R. DAWES.

SPINNING AND TWISTING MACHINE.

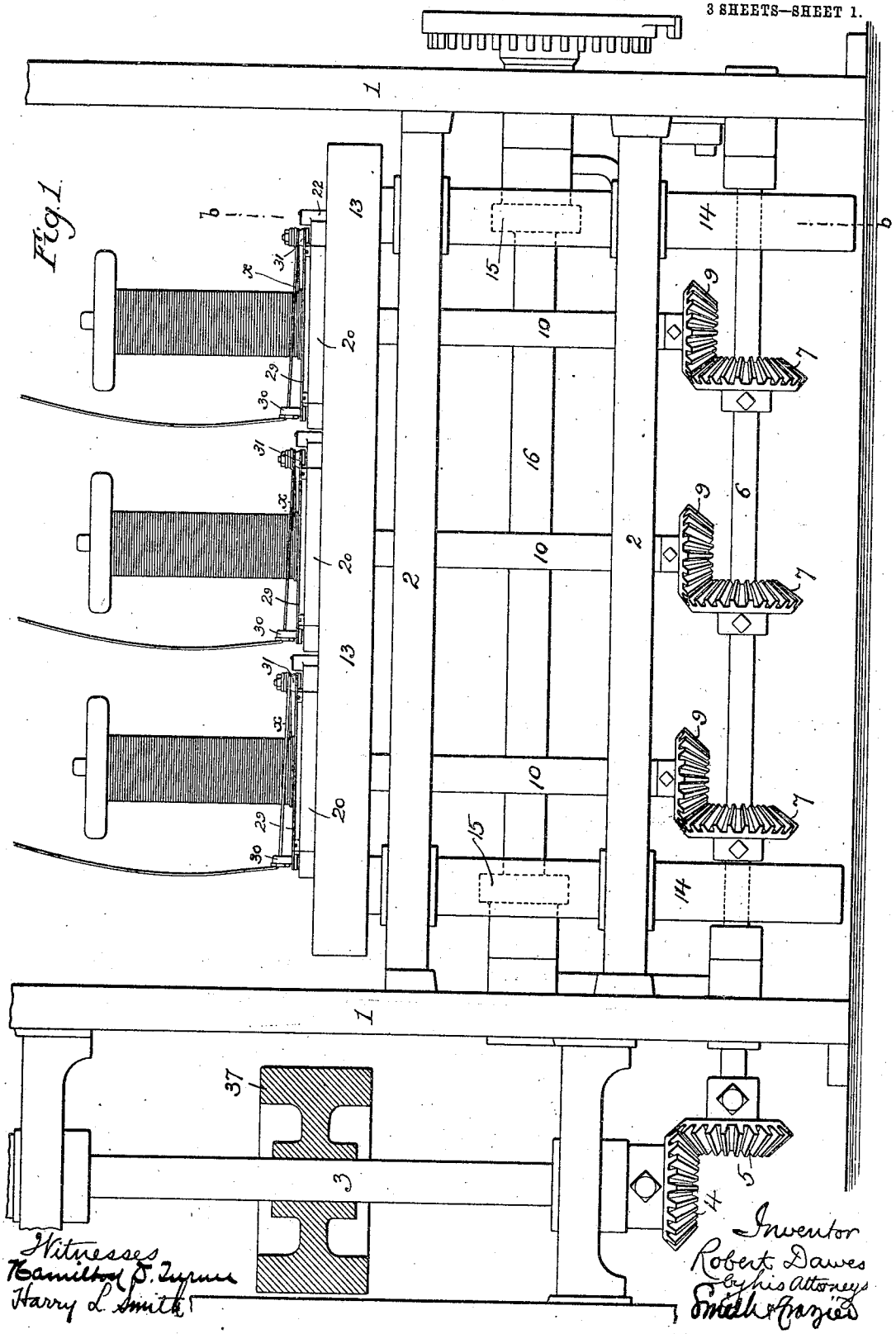
APPLICATION FILED JAN. 2, 1908.

959,316.

Patented May 24, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

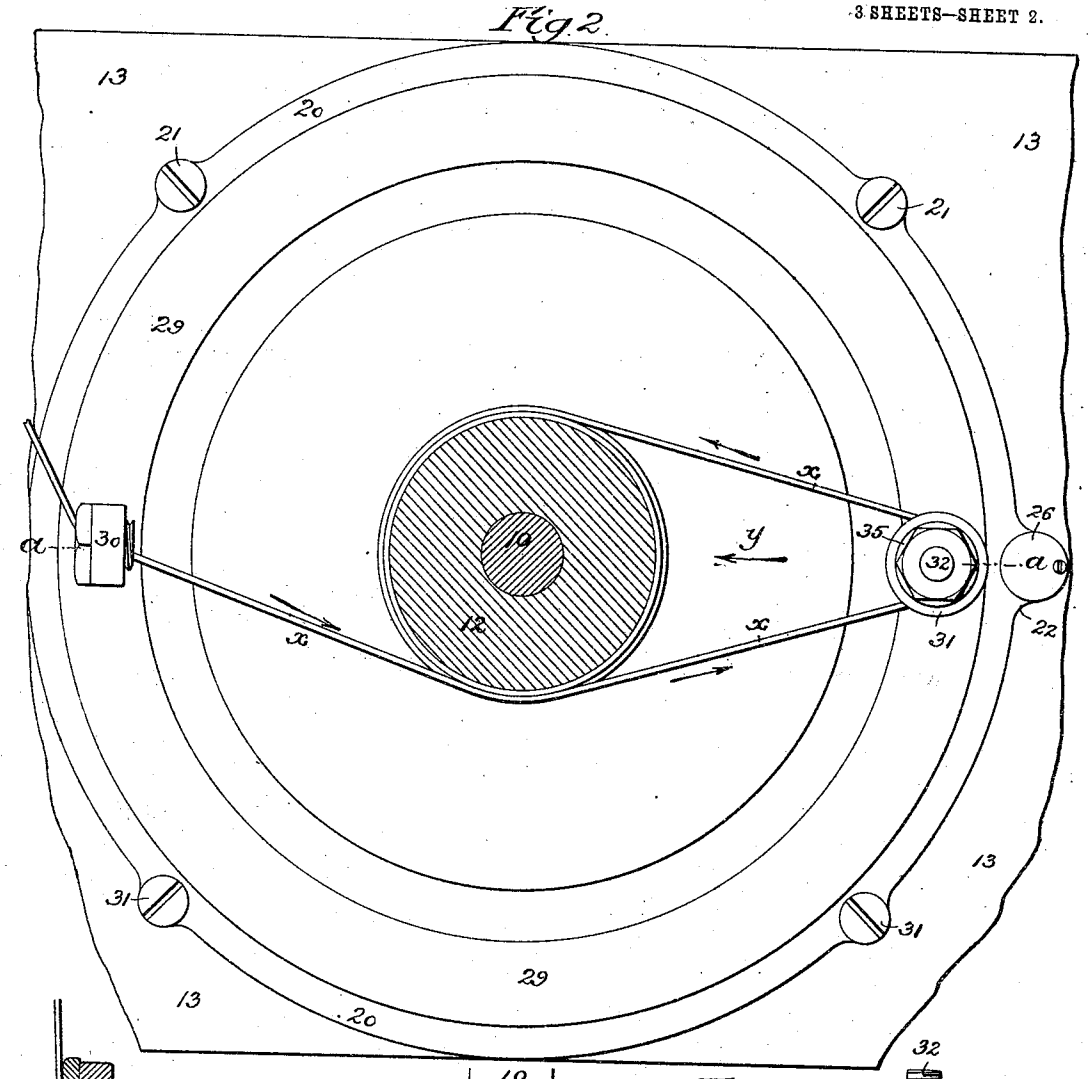
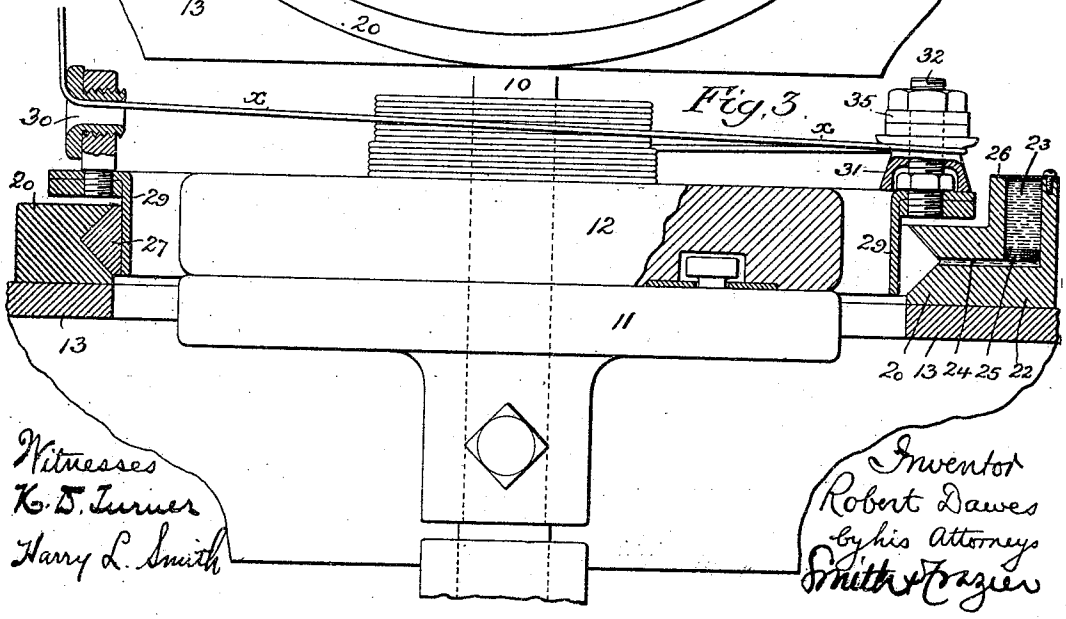


Fig. 3.



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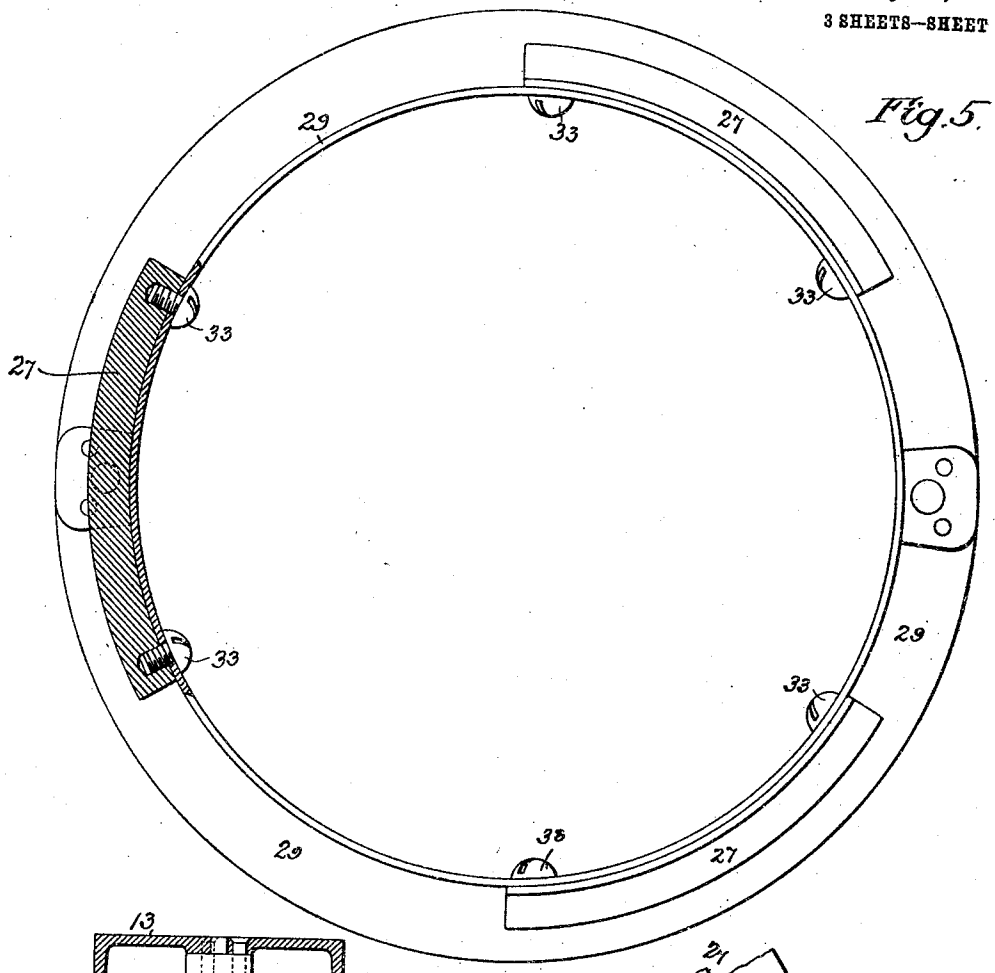
3 SHEETS—SHEET 3.

Fig. 5.



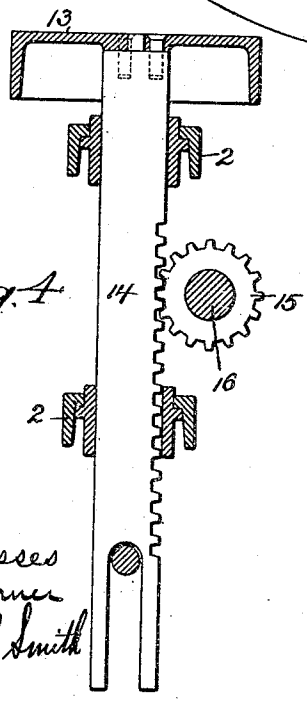


Fig. 4.

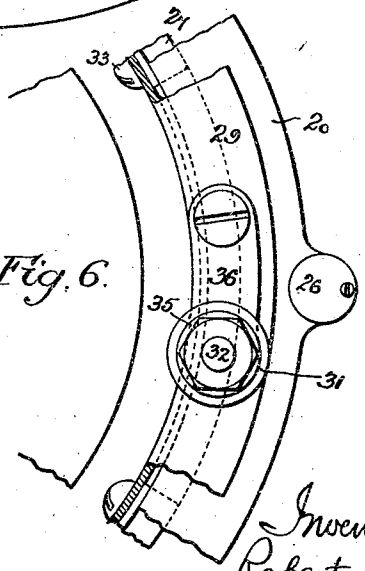


Fig. 6.

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UNITED STATES PATENT OFFICE.

ROBERT DAWES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HIMSELF AND EDMUND DAWES, OF PHILADELPHIA, PENNSYLVANIA, AND EDWARD H. HASKELL, OF NEWTON, MASSACHUSETTS.

SPINNING AND TWISTING MACHINE.

959,316. Specification of Letters Patent. **Patented May 24, 1910.**

Application filed January 2, 1908. Serial No. 408,922.

To all whom it may concern:

Be it known that I, ROBERT DAWES, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Spinning and Twisting Machines, of which the following is a specification.

My invention relates to that type of spinning or twisting machines in which are employed a rotating spool or bobbin, and a ring mounted in a bearing surrounding said bobbin, such ring carrying the guide or guides for the thread, cord, twine, or other body, (hereinafter, for convenience, referred to, as "thread,") which is being spun or twisted, and being rotated through the medium of said thread.

My invention has special reference to that particular type of such machine in which the rotating ring has two oppositely disposed guides for the thread, the latter passing first through the primary guide, then across to the opposite or secondary guide, and then to the bobbin, and the thread, in passing from the primary to the secondary guide, contacting with the bobbin or with the body of thread wound thereon.

The objects of my invention are to prevent interference with the proper rotation of the ring by reason of any deflection of the same from its true plane of rotation, under the influence of the pull exerted upon it by the thread, to provide for the proper lubrication of the ring, to readily vary the tension upon the thread which is being spun or twisted, to prevent breaking of the thread by starting too quickly the rotating movement of the bobbin, and to prevent unwinding of the thread from the bobbin because of the overrunning of the bobbin by the ring in stopping the machine. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of sufficient of a spinning or twisting machine to illustrate my present invention; Fig. 2 is a plan view, on an enlarged scale, of one set of the spinning or twisting devices of the machine; Fig. 3 is a view, partly in side elevation and partly in transverse section, on the line *a*—*a*, Fig. 2; Fig. 4 is a transverse section on the line *b*—*b*, Fig. 1; Fig. 5 is an inverted view of the ring constituting one of the elements of the spinning or twisting devices of the machine, and Fig. 6 is a plan view illustrating a modification of one of the features of my invention.

Referring in the first instance to Fig. 1 of the drawing, 1—1 represent opposite end frames connected by suitable longitudinal tie bars 2, one of the end frames having bearings for a vertical shaft 3 to which power is applied in any suitable way, said shaft being connected, by bevel gears 4 and 5, to a horizontal shaft 6 carried by suitable bearings on the end frames 1 and serving, by means of bevel gears 7 and 9, to drive a series of spindles 10 which can turn in bearing on the bars 2, only three of these spindles being shown in the present instance, although, in practice, a greater number than this will usually be employed.

Each spindle has a disk 11, which supports, and is in driving connection with, the lower head of a bobbin 12 upon which the spun or twisted thread is to be wound, each bobbin being contained in an opening in a flanged rail 13 and either rail or bobbin having movement in respect to one another in the direction of the axial line of the bobbin, in order to distribute the spun or twisted thread throughout the length of the bobbin. In the present instance this movement is imparted to the rail 13, the latter being provided with depending racks 14 guided in suitable bearings on the bars 2, as shown in Fig. 4, these racks meshing with pinions 15 on a longitudinal shaft 16 which is carried by suitable bearings on the end frames 1, and has a to-and-fro motion imparted to it by mechanism of any desirable character.

Surrounding each of the openings in the rail 13 is an annular bearing 20 with internal V-shaped groove, said bearing being secured to the rail 13 by vertical bolts or screws 21, or in any other suitable manner, and having at one side a projecting hollow lug 22, containing an oil chamber 23, which communicates at its lower end with the groove of the bearing through a passage 24, the oil chamber containing a suitable oil filter 25, and having a movable cap or cover 26. The groove of the bearing receives segmental ribs 27 secured to the periphery of a flanged spinning or twisting ring 29, and

fitting so snugly in the groove that the ring will rotate in its bearing without any material lost motion either vertical or radial.

At one side of the ring 29 is an eye 30 which constitutes the initial guide for the thread x which is being spun or twisted, and from said eye the thread passes to a guide on the opposite side of the ring, which guide may be of any desired character, being shown, in the present instance, as consisting of a grooved sheave or disk 31, which may be fixedly mounted upon a vertical pin 32 on the ring, or may be permitted to rotate on said pin, the thread, after passing around this guide, extending to the bobbin 11 and being wound thereon, as shown in Fig. 2.

The guides 30 and 31 are so disposed that the thread in passing from one to the other contacts with the bobbin or with the body of thread which has been wound thereon, as shown in Fig. 2, whereby the bobbin exerts, at diametrically opposite points, a pull upon the ring tending to cause the latter to rotate with the bobbin, this double pull facilitating the rotation of the ring when the machine is first started, or is restarted after being stopped.

The pull of the bobbin upon the ring 29 tends to draw the same radially in the direction of the arrow y, Fig. 2, and in the absence of some compensating means, this might cause the ring to bind in its bearing at a point adjacent to the primary guide 30. In order to overcome this objection, I dispose the guide ribs 27 equidistantly on the ring, one of said ribs being located adjacent to the guide 30, and the other two on the diametrically opposite half of the ring, whereby when said ring is in rotation, the centrifugal force, caused by the preponderance of weight on that side of the ring opposite to the guide 30, will overcome the pull upon the ring tending to move it in the direction of the arrow y.

The ring is of angular cross section, the guides 30 and 31 being secured to the upper or horizontal flange, and the bearing ribs 27 to the vertical flange, and to obviate the necessity of making the bearing 20 in separate parts, the bearing lugs are preferably secured to the vertical flange of the ring by screws 33, inserted from the inside of the same, after the lugs 27 have been placed in the groove of the bearing, and said vertical flange of the ring has been passed down into the opening presented by the bearing.

For the purpose of regulating the tension upon the thread which is being spun or twisted, washers 35 may be applied to the pin 32 which carries the secondary guide 31, the weight of these washers being dependent upon the degree of tension desired. This additional weight has the effect of increasing the centrifugal force exerted upon that side of the ring which carries the guide 31, and consequently the force with which the segmental ribs 27 on this half of the ring are pressed against the bearing, hence the frictional retardation of this portion of the ring, and consequently the force which must be applied to said ring through the medium of the thread in order to effect its rotation by the bobbin, bears a definite relation to the amount of extra weight applied, and by increasing or diminishing the amount of this extra weight the tension upon the thread can be increased or diminished accordingly. A similar effect may be obtained without the addition or removal of extra weight by so mounting a weight upon the ring that it can be adjusted nearer to or farther from the axis of rotation of the same, the centrifugal force increasing in proportion to the increase in the distance between the weight and said axis of rotation. One construction of this character is illustrated in Fig. 6, the guide 31 constituting the weight and said guide being carried by an arm 36, so hung to the ring 29 that its free end, which carries the guide 31, can be moved from and toward the axis of rotation of the ring, the arm being suitably locked in position on the ring after any desired adjustment of the same, as, for instance, by tightening the pivot screw of the arm.

If the driving belt was thrown on suddenly by a careless attendant the sudden start of the bobbin 11, while the ring 29 was at rest, would have a tendency to impart such strain to the thread as might, in some cases, break the same before the inertia of the ring could be overcome, and on the other hand sudden stoppage in the rotation of the bobbin, as by a quick throwing off of the belt, might cause unwinding therefrom of a number of turns of the thread, because of the continued rotation of the ring 29 due to momentum. In order to overcome this objection I provide one of the shafts of the bobbin driving mechanism, preferably the shaft 3, with an inertia wheel 37 the inertia of this wheel tending to prevent a sudden start of the rotative movement of the bobbins, and its momentum causing the bobbins to continue in rotation for a short time after the actual application of power thereto has ceased, whereby the rotating movement of the bobbins will cease gradually as does that of the rings, and the two will have a tendency to come to rest at the same time.

The term "ring" as used in my claims is to be construed broadly enough to cover a ring segment in all cases where the latter is susceptible of performing the same function as the ring.

I claim:—

1. The combination, in a spinning or twisting machine, of a rotatable bobbin-carrying spindle, a rotatable ring surround-

ing the same and having primary and secondary thread guides so disposed that the thread in passing from the primary to the secondary guide contacts with the bobbin or with the body of thread wound thereon, a bearing for the ring, and means for increasing or diminishing the effect of centrifugal action upon that portion of the ring which carries the secondary guide.

2. The combination, in a spinning or twisting machine, of a rotatable bobbin-carrying spindle, a rotatable ring surrounding said spindle and having primary and secondary thread guides so disposed that the thread in passing from the primary to the secondary guide contacts with the bobbin or with the body of thread wound thereon, a bearing for said ring, and removable washers applied to the secondary thread guide and serving to increase or diminish the effect of centrifugal action upon that portion of the ring which carries said guide.

3. The combination, in a spinning or twisting machine, of a rotatable bobbin-carrying spindle, a bearing surrounding said spindle, a ring having primary and secondary thread guides so disposed that the thread in passing from the primary to the secondary guide contacts with the bobbin or with the body of thread wound thereon, and segments secured to said ring and contacting with the bearing therefor, said segments being so disposed that they will present a greater body on that side of the ring carrying the secondary thread guide than on the side carrying the primary thread guide.

4. The combination, in a spinning or twisting machine, of a rotatable bobbin-carrying spindle, a continuous bearing ring surrounding the same and having an internal groove therein, and a ring carrying thread-guiding means and provided with external segments adapted to the groove of the bearing ring and secured to the guide ring from the inside of the same.

5. The combination, in a spinning or twisting machine, of a rotatable bobbin-carrying spindle, a rotatable ring surrounding the same and having primary and secondary thread guides so disposed that the thread, in passing from the primary to the secondary guide, contacts with the bobbin or with the body of thread wound thereon, a bearing for the ring, means for disturbing the balance of the ring so that the centrifugal force due to its rotation will cause it to press upon the bearing and create friction, and means for increasing or diminishing such disturbance of balance.

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

ROBERT DAWES.

Witnesses:
HAMILTON D. TURNER,
KATE A. BEADLE.