud 15, extended from one side of an arm,  $h$ , loose on the said rod, the said arm  $h$  having attached to it an adjustable two-part arm,  $h^2$ , provided with a bar  $h^3$ , upon which is mounted the series of clamps or jaws  $h^6$ , which seize the full bobbin and remove it from the tube and spindle after or as the cap 33 is being removed by the jaws  $t$ .

The roller or other stud 15 in the rise of the rod  $e^6$  starts from the bottom of the groove 16, meets the switch 48, and is thereby thrown into the branch groove 16\*, such movement of the arm  $h$  throwing quickly forward the clamps or jaws  $h^6$  to grasp the full bobbin  $f b$ , as in Fig. 4, and as the roller or other stud 15 travels upward in the said branch groove 16\* (see Fig. 4) the clamps or jaws  $h^6$  rise vertically, yet holding the bobbin  $f b$ , and carry it up from the top of the spindle, and as soon as the full bobbin is lifted from the top of the spindle the roller-stud 15 comes into the upper diagonal portion of the branch groove 16\* and throws the clamps or jaws  $h^6$  back into the position shown in Fig. 6, at one side of the top of the spindle. The cam  $w$  has an irregular groove composed of a straight part, 50, an inclined part, 51, another straight part, 52, an inclined part, 53, and a third long straight part, 54. The shaft  $e^6$  has loose upon it an arm,  $w'$ , having a roller or other stud,  $w^2$ , which, when the shaft  $e^6$  commences to rise, rests in the bottom of the straight slot 50.

The arm  $w$  has fast to it an extension-arm,  $w^4$ , (see Fig. 8,) provided with a prolongation,  $w^5$ , which is jointed to the part  $w^4$ , the extension  $w^5$  supporting a bar,  $w^6$ , extended throughout the length of the machine, which bar serves as a support for a series of clamps or jaws,  $t$ , which are made to grasp the cap 33 and lift it from the top of the spindle from the position Fig. 8 into the position Fig. 6, Fig. 7 showing the said cap on its downward passage to be put upon the top of the spindle, the jaws being, however, omitted. As shown in Fig. 8, the roller or other stud  $w^2$  has risen through the branch part 51, which moves the clamp or jaw  $t$  forward to grasp the cap, and thereafter, while the said roller or other stud continues to rise in the slot 52, the cap 33 is lifted in a straight line; but as soon as the roller or other stud enters the groove 53 the jaw  $t$  and cap are thrown back quickly to the left, and thereafter, as the stud travels in the straight part 54, the clamps or jaws  $t$ , yet holding the cap, rise vertically.

All the jaws or clamps are composed of pairs of arms pivoted centrally, their rear ends being acted upon by suitable spiral or other springs, which act normally to close the jaws, the forward ends of the jaws being rounded, so that when they are pushed against the round surfaces of either the full bobbin, the empty bobbin, or the cap the said jaws will yield, and then close upon and grasp the parts within

their jaws by a force measured by the said springs.

I have herein described my invention as applicable for spinning; but I desire it to be understood that my invention is equally well adapted for twisting together two or more yarns.

I claim—

1. A series of dead-spindles, a series of sleeves, 25, loose thereon, a series of whirls surrounding the said sleeves and loosely connected therewith, a collar-rail and extension,  $A^6$ , to hold the spindles and form bearings for the sleeves and whirls, a series of caps for the said spindles, a series of bobbin-driving tubes adapted to be rotated by the said sleeves, and a builder-rail, combined with a series of vibrating and vertically-movable clamps or jaws to remove and then reapply the said caps, a series of vibrating and vertically-movable clamps or jaws to receive empty bobbins and apply them to the bobbin-driving tubes, and a series of vibrating and vertically-movable clamps or jaws to engage and remove full bobbins from the said tubes, and with supports and operating mechanism for the said clamps or jaws, substantially as described.

2. The dead-spindle, the loosely-surrounding rotating and vertically-movable slotted sleeve provided with a recessed head, 24, the whirl having a stud or projection entering the slot of the said sleeve, a collar-rail provided with an upper bearing to receive and support the said whirl loosely and prevent vertical movement of the whirl, and a depending yoke-shaped portion serving as a steadying-bearing for the said sleeve, and also forming a rest or support for the said dead-spindle, combined with a cap, the independent bobbin-driving tube, the base of which is connected to the head of the sleeve, and with an independent builder-rail and means to move it to raise and lower the sleeve and bobbin-driving tube on the dead-spindle, substantially as described.

3. The dead-spindle, the independently-movable builder-rail, and the grooved oil-cup 23, resting thereon, combined with the rotating sleeve extended through the said rail and cup and having an attached head, 24, provided at its underside and about the said sleeve with an annular flange or projection,  $24^x$ , to enter snugly and revolve within the groove or chamber  $23^x$  of the said cup 23, and with the bobbin-receiving tube having at its lower end a collar or projection to enter a recess cut in the upper side of the said head 24, to operate all substantially as shown and described.

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

JAMES MARJERISON.

Witnesses:

G. W. GREGORY,  
C. M. CONE.