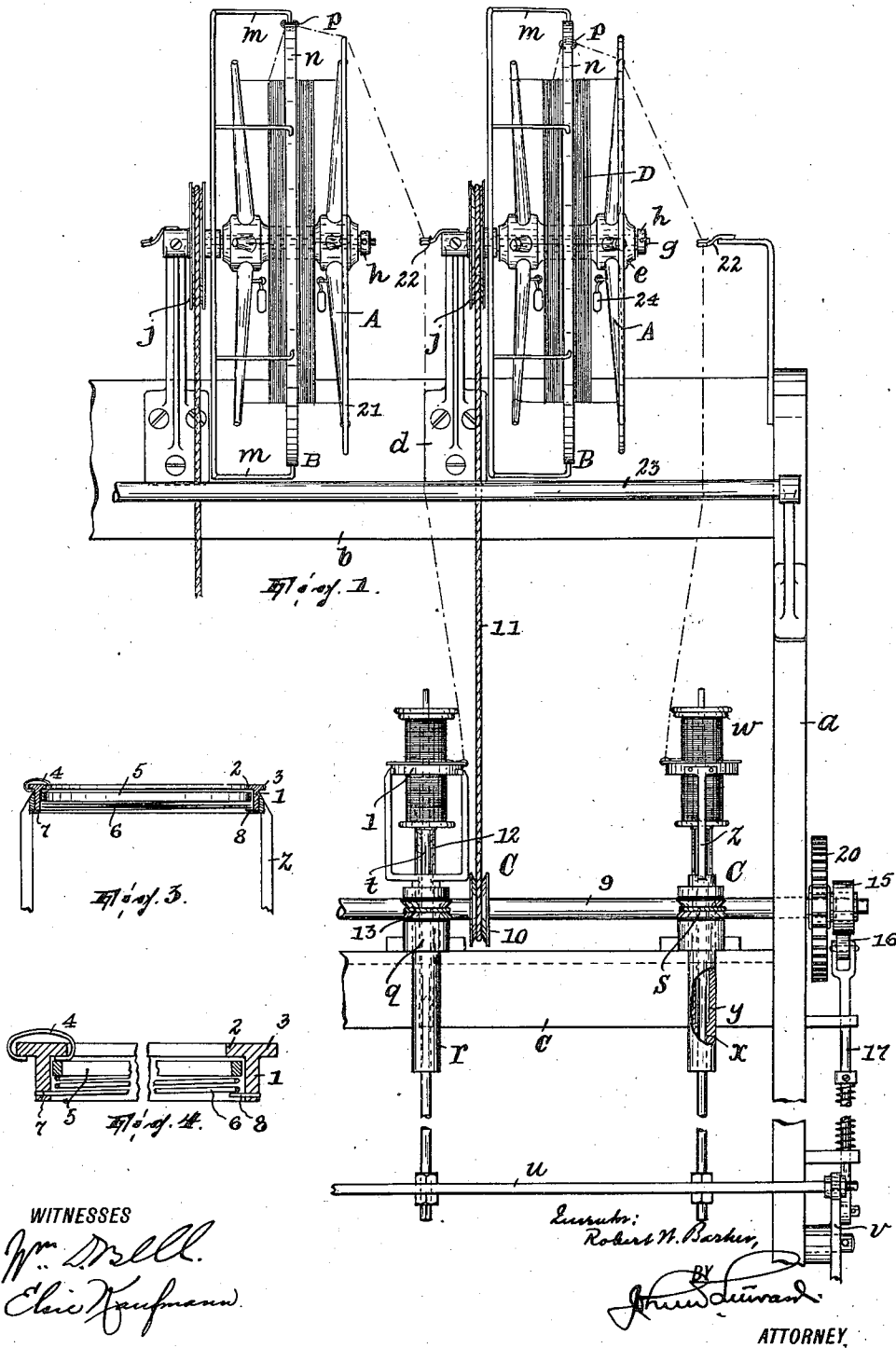


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APPLICATION FILED DEC. 20, 1909.

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Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.

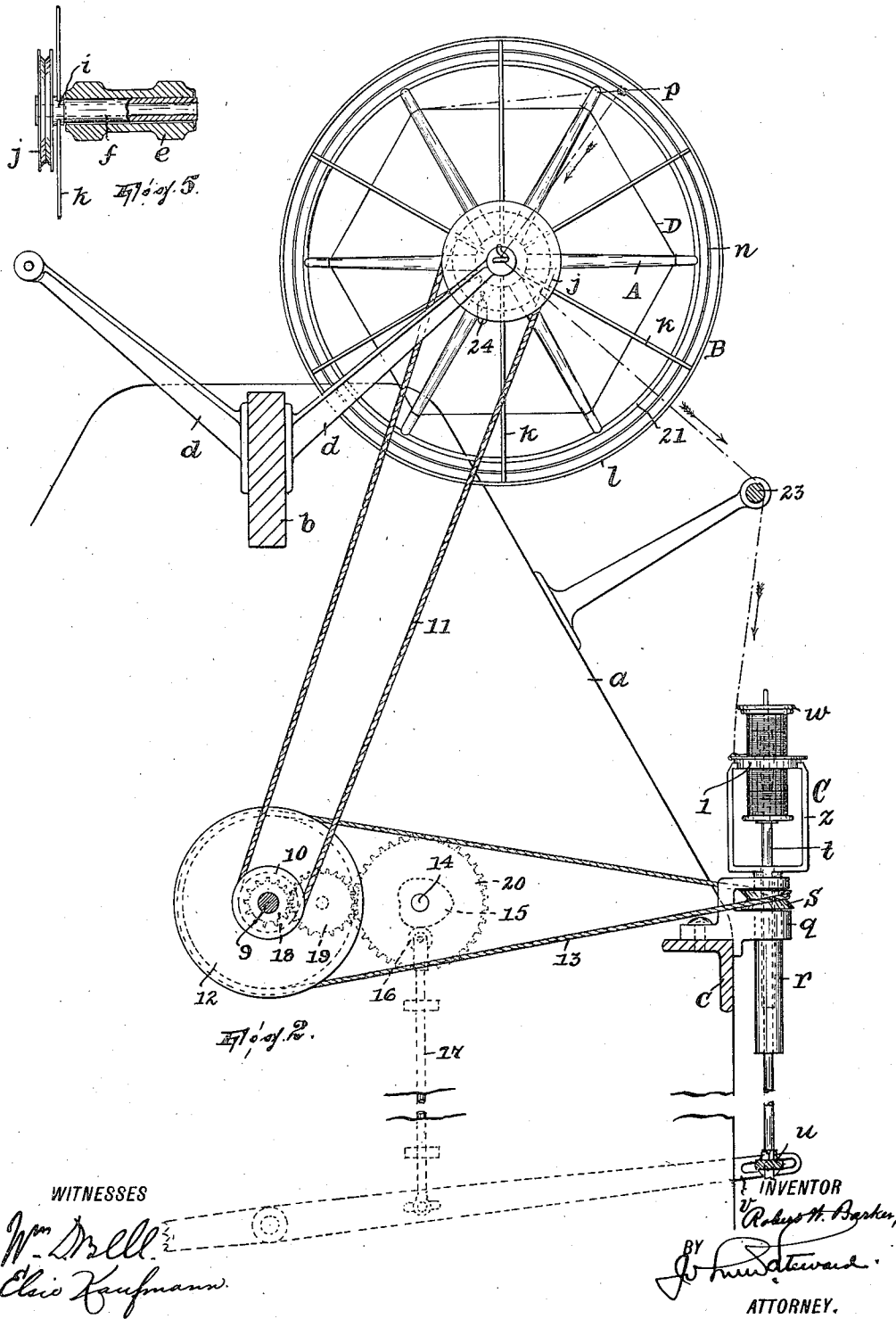


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UNITED STATES PATENT OFFICE.

ROBERT W. BARKER, OF PATERSON, NEW JERSEY.

WINDING-MACHINE.

981,520.

Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed December 20, 1909. Serial No. 534,013.

To all whom it may concern:

Be it known that I, ROBERT W. BARKER, a citizen of the United States, residing in Paterson, Passaic county, New Jersey, have invented a certain new and useful Improvement in Winding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to machines for winding thread or yarn from swifts onto bobbins or the like. The common practice in these machines is to rotate the bobbin or other thread or yarn receiving device and utilize the pull emanating therefrom to effect the rotation of the swift or other supply medium necessary to produce the unwinding of the thread from the latter. High speed, accompanied by a uniform winding of the thread or yarn on the receiving device and with as infrequent breaking of the thread or yarn as is possible, is a desideratum in the use of a machine of this character, but heretofore it was impossible to increase the speed beyond a certain limit owing to the inertia of the supply medium, which, because it was the cause of the swift running constantly under a condition of varying speed, produced either so frequent breaking of the thread or a failure of uniform winding thereof that any gain accomplished by increase of speed was directly offset by a corresponding loss either in an inferior product or in loss of time spent in repairing broken threads.

My principal object is so to construct a winding machine of the character above indicated that the speed may be materially increased and yet a uniform tension maintained on the thread or yarn, with the consequence that the winding is kept uniform and breakage of the thread or yarn is not increased.

In an application for U. S. Letters Patent for winding machine already filed by me, Serial No. 517438, the thread, while being drawn lengthwise by the winding means, was caused to extend around the periphery of a member having a continuous portion whose axis was substantially coincident with that of the swift, said member being prefer-

ably rotated in the direction of unwinding the thread from the swift. In the present invention, I provide a guiding member having a substantially circular guiding portion which preferably surrounds the swift and has its axis coinciding with that of the swift and a traveler arranged to move on said guiding portion, said member being preferably rotated in the direction of unwinding the thread from the swift.

One part of my present invention is thus briefly outlined.

Another part consists in an improved construction of ring and traveler to be employed particularly in winding the thread on the receiving device.

My invention further consists in a novel construction and arrangement of a spindle for carrying the thread-receiving device and a flier carrying a sleeve through which the spindle extends.

In the accompanying drawings, Figure 1 is a view in front elevation of the right-hand end of so much of the improved winding machine as it is necessary to show for the purpose of illustrating the invention; Fig. 2 is a vertical sectional view taken in a plane between the two winding units shown in Fig. 1 and looking toward the right in said figure; Figs. 3 and 4 are details illustrating the improved ring and traveler employed in connection with the thread receiving device; and, Fig. 5 illustrates a detail affecting parts A and B.

In the drawings, *a* designates a suitable frame comprising an upper rail *b* and a lower rail *c*. The upper rail *b* carries a series of arms *d* in which are supported the swifts A and the rotary members and travelers B whereby the thread is unwound from the swifts; in the lower rail *c* is arranged the means C for effecting the winding of the threads.

The parts A, B and C will now be described in detail, as also the means whereby they are supported and otherwise arranged and coördinated so as to coöperate with each other.

Referring, first, to the swift A: the swift is of usual construction and has its hub *e* journaled on a sleeve *f* which itself is journaled on a horizontal shaft *g* projecting from the arm *d*, the sleeve being retained on the shaft by a collar *h* pinned to the latter and the hub of the swift being interposed

between said collar and the enlargement or hub *i* of a pulley *j* which is fixed on the inner end of the sleeve.

Referring now to the member B, the parts *f*, *i* and *j* form the axial portion of this member; from the hub *i* project the radial arms *k* which at their outer ends carry a ring *l* which is concentric with the sleeve *f*, and from this ring project, parallel with the axis of member *b*, arms *m* whose free ends are turned in radially. To the free ends of the arms *m* is attached a ring *n* which is flat in cross-section, the said ends of the arms being secured to the ring *n* midway between its lateral edges (see Fig. 1) so as to leave said edges continuously free or clear. On this ring *n* is loosely arranged a C-shaped or other suitable form of traveler *p*, the same being adapted to run freely around the ring.

Referring now to the winding means C. On the rail *c* is arranged a forked bracket *q* in which is journaled a vertical sleeve *r* having fixed thereto a pulley *a* which, being disposed in the forked portion of the bracket *q*, confines the sleeve against vertical movement. The sleeve is penetrated by a spindle *t* which is suitably secured at its lower end to a rocking bar *u* journaled in one of two or more levers *v* (only one of which is shown) fulcrumed in the frame. This spindle carries at its upper end the spool *w* or other thread receiving member. In the present adaptation, the spindle reciprocates while the sleeve rotates, and in order to keep the spindle true in its reciprocations, without binding in the sleeve, the bore of the sleeve has only a limited portion *x* thereof, preferably at its lower end, fitting the spindle, the remaining portion *y* of said bore being of slightly larger diameter than the spindle. The sleeve *r* forms the lower part of a flier, the upper part of which consists of a fork *z* the upper ends of whose arms carry a ring 1 which is T-shaped in cross-section (see Figs. 4 and 5) so that the inner and outer continuous flanges 2 and 3 are formed at the top thereof, the same standing clear of the upper ends of said arms. On the flanged portion of the ring is arranged a C-shaped traveler 4. In the ring and bearing upwardly toward its inner flange 2 and against the traveler 4 is a ring 5 engaged from beneath by a light spiral spring 6 which is supported at one point by having one end 7 introduced into the ring and at the diametrically opposite point by a pin 8 in the ring.

9 is a rotary shaft journaled in the frame and driven in any suitable manner. On this shaft is arranged a pulley 10 around which and the pulley *j* extends a belt 11. On said shaft is also arranged a pulley 12 around which and the pulley *s* extends a belt 13. In one side of the frame is jour-

naled a counter-shaft 14 carrying a heart-cam 15 engaged by a roller 16 on the inner end of a pitman 17 guided for vertical movement in the frame and connected at its lower end to the lever *v*. Rotary motion is transmitted to the shaft 14 from shaft 9 by the gearings 18, 19 and 20. The thread extends from the skein D through the traveler *n*, then around a peripheral ring 21 surrounding and carried by the right-hand spokes in Fig. 1 of the swift A, then through a thread guide 22 carried by the frame or by the adjoining arm *d* in the axis of the guiding member B and swift, then over a bar 23, and then through the traveler 4 to the spool or bobbin *w*. The swift does not normally rotate, it being held against rotation by the weights 24 carried by two of its spokes. The shaft 9 being driven, it causes the rotation of the flier-carrying sleeve *r*, the vertical reciprocation of the spool and the rotation of the member B, the spool rotating in the direction to wind the thread thereon and the member B rotating in the direction of unwinding the thread from the swift. (If the skein should be placed on the swift so as to require it to be unwound in the direction reverse to that indicated in Fig. 1, the member B should be rotated in the reverse direction and this may be accomplished by crossing the belt 11.) The tendency of the traveler *p* under the pull of the thread is to advance around the ring *n* in the direction of unwinding, and this tendency is assisted by the rotating ring *n*. If the thread should catch in the skein, the ring impels the traveler and tends to cause it to disengage the thread at the point where it is caught, an effect which obviously would not be produced as efficiently if the ring were stationary. As the flier carried by the sleeve *r* is rotated, it carries the traveler 4 around with it and thus lays the thread in coils on the spool while the spindle is reciprocating the bobbin and producing the necessary traverse. The traveler 4 being free to move around the ring 1, it affords the necessary yield to the thread should the speed of the spool become unduly high. It will be understood that the spring-actuated ring 5 serves to keep the traveler 4 normally rotating with the ring, while allowing it sufficient lost motion with respect thereto in the way above indicated should occasion require.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:

1. The combination of a frame, means for winding the thread comprising a rotary member, a guiding member having a substantially circular guiding portion, a traveler arranged to move on the guiding portion of said guiding member, a thread-supply member having its axis of winding substantially coinciding with the axis of the

guiding portion of said guiding member, and means for rotating the rotary member of said winding means, substantially as described.

5 2. The combination of a frame, means for winding the thread comprising a rotary member, a rotary guiding member having a substantially circular guiding portion arranged substantially concentrically relatively to the axis of rotation of said guiding member, a traveler arranged to move on the guiding portion of said guiding member, a thread-supply member having its axis of winding substantially coinciding with the axis of rotation of the guiding member, means for rotating said rotary member and means for rotating the guiding member, the first in the direction to effect the winding and the second in the direction to unwind the thread from the supply member, substantially as described.

3. The combination of a frame, means for winding the thread comprising a rotary member, a guiding member having a substantially circular guiding portion, a traveler arranged to move on the guiding portion of said guiding member, a thread-supply member having its axis of winding substantially coinciding with the axis of the guiding portion of said guiding member, a thread-guide arranged substantially in the axis of the guiding portion of the guiding member, and means for effecting the rotation of the rotary member of said winding means, substantially as described.

4. The combination of a frame, means for winding the thread comprising a rotary member, a rotary guiding member having a substantially circular portion arranged substantially concentrically relatively to the axis of rotation of said guiding member, a traveler arranged to move on the guiding portion of said guiding member, a thread-supply member having its axis of winding substantially coinciding with the axis of rotation of the guiding member, a thread-guide arranged substantially in the axis of rotation of the guiding member, means for rotating said rotary member and means for rotating the guiding member, the first in the direction to effect the winding and the second in the direction to unwind the thread

from the supply member, substantially as described.

5. The combination of a frame, means for winding the thread comprising a rotary member, a guiding member having a substantially circular guiding portion, a traveler arranged to move on the guiding portion of said guiding member, a thread-supply member having its axis of winding substantially coinciding with the axis of the guiding portion of said guiding member and being surrounded by said guiding portion, and means for rotating the rotary member, substantially as described.

6. The combination of a frame, means for winding the thread comprising a rotary member, a rotary guiding member having a substantially circular guiding portion arranged substantially concentrically relatively to the axis of rotation of said guiding member, a traveler arranged to move on the guiding portion of said guiding member, a thread-supply member having its axis of winding substantially coinciding with the axis of rotation of the guiding member and being surrounded by the guiding portion of said guiding member, means for rotating said rotary member and means for rotating the guiding member, the first in the direction to effect the winding and the second in the direction to unwind the thread from the supply member, substantially as described.

7. The combination, in a winding machine, of a ring having an internal continuous projection, a traveler movable around said ring and engaged with its projection, and spring-actuated means for maintaining the traveler in frictional contact with the ring, substantially as described.

8. The combination, in a winding machine, of a ring, a traveler engaged with said ring and movable around the same, and spring-actuated means for maintaining the traveler in frictional contact with the ring, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand this 18th day of December, 1909.

ROBERT W. BARKER.

Witnesses:

JOHN W. STEWARD,
WM. D. BELL.