No. 667,160.

Patented Jan. 29, 1901.

D. G. BAKER.

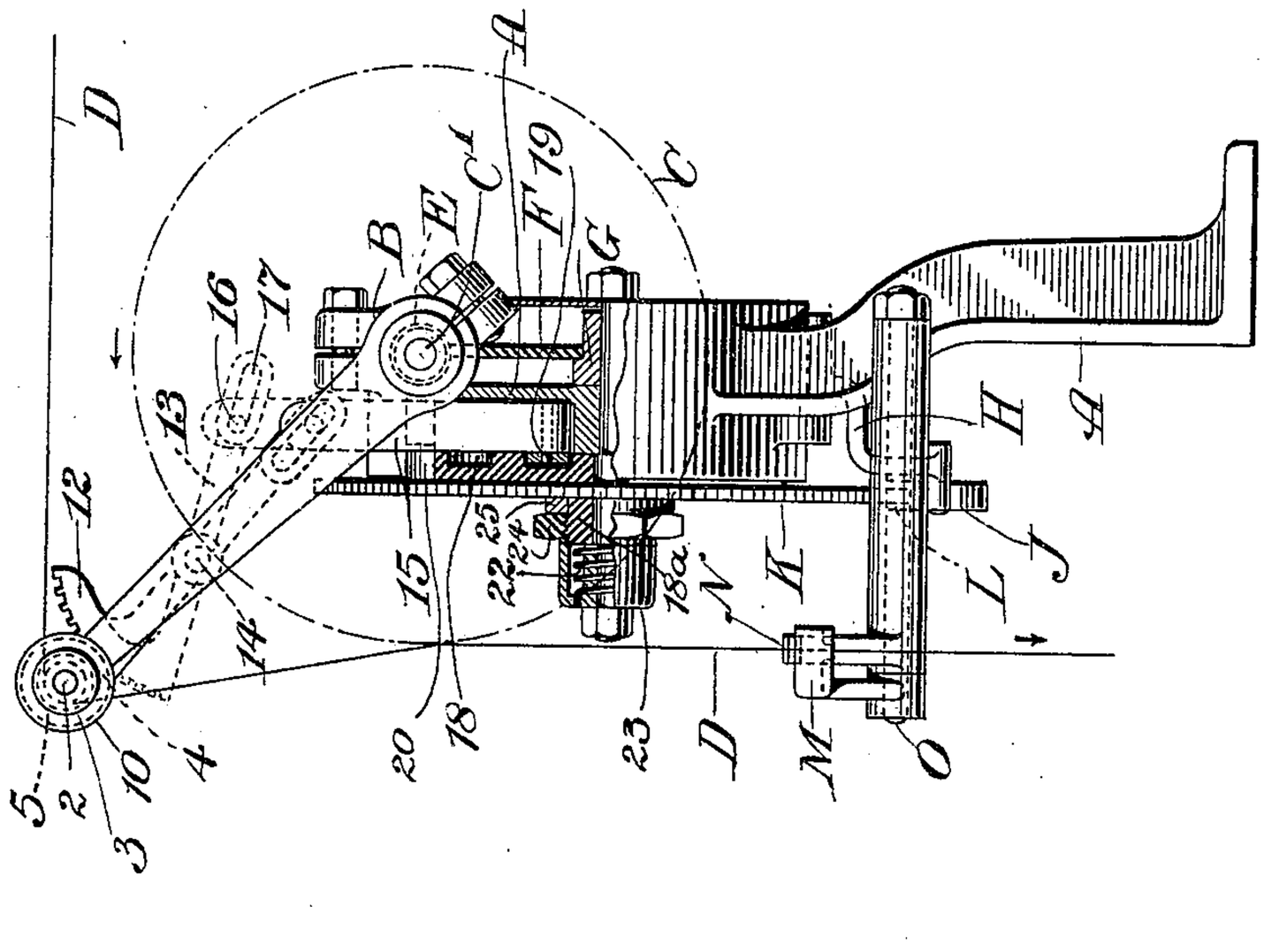
WINDING MACHINE.

(Application filed Feb. 9, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 2.



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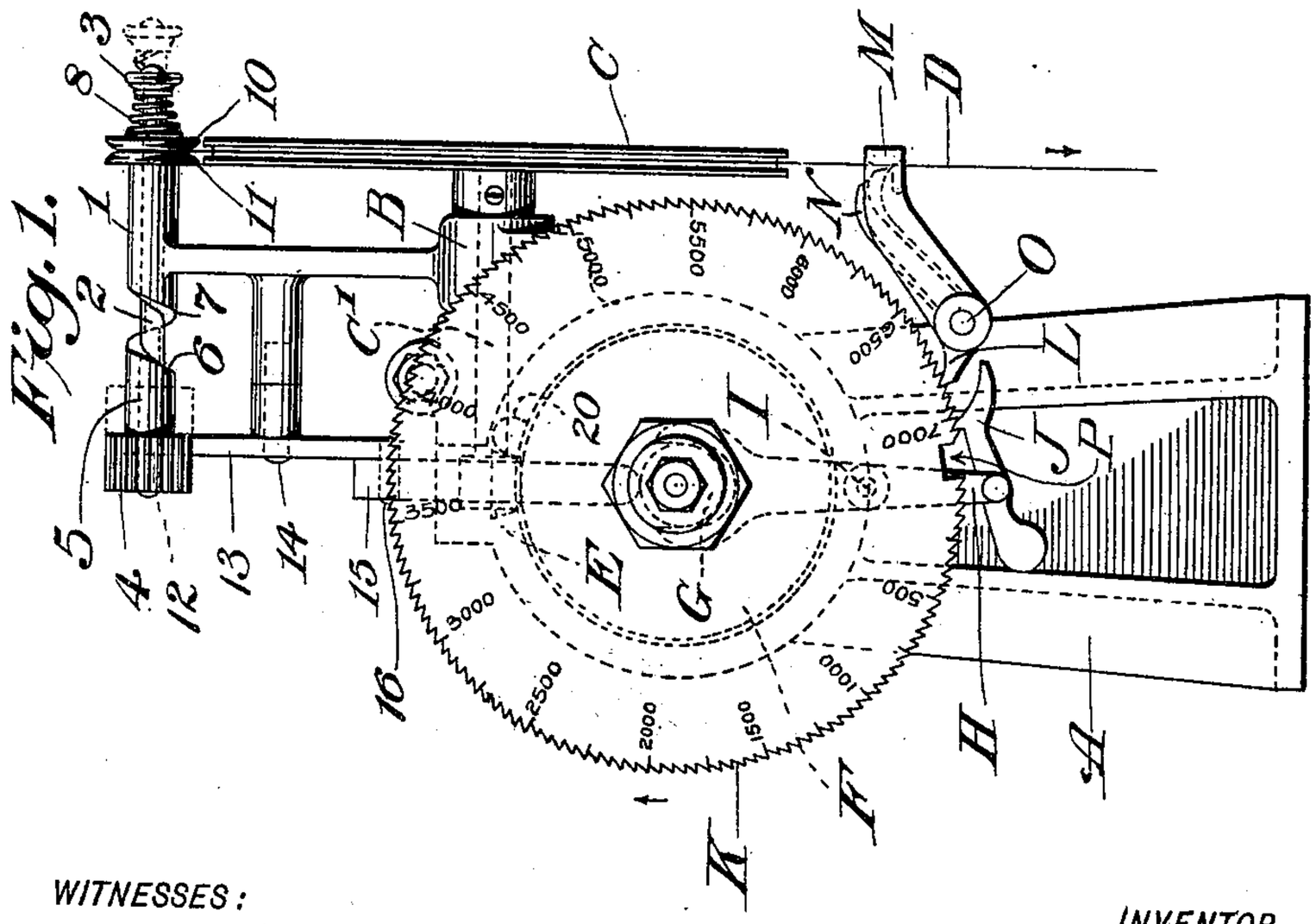

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Fig. 3.

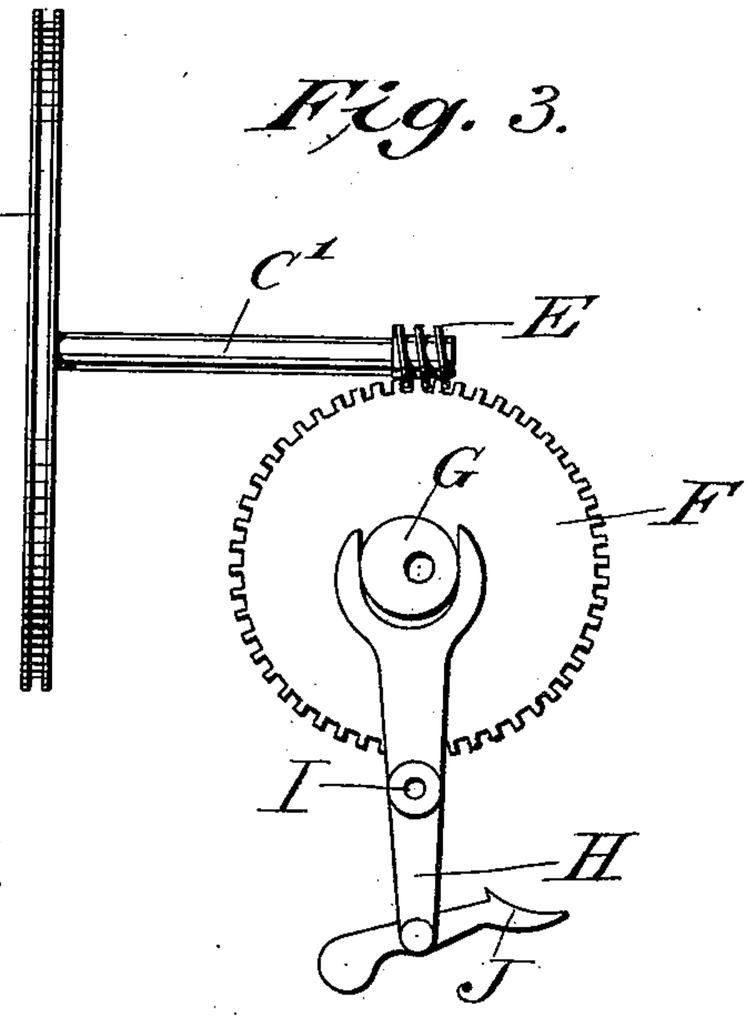


Fig. 5.

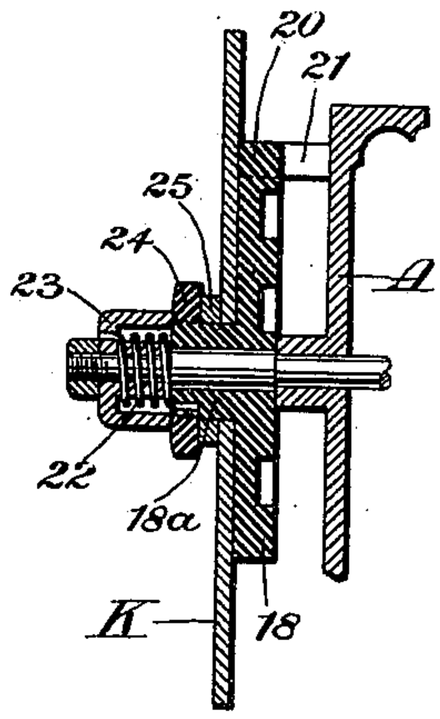
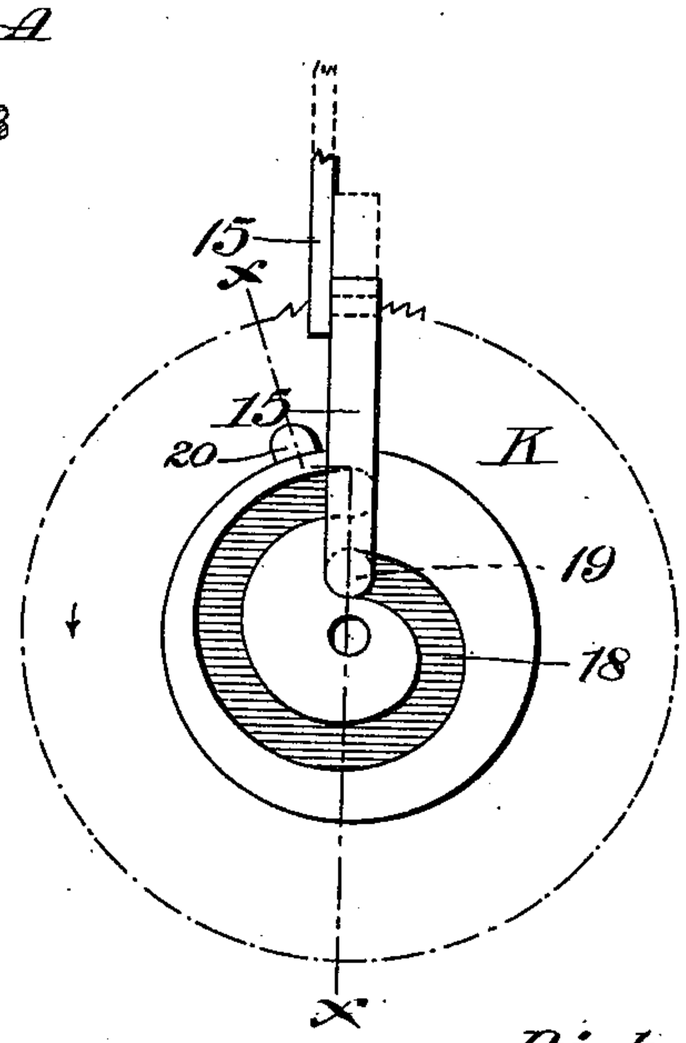


Fig. 4.



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UNITED STATES PATENT OFFICE.

DICKERSON G. BAKER, OF WILLIMANTIC, CONNECTICUT.

WINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 667,160, dated January 29, 1901.

Application filed February 9, 1900. Serial No. 4,582. (No model.)

To all whom it may concern:

Be it known that I, DICKERSON G. BAKER, a citizen of the United States, residing at Willimantic, Windham county, Connecticut, have invented certain new and useful Improvements in Winding Machinery, of which the following is a full, clear, and exact description.

My invention relates to winding machinery, and is primarily a tension device which may be advantageously employed, whereby the tension of the thread being wound may be automatically varied to a nicety.

This invention is particularly useful in connection with machinery adapted to wind thread, cord, and the like.

The main object of my invention is simplicity, effectiveness, and durability.

During the process of winding as the diameter of the spool or cop being wound increases it is desirable for well-known reasons to have the tension of the thread gradually lessened, and it is to accomplish this end that I have invented the machinery shown in the accompanying drawings and described in the following specification. This mechanism is operated by the thread which is being wound and may be employed in almost any kind of winding-machine. It is because the construction of the winding-machine is immaterial that I have omitted the same from the accompanying drawings, in which—

Figure 1 is a front elevation of my tension device. Fig. 2 is a side elevation of the same. Fig. 3 is a detailed view of detached portions. Fig. 4 is a detailed view of other detached portions. Fig. 5 is a longitudinal sectional view on the line X X, Fig. 4.

A is a suitable frame or standard.

B represents bearings.

C is a grooved wheel mounted in the bearings.

D is the thread, which in its course to the cop passes around the grooved wheel C. The travel of the thread rotates the wheel C, and the rotation of the wheel C drives the mechanism whereby the tension is controlled, and for that reason said wheel C may be referred to hereinafter as the "driving-wheel."

C′ is the driving-wheel shaft, which in turn may carry a worm-gear E or other suitable device whereby a wheel F may be rotated. The wheel F may be mounted in a suitable bearing and may carry an eccentric G or its equivalent.

H is a lever pivoted at I and so connected with the eccentric H that it may be rocked or otherwise moved in such way that it will engage with a cam-wheel K through the medium of a pawl J. The cam-wheel K may, if desired, be formed of two parts, the main portion being the part in which a cam-groove 18 is formed for a purpose hereinafter described. The other part may be a dial-face which may be adjustable on said main portion, although when once set upon said main portion it moves therewith, so that said parts are practically a unit. Suitable teeth may be formed upon the cam-wheel K or its dial-face, whereby the pawl J may engage and rotate the same by a step-by-step movement at each stroke of the oscillating or swinging lever H.

L is a pawl mounted upon a stationary bearing O on the frame H, which pawl may engage with the teeth upon the cam-wheel K or its dial-face and block the return of said wheel so long as it is in engagement therewith.

M is a cutting-frame or guide through which the thread may pass.

1 is a bearing for the shaft 2, which carries at one end a thumb-nut 3 and at the other end a spur-gear 4, which has a laterally-projecting head 5 and a volute cam-face 6. The latter bears against a correspondingly-formed stationary volute cam-face 7 at the adjacent end of the bearing-frame 1. As the spur-gear 4 is rotated the head 5 moves toward the bearing 1, the cam-face 6 riding down the incline of the cam-face 7. This movement may be effected in various ways—for example, by a spring 8, located between the thumb-nut 3 and tension-disks 10 and 11, the effect of which spring is to draw the cam-faces 6 and 7 toward each other. The tension-disks 10 and 11 may be formed in the usual manner, and the thread D prior to being wound upon the driving-wheel C passes between said disks. The initial or starting tension of the thread may be first determined by adjusting the spring 8 by the turning of the thumb-nut 3. Starting from the position indicated in Fig. 1, the rotation of the spur-gear 4 will cause the thumb-nut 3 to gradually move away from the tension-disk 10, thereby lessening the pressure of the spring 8 and thereby gradu-

ally reducing the tension applied to the thread D.

The spur-gear 4 is rotated as follows: 12 is a toothed segment in mesh with said spur-gear and carried by rocking lever 13, pivotally mounted at 14 15 is a longitudinally-movable rod controlled by the cam-wheel K and suitably connected to the rocking lever 13, as by a pin 16 in slot 17, so that as the rod 15 is moved upwardly the rack 11 will rotate the spur-gear 4 and thereby the volute cam 6. One convenient means for moving the rod 15 may be described as follows: In the rear of the cam-wheel K may be formed a volute cam-groove 18, into which a pin 19, carried by the rod 15, may project. As the cam-wheel K is rotated by the rotation of the driving-wheel C the cam-groove 18 will cause the rod 15 to move upwardly. The cam-groove 18 is so positioned that the pin on the rod 15 will rest in the lowest point of the groove at the beginning of the winding, and in this position the tension is at its maximum. This position is indicated in Fig. 1 of the drawings. As the cam-wheel K is gradually rotated the tension upon the disks 10 and 11 is gradually reduced. Hence as the diameter of the cop or spool being wound is gradually increased the tension upon the thread is gradually reduced, for reasons well known in the art.

Manifestly a variety of changes, such as would suggest themselves to the mechanic ordinarily skilled in the art, might be made without departing from the spirit of my invention.

What I claim is—

1. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for bearing against a portion of the thread or cord, and means intermediate of the driving-wheel and said tension device whereby the pressure of the latter against said thread is reduced according to the number of revolutions of the former.

2. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for bearing against said thread or cord, and a movable device intermediate of the driving-wheel and said tension device, said movable device being intermittently actuated by said driving-wheel and in turn controlling the pressure of the tension device to effect a gradual reduction of the tension controlled by the number of revolutions of said driving-wheel.

3. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for bearing against said thread or cord, and a cam intermediate of the driving-wheel and said tension device, said cam being actuated by said driving-wheel and in turn controlling the pressure of the tension device to effect a gradual variation of the tension.

4. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for said thread or cord, means intermediate of said driving-wheel and said tension device whereby the tension of the latter is gradually reduced, said means comprising a cam-wheel rotated by said driving-wheel for the purpose of controlling said tension device.

5. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for said thread or cord, means intermediate of the driving-wheel and said tension device whereby the tension upon the thread is gradually reduced, said means including an eccentric rotated by said driving-wheel, an oscillating pawl-lever, a cam-wheel controlled by said pawl-lever, a device controlled by said cam-wheel for gradually moving the parts of the tension device relatively to each other.

6. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for said thread or cord, means intermediate of the driving-wheel and said tension device whereby the tension upon the thread is gradually reduced, said means comprising a gear-wheel rotated by said driving-wheel, an eccentric thereon, a pawl controlled thereby, a toothed cam-wheel controlled by said pawl, a toothed rack controlled by said cam-wheel, a shaft carrying at one end a spur-gear and at the other end one of the parts of the tension device and means for laterally shifting said spur-gear as the same is rotated by said rack to control the tension on the thread.

7. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for bearing against said thread or cord and composed of a plurality of parts, one of said parts being movable, means to yieldingly press said parts toward each other, a spur-wheel coöperating therewith and a cam device intermediate of said tension device and said spur-wheel whereby the pressure of the movable part of said tension device against the other part is gradually lessened as the spur-gear is rotated in one direction.

8. In a device of the character described, in combination, a driving-wheel adapted to be rotated by the thread or cord, a tension device composed of a plurality of parts, one of said parts being movable, and means to cause a yielding pressure between said parts and against said thread or cord, a cam associated with said movable part and controlled by a gear, in turn controlled by the rotation of the driving-wheel, and means for transmitting the rotary movement of the driving-wheel to said gear.

9. In a device of the character described in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for said thread or cord, means interme-

diate of the driving-wheel and said tension device including a cam-wheel whereby the tension upon the thread may be automatically varied, and a pawl for retaining said wheel against rearward movement.

10. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device for said thread or cord, controlling means intermediate of said driving-wheel, a tension device including a cam-wheel, notches therein and a pawl bearing against the notched portion of said wheel.

11. In a device of the character described, in combination, a driving-wheel adapted to be rotated by a thread or cord, a tension device frictionally engaging said thread or cord, and means intermediate of said friction device and driving-wheel for gradually decreasing the friction of said tension device on said thread or cord, and controlled by the number of revolutions of said driving-wheel.

12. In combination, a movable device adapted to be engaged and rotated by a moving thread or cord, a tension device frictionally engaging said thread or cord, and means intermediate said tension device and movable device to automatically decrease the friction of said tension device on said thread or cord, and controlled by the number of revolutions of said movable device.

DICKERSON G. BAKER.

Witnesses:
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L. VREELAND.