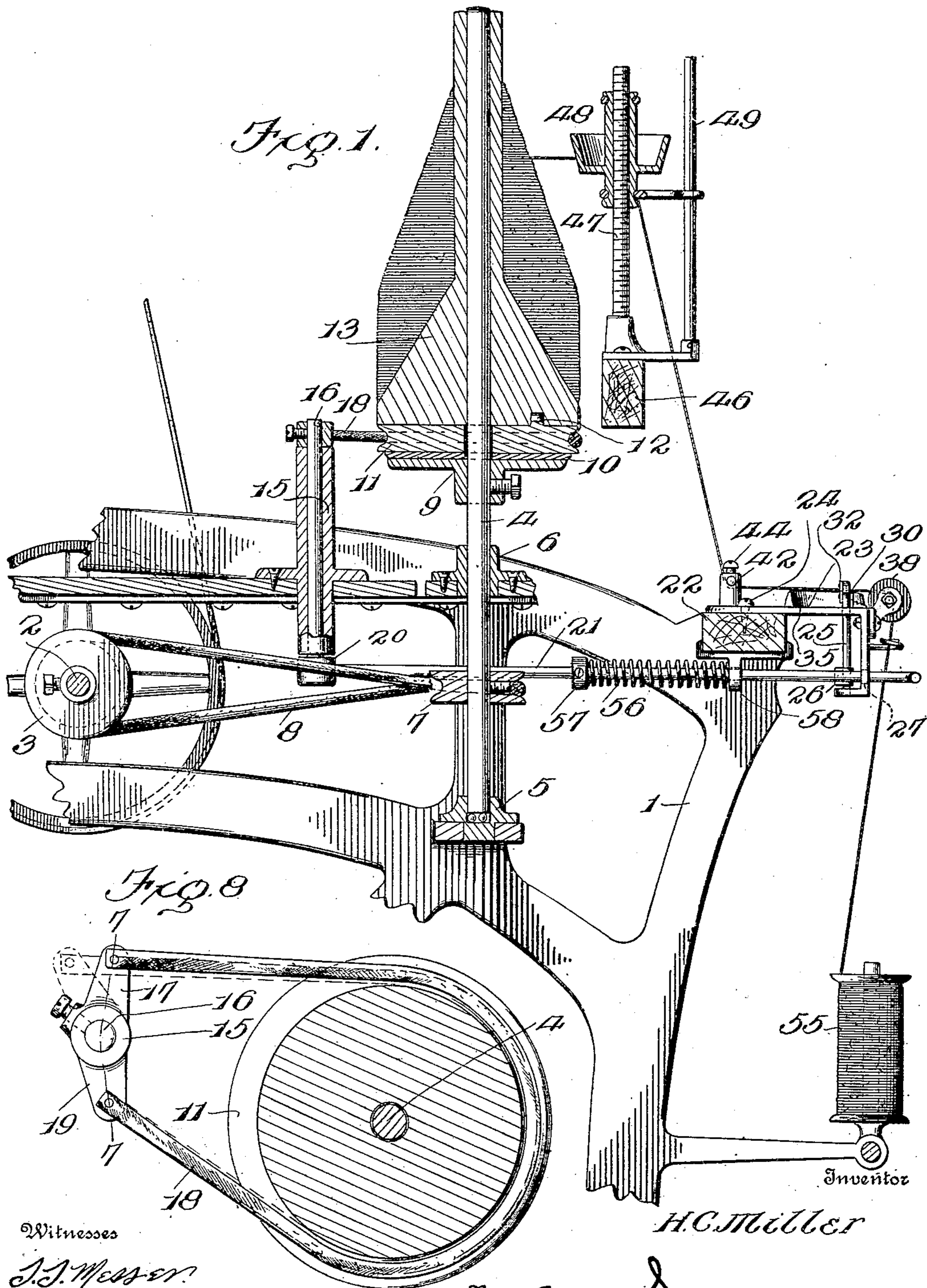


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STOPPING MECHANISM FOR YARN WINDING MACHINES.
APPLICATION FILED JAN. 22, 1909.

955,657.

Patented Apr. 19, 1910.

3 SHEETS—SHEET 1.



Witnesses
J. J. Messer
H. C. Miller

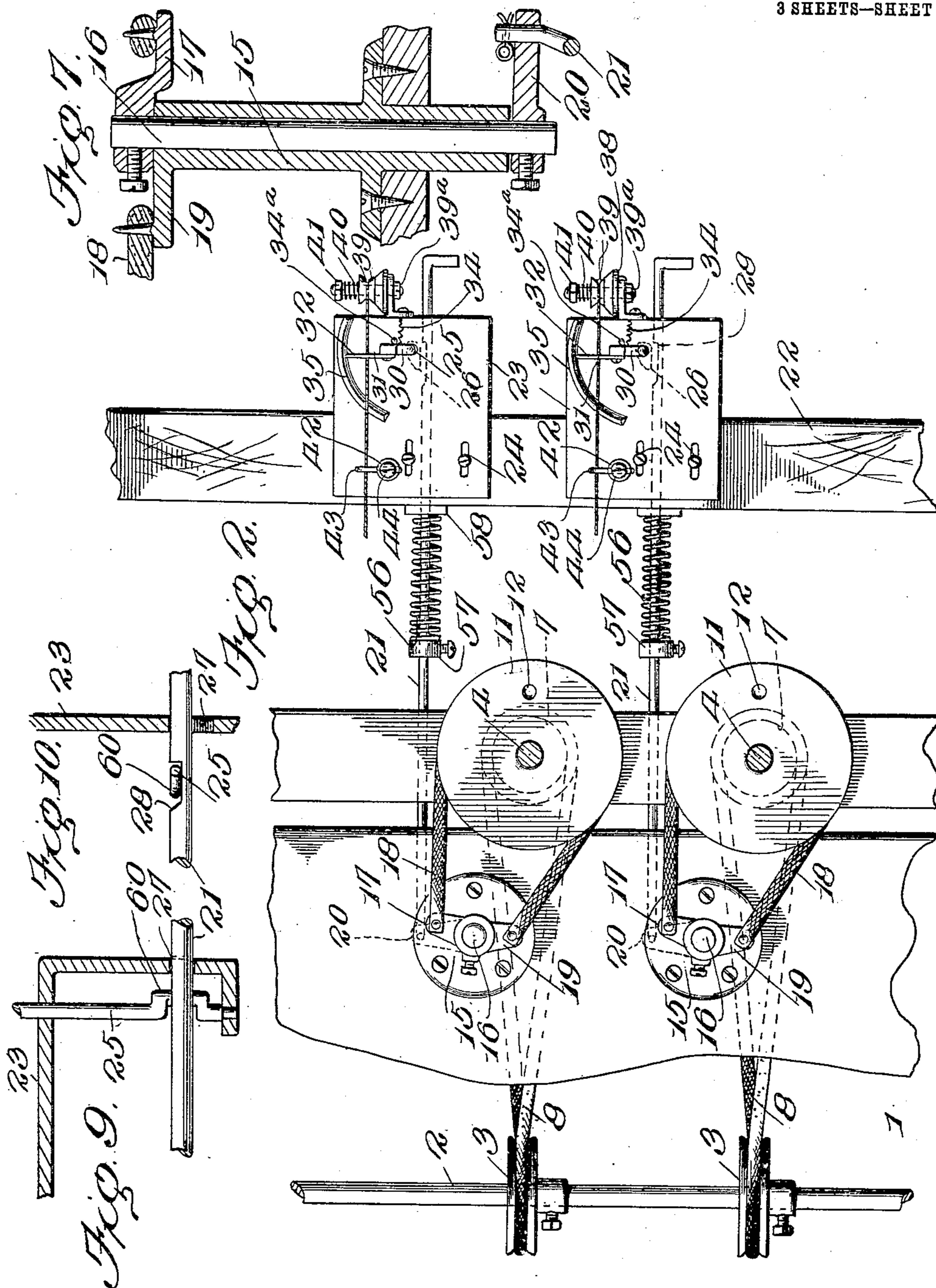
By *H. C. Miller*
Attorney

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3 SHEETS—SHEET 2.



Witnesses
J. S. Wood
H. J. Connel

Inventor
H. C. Miller

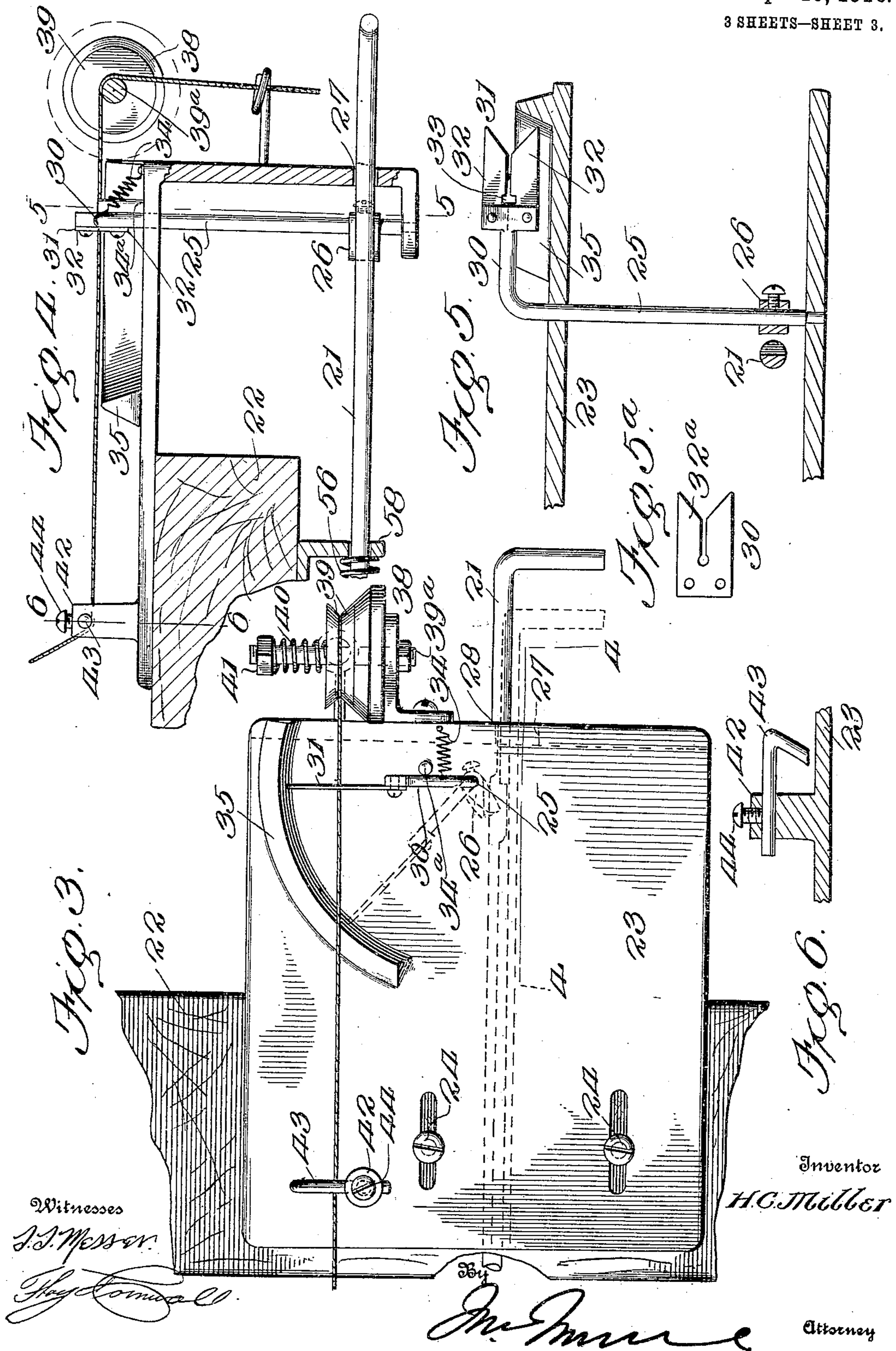
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

HENRY C. MILLER, OF WATERFORD, NEW YORK.

STOPPING MECHANISM FOR YARN-WINDING MACHINES.

955,657.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed January 22, 1909. Serial No. 473,717.

To all whom it may concern:

Be it known that I, HENRY C. MILLER, a citizen of the United States, residing at Waterford, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Stopping Mechanism for Yarn-Winding Machines, of which the following is a specification.

This invention relates to improvements in stopping means for individual bobbins on a winding machine.

Each winding machine usually has a number of bobbins, frequently as many as sixty, and with such machines known to me difficulty has been experienced in stopping a bobbin automatically by knots, slugs or other defects without breaking the yarn when the same contacts with the gages employed to locate such defects. This condition arises, notwithstanding the fact the gages are placed as close together as possible, resulting in not only the yarn breaking but also allowing the smaller knots, and soft slugs to pass through and become wound on the bobbins. The result is when the yarn runs through the knitting frames, the imperfections become entangled in the beards of the needles and cause them to break, thereby forming holes in the cloth, and causing great loss to the manufacturer. Obviously where cloth is manufactured under these circumstances, every few yards has holes and frequently bunches are present, and the product must be sold as inferior quality.

According to my invention I provide an automatic device in connection with each bobbin, whereby the defects in the yarn will effectually be detected, and when the same contacts with the gage the winding of the yarn on the particular bobbin will cease, but said yarn will not be broken. The attendant, upon the stopping of a bobbin ascertains the difficulty, and if it is a knot and is perfectly tied the bobbin is started again. However, should a defect of another character appear, the operator removes it, ties the yarn and starts the bobbin again. This results in a large saving, as it enables the operator to turn out more and better wound yarn in a day.

The breaking of the yarn with machines now known to me, causes the broken end to become wound on the bobbin and lost. With this invention this disagreeable feature is overcome, because when a defect is caught by the gage the winding operation

is stopped, and if it is found necessary to break the yarn it is done and retied before the bobbin is again started.

The invention also relates to the construction and arrangement of parts, and possesses other advantages, which will be hereinafter pointed out.

Figure 1, is a vertical section of a portion of the winding machine, showing my invention applied thereto. Fig. 2, is a plan view of same showing two bobbins. Fig. 3, is an enlarged plan view of the device. Fig. 4, is a detail side elevation partially in section on the line 4—4 Fig. 3. Fig. 5, is a detail section on the line 5—5 Fig. 4. Fig. 5^a, is a detail view of a modified form of a gage. Fig. 6, is a detail sectional view on the line 6—6 of Fig. 4. Fig. 7 is a detail sectional view on the line 7—7 of Fig. 8. Fig. 8, is a detail plan view partially in section of the brake mechanism. Figs. 9, and 10, are detail sectional views of a modification.

The numeral 1, indicates the frame of a winding machine, having bearings for a power shaft 2, on which is a pulley 3. A spindle 4, is mounted in bearings 5 and 6, in the frame 1, and has secured to it a pulley 7, around which and the pulley 3, passes a belt 8. Above the bearing 6, the spindle has secured to it a disk 9, having a friction surface 10, above which and loosely mounted on the spindle is a grooved cooperating friction element or bobbin support 11, having a stud or projection 12. On the upper end of the spindle, and supported on the friction element 11, is the bobbin 13, formed on its bottom with an opening to receive the stud 12, to cause the two to turn together.

15 indicates a bearing on the frame 1, for a shaft 16, provided at its upper end with an arm 17, to the outer portion of which is connected one end of a strap or brake band 18, which is passed around the grooved element or bobbin support 11, and has its opposite end connected to a lug 19, extending from the bearing 15. To the lower end of the shaft 16, is fastened an arm 20, to which a releasing rod 21, is pivotally connected.

22, indicates a beam on the frame 1, and supporting a plate 23, having its front end bent down and then rearwardly. This plate is provided with slots, through which pass bolts 24, to secure it to the beam; the slots permitting of proper adjustment. A vertical shaft 25, is mounted in the forward

part of the plate 23, and is provided at its lower end with a cam 26, operating in the path of the releasing rod 21. The rod 21 operates in an opening 27, in the front of the plate 23, and is formed with a notch 28, the front wall of which engages the side of the opening 27, as shown in Fig. 3. The upper end of the shaft 25, is bent to form an arm 30, formed at its end with a head, to which is secured a gage 31. The gage may be of the form shown in Fig. 5 wherein it comprises two spaced apart members 32, having their inner edges provided with notches 33, and their outer ends beveled, or I may form a gage from one piece as shown in Fig. 5^a. In either case, the outer end of the gage must be open to admit of the passage of the yarn. A spring 34, is connected to the arm 30 to normally draw it toward the front of the machine, and against a stop 34^a, as shown in Fig. 3.

An arc shaped guard 35, is arranged on the plate 23, in a plane under and just outside the path of movement of the arm 30.

Extending from the front of the plate 23, is a tension device 38, comprising disks 39, spring 40, and adjusting nut 41. To the rear of plate 23 is arranged a yarn guide 42, including a post and an arm 43, held in adjusted position on the post by a screw 44.

Located on a bar 46 in front of the bobbin is a threaded post 47, on which operates a bobbin thread shape controller cup 48, which is guided in its movement by an arm operating on a rod 49.

In operation the yarn is taken from the spool 55, and over the tension device 38, and thence through the slot in the gage 31, under the guide 42, then over the bobbin thread controller 48, to the bobbin 13. Power is applied to the shaft 2, hence all the spindles on the winder are revolving as long as the said shaft is in motion. The yarn having been properly placed, the releasing rod 21, is drawn forward until the front wall of the notch catches on the wall of the opening 27, in plate 23. The pulling of this rod compresses a spring 56, confined between a collar 57, and a lug 58, and also revolves the shaft 16, sufficient to release the brake band 18. Immediately the brake band 18, is released the now revolving spindle 4, (which fits loose in the bobbin) is revolved by reason of the friction between the friction element or bobbin support 11, and the disk 9. The intermediate friction surface 10, which is also loose on the spindle causes frictional engagement between the two disks and the bobbin is revolved. When the parts are in this position, the cam 26, lies adjacent the rod 21, and the arm 30, is positioned against the stop 34^a. When an enlargement, larger than the slot in the gage 31, contacts with the latter, it causes the shaft 25, to turn. The turning of the

shaft 25, causes the cam 26, to force the releasing rod 21, laterally and thereby disengages the wall of the notch or recess 28, from the wall of the opening 27, in the plate 23. When the rod 21, is released, the spring 56, forces it rearwardly which turns shaft 16, and through the connections causes the arm 17, to draw the brake band tight around the grooved element or bobbin support 11, and thereby causes the bobbin to stop. Obviously this is effected by holding it against the frictional connection between the elements 9—10 and 11. The arm 30 is now in the position shown in dotted lines in Fig. 3, and it will be observed that the yarn is not broken and after the defect releases the rod 21, from its hold, the gage automatically returns to normal position. The operator now notices the idle bobbin, and upon examination if it be found a perfectly tied knot is the cause of the trouble, the rod 21, is again set to start the bobbin. If however, it be found a slug or other unusual enlargement is the cause, the yarn is broken, retied, and the mechanism is restarted.

It will be evident that by the herein described mechanism the smallest defect in the yarn will be detected. The parts are so arranged that the bobbin is caused to stop almost instantly, so that the defect in the yarn is never wound on the bobbin, but on the contrary is always to be found between the gage and the bobbin, which saves unwinding any part of the yarn to note the trouble.

By arranging the mechanism as described, the top of the rod 39^a, of the tension disks is on a level with the under side of the guide 43, and the yarn is held about one thirty second of an inch from the dirt releasing notches 33, or enlargement 33, of the gages. Furthermore the parts are so arranged that the yarn is guided in such manner that it will not rub too hard against the gage pieces.

In Figs. 9, and 10, I have shown a slightly modified form of means for operating the releasing rod 21. In this instance the shaft 25, is provided with a crank 60, which co-operates with the notch 28, and acts substantially the same as the cam.

Obviously the releasing rod 21, may be employed to manually stop the revolution of the bobbin, without regard to the automatic trip coming into use.

One of the important features of this invention is the manner of mounting, and the construction of the gage, so as to permit of its swinging and in doing so releasing the defect in the yarn from said gage, to prevent breaking. The yarn travels in a straight line from the tension device 38 to the guide 42, and the gage intersects it. When a defect in the yarn contacts with the gage, it swings in the arc of a circle, the open end of the slot being toward and in the direction

of the arc of movement, which because of such arcuate movement traversing the straight course of the yarn, the latter will be shed through the open end of the slot, and the spring 34 will immediately return the gage to normal position against its stop 34^a.

What I claim is:

1. In a winder, the combination with a frame, a power driven element, a spindle connected with the power driven element, a frictionally driven bobbin support cooperating with the spindle, a brake and tripping mechanism operated by a defect in the yarn being wound to release the brake and stop the revolving of the bobbin support.

2. In a winder, the combination with a continually revolving spindle, a bobbin support, means between the bobbin support and spindle to cause the former to revolve with the latter, a brake, and mechanism operated by a defect in the yarn being wound to release the brake and stop the revolving of the bobbin support.

3. In a winder, the combination with a continually revolving spindle, a bobbin support, means between the bobbin support and spindle to cause the former to revolve with the latter, a friction brake, a yarn gage, and mechanism operated by a defect in the yarn being wound contacting with the gage and operating the friction brake to stop the revolving of the bobbin support.

4. In a winder, the combination with a continually revolving spindle, a bobbin support, tripping mechanism including a gage, and a brake which is released by a defect in the yarn striking the gage and operating the tripping mechanism to stop the revolving of the bobbin support without breaking the yarn being wound.

5. In a winder, the combination with a continually driven spindle, a friction element fixed to the spindle, a bobbin support frictionally driven by the friction element, the bobbin support being positively driven by the friction element a brake cooperating with the friction element, brake setting means, means for automatically releasing the brake setting means, said automatic means being operated by a defect in the yarn being wound and stopping the revolving of the spindle.

6. In a winder, the combination with a continually revolving spindle, means for revolving the spindle, a bobbin support, means including a clutch and a circumferentially operated brake for stopping the bobbin support, said means being operated by a defect in the yarn being wound, the stopping means having a handle whereby the clutch and brake may be manually operated to stop the bobbin.

7. In a winder, the combination with a continually revolving spindle, a friction disk

driven by the spindle, a grooved bobbin support cooperating with the friction disk, a band brake operating in the groove of the disk, means for securing one end of the band brake, mechanism connected to the opposite end of the band brake, for operating the same, mechanism for setting the operating means, and automatic means operated by a defect in the yarn for releasing the setting mechanism to stop the bobbin support.

8. In a winder, the combination with a continually revolving spindle, a friction disk driven by the spindle, a grooved bobbin support cooperating with the friction disk, a band brake operating in the groove of the disk, means for securing one end of the band brake, mechanism connected to the opposite end of the band brake for operating the same, mechanism for setting the operating means, automatic means including a handle operated by a defect in the yarn for releasing the setting mechanism to stop the bobbin support, said handle being located to permit the manual operation of the brake to stop the bobbin.

9. In a winder, the combination with a continually revolving spindle, a bobbin support on the spindle, a tension brake cooperating with the bobbin support, brake tripping mechanism including a slotted yarn gage and mounted independently of the brake, the slotted yarn gage being operated by a defect in the yarn being wound to release the tension brake to stop the bobbin on the spindle without stopping the spindle or breaking the thread, and means for returning the tripping device to normal position after the defect in the yarn has passed.

10. In a winder, the combination with a continually revolving spindle mounted in fixed bearings, a bobbin support, a brake cooperating therewith, a pivotally mounted yarn gage having a slot open at one end a connection between the gage and the brake, a defect in the yarn operating the gage to automatically set the brake and stop the revolving of the bobbin support without stopping the spindle or breaking the thread.

11. In a winder, the combination with a continually revolving spindle, a bobbin support, a brake including a disk and brake band cooperating therewith a pivotally mounted gage swinging in a definite arc, said gage having an open end slot to permit the yarn to be automatically withdrawn without breaking same, means for returning the gage to normal position after the yarn has been automatically withdrawn and a connection between the gage and the brake, a defect in the yarn being wound operating on the gage to set the brake and stop the revolving of the bobbin support.

12. In a winder, the combination with a plurality of continually revolving spindles, means for operating all the spindles, a bob-

bin support and brake for each spindle, automatic tripping mechanism for each spindle including a swinging slotted gage, the slot permitting the yarn to be withdrawn from the gage without breaking, and means for returning the gage to normal position after the yarn has been withdrawn, each gage being operated by a defect in the yarn being wound and operating the brake for stopping its respective bobbin support without affecting the operation of the other said bobbin supports.

13. In a winder, the combination with a bobbin support, means for revolving the bobbin support, a brake cooperating with the bobbin support, means for setting the brake, pivotally mounted tripping means having a slot formed with an enlargement, the slot permitting the yarn to be automatically withdrawn to prevent breaking, means for returning the tripping means to normal position after the yarn has been automatically withdrawn, a defect in the yarn being wound contacting with the walls of the slot in the tripping means and releasing the brake to stop the revolution of the bobbin support and the enlargement in the slot releasing accumulated lint from said slot.

14. In a winder, the combination with a spindle, means for continually revolving the spindle, a bobbin support mounted on the spindle, a brake tripping means including a spring rod and catch, a gage support, a swinging gage formed with an open slot and mounted on the support, one part of the support being in the path of movement of the rod, the gage being swung by a defect in the yarn being wound and thereby causing the end of the part of the gage support in the path of the rod operating the latter to release the catch to permit the spring to apply the brake and stop the revolving of the bobbin support.

15. In a winder, the combination with a continually revolving element, a bobbin support operated thereby, a yarn gage, a connection between the yarn gage and the bobbin support, including a device to be manually operated to lock the bobbin support, and the continually revolving element together, the gage being operated by a defect in the yarn being wound and through the connection holding the bobbin support from revolving with the continually revolving element to stop said bobbin support without breaking the yarn.

16. In a winder, the combination with a continually revolving element, a bobbin support operated thereby, a yarn gage, a connection between the yarn gage and the bobbin support including a device to lock the bobbin support and the continually revolving element together, the gage being operated by a defect in the yarn being wound and through the connection holding the bob-

bin support from revolving with the continually revolving element to stop said bobbin support without breaking the yarn.

17. In a winder, the combination with a continually revolving element, a bobbin support, a spring impelled brake cooperating therewith and mechanism controlled by a defect in the yarn being wound to release the spring and apply the brake to stop the bobbin support without breaking the yarn or stopping the revolving element.

18. In a winder, the combination with a continually revolving element, a bobbin support, a spring impelled brake cooperating therewith and mechanism including a slotted swinging gage controlled by a defect in the yarn being wound to release the spring and apply the brake to stop the bobbin support without breaking the yarn or stopping the revolving element, and means for automatically returning the gage to normal position.

19. In a winder, the combination with a continually revolving element, a bobbin support, a brake, a catch, a slotted gage, and a spring to apply the brake, the gage being operated by a defect in the yarn and releasing the catch to permit the spring to apply said brake to stop the revolution of the bobbin support without breaking the thread.

20. In a winder, the combination with a continually revolving element, a bobbin support, a brake, a movable gage, and a connection including a spring between the gage and brake, said gage being moved by a defect in the yarn being wound to release the spring and apply the brake.

21. In a winder, the combination with a continually revolving element, a bobbin support, a brake, a movable gage having an open end slot, a tension device located in advance of the open end slot, a yarn guide in rear of the gage, the gage being moved by a defect in the yarn being wound and operating the brake, the open end of the gage permitting of the automatic release of the yarn, and means for automatically returning the gage to normal position after the yarn is released.

22. In a yarn winder, the combination with a bobbin support, means for revolving the bobbin support, a circumferential brake operating means, a yarn trip, and a connection intermediate the yarn trip and the circumferential brake operating means, the yarn trip being controlled by an enlargement in the yarn and through the intermediate connection operating the circumferentially operated brake to stop the bobbin support without stopping the revolving means and without breaking the yarn.

23. In a yarn winder, the combination with a bobbin support, means for revolving the bobbin support, movable means including a slotted element controlled by a defect

in the yarn for stopping the bobbin without breaking the yarn, the slot in the element permitting of the removal and insertion of the yarn, and also permitting of the automatic withdrawal of the yarn upon stopping of the bobbin support, and automatic means for returning the element to normal position.

24. In a yarn winder, the combination with a bobbin support, means for revolving the bobbin support, and means including a member having a slot and handle controlled by a defect in the yarn for stopping the bobbin without breaking the yarn, the slot permitting of the removal and insertion of the yarn, and the handle permitting of manual control of the means whereby the bobbin support may be stopped.

25. In a winder, the combination with a driven spindle, a bobbin support loosely mounted thereon, means causing engagement between the spindle and bobbin support, a yarn gage pivotally mounted to swing in the arc of a circle, said gage having an open end slot, the open end of the slot being toward and in direction of the arc of movement of said gage, means between the gage and the bobbin support to stop movement of the latter when said gage is operated, and automatic means for returning the gage to normal position.

26. In a machine of the class described, the combination with a pivotally mounted yarn gage having an open end slot, the open end of said slot being toward and in the direction of the arc of movement of said gage, a bobbin spindle adapted to carry a bobbin, and means between the bobbin spindle and the gage to stop a bobbin carried when a defect in the yarn contacts with the gage, the open end slot permitting the defect to pass as the gage swings without breaking the thread, and means for returning the gage to normal position.

27. In a yarn winding machine, the combination with a revolving spindle a bobbin support, a yarn gage formed with an open end slot, means for pivotally mounting the yarn gage, means for winding the yarn through the slot in the yarn gage, tripping means intermediate the yarn gage and the bobbin support, a defect in the yarn being wound operating on the gage, and swinging the same out of line of the yarn guiding means to operate the tripping means and stop the bobbin support, the open slot permitting the defect to pass from the gage after the tripping device is operated, and means for returning the yarn gage to normal position after the bobbin support is stopped.

28. In a yarn winder, a spindle, a brake including a catch and means for automatically applying said brake to stop a bobbin supported on the spindle, a swinging yarn gage having a part which coöperates with the brake catch, and means for returning the yarn gage to normal position irrespective of the position of the brake.

29. In a yarn winder, the combination with a spindle, a brake for stopping a bobbin carried by the spindle and including a catch and rod and a spring to apply the brake, a pivotally mounted yarn gage formed with an open slot through which the yarn passes to the bobbin, a slug or defect in the yarn operating on the gage and swinging the latter on its pivot and causing a part thereof to operate on the catch and applying the brake, and automatic means for returning the gage to normal position after the slug or defect is free of the slot.

30. In a winding machine, the combination with a spindle, means for continually revolving the spindle, a brake including a band and shaft operating in connection with the same, tension means for frictionally applying the brake to stop a bobbin carried by the spindle without stopping the revolution of the latter, and a catch for preventing operation of the tension means, a movable yarn gage having a part located to release the catch, and means for automatically restoring the yarn gage to normal position.

31. In a winder, the combination with a continually revolving spindle, a brake including a disk mounted on the spindle to stop the bobbin, and mechanism operated by an enlargement in the yarn being wound to grip the disk and stop the revolving of the bobbin without breaking the yarn.

32. In a yarn winder, the combination with a frame, a bobbin support, means for revolving the bobbin support, brake mechanism adapted to stop the revolution of the bobbin support, a yarn gage having an element to automatically operate the brake when an enlargement in the yarn operates the gage, said element being normally spaced from the part of the brake mechanism with which it coöperates, whereby an enlargement in the yarn will operate the gage and impart motion to the element and cause the latter to strike with a blow the part of the brake mechanism with which it coöperates to operate said brake mechanism.

In testimony whereof I have affixed my signature in presence of two witnesses.

HENRY C. MILLER.

Witnesses:

GERALD A. BOYLE,
GEORGE P. MULHEM.