

No. 655,616.

Patented Aug. 7, 1900.

C. F. FOSTER.
SPOOLING MACHINE.

(Application filed Jan. 27, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

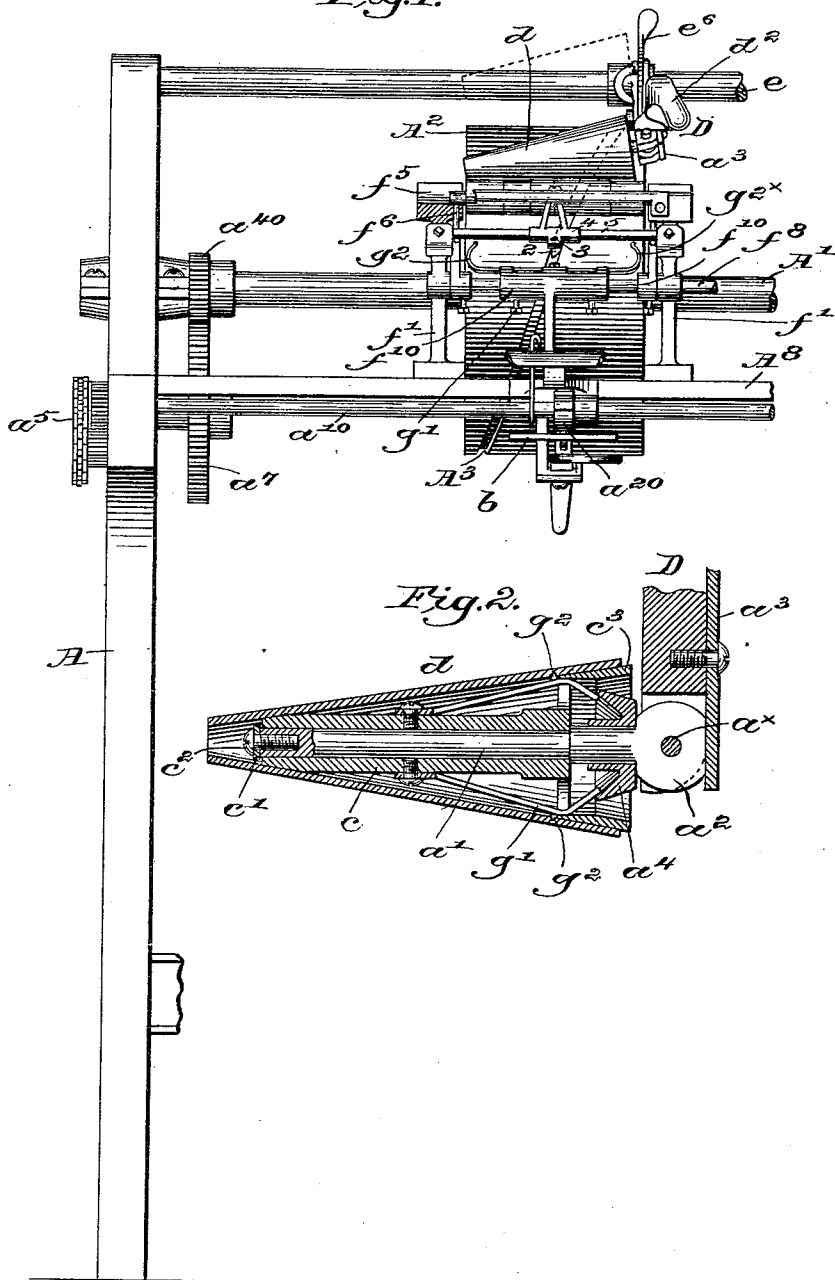
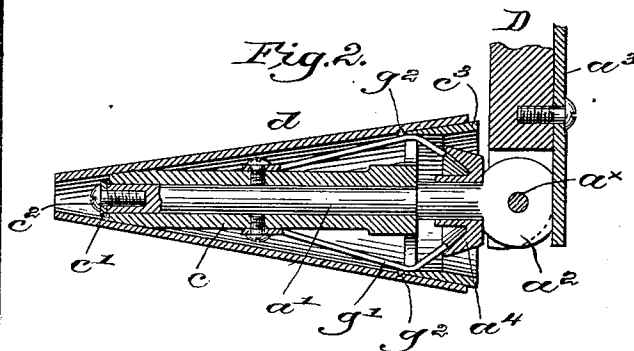


Fig. 2.



Witnesses.

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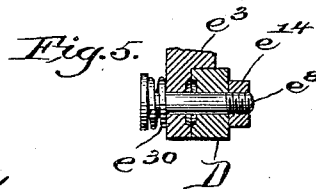
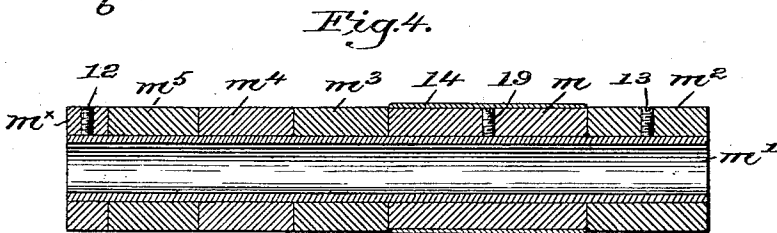
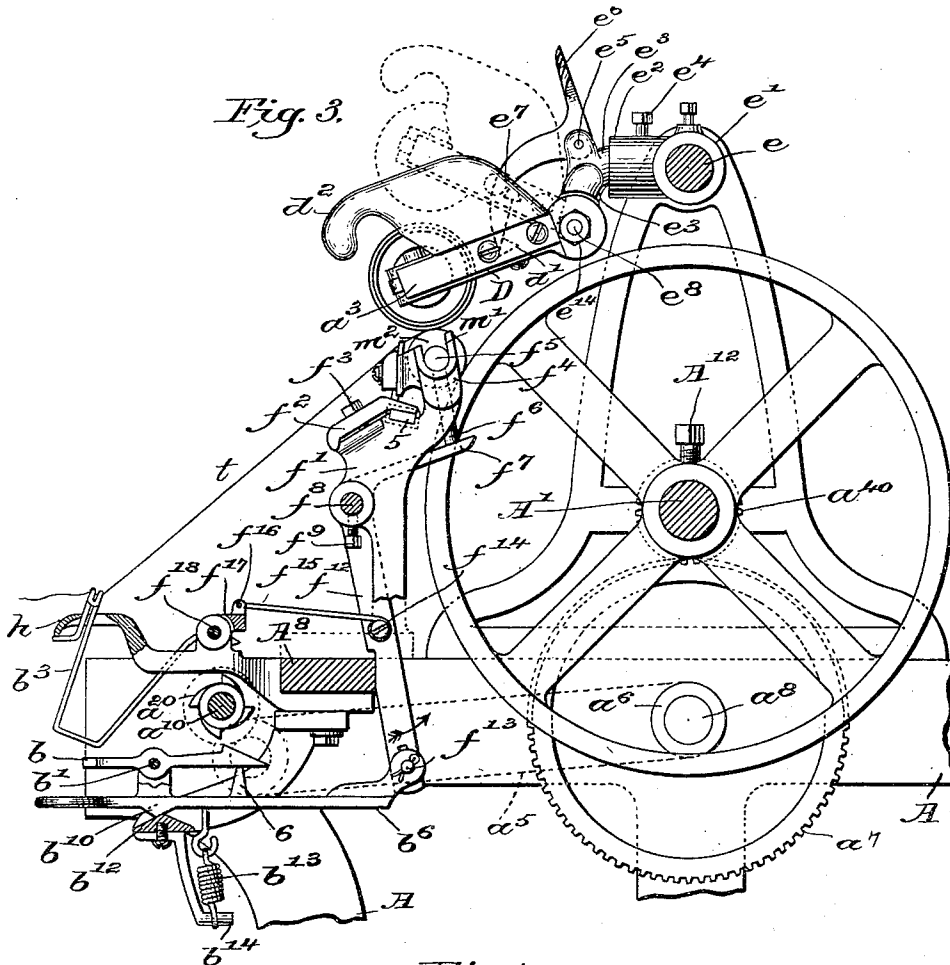
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2 Sheets—Sheet 2.



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Edward Allen.

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UNITED STATES PATENT OFFICE.

CHARLES F. FOSTER, OF WESTFIELD, MASSACHUSETTS, ASSIGNOR TO THE
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SPOOLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 655,616, dated August 7, 1900.

Application filed January 27, 1900. Serial No. 2,931. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. FOSTER, a citizen of the United States, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented an Improvement in Spooling-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object to improve the construction of spooling-machines, such as represented in United States Patent No. 535,616, dated March 12, 1895, wherein a device carrying a cone-shaped or a tubular shell on which the thread or yarn is wound is rotated by contact with a winding-roller driven by a drum.

My present invention includes a novel construction of winding-roll and novel mechanism for stopping the rotation of the winding-roll to stop the rotation of the shell receiving the thread or yarn and also a novel construction of means for supporting the arm carrying the winding-spindle, whereby the thread or yarn after the same has been wound upon the shell will not be cut or broken by the action of the thread-guide against the wound mass of thread or yarn.

Figure 1 of the drawings represents a partial front side elevation of the spooling-machine containing my present improvements. Fig. 2 shows part of a carrier and its spindle, the latter carrying a conical shell. Fig. 3 is an enlarged view of the parts represented in Fig. 1 looking at it from the right. Fig. 4 is an enlarged longitudinal section of the winding-roller; and Fig. 5 is a detail showing the arm D and its supporting-stand in section and its pivot e^3 in elevation, said detail showing the tension device for said arm.

Referring to the drawings, A represents one end of the framework of a machine, A' the main shaft thereof, and A² one of a series of drums having a spiral groove A³ to receive a pivoted shoe 2, (see Fig. 1,) connected loosely through a suitable stud 3 with a thread-guide 4, guided by a suitable bar, as 5. The shaft a^{10} derives its movement from a sprocket-chain a^5 , Fig. 3, fast on the hub of a toothed gear a^7 , loose on a stud a^8 , supported by the

frame, said gear being driven by a pinion a^{40} on the shaft A', said shaft a^{10} having a stop-motion-moving ratchet-wheel a^{20} , adapted to engage the toothed end of a lever b , pivoted at b' and maintained normally in the position shown in Fig. 3 by contact with a suitable projection 6, connected with a slide-bar b^6 , said ratchet being adapted to be turned about its pivot to put its hooked end in the path of movement of said ratchet-wheel whenever a drop device, as b^3 , normally hanging on the thread, drops by reason of breakage of the thread to effect the stopping of the machine, and the cross-rod e , mounted in uprights erected upon the frame sides, are and may be substantially as represented in said United States patent, it being understood that in practice the machine to be herein described will have contacting with the drum at two or more points suitable driving-rollers to actuate a plurality of series of spindles carrying shells upon which the thread or yarn is to be wound, as provided for in said patent.

The arm D, provided with the spring a^3 , the spindle a' , having a head a^2 pivoted at a^x on a part of said arm, and the conical block a^4 , loose on said spindle and having at one side thereof a recess which is adapted to receive in it the free ends of shell-holding springs g' , which may be provided with points, as g^2 , to enter the paper or other tube d , are and may be all substantially as fully described in United States Patent No. 535,617, dated March 12, 1895, with the exception that the shape of the arm D and the point where it is pivoted are herein differently constructed.

The spindle a' receives about it, as provided for in the latter patent, a carrier or tube c , with which the springs g' are suitably connected, and this carrier or tube, rotatable freely on or with relation to the spindle, has a head c^3 , which is of a shape and diameter to properly fill one end of the shell, either a cone or a cylinder, the opposite end of the carrier or tube meeting and supporting the shell at its outer or small end, the carrier or tube being kept upon the spindle by means of a suitable set-screw, as c^2 , working against a washer, as c' .

Having briefly referred to parts which are old and common, I will now describe the par-

ticular features in which my present invention consists.

In the Patent No. 535,616 referred to the rod e , located in a substantially-vertical line above the main shaft A' and parallel therewith, served as a fulcrum for the arm D , carrying the spindle a' referred to, and as the yarn mass was increased in diameter the swinging of the arm from the center described therein caused such a movement of the yarn mass that it came into the line of travel of the thread-guide, which by striking against the yarn mass resulted in cutting the thread or yarn already wound into the yarn mass, thus destroying the value thereof. To overcome the possibility of the yarn mass being struck by the reciprocating thread-guide, I have changed the pivotal point of the arm D by providing the rod e with a series of collars e' , having projections e^2 , which receive in an adjustable manner the shanks of suitable stands e^3 , said stands being held adjustably in said projections by means of suitable set-screws e^4 , the shanks being rounded, so that they may be rotated more or less in the sleeves in order to secure for each spindle a' the proper horizontal alinement. These shanks receive a stud e^5 , upon which I have mounted a suitable latch or yarn-holder e^6 , it having at its lower end a suitable hook, as e^7 , (represented by dotted lines in Fig. 3,) and said stand also receives in a depending branch thereof a stud e^8 , constituting the fulcrum for the arm, whereby said fulcrum is brought quite close to the surface of the drum a^2 and quite close to the path in which reciprocates the thread-guide 4, the arm D so mounted moving up and down in the arc of a circle described from the pivot e^8 , which is so located that the yarn or thread mass will not come into the path of movement of and be struck by the reciprocating thread-guide, and consequently the wound thread or yarn is not injured or broken during the winding operation.

The pivot e^8 , supporting the arm D , is located at one side of a vertical line intersecting the shaft carrying the drum, such location of said pivot enabling the arm during the thread-winding operation to swing, due to increase of thickness of the thread or yarn mass thereon, it moving in such an arc of a circle that the thread mass cannot after it is wound contact with the reciprocating thread-guide.

The arm D has projecting inwardly from it (see dotted lines, Fig. 3) a suitable projection d' , and said arm has an attached weight d^2 , made as a handpiece, which when the winding is to be stopped or when a shell d is to be applied to receive thread or yarn or a wound shell is to be removed will be lifted, as herein represented, by hand and put into the dotted-line position, Fig. 3, in which position the hook e^7 of the latch will engage said projection and maintain the arm and spindle in their inoperative position.

Herein I have represented the latch e^6 as normally occupying a position due to gravity to automatically engage the projection d' whenever the arm D is lifted, and to release the arm it is only necessary for the operator to take hold of the upper end of the latch and turn it backwardly or to the right, viewing Fig. 3, and thereafter the arm D may be brought into position to have the thread wound upon the cone or tube carried thereby.

The driving-rolls herein represented are of novel construction (see Fig. 4)—as, for instance, the driving-roll is composed of several independently-movable sections, the section m being herein represented as of the greatest length, being secured by a set-screw 10 to a suitable sleeve m' , the sleeve having, as herein shown, fixed to it outside one end of the section m by a screw 13 a roller m^2 , the sleeve at the opposite side of the section m having applied to it loosely three rollers m^3 , m^4 , and m^5 , the latter rollers being held on the sleeve by a collar m^x , through which is extended a set-screw 12. The section m has a leather cover 14. The sleeve m' , with its parts constituting a winding-roller, is applied loosely to a journal f^5 , supported as will be hereinafter described.

For the best results the arm D should be held when in its operative position by sufficient friction, so that it will be moved only positively by the increasing diameter of the yarn mass, and to provide for this friction or tension I may place between the head of the bolt e^8 and the stand e^3 , through which the bolt is inserted preparatory to entering a hole in the inner end of the arm D , any usual spring or tension device e^{20} , so that by adjusting the nut e^{14} the effective strength or tension of this spring may be varied according to the yarn being wound.

The slide b^6 , before described, has at its lower side a suitable two-faced cam b^{10} , which rests upon a two-faced cam b^{12} , the said cams being kept in operative contact by or through a suitable spring b^{13} , suitably connected at one end with said slide and at its opposite end with a projection, as b^{14} , from the cam-shaped bar b^{12} . The front end of the slide b^6 is loop-shaped and is represented as adapted to be engaged by the operator whenever for any reason he desires to stop the winding operation; but this bar may be slid also automatically to stop the winding operation whenever the thread or yarn t , coming from any suitable source and being wound upon the shell d , which may be a cone or a cylindrical tube, is broken, this being done by the ratchet-wheel a^{20} , before described, engaging the hook of the lever b .

I have mounted upon a suitable cross-bar A^8 , it in practice connecting the opposite ends of the frame of the machine, suitable uprights f' , the upper ends of said uprights being suitably shaped (see Fig. 3) to receive the bar 5, upon which slides the thread-guide 4, said bar having its under side and edges

seated and held seated in suitable notches of the stand by a clamp, as f^2 , held in position by a suitable set-screw, as f^3 , acting upon the upper side of said bar to confine it fixedly in position to receive and guide the thread-guide 4, the latter being made as light as possible to thereby overcome the strains due to momentum, as when changing the direction of movement of the thread-guide rapidly. To provide for this lightness in weight of the thread-guide, I have made the same in skeleton form, and the bar 5 is set angularly, as represented in Fig. 3, so that the pin 3, carrying the shoe 2, may extend inwardly directly from the inner side of the foot of the thread-guide and enter the groove in the drum.

Each drum A^2 , usually a number of them, mounted upon the shaft A' at suitable distances apart, is held in position on said shaft by means of a suitable set-screw A^{12} .

The uprights f' have open bearings f^4 to receive the journal f^5 for the winding-roller, said bearings having suitable holes to receive journal-elevators, represented as dowel-pins f^6 , the lower end of said dowel-pins resting loosely upon inwardly-extended arms f^7 , connected with a rock-shaft f^8 by suitable set-screws f^9 , there being two such arms for each journal. The rock-shaft f^8 is surrounded between the uprights f' by a sleeve f^{10} , fixed thereto by set-screws g' , said sleeve f^{10} having a suitable arm f^{12} , to the lower end of which is jointed by a pin f^{13} the inner end of the slide b^6 , and, as herein represented, said arm f^{12} has connected with it at f^{14} a rod f^{15} , in turn jointed at f^{16} to a suitable block f^{17} , pivoted at f^{18} , said pivot carrying the drop-wire, so that whenever the rod b^6 is moved inwardly or to the right, viewing Fig. 3, preparatory to stopping the machine the arm f^{12} will be moved in such direction as to cause the rod f^{15} to lift the drop-wire b^3 , putting it into the position Fig. 3, all ready to be again handily threaded preparatory to starting the machine again into operation. Whenever the lever f^{12} is turned in the direction of the arrow on it in Fig. 3, whether by the hand of the operator or by a broken thread, the arms f^7 will be raised and acting upon the journal-elevators or dowel-pins f^6 will lift the journal, removing the driving-rolls immediately from frictional contact with the drum, so that the driving-roll will be left at rest, the drum continuing its rotation and the thread-guide continuing its rotation.

The hub f^{10} has connected with it in any suitable manner suitable spring-pieces, as g^{2x} , against which may contact the ends of the thread-guide 4 as the latter reaches the end of its winding stroke, said springs aiding in overcoming the momentum of the thread-guide and by their reaction aiding in changing the direction of movement of the thread-guide.

The cross-bar A^8 has suitably connected with it thread or yarn supports h , represented as slotted to receive and guide the

drop devices, said supports also sustaining the fulcrum f^{18} for the drop devices.

I have herein shown dowel-pins as the journal-lifters, they being the simplest form of lifting device known to me; but it will be obvious that any movable device occupying a position in or near the bearings supporting the journal f^5 and adapted to act on the lower side of the same to slide the said journal in a direction to remove the roller from contact with the drum may be employed and yet be within the scope of my invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a spooling-machine, a drum, a winding-roll adapted to be rotated thereby and mounted loosely upon a suitable journal, and means coöperating with said journal to lift it and remove the roll from frictional contact with said drum.

2. In a spooling-machine, a winding-roll composed of a roller having a fixed sleeve extended therefrom, a plurality of rollers loose on said sleeve.

3. In a spooling-machine, a winding-roll composed of a roller having a fixed sleeve extended therefrom, a plurality of rollers loose on said sleeve, and a journal to sustain said sleeve loosely.

4. In a spooling-machine, a drum, means to rotate it, a winding-roll having a journal, bearings to sustain said journal, journal-lifting means extended through said bearings, and means to slide said journal-lifting means to remove the winding-roll from contact with said drum.

5. In a spooling-machine, a journal supporting a winding-roll, a stand having bearings for the journal of said winding-roll, dowel-pins guided in said bearings, a stop-motion device adapted to be operated by the breakage of the thread or yarn being wound, and means controlled by said stop-motion device to move said dowel-pins in said bearings to meet and lift the journal of said roll from its bearings.

6. In a spooling-machine, a winding-roll, suitable bearings for the journal of said roll, a rock-shaft having arms, means actuated by said arms and adapted to act upon the journal of said winding-rolls to lift the same from its bearings, means to operate said rock-shaft.

7. In a spooling-machine, a shaft, a drum carried thereby, a reciprocating thread-guide, a winding-roll adapted to be rotated by said drum, an arm carrying a spindle, a pivot for said arm parallel with the longitudinal axis of said drum, said pivot being located substantially close to said drum and at one side a vertical line intersecting the longitudinal axis of the drum and the axis of said winding-roll, the described location of the pivot of said arm preventing the contact of the enlarging thread mass with the reciprocating thread-guide.

8. In a spooling-machine, a drum, a rod parallel with the axis of rotation of said drum, a stand rotatably and slidably mounted upon or with relation to said rod and having a depending ear, an arm carrying a spindle and pivoted upon said depending ear whereby said pivot is located substantially close to the surface of the drum and at one side of a vertical line intersecting the axis of rotation of said drum.

9. In a spooling-machine, a drum, a rod parallel with the axis of rotation of said drum, a sleeve adjustably mounted on said rod, a stand having its shank adjustable and rotatable in said sleeve, said stand having a depending ear and a pivot, combined with an arm mounted to turn on said pivot and carrying a spindle provided with a tube for the reception of a shell on which the thread or yarn is to be wound.

10. In a spooling-machine, a drum, a rod parallel with the axis of rotation of said drum, a sleeve adjustably mounted on said rod, a stand having its shank adjustable and rotatable in said sleeve, said stand having a depending ear and a pivot, an arm surrounding said pivot, and a tension device cooperating with said pivot to produce friction upon said arm that it may be moved only positively during the winding operation due to increase in diameter of the thread mass being wound.

11. In a spooling-machine, a drum, a shaft carrying said drum, a rod occupying a position parallel with the axis of rotation of said drum, stands adjustably connected with said rod and having a depending ear, an arm pivotally mounted on the ear of said stand and carrying a spindle, and a locking device to engage a suitable projection of said arm when the latter is put in its inoperative position, said locking device retaining said arm in such position for the removal of thread or yarn from the spindle or the application of a new shell to the spindle.

12. In a spooling-machine, the following instrumentalities, viz: a drum having a spiral groove, a rod parallel with the axis of motion of said drum, a winding-roller, means

to sustain the journal of said roller, dowel-pins acting upon said journal, means to move said dowel-pins to act upon said journal and remove the driving-roll from contact with said drum, an arm having a spindle, said arm being pivoted upon a depending ear of a stand adjustably mounted upon or with relation to said rod, and means to resist frictionally the movement of said arm due to increase of diameter of the thread mass being wound about a shell carried by a spindle mounted in said arm.

13. In a spooling-machine, the following instrumentalities, viz: a drum having a spiral groove, a rod parallel with the axis of motion of said drum, a winding-roller, means to sustain the journal of said roller, dowel-pins acting upon said journal, means to move said dowel-pins to act upon said journal and remove the driving-roll from contact with said drum, an arm having a spindle, said arm being pivoted upon a depending ear of a stand adjustably mounted upon or with relation to said rod, and means to resist frictionally the movement of said arm due to increase of diameter of the thread mass being wound about a shell carried by a spindle mounted in said arm, and a suitable locking device connected with said stand and cooperating with said arm to hold the latter in its adjusted position.

14. In a spooling-machine, stands having bearings, a journal mounted in said stands, a winding-roller mounted loosely on said journal, dowel-pins occupying a position in said bearing to contact with the under sides of said journals, and means to automatically lift said dowel-pins to move the journals in the bearings and break the contact of the winding-roller from the drum employed to actuate it.

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

CHARLES F. FOSTER.

Witnesses:

A. F. LILLEY,
C. K. GAMBEON.