No. 863,766. PATENTED AUG. 20, 1907.

M. WADDELL.

REELING OF THREADS INTO SKEINS.

APPLICATION FILED FEB. 28, 1906.

5 SHEETS—SHEET 1.

Fig. 1.

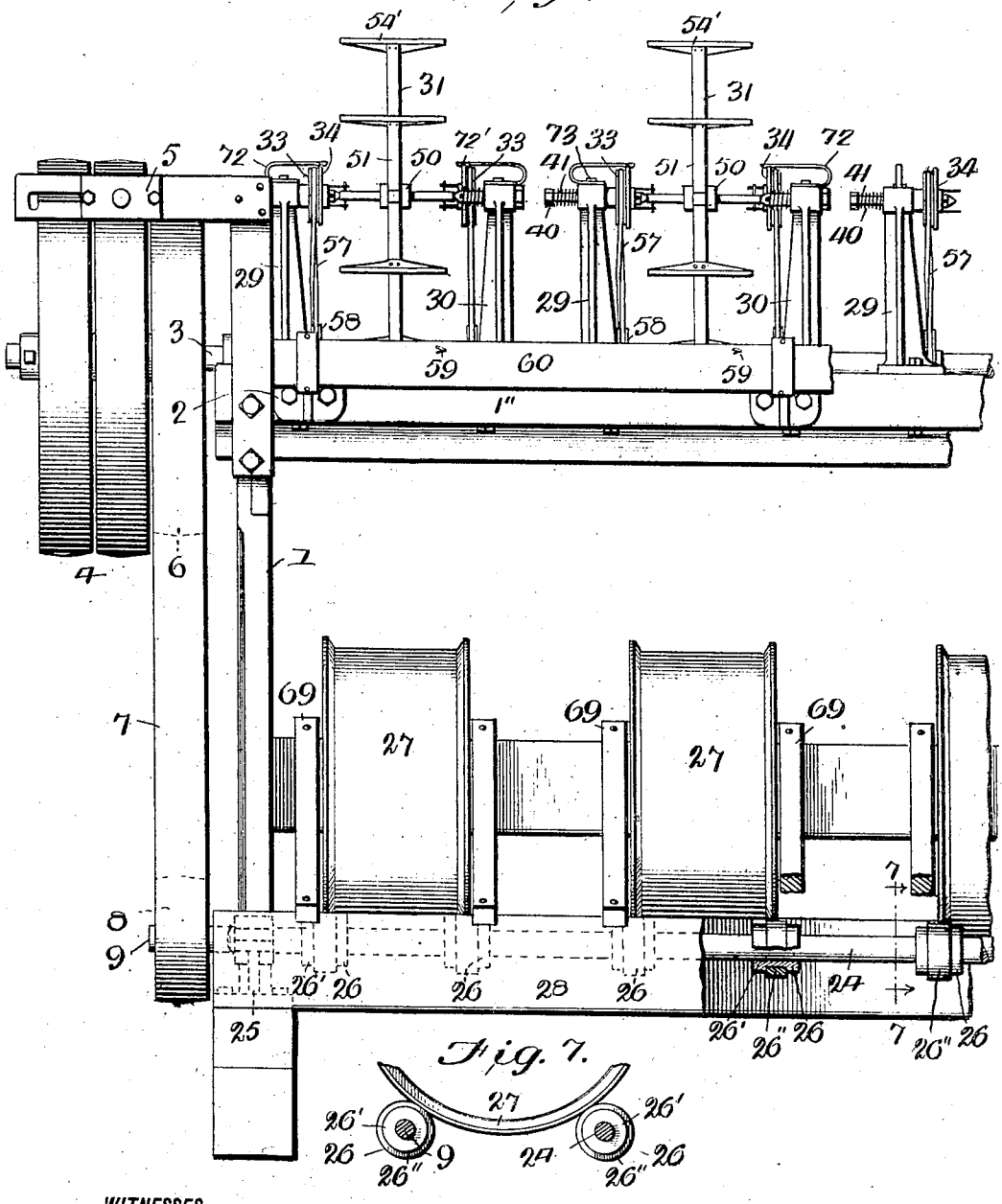
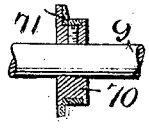


Fig. 7.

Fig. 8.



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No. 863,766. PATENTED AUG. 20 1907.

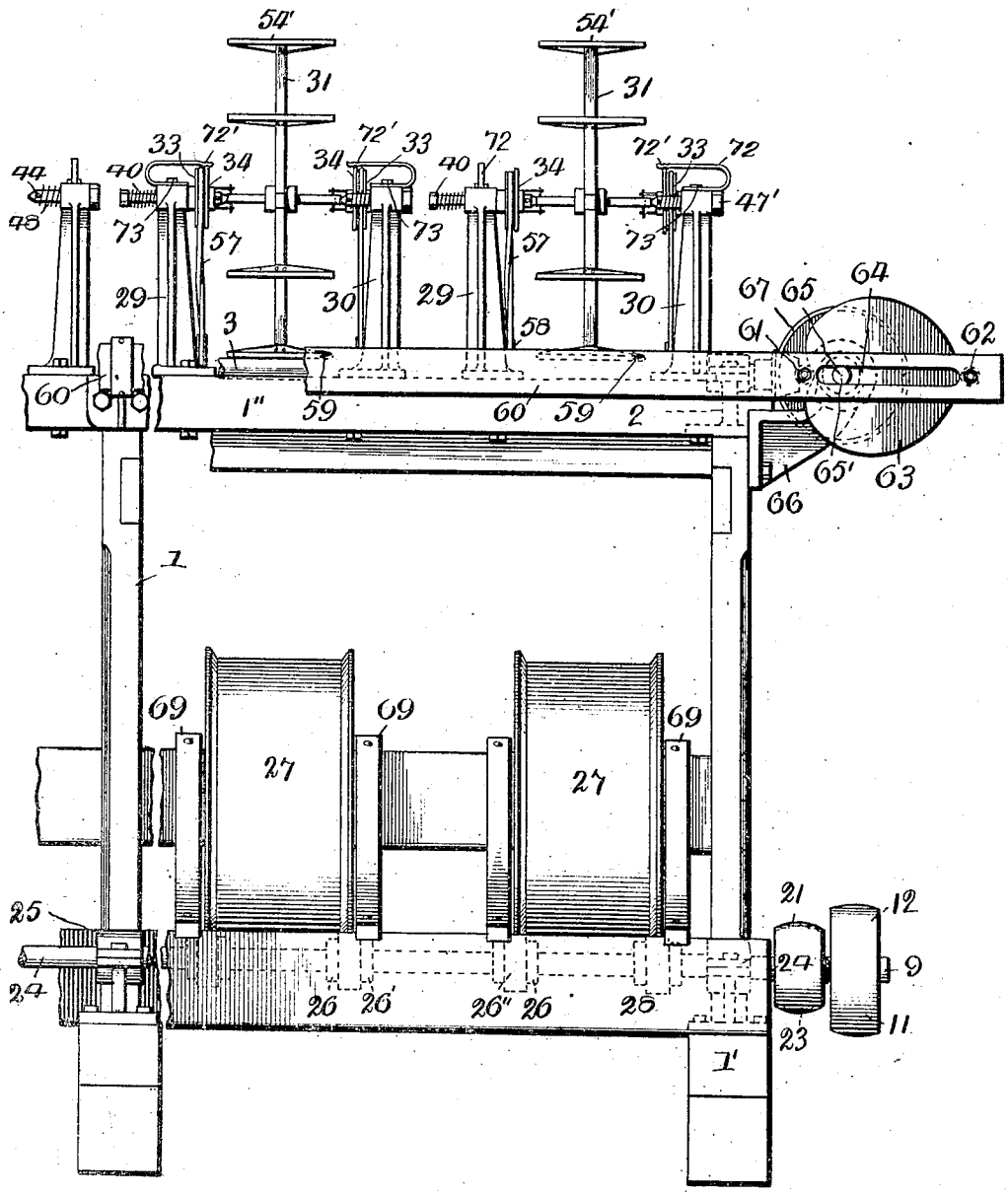
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5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

Fig. 3.

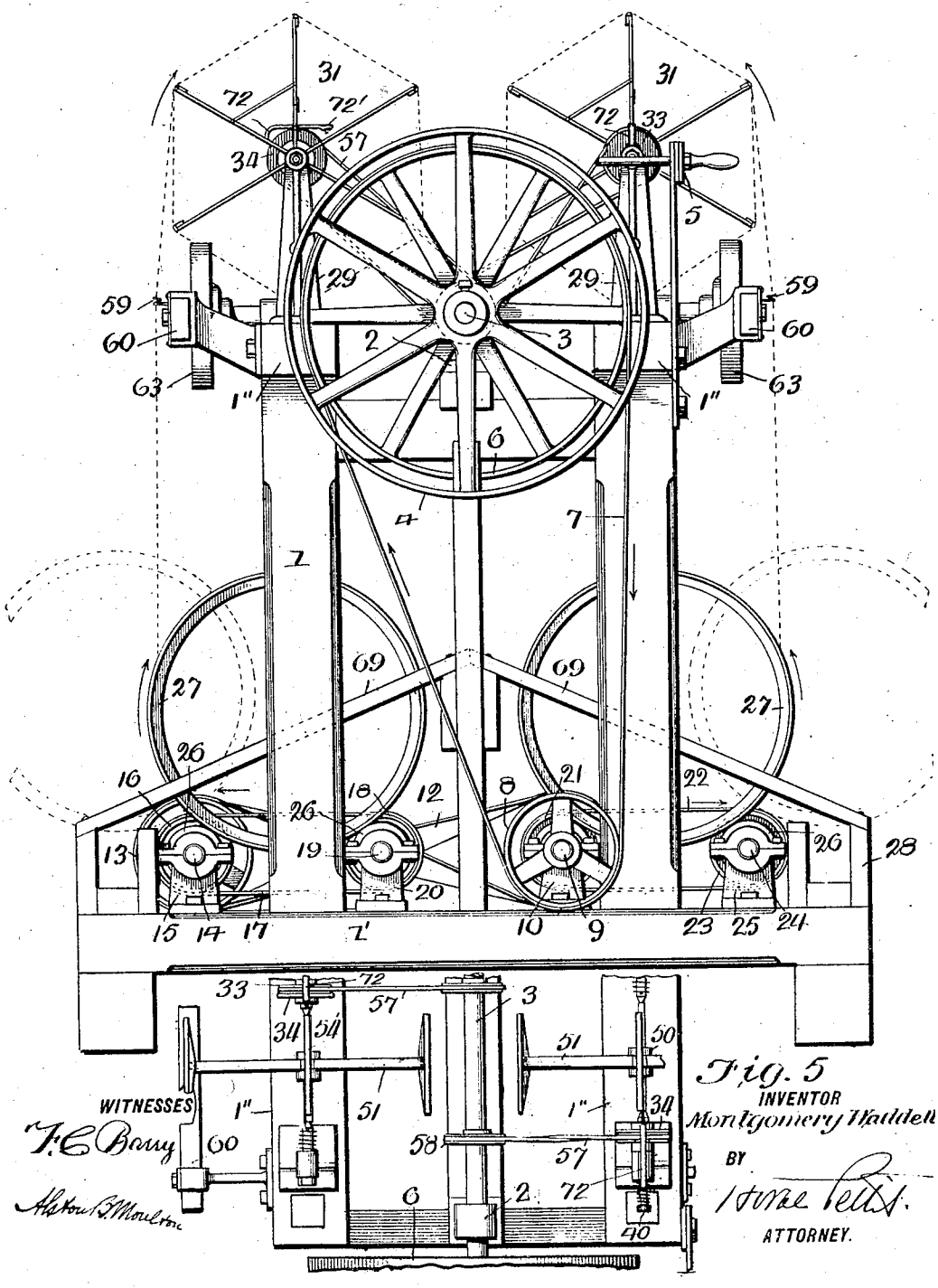


Fig. 5

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5 SHEETS—SHEET 4.

Fig. 4.

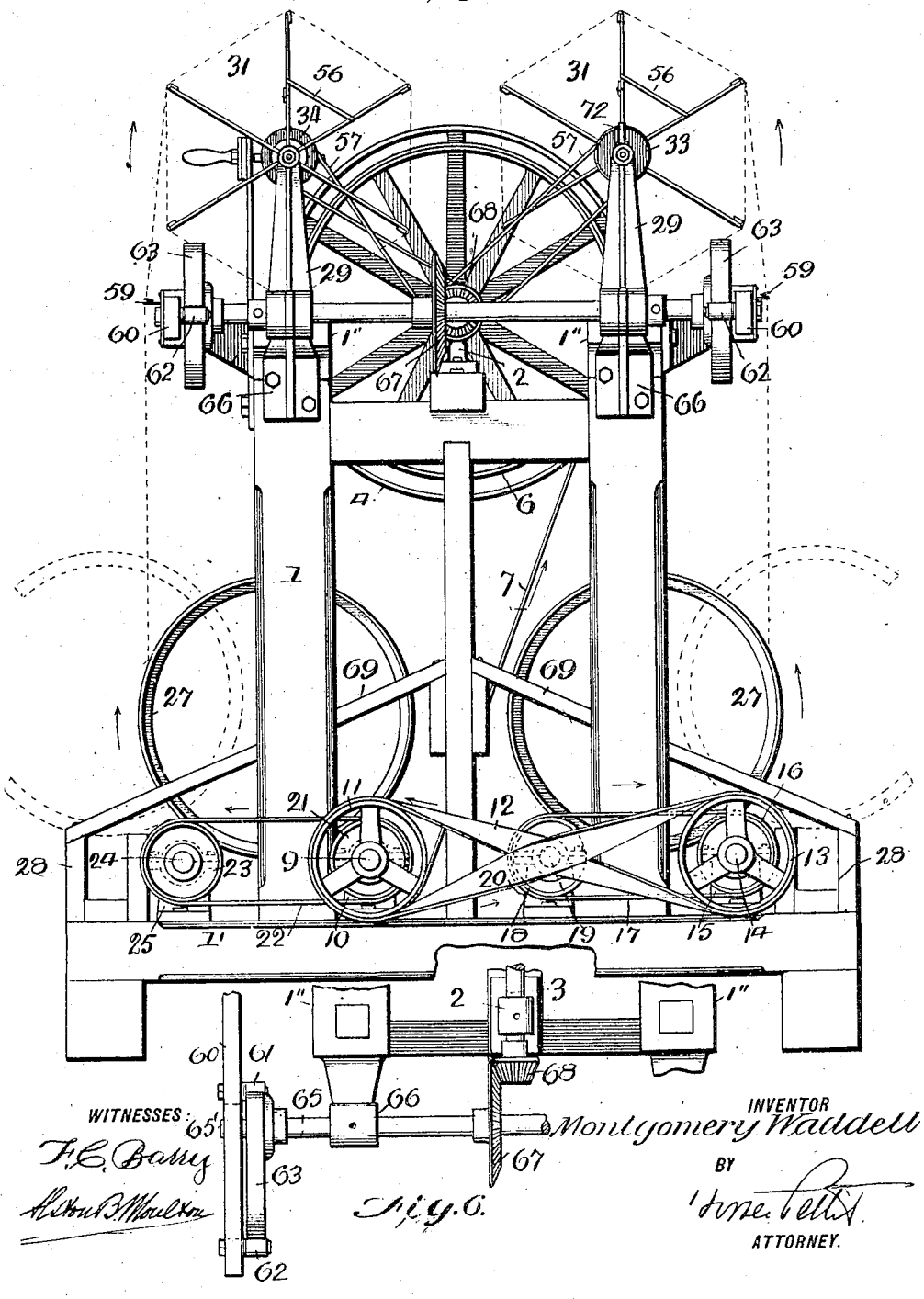


Fig. 6.

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APPLICATION FILED FEB. 28, 1906.

6 SHEETS—SHEET 6.

Fig. 10.

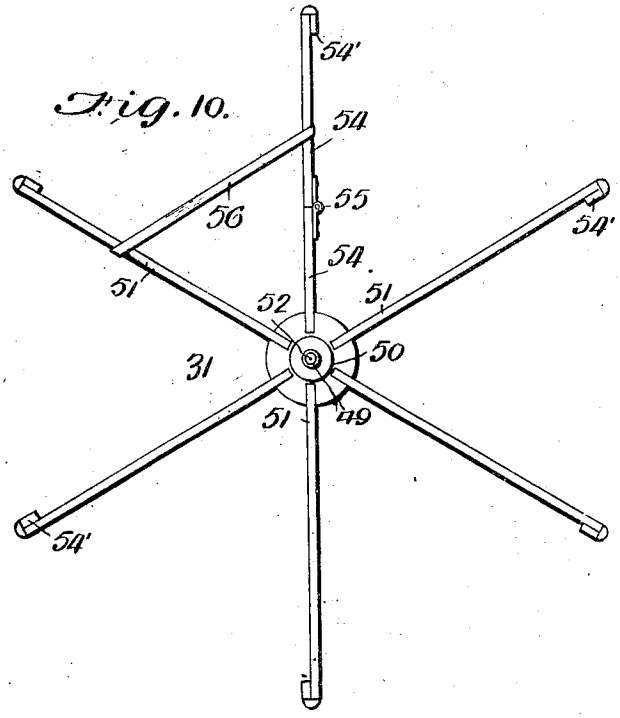


Fig. 9.

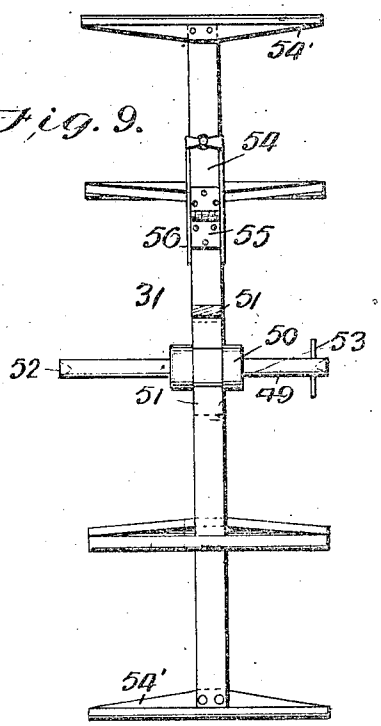


Fig. 11.

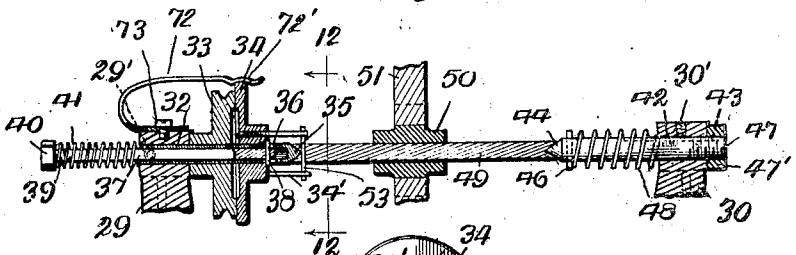


Fig. 12.

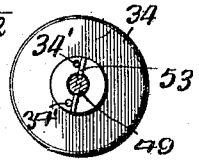
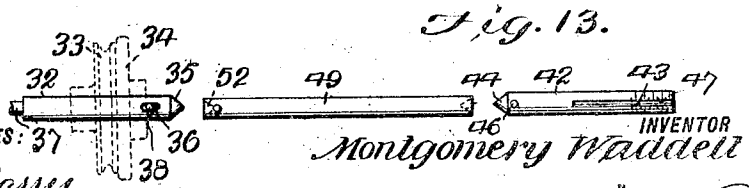


Fig. 13.



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UNITED STATES PATENT OFFICE.

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REELING OF THREADS INTO SKEINS.

No. 863,766. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed February 28, 1906. Serial No. 303,411.

To all whom it may concern:

Be it known that I, MONTGOMERY WADDELL, a subject of the King of Great Britain, and a resident of New York, State of New York, United States of America, have invented certain new and useful Improvements in the Reeling of Threads into Skeins, of which the following is a full, clear, and exact disclosure.

My invention relates especially to the reeling of artificial silk or similar material into skeins directly from the bodies upon which the thread has been wound as it emerges from the fixing or coagulating bath and upon which it has been subjected to the subsequent steps of the process of making the same prior to that of winding the finished thread into skeins.

One of the objects of my invention is to provide a machine upon which a thread of artifical silk or similar material may be reeled directly from the body upon which the thread was originally wound, and upon which it is subjected to the steps of the process of forming the same prior to that of reeling.

A further object of my invention is to positively deliver the thread to the reel upon which the skeins are formed and to rotate the reels by means of a friction drive so that the speed of the reel will be controlled by the thread as it is delivered thereto, and a definite or predetermined tension may be applied to the thread between the reel and the body from which it is being delivered.

A further object of my invention is to enable the operator to stop the delivery of the thread to the reel without breaking the thread and to enable him to substitute an empty reel for a full reel with facility and without stopping the machine.

Other objects will appear in the specification and claims forming a part of this application.

In the accompanying drawings forming a part of this specification, Figure 1 is a side elevational view of one end of a machine embodying my invention; Fig. 2 is a similar view of the opposite end of a machine; Fig. 3 is an end elevational view of the left hand end of Fig. 1; Fig. 4 is an end elevational view of the right hand end of Fig. 2; Fig. 5 is a plan showing the reels and the means by which they are driven from the main shaft; Fig. 6 is a plan view of the traverse cam and its driving connection illustrated in Fig. 4; Fig. 7 is a sectional view of a detail taken on the line 7—7 of Fig. 1; Fig. 8 is a sectional view of a modified form of roller for supporting and rotating the flanged rings from which the thread is delivered to the reel; Fig. 9 is a view of the reel showing means for removing the wound skein therefrom; Fig. 10 is a side elevational view of the reel shown in Fig. 9; Fig. 11 is a sectional view of the friction drive by which the reel is revolved; Fig. 12 is a sectional view on the line 12—12 of Fig. 11 and Fig. 13 is a view showing the parts illustrated in Fig. 11 disconnected from each other.

1 indicates the main frame of the machine in the upper part of which is mounted in suitable bearings 2, the main driving shaft 3 extending the full length of the frame. On one end of the main shaft are located the usual tight and loose pulleys 4 and the belt shifter 5, by means of which the main shaft is driven from any suitable source of power. Adjacent the tight and loose pulleys 4, is a drive pulley 6, which, through the belt 7 turns the pulley 8 mounted on the shaft 9, which is journaled in suitable boxes 10 in the lower part of the frame. The shaft 9 extends the full length of the frame and at its end opposite the pulley 9 carries a second pulley 11 which in turn through the crossed belt 12 drives the pulley 13, mounted on shaft 14 which is also journaled in boxes 15 on the cross bar 1′ of the frame. The shaft 14 also carries a second pulley 16 which in turn through its belt 17 rotates the pulley 18 mounted on shaft 19 in boxes 20 on the lower cross bar 1′. 21 is another pulley mounted on the shaft 9 adjacent the pulley 11 which is connected by belt 22 with pulley 23 carried on shaft 24 mounted in boxes 25 on the main cross bar 1′.

The shafts 24, 9, 19 and 14 carry series of rollers 26 and each roller may consist of a body portion 26′ and a frictional or elastic driving portion 26″. I preferably provide the body portion of 26′ with a circumferential groove and form the tire or driving portion of 26′ of an elastic band which is securely seated in the said groove. I may, however, make the said rollers with a flanged body portion 70 and a flanged rim or driving portion 71 as is illustrated in Fig. 8 of the drawings.

By means of the gearing above described, it will be seen that the pair of shafts 19 and 14 and the rollers 26 carried thereby, will be revolved in the same direction and that the pair of shafts 24 and 9 will be revolved in the opposite direction and that the flanged rings 27 when the same are supported on the rollers 26 as shown in the various views of the drawings and especially as shown in Fig. 7, will be rotated thereby.

On opposite sides of the frame and adjacent the outer shafts 14 and 24 are longitudinally extending boards or rails 28, the upper edges of which are adapted to support and hold the flanged rings either before the same are placed upon the driving rollers or after the same have been unwound or whenever it is desirable to stop the reeling operation. The position occupied by the ring when they are in this inoperative position is indicated in dotted lines in Fig. 4.

On the top of the frame 1 on the cross bars 1″ extending the full length of the frame are a series of pairs of brackets or boxes 29 and 30 adapted to support between them in dead centers 32, 42, the winding reels 31.

Referring now to Figs. 10, 11 and 12, the upper end of the bracket 29 carries the hollow bushing or dead center 32 securely held within said bracket by a set screw 29′. Loosely mounted upon said bushing is a pulley 33 adapted to bear against the friction disk 34 also loosely mounted upon said bushing. The bushing 32 is pointed at one end as at 35 to form one center for supporting the reel, and the bushing is also provided near its pointed end with one or more longitudinally extending slots 36. Within the bushing is a longitudinal movable rod 37, the inner end of which carries a pin 38 which passing through the said slots bears against the hub of the friction disk 34. The outer end of the rod 37 is provided with screw threads 39 and with a nut 40, and between said nut and said bracket 39 is a coiled spring 41 adapted to be compressed between the nut 40 and the bracket 29. The other bracket 30 carries a pin, or center 42 splined as at 43, pointed at its inner end as at 44 and provided with a pin 46 adjacent the pointed end. The opposite end of the stud is screw threaded at 47 and carries a nut 47′ bearing against the bracket 30. 30′ indicates a pin or screw adapted to engage the spline 43 to prevent the stud 42 from rotating. Between the pin 46 and the bracket 30 is a coiled spring 48, which is adapted to force the stud in the direction of the opposite bushing or center 32. The disk 34 is further provided with one or more pins 34′ extending outwardly from the hub parallel with the axis of the bushing.

Mounted upon the bracket 29 is a spring 72, one end of which is secured to the said bracket by means of the screw 73, and the other end of which is provided with a bent or curved portion 72′ adapted to engage the periphery of the disk 34. This spring is adapted to be swung about the screw 73 as a pivot to throw its outer end into and out of engagement with the edge of the disk for the purpose of preventing the rotation of the disk whenever it becomes necessary to do so.

The reel shown in Figs. 8 and 9 consists of a spindle 49 carrying midway its ends a hub 50 to which are secured in a suitable manner the radially extending arms 51, provided at their outer extremities with cross bars 54′ upon which the thread is wound into skeins. The ends of the spindle are preferably countersunk as at 52 and one end of the spindle is provided with a radially extending pin 53 which is adapted to contact with one or more of the pins 34′, in order that the reel may be positively coupled to the friction disk 34. The reel also has one or more radially extending arms 54, said arms being joined or hinged as at 55 at a point between the hub and the outer end of the arm. 56 indicates an elastic band extending from the hinged portion of the arm 54 to the adjacent rigid arm 51 by means of which the end 54 may be kept in a normally radial position while the thread is being wound thereon.

As indicated in Fig. 11, I preferably provide the friction disk with two pins 34′, 34′ so located as to contact on the same side of both ends of the pin 53 since this provides a simple and inexpensive means for removing or placing the reel upon the centers and holding it there with comparatively little back lash. From the description of the friction drive and of the reel as above set forth, it will be apparent that in order to insert the reel between the centers it is merely necessary to slide the stud 42 outwardly, compressing the spring 48 and to then place the reel between the centers with the pin 53 contacting with both pins 34′ and 34′, and allow the spring 48 to engage the opposite end of the spindle. By adjusting the nut 47′ at different positions upon the stud 47, I can provide only so much pressure upon the ends of the spindle as will suffice to support the reel and am enabled to regulate the pressure between the pulley 33 and the disk 34 and consequently the tension to which the thread is subjected by merely adjusting the nut 40 upon the stud 37 to vary the compression of the spring 41.

Motion is communicated to the reels 31 through the pulley 33, belt 57 and pulleys 58 secured to the main driving shaft 3, and the speed of the pulley is such as would tend to rotate the reels at a speed faster than that at which the thread is being delivered thereto from the rings.

In order to lay the thread as it is reeled in regular courses upon the reel, I provide a traverse mechanism consisting of the guide eyes 59 carried by the traverse bar 60, one end of which is provided with rollers 61, 62 bearing on opposite sides of the cam 63. In order to hold the traverse bar in its proper position with respect to the cam, I provide it between the rollers 61 and 62 with a slot 64 which engages the outer end 65′ of the shaft 65 upon which the cam is mounted. The shaft 65 is held in suitable boxes 66, 66 on the ends of the form and is rotated through the beveled gearing 67, 68 from the main shaft 3.

To assist in placing the ring 27 in proper position upon the rollers 26, I provide the frame with inclined cross bars 69 extending from the outer sides of the rails 28 to a point at or near the middle of the machine.

The operation of my machine is as follows:—The rings 27 being in position indicated in the dotted lines on Figs. 3 and 4, the thread is passed upwardly through the guide eye 59 and is wrapped around one of the cross bars of the reel and the amount of friction between the pulley 33 and the friction disk 34 is so adjusted that when the machine is started and the rollers are supported on the troughs 28, the reel will be prevented from rotation by the thread. In other words the friction is so adjusted that the ring may be stopped from rotating without breaking the thread which is being reeled. The shipper 5 being then thrown to the position to apply power to the shaft 3, the traverse mechanism the shafts carrying the rollers 26 and the pulleys 33 will be rotated. To begin the reeling operation, then it is merely necessary to roll the flanged rings 27 from the rails 28 between the guide bars 69 to a position in which the same are supported on their flanges, upon the rollers 26. The rings 27 will then be positively driven to unwind the thread carried thereby and the reels, driven through the friction drives before described, will be rotated to wind up the thread as fast as the same is delivered from the spools, the traverse mechanism, laying the thread in regular courses upon the reels. Whenever it is desirable to stop the reeling of any one of the set of reels in the frame, it is merely necessary to withdraw the corresponding ring from its position upon the rollers 27 and place it upon the rails 28, which operation of itself will stop the rotation of the reel without interfering with the motion of any of the other reels or parts of the machine.

While the friction between the disk 34 and pulley 33 is so adjusted that the reel will be held from rotation while the ring is stationary, so long as the thread is unbroken, it is plain that whenever a thread breaks, or a reel is removed from between its centers, or whenever it is necessary to replace a full reel by a new or empty reel, the disk would rotate as long as the pulley 33 is driven, unless some suitable means were provided for holding the same. Therefore, whenever any of the above conditions arise the rotation of the disk is prevented by swinging the spring 72 about its pivot so that the outer end of the same engages and presses against the periphery of the disk. To put the disk into operative relation with the pulley, it is merely necessary for the operator to push the spring out of contact with the disk.

A reel may be removed from between the centers 32 and 42 by forcing the center 42 outwardly against the pressure of the spring 48 and withdrawing the opposite end of the spindle 49 from its engagement with the center 32 and the pins 34′ and 34′ and the reeled thread may be readily removed from the reel by swinging the outer end of the radial arm 54, about its pivot 55 and against the tension of the rubber band 56, until its outer end is adjacent one of the arms 51. This motion of the arm 54 will relieve the skein of its tension and permit the skein to slide over and off of the cross bars 51′.

While I have described one form of apparatus in which my invention may be carried into effect, I do not desire to be limited to the precise construction shown, since any apparatus in which the objects of my invention are carried out is fully within the scope of my invention.

What I claim and desire to protect by Letters Patent of the United States, is:—

1. In a reeling machine a frame a pair of parallel shafts mounted on said frame, a body adapted to contain a supply of thread, supported and rotated by said shafts and means on the outside of said frame and adjacent said shafts upon which said body may be supported to stop the reeling operation, a reel, means tending to rotate said reel faster than the thread is delivered thereto, and means controlled by the thread being reeled for allowing the reel to rotate at the same speed as that of the thread being delivered thereto.

2. In a reeling machine, a frame, parallel shafts mounted on said frame, rollers mounted on said shafts, a flanged ring adapted to contain a supply of thread to be reeled, and means for guiding said ring to position between said shafts and with its flanges resting on said rollers.

3. In a machine for reeling artificial silk or similar material, a frame, a pair of parallel shafts mounted in said frame, a pair of rollers mounted on each shaft arranged opposite those on the other shaft, a body adapted to contain a supply of thread to be reeled, and means mounted on said frame for guiding said body into position upon said rollers.

4. In a reeling machine, a frame, bodies adapted to contain a supply of thread to be reeled, means mounted on said frame for positively rotating said bodies, means also mounted on said frame for guiding said bodies into operative relation with said driving means, and means mounted on said frame for holding said bodies in an inoperative position adjacent said driving means.

5. In a machine for reeling artificial silk or similar material, a frame, a ring provided with flanges adapted to contain a supply of thread to be reeled, a pair of parallel shafts mounted on said frame, means to rotate said shafts in the same direction, of rollers mounted on said shafts and arranged opposite each other, and adapted to support between them the said ring by its flanges, and guide bars mounted on said frame above said shafts and adapted to position said rings upon said rollers.

6. In a machine for reeling artificial silk or similar material, a frame, a pair of parallel shafts mounted in said frame, means to rotate said shafts in the same direction, a series of rollers mounted on said shafts opposite to each other, said rollers comprising a body portion provided with a groove midway its length, and an elastic tire or ring mounted in said groove, rings provided with flanges adapted to contain a supply of thread to be reeled, and means mounted on said frame to position said rings upon said rollers with the flanges of the rings engaging said elastic tires.

7. In a machine for reeling artificial silk or similar material a ring adapted to contain the thread to be reeled, means for positively rotating said ring and means adjacent said ring rotating means upon which said ring may be placed to stop the reeling operation, a reel, means tending to rotate said reel at a speed faster than that in which the thread is delivered from said ring to said reel, means controlled by the thread being reeled for allowing said reel to rotate at the same speed as the rate of the delivery of said thread and for applying a predetermined tension to said thread, and a traverse motion for laying the thread in regular courses upon said reel.

8. In a machine for reeling artificial silk or similar material, a frame, a pair of parallel shafts mounted in said frame, a body adapted to contain the supply of thread to be reeled supported on said shafts and means to positively rotate said shafts in the same direction, a support on said frame adjacent said shafts to receive said body, both before the same is put into the machine to be unwound and to stop the reeling operation of a reel-driving mechanism also mounted on said frame, and comprising a pulley, a frictional disk engaging said pulley, means to vary the pressure between said pulley and said frictional disk, and means to rotate said pulley.

9. In a machine for reeling artificial silk or similar material, a frame, a pair of parallel shafts mounted in said frame, a body adapted to contain the supply of thread to be reeled supported on said shafts and means to positively rotate said shafts in the same direction of a reel-driving mechanism also mounted on said frame, said reel-driving mechanism comprising a hollow dead center, a pulley loosely mounted on said center, a friction disk also loosely mounted on said center, reel engaging means mounted on said disk, a tension rod within said center, a pin passing through the inner end of said tension rod and through said center into engagement with the said friction disk, means mounted on the outer end of said tension rod to apply an adjustable tension to said rod and consequently an adjustable pressure between said pulley and said friction rod, and means for rotating said pulley.

10. In a machine for reeling artificial silk or similar material, the combination with the reel, and a pair of alined centers adapted to hold the reel between them, of a frictional driving mechanism mounted on one of said centers, said frictional driving mechanism comprising a positively turned driving member, and a frictionally driven member, and means to connect said reel with the frictionally driven member.

11. In a machine for reeling artificial silk or similar material, the combination with the reel and a pair of alined centers adapted to hold the reel between them, of a frictional driving mechanism mounted on one of said centers, said frictional driving mechanism comprising a positively turned driving member and a frictionally driven member, and means to vary and adjust the pressure between the said driving and the said driven member.

12. In a machine for reeling artificial silk or similar material, a frame, a reel and a reel driving mechanism mounted on said frame, comprising a pulley, a frictional disk, engaging said pulley, means to vary the pressure between said pulley and said frictional disk, means to rotate the pulley and means adapted to be brought into engagement with said disk to hold the same from rotation while the pulley is being rotated.

13. In a machine for reeling artificial silk or similar material, the combination with a reel, of a pair of alined centers adapted to hold the reel between them and a fric-

tional driving mechanism mounted on one of said centers, said frictional driving mechanism comprising a positively turned driving member and a frictionally driven member with means adapted to be brought into contact with said frictionally driven member to hold the same from rotation while the driving member continues to rotate.

14. In a machine for reeling artificial silk or similar material, the combination with a reel of a pair of centers adapted to support between them said reel, one of said centers being provided with a longitudinal slot, a frictional driving mechanism mounted on one of said slotted centers and comprising a positively rotated pulley loosely mounted on said center, a frictionally driven disk also loosely mounted on said center and adapted to engage said pulley, a rod mounted with said center, a pin carried by said rod and extending through said slot into engagement with the hub of said friction disk, a spring mounted on the outer end of said rod, means to apply variable degrees of compression to said spring, and a reel engaging pin mounted upon said disk.

15. In a machine for reeling artificial silk or similar material, a ring adapted to contain a supply of thread to be reeled, means for positively rotating said ring to deliver said thread to the reel, a reel, means tending to rotate said reel faster than the thread is delivered thereto and means controlled by the thread being reeled for allowing the reel to rotate only so fast as the thread is delivered thereto, means adjacent said ring rotating means to hold said ring when not in engagement with said rotating means, said reel comprising a spindle, a hub mounted on said spindle, a series of radial arms extending from said hub, cross bars mounted on said arms, one of said arms being provided with a hinge midway its length, and yielding means for holding the said arm in a substantially radial position through the reeling operation.

16. In a reeling machine, a frame, bodies adapted to contain a supply of thread to be reeled, means mounted on the frame for positively rotating said bodies, and means also mounted on said frame for guiding said bodies into operative relation with said driving means.

17. In a machine for reeling artificial silk or similar material, a frame, a body adapted to contain a supply of thread to be reeled, a pair of parallel shafts mounted in said frame, means to rotate said shafts in the same direction, rollers mounted on said shafts and arranged opposite to each other and adapted to support between them the said body, and guide bars mounted on said frame above said shafts, adapted to position said bodies upon said rollers.

18. In a machine for reeling artificial silk or similar material, a frame, a pair of parallel shafts mounted on said frame and means to rotate said shafts in the same direction, a series of rollers mounted on said shafts opposite to each other, said rollers comprising a body portion provided with a groove midway its length, and an elastic tire or ring mounted in said groove, bodies adapted to contain a supply of thread to be reeled, and means mounted upon said frame to position said bodies upon said rollers and to bring the same into engagement with said elastic tire.

In witness whereof, I have hereunto set my hand this 27th day of February, A. D. 1906.

MONTGOMERY WADDELL.

Witnesses:
ALEXANDER PARK,
ALSTON B. MOULTON.