

No. 775,514.

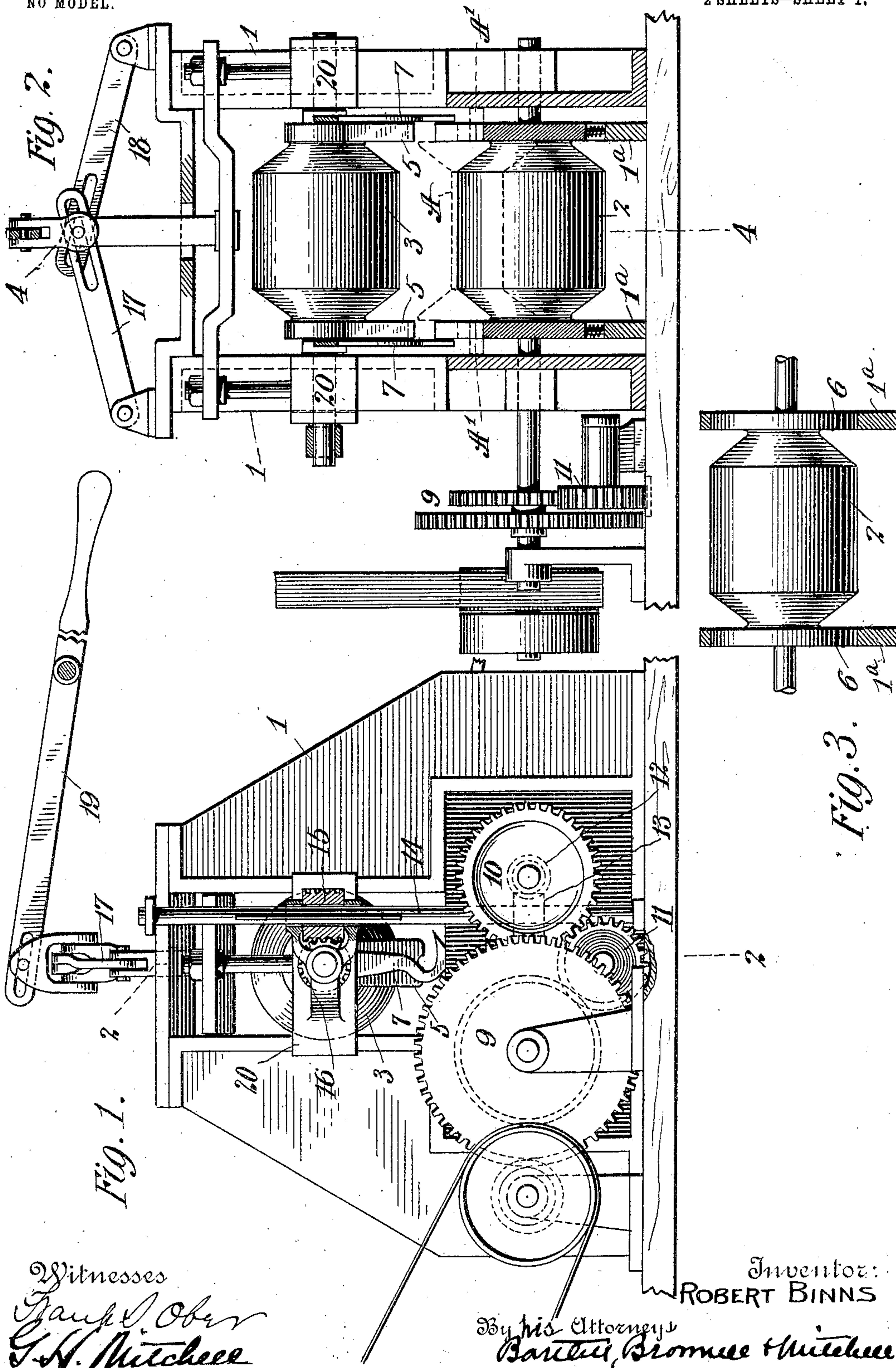
PATENTED NOV. 22, 1904.

R. BINNS.
SPOOL ROLLING AND FINISHING APPARATUS.

APPLICATION FILED FEB. 23, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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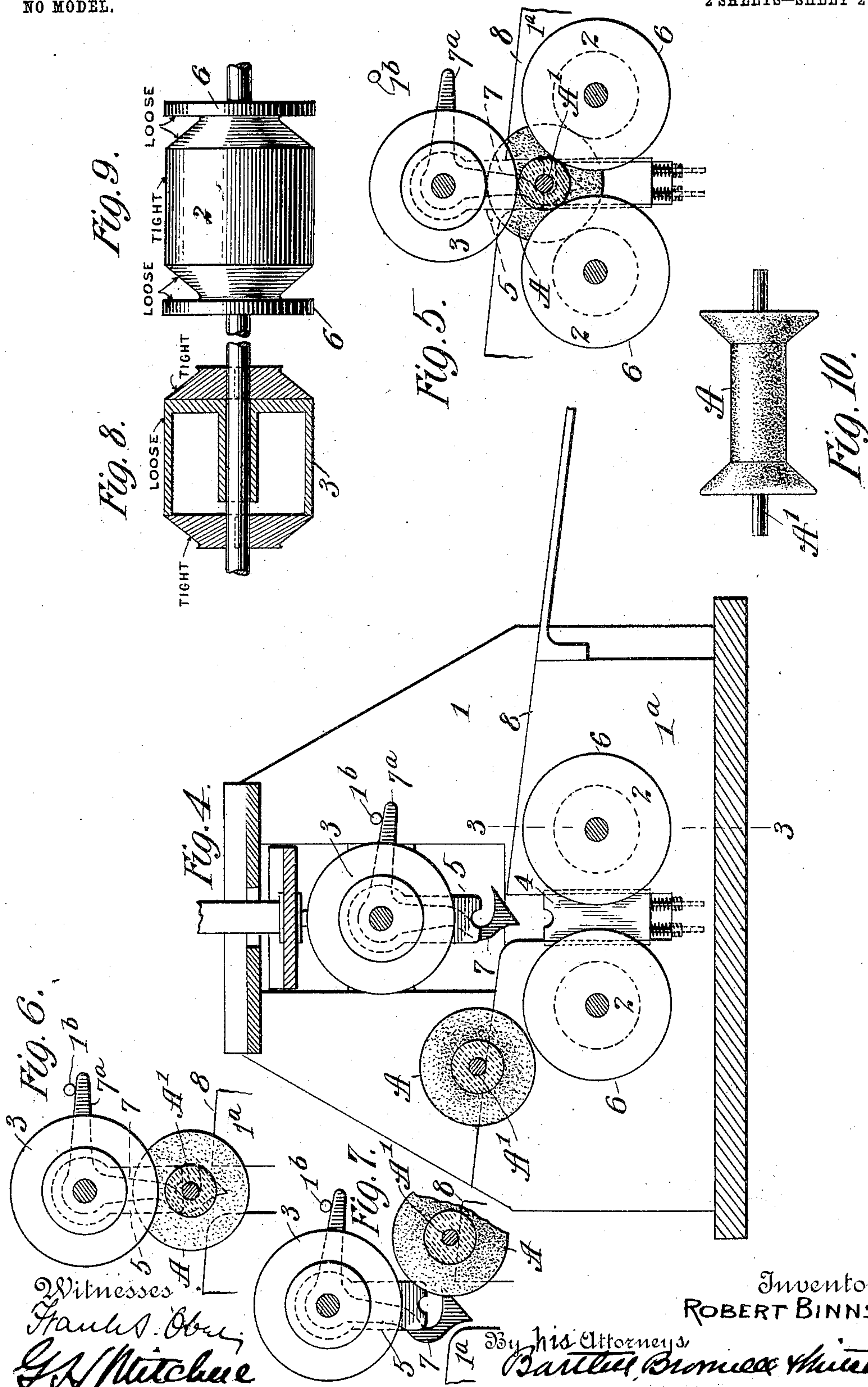
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UNITED STATES PATENT OFFICE.

ROBERT BINNS, OF SOUTH WINDHAM, CONNECTICUT.

SPOOL ROLLING AND FINISHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 775,514, dated November 22, 1904.

Application filed February 23, 1904. Serial No. 194,790. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BINNS, a citizen of the United States, residing at South Windham, in the county of Windham, State of Connecticut, have invented certain new and useful Improvements in Spool Rolling and Finishing Apparatus, of which the following is a full, clear, and exact description.

My invention relates to apparatus for forming spools, and has particular utility when employed in connection with the forming of spools after the manner described in my accompanying applications, serially numbered 194,788 and 194,789, filed of even date herewith. In those cases I explain how I first form a web of moist pulp having reinforcements along the edges thereof, which reinforced web while in a moist state is transferred to a winding-machine which winds the pulp into spool form, said winding continuing until the spool body and heads are of the right size, at which moment the winding-machine automatically releases it, whereupon it may be directed to the machine which I shall now proceed to describe and in which the final rolling and shaping of the spool is effected. This apparatus may work in unison with the paper making and winding apparatus, although it is obvious that it may be worked independently thereof.

In the accompanying drawings, Figure 1 is an end elevation of my improved rolling and finishing machine. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is a detail section on line 3 3, Fig. 4, of one of the rolls and the end pieces therefor. Fig. 4 is a section on the line 4 4, Fig. 2. Fig. 5 conventionally shows the rolls in their position of operation. Fig. 6 shows the top roll and spool-carrier partially elevated and at about the end of the upward excursion. Fig. 7 is a similar view showing the roll at the limit of its upward excursion. Fig. 8 is a longitudinal section of the upper roll. Fig. 9 is a front elevation of one of the lower rolls. Fig. 10 is a front elevation of a spool as it appears after it has been given the final shape.

1 is a frame.

2 2 are lower rolls arranged horizontally and designed to receive between them a spool A.

3 is an upper roll which is mounted in a vertical guideway, so that it may be moved up and down by any suitable mechanism.

In the form shown each spool A has fitted within it a spindle A', which projects beyond the ends thereof. Within the frame 1 are plates 1^a 1^a, spaced apart a distance equal to the length of the spool. The top edges of the side plates 1^a may be inclined so that the spindle A' of the spool may be supported thereon to guide the spool to the position where it is operated upon, the vertical plane of which is indicated in Fig. 5. The plates 1^a 1^a are notched at points between the rolls 2 2, and in each notch is mounted a yielding bearing-block 4, arranged to receive the spindle A'. In normal position each bearing-block 4 is pressed upward slightly above the bottom of the notch in each side plate 1^a. When the spool has assumed its proper position between the rolls 2 2, the roll 3 is moved down to compress the same and give it its final shape. It is because the downward pressure of the roll 3 reduces the diameter of the spool A that it is necessary that the bearing-block 4 should be capable of being depressed. The function of the bearing-block 4 is not only to properly center the spool, but is also to cooperate with the movable slide 5 above the spindle A' in closing the notch in the side plate 1^a, into which the spindle A' drops when the spool A is supported by the rolls 2 2 and while it is being compressed; otherwise the pulp at each end of the spool near the center might be pressed into the notches and broken. Since the diameter of the spool-head is greater than the diameter of the spool-body, the rolls are specially shaped to receive the head portions of the spool. This may best be seen by reference to Figs. 2, 8, and 9. In these views the ends of the rollers are tapered, and because the peripheral speed of the head of the spool would be greater than the peripheral speed of the body of the spool I preferably make the ends of the rolls independent of the body of the roll. In Fig. 8 I have shown the ends of the upper roller tight upon the shaft, while the body portion of the roller is loose. In Fig. 9 I have indicated one of the lower rolls having the body portion of the roll tight

and the ends loose. In Figs. 3 and 9 I have shown circular end plates 6 6 fixed on and corresponding to the largest diameter of the roll 2. By these means any tendency of the spool to expand longitudinally as the pressure is applied laterally to the same will be received by the end pieces 6 6 rather than by the immovable side walls 1^a 1^a, thus avoiding any tendency to abrade or tear the ends of the spool.

7 7 are hooks arranged to engage the spindle A' when the roller 3 is depressed and by means of which the spool A may be withdrawn from the notches when finished and the roll 3 elevated. In Fig. 6 I have shown the roll 3 near the limit of its upward excursion, and in which the lever 7^a of the hook 7 encounters a stationary abutment 1^b. In Fig. 7 I have shown the roll elevated still higher, the hook 7 being swung back by said abutment 1^b. When the hook is swung back, the spool A rolls out and upon the discharge-incline 8.

The driving means for the apparatus comprises means for driving all three rolls. Power is derived from a suitable source and directed to a large gear 9, fixed to one of the lower rollers.

10 is a second gear, coupled to the gear 9 by an intermediate gear 11, gear 10 being mounted on the second of the lower rollers.

12 is a spiral gear on the shaft of gear 10, engaging with the spiral gear 13 on the vertical shaft 14, which in turn carries the spiral gear 15, meshing with the spiral gear 16 on the upper roll 3. The gear 15 is splined on the shaft 14, so as to allow the upper roll 3 to be moved vertically without disconnecting the gears 15 16.

Any suitable means may be provided for moving the upper roll 3 vertically; but said means should preferably be very powerful in order that the proper compressive force may be applied to the spool A. In the drawings I have shown a system of levers comprising toggle-levers 17 18, connected to an intermediate lever 19 and in turn connected with the sliding boxes 20 20 in any suitable manner, so as to move said roll 3 up and down.

What I claim is—

1. In an apparatus of the character described, a pair of supporting-rolls, said rolls having tapered ends, a presser-roll movable toward and away from said supporting-rolls, said presser-roll having tapered ends, the body portion of one roll being rotatable independently of the end portions of the same roll.

2. In an apparatus of the character described, a pair of supporting-rolls, said rolls having tapered ends, a presser-roll movable toward and away from said supporting-rolls,

said presser-roll having tapered ends, the body portion of all said rolls being rotatable independently of the tapered end portions thereof.

3. In a spool-finishing machine, supporting-rolls, each of said rolls having tapered ends, the body and end portions of said rolls being independent, means for driving either the body or the ends of each of said rolls in a similar direction, a presser-roll movable toward and away from said supporter-rolls, the ends of said presser-roll being tapered and independent of the body portion.

4. In a spool-finishing machine, supporting-rolls, each of said rolls having tapered ends, the body and end portions of said rolls being independent, means for driving either the body or the ends of each of said rolls in a similar direction, a presser-roll movable toward and away from said supporter-rolls, the ends of said presser-roll being tapered and independent of the body portion, one of the independent parts being positively rotated.

5. In an apparatus of the character described, a pair of supporting-rolls, said rolls having tapered ends, a presser-roll movable toward and away from said supporting-rolls, said presser-roll having tapered ends, the body portion of one roll being rotatable independently of the head portions of the same roll, and means for transmitting power from the same source to all of said rolls.

6. In a spool-finishing machine, a roll having tapered ends, a frame, intermediate side plates between which said roll is located, a circular flange at each end of said supporting-roll, each of said flanges being parallel and of a diameter substantially equal to or in excess of the diameter of the roll, recesses in the side plates to receive said flanges so that the latter will lie substantially flush with the inner surface thereof.

7. In an apparatus of the character described, a pair of supporting-rolls having tapered ends, a side plate at each end of said rolls, a notch in each of said side plates between said rolls, a spindle-supporting block in each of said notches and flush with the inner opposite faces thereof, a presser-roll, bearing-boxes therefor and members carried thereby in line with said blocks and coacting with said blocks to close said notches when the presser-roll is moved toward the supporting-rolls.

Signed at South Windham, Connecticut, this 9th day of February, 1904.

ROBERT BINNS.

Witnesses:

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