

J. JACKSON.
SPINNING JACK.

No. 9,858

PATENTED JULY 19, 1853.

3 SHEETS—SHEET 1.

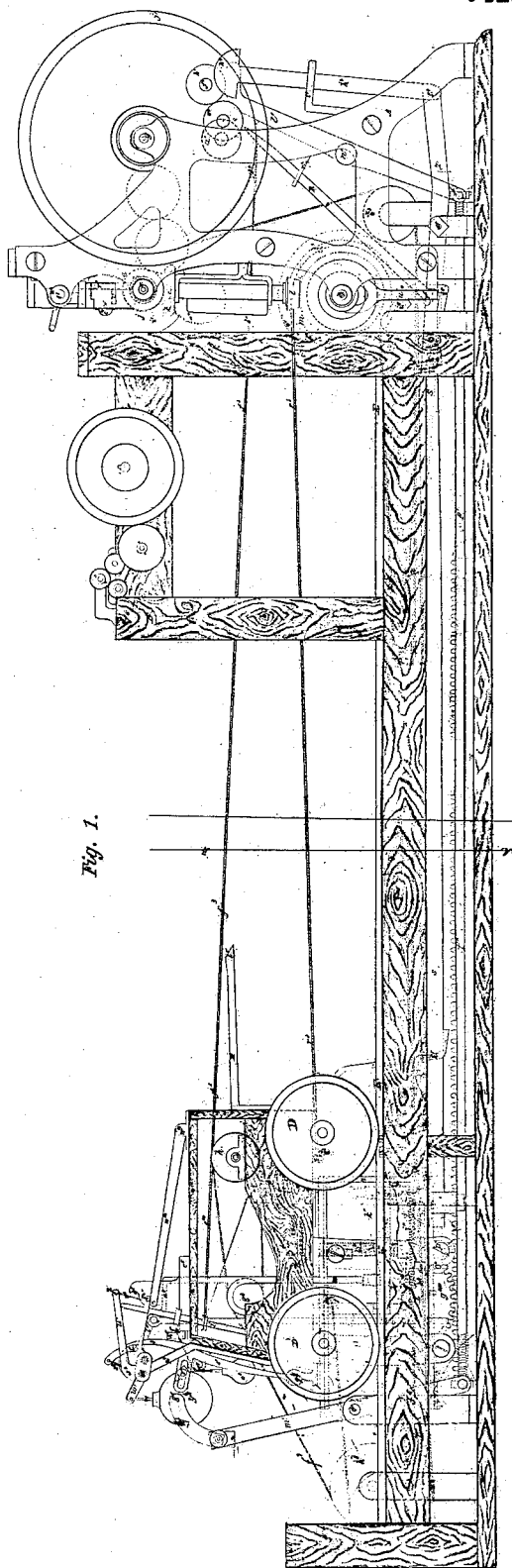


Fig. 1.

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3 SHEETS—SHEET 2.

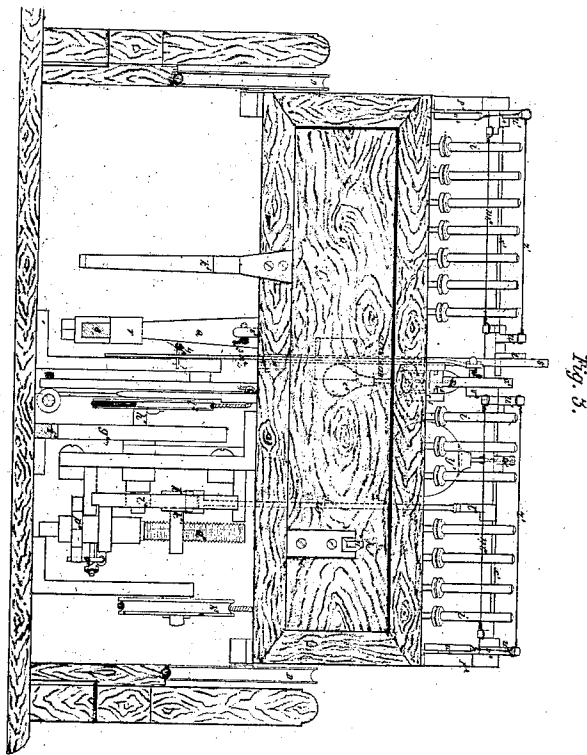


Fig. 5.

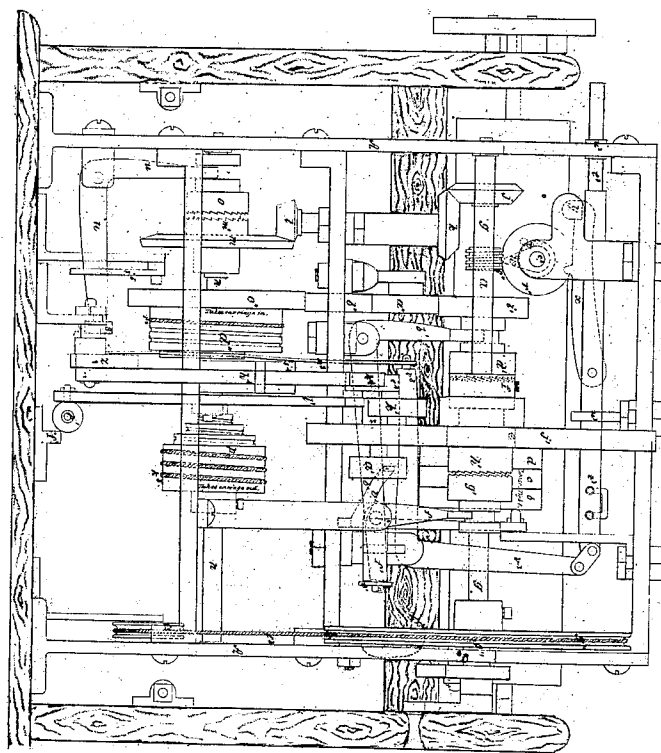


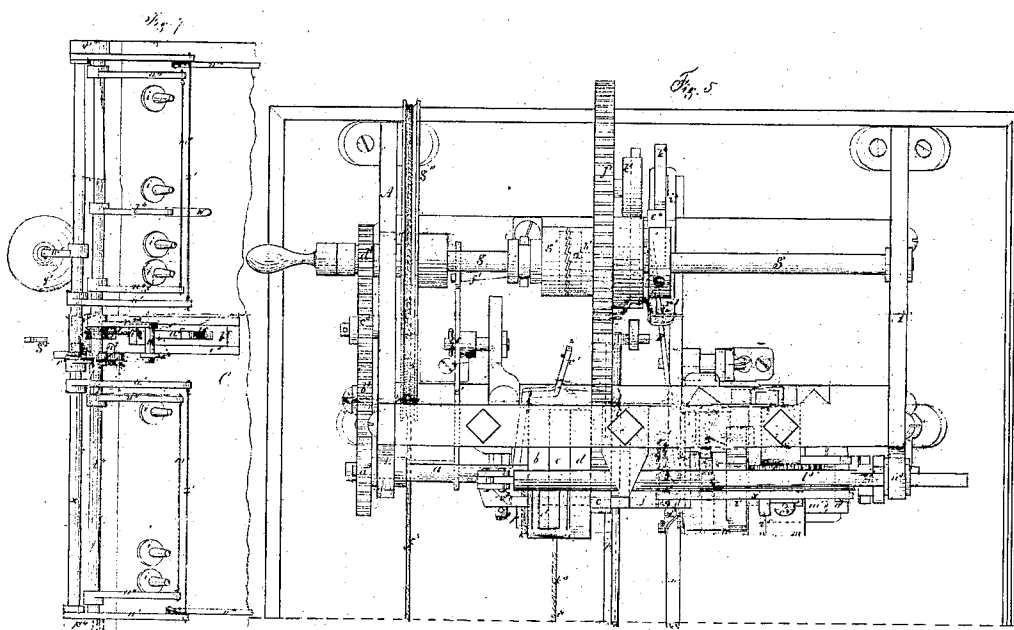
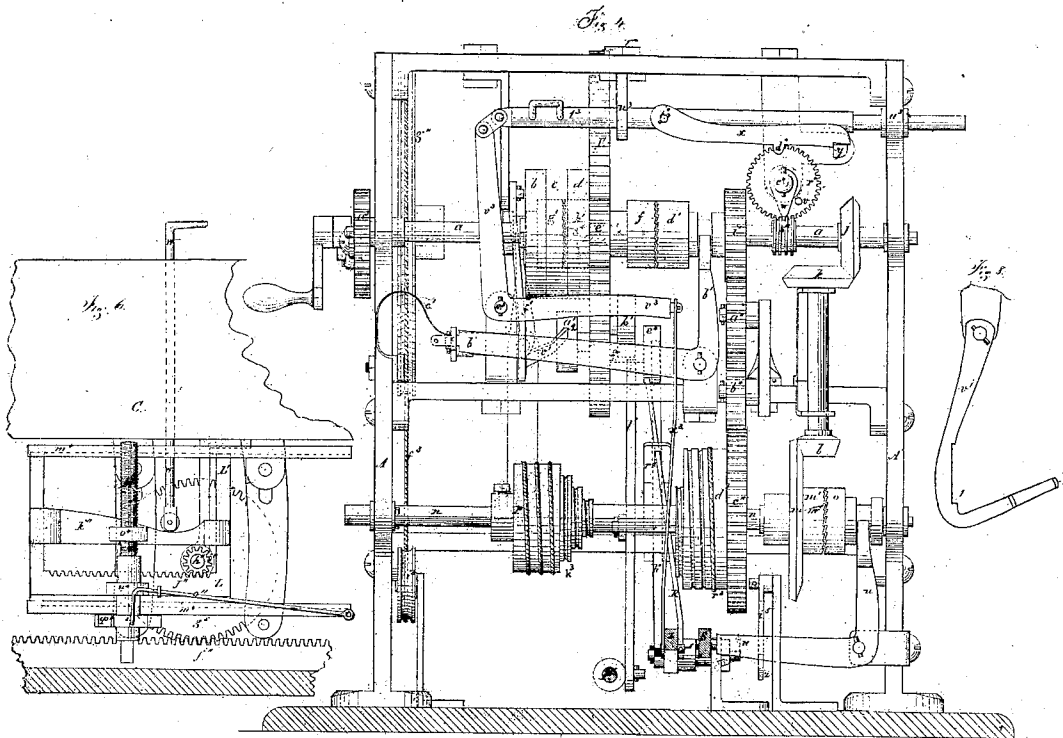
Fig. 2.

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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

JOHN JACKSON, OF LAWRENCE, MASSACHUSETTS.

SPINNING-JACK.

Specification of Letters Patent No. 9,858, dated July 19, 1853.

To all whom it may concern:

Be it known that I, JOHN JACKSON, of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Jacks for Spinning Woolen or other Yarn, by which the Same are greatly Simplified; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification.

The nature of my invention consists in a simple and effectual method of forming the cops and bobbins, and also in an improved method of stripping the spindles preparatory to "winding on" the thread.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

Figure 1 represents a side elevation of my self-operating jack, with the carriage taken out. Fig. 2 is a rear elevation of the head stock. Fig. 3 is a section on A B of Fig. 1, showing the carriage and the parts connected therewith. Fig. 4 is a front elevation of the head stock. Fig. 5 a plan of the same. Fig. 6 is a detached view of the former k'' and the parts by which it is actuated. Fig. 7 is a plan of the carriage. Fig. 8 is a view of the hook v' .

My machine is of the class in which the head stock is placed behind the roller beam. The rovings are given out from the drawing rollers in the customary manner. No further description is therefore required of this part of the mechanism, and I will confine my description to those portions of the machine which I consider as new and to the parts immediately connected therewith.

The movements of the machine may be divided into two classes: firstly, those governing the motions of the carriage; secondly, those connected with the formation of the cops, and the stripping of the spindles. These movements I will now proceed to describe.

A is the containing frame of the head stock; B, the roller beam; C, the carriage, the wheels D of which run upon the ways E.

The carriage is taken out in the following manner:— a is the driving shaft, upon which is secured the bevel gear j' , which through the intermediate bevel gears k and l , drives the gear m , and clutch m' , which are fast together, and loose on the shaft n . They are made to revolve with the shaft,

however, by the clutch o , which revolves with the shaft n , by means of a feather, while it slides horizontally upon it. The clutch o is moved by the lever u . The end of the lever u is secured to one end of a lever s , which has its fulcrum at t , Fig. 1. Upon the other end of this lever s is a semi-circular piece v , which is struck by the piece 2, Figs. 1 and 2, upon the carriage, when the latter has reached the end of its motion, by which means this end of the lever s is depressed and the other end, bearing the clutch lever u , is raised. The clutch o is thus unshipped from m' , and the shaft n ceases to turn, as also the scroll p , which is secured thereto. This scroll carries the cord k^3 , which after passing over the stationary guide pulley l^3 , is secured to the carriage at m^3 . As the shaft n revolves, the cord k^3 , is wound upon the scroll p , and the carriage is taken out. When the clutch lever u is raised by the upward motion of the lever s , the former falls into a notch in a pendant hook i^3 , similar to that represented in Fig. 8, and the lever u is thus held up, the clutch o , m' being open, until the carriage again comes in, when the foot k^5 projecting from the carriage, strikes the point 2, of the hook i^3 , and the clutch lever u is thus disengaged from the notch 1 of the hook i^3 , and the lever u falls, the clutch o , m , is closed, and motion is again communicated to the shaft n and scroll p , for the purpose of taking the carriage out as before.

The carriage is taken in in the following manner: Upon the shaft a are the three pulleys b , c , and d . Pulley b , is fast to the shaft; C is loose thereon, and the pulley d , the gear e , and clutch f , are fast together and loose upon the shaft a . Also loose upon this shaft is the clutch d' , and gear i' , which are fast together. The gear i' through the intermediate wheels a'' , b'' , gives motion to the cog wheel C'', which is fast to the scroll d'' , and runs with it loosely upon the shaft n . The cord r^3 , which is wound around the scroll d'' , passes thence to the carriage, where it is secured to the pin s^3 ; and thus whenever the belt is shipped upon the pulley d , and d' is in clutch with f , the cord r^3 , is wound upon the scroll d'' , and the carriage is taken in. This movement of the belt shipper and clutch is effected as follows: The belt shipper t^3 , slides in bearings u^3 , upon the frame of the head stock. To the belt shipper t^3 , is jointed a lever v^3 , which

is pivoted to the frame of the machine at w^3 . From the other end of this lever is suspended by the rod x^3 , the lever z , the weight of which rests constantly upon the lever v^3 , and thus tends to slide the belt shipper t^3 , in its bearings (Fig. 4). This motion of the belt shipper is prevented by the catch x , which is pivoted to it at the point b^4 . At the other end of the catch x , is a notch which rests against the stationary pin y , projecting from the frame of the machine. The belt shipper is thus held stationary, and the belt runs upon the fast pulley b .

The following device is made use of to move the belt shipper when it is desired to shift the belt upon the pulley d : The worm s'' is attached to the shaft a , Fig. 4, and engages with the cog gear r' , which runs upon a pin c^4 , projecting from the frame of the machine. Pendant from the said pin is the finger w , and from the gear r'' projects the pin v , which, as it revolves, carries around the finger w , which striking against the projection d^4 , upon the catch x , raises the latter over the pin y , and thus the belt shipper is left free to move under the action of the weighted lever z , as before described. The belt is returned to the fast pulley b at the proper time, in the following manner: e^4 is a roller running freely upon a pin projecting from the cog gear j' . To the extreme end of the lever z , and beyond its fulcrum a^4 , is hinged upon a pin g^4 , the upright lever h^4 , which rests in a guide i^4 , projecting from the frame of the machine. Upon the top of the lever h^4 , is a semicircular piece k^4 . As the belt is now upon the pulley d , the gear e , which is fast to the pulley, engages with the wheel j' , which is thus driven until the roller e^4 , at the appointed time strikes the semicircular head of the lever h^4 , Fig. 1, and depresses the short arm of the lever z , and raises the long arm, and thus through the rod x^3 , the horizontal arm of the lever v^3 (Fig. 4) is raised and the belt shipper t^3 , moved, throwing the belt upon the fast pulley b , and withdrawing the catch x until its notch again falls over the pin y , which holds the belt upon the pulley b , until, by the revolution of the pin v , the catch x , is again released at the appointed time and the belt is shipped as before to the pulley d . At the instant that the roller e^4 , has passed the head of the lever h^4 , and shifted the belt as just described the gear j' , no longer driven by the gear e , stops, and in order that its momentum may not carry it beyond the point at which it was when the belt was shipped the roller e^4 , is made to strike against a brake or stop R , hinged to the long arm of the lever z , at the point r^6 , and passing up through the guide r^7 , and thus the motion of the gear j' , is instantly arrested in such a position that when the belt is again shipped upon the pulley d , and the cog gear j' is set in mo-

tion the roller k' shall be in position to depress the head of the lever h' , and thus operate the stripping and building wires in a manner to be described. The brake R , being hinged to the lever z , is dropped out of the way of the roller e^4 , when the lever z , is depressed and at the instant that motion is again communicated to the gear j' , by the shifting of the belt.

Motion is given to the spindles as follows: The shaft a is geared to the shaft g , by the wheels a^3 , d^3 , and intermediate wheels c^3 , b^3 . Upon the shaft g is the band wheel g'' , carrying the cord f^3 , which, after passing once around the cylinder h , and over the guide pulley g^3 , upon the carriage, is conducted over the pulleys h^3 , and i^3 , back to the band wheel g'' . Thus when the driving band is upon the fast pulley b and the shaft a is in motion the band wheel g'' , upon the shaft g , is revolved, and also the drum h , from which pass the bands e^4 , to the wherves of the spindles. During the return of the carriage the spindles receive a much slower motion, which is produced in the following manner: The clutch d' is moved by the bent lever b' . The long arm of this lever is held up by resting in a notch (1) in the pendant hook v' , see Fig. 8. When released from this notch the lever b' gives way to the pressure of the spring c' , and is depressed, carrying with it the lever e' , pivoted at i^6 , and connected at its other extremity with the lever f' , which moves the clutch g' , so that the depression of the lever b' moves simultaneously the clutches d' and g' . The band being now upon the pulley d , the cog wheel e attached to it, drives the gear j' , which is loose upon the shaft g . Projecting from the wheel j' is the roller a' , which as the former revolves strikes against the point 2 of the pendant catch v' , and knocks the latter from beneath the lever b' , which falls from out the notch 1 of the lever v' , and thus at the instant that d' is made to clutch with f , (by which means, through the gearing i' , a'' , b'' , c'' , and scroll d^2 the carriage is brought in) the gear j' is clutched with the shaft g , by which means, through the band wheel g'' , a much slower motion is communicated to the spindles to wind on the thread as the carriage comes in. The lever b' is again raised and lodged in the notch 1 of the hook v' , for the purpose of opening the clutches f , d' , and g' , h' , in the following manner: H , Figs. 1 and 2, is an arm projecting from the carriage, having at its advanced end an inclined plane l^5 , which passes beneath the lever b' when the carriage comes in and raises it, by which means, through the connections already described, the clutches f , d' , and g' , h' , are simultaneously opened. The scroll d^2 , having brought in the carriage, ceases to revolve, and the band wheel g'' no longer receives its slow

motion from the gear j' . At the same instant that this is performed the belt is shipped upon the fast pulley b , and the band wheel g'' , through its connections with the shaft a , commences its rapid motion necessary on the going out of the carriage for the performing of the spinning operation, the clutch $m' o$ having been closed at the same instant by the release of the lever u from the notch l in the hook i .

The operation of building the cop is performed as follows: L , Figs. 1 and 6, is a sliding frame running in ways m^4 , upon the carriage. Upon the upright bars L' of this frame, as ways, moves the former k'' . Upon the upper surface of the former k'' , which is curved, so as to give the requisite shape to the bobbin, rests the vertical rod w , which is connected with the faller wire, as will be hereafter explained. To the former are communicated two motions, the one horizontal with the frame L in its ways m^4 , the other a vertical motion upon the upright arms L' . The first of these motions is communicated as follows: Beneath the carriage and along its whole path is laid the rack f'' , which engages with the cog wheel g^5 , upon the short shaft h'' upon the carriage. Upon the same shaft is the pinion i'' , which engages with the rack j'' upon the sliding frame. As the carriage is taken in the cog wheel g^5 , engaging with the stationary rack f'' is revolved and the pinion i'' upon the same shaft is revolved also. This pinion engaging with the rack j'' , gives motion to the sliding frame L , in a direction contrary to that in which the carriage itself moves, and thus the former k'' traverses a distance equal to its length each time the carriage comes in, and raises and depresses the rod w , in accordance with the contour of its upper surface. The vertical motion of the former is communicated as follows: Q'' is a screw which revolves freely in the boss n^4 , projecting from the sliding frame L . This screw works in a nut o^4 , projecting from the former k'' , in such a manner that as the screw is turned the former is raised. At the lower extremity of the screw Q'' is the ratchet wheel p'' . o'' is a pawl hinged to the carriage, and so placed that upon each motion of the carriage L in its ways the ratchet wheel shall be brought in contact with the pawl and turn thereby a distance equal to the length of one tooth. The former is thus gradually raised as the operation of building the cops goes on.

The bobbins i are stripped in the following manner: p^4 , are arms attached to the back of the carriage, in which is boxed the shaft x' . s' is an upright rod pivoted to the carriage at q^4 , and pressed toward the shaft x' by the spring r^4 . s^4 , is a bent arm upon the shaft x' , having a catch a' , which passes under a notch t' in the lever s' , which pre-

vents the shaft x' from being revolved by the action of the weight y' attached to the arm w' , secured to the shaft x' . The arms u' of the stripping wire z' are also attached to the shaft x' . l', m' , Fig. 1, connected together by the rod p' , and pivoted near their centers at the points n' and o' , receive at the appointed time a limited vibratory motion, in manner and for the purpose which will now be explained. When the carriage is fully taken out, the belt being thrown upon the pulley d , and the gear j' being in the position shown in Fig. 1, the gear e drives the cog wheel j' , and the roller k' upon an arm projecting from the gear j' , strikes the top of the lever l' , which is thrown back, and the top of the lever m' , by its connection with the former is thrown forward toward the carriage, and the arm Q' upon the lever m' strikes against the pin r' , made adjustable in a projection from the lever s' , by which means the lever s' is forced in, and the arm s^4 , upon the shaft x' , escapes from the notch t' in the lever s' , and the weight y' is permitted to revolve the shaft x' , by which means the arms u' , and the stripping wire z' , are thrown up and the bobbins are stripped.

The arms u' , and the stripping wires which they carry are depressed and held out of action while the operation of spinning is going on in the following manner: u^{14} , are arms pivoted to the top of the carriage, at the point w^{14} , (Fig. 1,) and connected to the arms u' by the wires v^4 . When the carriage comes in, the arms u^{14} , passing under the roller beam B , are pressed down, and with them the arms u' , by which means the shaft x' is revolved, and the catch upon the curved arm s^4 , passes beneath the notch in the lever s' , and the stripping wire is held out of the way of the thread until the proper time arrives for the bobbins to be stripped, and the catch a' , upon the curved arm s^4 , is relieved, as before described, by the piece Q' striking the pin r' , and moving the lever s' .

In the description of Fig. 6 has been shown the manner in which the cop is formed, and I will now describe the method by which the faller wire is moved, and held out of the way of the spindles while the operation of spinning is going on.

t^4 , Fig. 7, is another shaft upon the carriage, running in the arms p^4 , which also carry the shaft x' , and immediately in front of the latter, attached to this shaft, are the arms u^4 , which carry the building wire m'' . z^4 , is another arm attached to the shaft t^4 , and resting upon the rod w , while the carriage is taking in, by which means the requisite motion is given to the building wire m'' to enable it to form the bobbin as required. v^5 , is another arm upon the shaft t^4 , to which is attached the wrist w^4 . To this latter is attached the vertical rod x^4 , see Figs. 3 and 7, having a pin y^4 , through it near its lower

extremity. When the carriage has finished taking in, the pin y^4 , has passed up the inclined plane z^4 , upon the lever z , seen in dotted lines in Fig. 1, and the upright rod w^4 , is thus raised, and with it the crank or wrist w^4 , by which means the shaft t^4 , is revolved, and the building wire m'' is raised. The latter is kept in the position it now occupies until the carriage is again taken out in the following manner: a^5 , is a metallic sliding rest attached to the base piece b^5 , which slides freely in the trough c^5 . The sliding stop a^5 , is of the form seen in Figs. 1 and 7. d^5 , is a notch or depression in which the crank w^4 , when it is raised, as before described, is permitted to rest. At such time the piece a^5 , is thrown into the position immediately beneath the crank w^4 , in the following manner: e^5 , is a weight suspended from the sliding rest a^5 , by the cord f^5 , by which means, when the crank w^4 , is raised, the rest a^5 , is drawn up beneath it. When the carriage has taken out and reached the end of the stretch and the building wire is required to descend for the purpose of forming the cop, the curved head g^5 , of the lever m' , strikes against the projection h^5 , from the base of the sliding rest and the latter is thrown back into the position seen in Fig. 7. The crank w^4 , then drops the arm l^4 , upon the rod w , and as the carriage takes in, the motion of the building wire m'' , is governed by the rod w , which receives its motion directly from the former k'' .

Operation: We will suppose the carriage to be taken in. The projecting bar H in front of the carriage having, in the manner already described, raised the lever b' into the notch 1 of the hook v' , thereby opening the clutch f , d' , and also through the rod e' connecting the clutch levers b' and f' , opening the clutch g' , h' , whereby the motion of the scroll d'' , which takes the carriage in, is stopped, and the gear j' , is unshipped from the shaft g , the foot k^5 , at the same instant striking against the point Q of the hook i^5 , by which means the latter is thrown back and the clutch lever u , is permitted to drop out of the notch in the hook i^5 . The long arm of this clutch lever being thus depressed, the clutch m' o , is closed and the shaft n , and scroll p , commence to revolve for the purpose of taking the carriage out, the belt having the instant before been thrown upon the fast pulley b , by the motion of the shipper t^3 , as already described, by which means the shaft a is again set in motion and the spindles are turned rapidly while the carriage is taking out, the band wheel g'' now receiving its motion from the shaft a through the intermediate gear b^3 , c^3 , as already described, the rovings, as before stated, being now delivered in the customary manner from the drawing rollers. The carriage continues to take out until it

reaches the position shown in Fig. 1. The projecting bar Q, from the bottom of the carriage now strikes the semicircular piece upon the end of the bar s , the other end of which, being thereby raised, elevates the clutch lever w , Fig. 4, which opens the clutch m' , o , and stops the motion of the shaft n and scroll p , and the outward motion of the carriage ceases. At the appointed time, when sufficient twist has been put into the yarn, the belt is shipped on to the pulley d , by the operation of the pin v , in the wheel r'' , and motion is thus communicated to the gear j' , which (being now in the position represented in Fig. 1, the brake R having been withdrawn by the moving of the shipper t^3 and the dropping of the lever z) is revolved. The roller k' now depresses the head of the lever l' , which through its connection with the lever m' releases the stripping wire, which is thrown up by the action of the weight y' , as already described. The sliding piece a^5 , being pushed back at the same instant by the projecting nose g^5 , of the lever m' , the lever l^4 , upon the shaft t^4 , falls upon the rod w , which rests upon the surface of the former k'' . The belt having now been shifted to the pulley d , and the roller a' upon the gear j' , having knocked the hook b' from beneath the lever b' , the clutch f , d' , is closed and the scroll d'' , commences to take the carriage in. The clutch g' , h' being now closed, the gear j' drives the shaft g , and with it the band wheel g'' , by which means the slow motion is given to the spindles while the carriage takes in, for the purpose of winding on the yarn, the former k'' , traversing a distance equal to its length beneath the rod w , as the carriage takes in, to regulate the form of the bobbin in manner already described, the former being raised on each stretch by means of the screw, ratchet, and pawl, represented in Fig. 6, to allow for the increase in size of the bobbin. When the carriage coming in has nearly reached the end of its course, the pin y^4 , projecting from the rod w^4 , attached to the crank w^4 , (Figs. 3, 7,) encountering the inclined plane z^4 , of the lever z , as already described, the arm v^4 , and with it the building wire, is raised. The levers w^4 , at the same time passing beneath the roller beam are depressed and carry with them the arms u' , and the stripping wire preparatory to commencing another stretch, the projecting arm H opening the clutch f , d' , and stopping the scroll d'' , which takes the carriage in, the foot k^5 , upon the carriage in manner already described closing the clutch m' , o , that the scroll p , may take the carriage out when the roller e^4 , upon the gear j' , has shifted the belt upon the fast pulley b , and the rapid motion of the spindles commences.

It will be seen that by means of the combinations above described I am enabled to effect with unerring precision all the various intermittent and complicated movements required from machines of this description, and with an amount of machinery less than half of that heretofore employed for the same purpose.

The gear j' , with the aid of a few rollers and other simple appendages, operates the winding on mechanism, raises the stripping wire and depresses the building wire, which operations it performs in the proper order by a simple motion of revolution, which it receives from the gear e , and then shifts the belt upon the fast pulley b , the wheel j' , itself being left in the precise position necessary for the re-performance of the same operations when it is again set in motion.

I do not claim stripping the bobbins preparatory to winding on. Neither do I claim raising the "former" by a horizontal screw, giving motion to an inclined plane beneath it; but

What I do claim and desire to secure by Letters Patent is—

1. The stop R in combination with the

tappet e^4 , on gear j , for the purpose of arresting the motion of the latter at the instant the belt is shipped upon the pulley b 30 that the gear j' may be left in the precise position, necessary for the performance of another duty, the instant it is again set in motion, without being carried past this position by momentum or otherwise, when 35 the brake R is so arranged in connection with the lever s or otherwise, that it shall be withdrawn by the mechanism which shifts the belt at the instant the gear j' , is again set in motion. 40

2. Operating the winding on mechanism, raising the stripping wire, and depressing the building wire, in the proper order, and then shifting the belt on to the fast pulley at the close of these operations, by means 45 of a single cogged gear, in combination with the tappet placed upon its side, the whole arranged and combined in the manner substantially as specified.

JOHN JACKSON.

Witnesses:

OTIS B. MORSE,
ARTHUR NEILL.