J. J. CONVERY.

TIRE BUILDING MACHINE.

APPLICATION FILED JUNE 13, 1918.

1,331,242.

Patented Feb. 17, 1920.

4 SHEETS—SHEET 1.

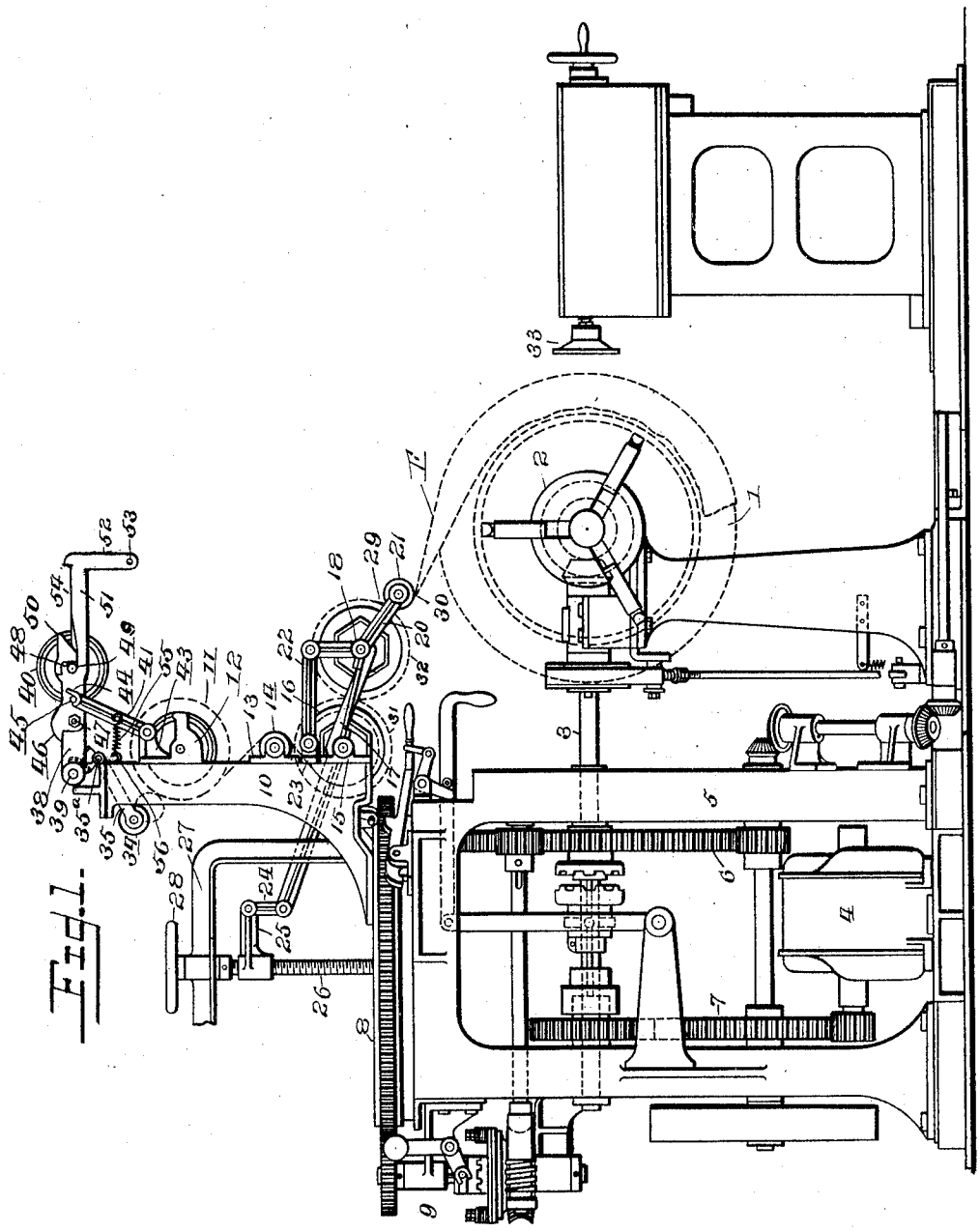


Fig. 1.

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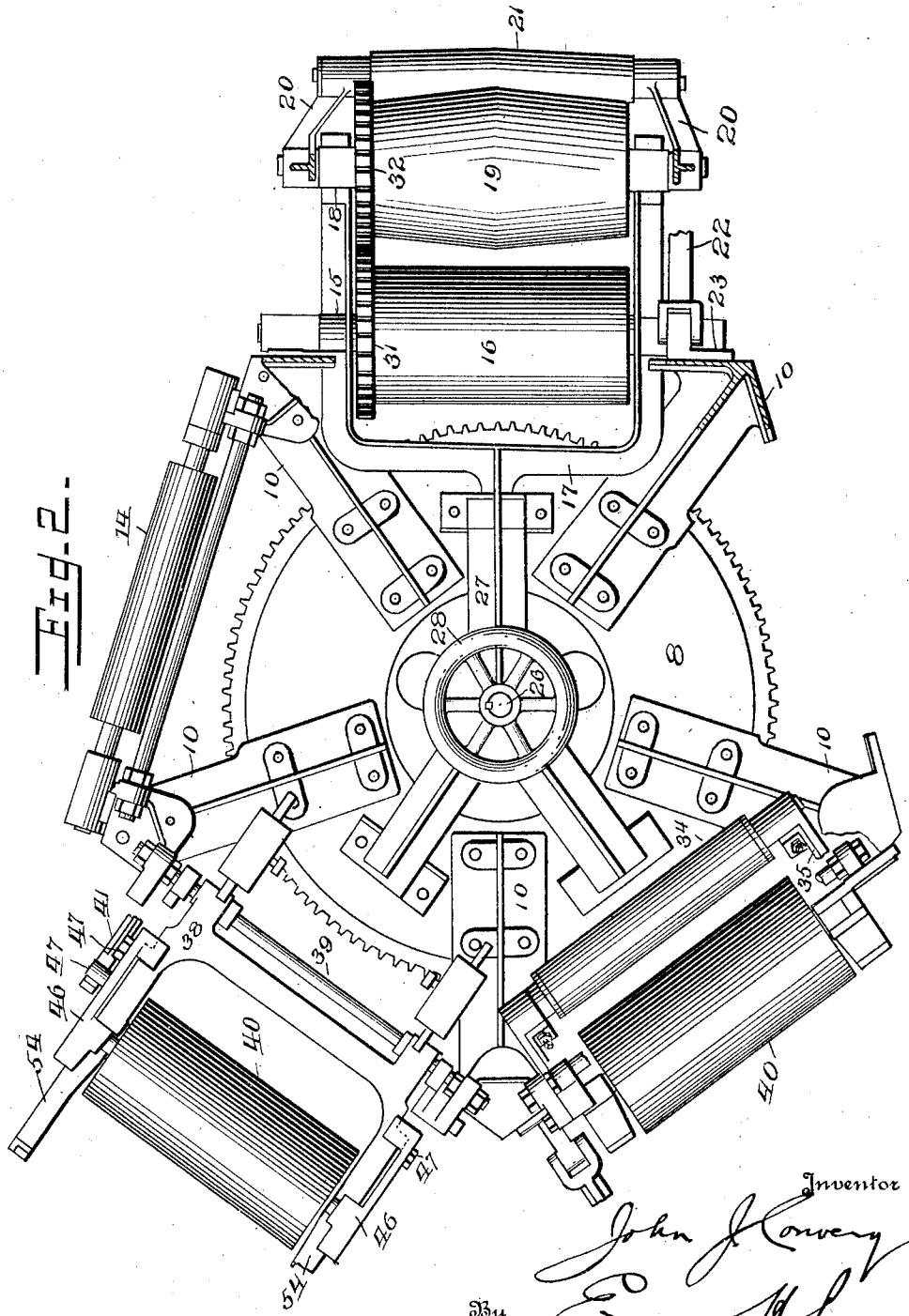
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4 SHEETS—SHEET 2.

Fig. 2.



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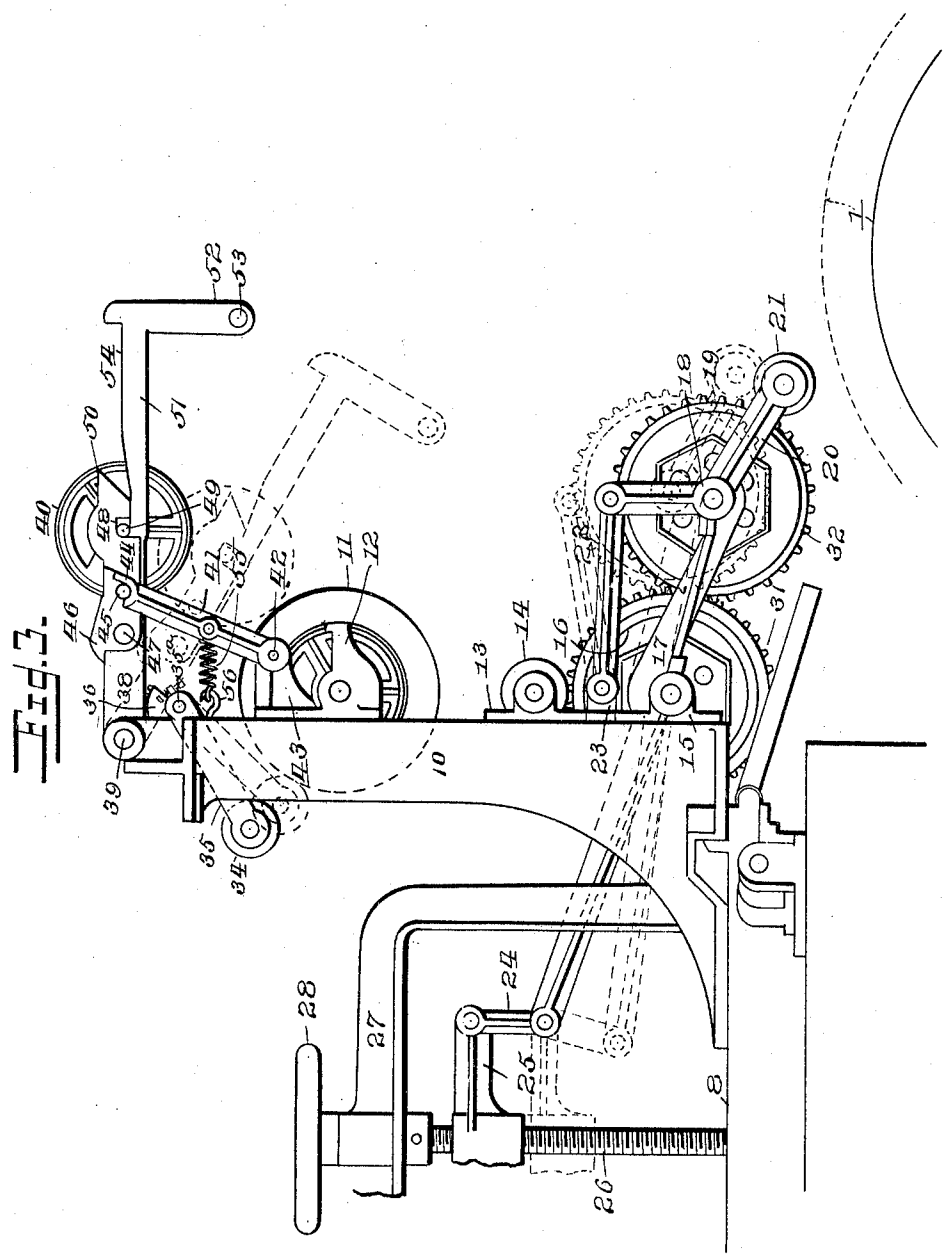
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4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 4.

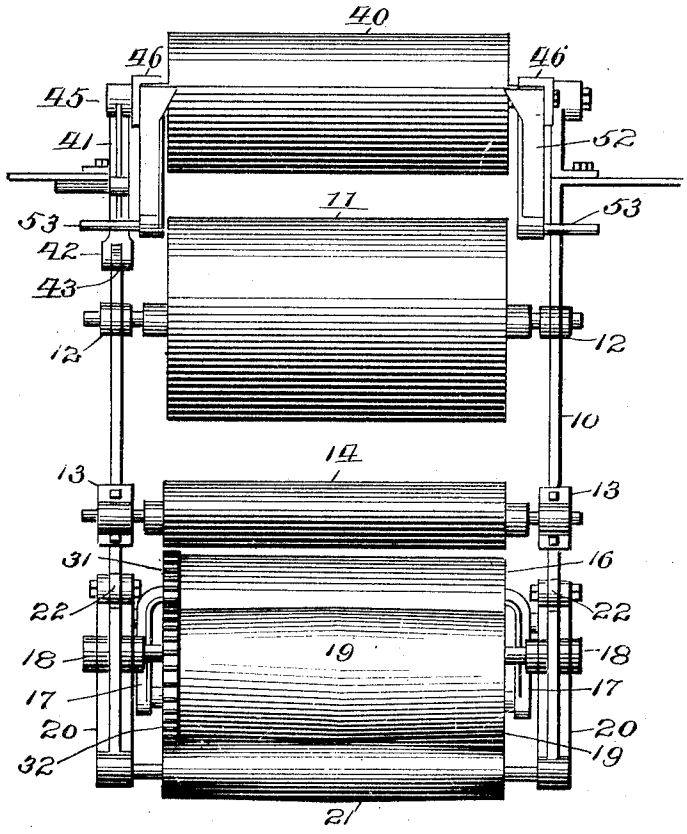


Fig. 5.

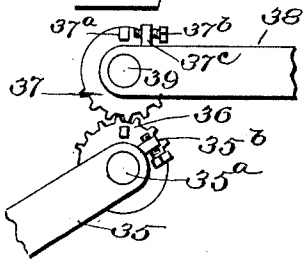
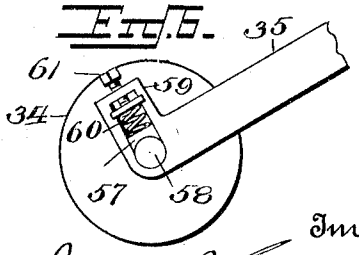


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TIRE-BUILDING MACHINE.

1,331,242. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed June 13, 1918. Serial No. 239,827.

To all whom it may concern:

Be it known that I, JOHN J. CONVERY, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Tire-Building Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to tire-building machines and more especially to components therein adapted to supply fabric to a tire-forming core and in connection therewith to effect an accurate and predetermined stretching of the fabric.

The primary object of the invention is to provide means, of a simple but easily manipulated type, for stretching a ply or strip of tire-fabric as it is drawn from a suitable source of supply, such as a supporting roll, onto a rotatable tire-forming core, these means residing in tensioning mechanism adapted to effect not only a predetermined amount of stretch in the fabric but also one which is uniform and correct at all times.

Another primary object of the invention is to provide means for delivering the stretched ply or strip of fabric from the tensioning device at a proper angle to the core, such that, when a change of size of core is made, the relation or the point of take-off from the tensioning device may be easily but accurately adjusted, it being an important desideratum that such take-off shall be in particular relation to the point at which the fabric passes onto the core and in specific relation to the point at which it leaves the tension device.

Other important objects are present in the invention and these will be made apparent in the following description:

In order that the invention may be readily comprehended, I have shown the same in the appended drawings, these being of a construction which in practice has been found to be practical and preferable; but it is to be understood that the invention is capable of being embodied and utilized in a considerably different form and is susceptible of a wide range of modification and variation, without departing from its spirit or from the salient features and underlying principles thereof.

In these drawings:

Figure 1 is a view in elevation of the fabric-supplying component of a tire-building machine constructed in accordance with my invention;

Fig. 2 is a view in plan thereof, partly in horizontal section;

Fig. 3 is a fragmentary view, on a larger scale, of the fabric-stretching or tensioning device, the same being shown in full lines in its operative position in relation to a core and, in dotted lines, in a position to which it had been adjusted in respect to a core of different diameter;

Fig. 4 is a fragmentary view in front elevation of the same; and

Figs. 5 and 6 are detail views of different parts of the structure.

In these drawings, the reference-numeral 1 designates a tire-forming core which, in this instance, is rotatable and is for that reason mounted upon a chuck 2 which is driven, through mechanism including a shaft 3, by a prime-mover or motor 4. This motor is disposed within a supporting frame or structure 5 and, through a low-speed gear 6 and a high-speed gear 7, drives the core at different speeds. Mounted on the supporting frame 5 is a rotatable table or turret 8, the same, driven through suitable mechanism designated generally 9—and which constitutes the subject-matter of a co-pending application filed June 13, 1918, Serial No. 239,826—constituting the support for a plurality of uprights or standards 10, these being spaced apart, and there being, in this instance, five of these. By means of the turret 8 and the connections between it and the low-speed gear 6, these uprights or standards may be positioned, by power mechanism, successively in relation to the core 1, and intermittently arrested when a particular standard 10 has been positioned opposite the core.

The standards 10 constitute a support for various instrumentalities, these including a fabric-supply roll 11 which is sustained by a bracket 12 mounted on the standard.

Mounted in a bracket 13 on the standard 10 is a guide-roll 14.

Also mounted in a bracket 15 on the standard 10 is a cylindrical stretching roll 16, the axis of which is in vertical alinement with that of the supply-roll 11 and of the guide-roll 14, though if preferred it may be differently disposed. Pivoting on the axis of the roll 16 is a lever 17, this extending

beyond the periphery of this roll and has formed at its end a bearing 18 in which is journaled a crowned stretching roll or drum 19. Fulcrumed on the axis 18 of the roll 19 is a bell-crank-lever 20 which supports a guide-roller or idler 21. Pivotally connected to the upper end of the bell-crank-lever 20 is a link 22 which in turn is pivoted to a bracket 23 mounted on the standard 10.

The lever 17 extends inwardly and to the rear of the standard 10 and has connected to its end a link 24 which in turn is pivoted to a spider 25. Through the spider is threaded a spindle 26 which is journaled in a bracket 27 secured to the turret or table 8. The spindle has a handwheel 28 secured at its upper end.

It is to be understood that for each of the plurality of standards 10 and for the set of fabric rolls 11 and stretching rolls 16 and 19, there is a pair of these levers 17 similarly connected to the spider 25. The operation of the spindle 26 will cause the spider 25 to ascend or descend and thereby rock the levers 17 on their fulcra to raise or lower their outer ends and thereby elevate or depress the several tensioning rolls 19.

The function of the bell-crank-lever 20 is to position the idler 21 in proper relation to the tension-roll 19 whenever it, by the lever 17, is raised or lowered. This is necessary in order to dispose the idler 21 in accurate relation to the periphery of the core 1, it being noted that the point of take-up of the fabric from the tension roller 19 should be in proper relation to the core so that, if the position of the roll 19 be changed—either raised or lowered—the ply or strip of fabric shall take off the periphery of the same at such a point that it, the fabric, will pass onto the core at the proper angle and distance therefrom and thus insure against wrinkling of the fabric as it passes onto the core. When a particular size of tire-carcass is being constructed, be it thirty-two, thirty-three, or thirty-four inches, the idler or guide-roll 21 must be positioned at the proper distance and angle from the periphery of the core 1, and this positioning is accomplished through the hand-wheel 28 and the interposed mechanism between it and the idler 21, as already described. Changing the position of the idler 21 by the means mentioned at the same time properly positions the tension-roll 19 so that it will bear a proper relation to the tension-roll 16. In practice, it has been found desirable to maintain the delivering position of the fabric as it passes from the roller 21 in the same relative position with respect to the surface of the tension-roller 19 no matter to what position the roller 21 may be disposed. Therefore, by means of the bell-crank 20, as the same may be actuated by reason of its being connected to the link 22, its position will always be accurately controlled and be in proper relation to the tension-roller 19 as the latter may be raised or lowered by the lever 17:

In Fig. 1, the fabric, designated F generally, is shown in dotted lines as passing from the rear side of the roller 11, over the outer surface of the guide-roll 14, around back of the tension-roll 16, and then up over and about the tension-roll 19, from which it takes off, at a point marked 29, and passes over the rear face of the idler 21. The bell-crank-lever maintains the axis of the roller 21 always in the same relation to the point 29, no matter to what position the tension-roller 19 and the idler 21 are adjusted, so that the fabric takes off the idler 21 at the point marked 30, which will, then, always be the same distance from the periphery of the core whatever its diameter may be. The tension-rollers 16 and 19 are each provided with gears 31 and 32, respectively, which are meshed so that both rollers are rotated at the same speed, such rotation being effected by the fabric as it passes around the roller 19, this imparting rotative motion to the roller 16. But, by reason of the fact that the diameters of the rollers 16 and 19 are different—the roll 16 being of smaller diameter than that of the roll 19—and by reason of the fact that the surface of the roll 19 is crowned, the fabric is, as it passes around these rolls and onto the idler 21 which is also crowned, as shown, stretched along a medial line so that it will more easily be formed upon the core, whereupon it will be operated upon by the stitching mechanism designated, generally, by the reference-character 33.

To control the rotation of the fabric-supply roll 11 as the ply is being unwrapped therefrom, I provide means which, in this instance, comprises a roll 34 carried by a pair of swinging arms 35 fulcrumed at the upper end of the standard 10. The operative position of the roll 34 is shown in dotted lines in Fig. 1. When the roll 11 is being placed in position—as when a new supply of fabric is being positioned thereon—it is desirable to maintain the roll 34 in an inoperative position; and to this end each arm 35 is mounted on a shaft 35^a and is provided with a lug 35^b adapted to engage a gear-segment 36 loose on the shaft 35^a. The segment 36 meshes with a similar segment 37, loosely mounted on a shaft 39 on which a roll-supporting arm 38 fulcrums. Projecting rearwardly from the gear-segment 37 is a lug 37^a adapted to abut against an adjustable screw or member 37^b carried by a lug 37^c formed on the arm 38. A pair of the arms 38 carries a liner-roll 40, the latter normally occupying a position above the plane of but in engagement with the supply-roll 11, its engaging position with the roll 11 being

maintained by gravity. To maintain this roll 40 out of contacting relation with the roll 11, however, a holding arm 41 is fulcrumed at 42 on a bracket 43 on the standard 10 and has its upper end 44 formed to receive a stud 45 carried by a latch 46 pivoted at 47 on the arm 38 and provided adjacent its outer end with an incut 48 to receive a shaft 49 of the roller 40. The extremity 50 of the latch 47 is preferably wedge-shape. The arm 38 is provided with an extension 51 having a pendant portion 52 carrying a handle 53 and is formed with a roller-guiding surface 54. When the roller 40 is to be placed in position, its shaft 49 is disposed on the surface 51—there being a pair of these extensions 51 for each roller—whereupon the roller will roll back and, by engaging the wedge-shaped end 50 of the latch, raise the latter until the shaft 49 enters the incut whereupon the latch will drop down. The operator then pulls the arm 41 forward to disengage it from the latch. This tensions a spring 55 secured to the arm 41 and to a hook 56 in the upper portion of the standard 10. When the arm 41 is disengaged from the latch, the arm 38 will, with its liner-roll 40, drop down so that the liner will engage the roll 11. At the same time, the gear-segment 37 will operate the segment 36 and move the arm 35 and, thus, the roll 34 into contacting relation with the fabric on the roll 11. By reason of the fact that the segments 36 and 37 are not rigid on their shafts—but are rendered active only when the gear 36 abuts against the lug 36^a and the gear 37 abuts against the set-screw 37^b—the arms 35 have a certain amount of free movement and this permits the roller 34 to lower by gravity as the quantity of fabric is withdrawn from the roll 11.

To control the rotative movement of the roll 34, I have provided a brake which, in this instance, comprises a brake-piece 57 which bears against a shaft 58 of the roll 34, the piece 57 working in a housing 59 and is held in engagement with the shaft 58 by a spring 60, the tension of which may be varied by an adjustable screw 61.

From the foregoing, it will be seen that I have devised an effective but simple structure of the kind required for effecting a longitudinal stretching of the fabric along the medial line, and one well adapted for effecting the functions herein ascribed to it.

What I claim is:

1. A structure of the kind described including a standard, a pair of fabric-stretching rolls juxtaposed thereto and of relatively different diameters, gearing between the rolls to effect rotation of one by the other, a lever fulcrumed on the axis of one of the rolls and constituting a support for the axis of the other roll, means for actuating said lever to change the relative vertical position between the rolls, an idler-roll juxtaposed to said rolls, a bell-crank-lever fulcrumed on the axis of the second roll and constituting a support for the idler and receiving motion by the action of the lever whereby the relation of the idler to the roll is maintained.

2. A structure of the kind described including a standard, a pair of stretching rolls geared together for rotative movement effected by one to the other, an idler-roll juxtaposed to said rolls, and means for changing the position of one of the stretching rolls with respect to the other and simultaneously shifting the idler-roll to maintain it in a corresponding relation to the second-mentioned stretching-roll.

3. A structure of the kind described including a standard, a pair of fabric-stretching rolls juxtaposed thereto, the rolls being geared together to effect rotative movement of one by the other, an idler-roll juxtaposed to one of the fabric-stretching rolls, a bell-crank-lever supported on the axis of one of said rolls and operated to position the idler-roll in relation to one of the stretching-rolls, and means for simultaneously changing the position of one of the stretching rolls in respect to the other and also shifting the idler-roll in respect to the second fabric-stretching roll.

4. In a structure of the kind described, a pair of fabric-stretching rolls of relatively different diameters, means interposed between the rolls for effecting rotation of one by the movement of the other at the same speed and means for changing the angle of relative position of the rolls.

5. In a structure of the kind described, a pair of fabric-stretching rolls of relatively different diameters, gearing interposed between the rolls for effecting rotation of one by the movement of the other at the same speed, an idler-roll supported adjacent one of the fabric-stretching rolls, and means for shifting the same in reference to any changed position of the second of the fabric-stretching rolls.

6. A tire-building machine including a rotatable core, a fabric-supplying structure juxtaposed thereto and including a standard, an idler-roll supported from the standard and bearing a definite relation to the core, a pair of fabric-stretching rolls also supported on the standard, and means for shifting the position of said idler-roll in respect to the periphery of the core and simultaneously changing the relative position of one of the tension rolls with respect to said idler-roll.

7. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of rela-

tively different diametral dimensions whereby fabric passing from one instrumentality to another is given a substantial stretch longitudinally and means associated with the rolls for altering the angle of relative position of the stretching instrumentalities.

8. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of relatively different diametral dimensions, one of said instrumentalities being crowned centrally, whereby fabric passing from one of the instrumentalities to another is given a substantial longitudinal stretch along its medial portion and means associated with the stretching instrumentalities for varying the angle of relative position thereof at the will of the operator and in relation to the rotatable element.

9. A fabric-stretching apparatus including a rotatable element, a fabric-supporting structure juxtaposed thereto and comprising a plurality of rotatable fabric-stretching instrumentalities, coacting means on these instrumentalities for effecting rotation thereof at substantially the same speed, one of said instrumentalities receiving motion from fabric passing over it, the fabric, itself, deriving its motion from passing around the rotatable element, said stretching instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby as the fabric passes from one to another of the rotatable instrumentalities it is stretched longitudinally along a medial line and means associated with the stretching instrumentalities for varying the angle of relative position thereof at the will of the operator and in relation to the rotatable element.

10. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities, coacting means on these instrumentalities for effecting rotation thereof at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line and means associated with the stretching instrumentalities for varying the angle of relative position thereof at the will of the operator and in relation to the rotatable element.

11. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of relatively different diametral dimensions whereby fabric passing from one instrumentality to another is given a substantial stretch longitudinally, a fabric-guiding instrumentality interposed between said stretching instrumentalities and the rotatable element and operable to deliver fabric onto the element at a predetermined angle relatively to the point of take-off of the fabric from one of said instrumentalities and means for changing the relative angle of relation of the guiding instrumentality in respect to the rotatable element by varying the position of the stretching instrumentalities.

12. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of relatively different diametral dimensions, one of said instrumentalities being crowned centrally, whereby fabric passing from one of the instrumentalities to another is given a substantial longitudinal stretch along its medial portion, and a vertically shiftable fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element.

13. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of relatively different diametral dimensions, one of said instrumentalities being crowned centrally, whereby fabric passing from one of the instrumentalities to another is given a substantial longitudinal stretch along its medial portion, and a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, the fabric-guiding instrumentality being formed with a crown at its central portion.

14. A fabric-stretching apparatus including a rotatable element, a fabric-supporting structure juxtaposed thereto and comprising a plurality of rotatable fabric-stretching in-

strumentalities intergeared for rotation at substantially the same speed, one of said instrumentalities receiving motion from fabric passing over it, the fabric itself deriving its motion from passing around the rotatable element, said stretching instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby as the fabric passes from one to another of the rotatable instrumentalities it is stretched longitudinally along a medial line, and a vertically shiftable fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element.

15. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, and a vertically shiftable fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element.

16. A structure of the character specified including a rotatable tire-building core, a support juxtaposed thereto and comprising a fabric-stretching mechanism including a plurality of rolls of relatively different diameters, gearing between the rolls for rotating them at substantially the same speed during the rotation of the core, and a fabric-guiding idler-roll associated with the stretching rolls and movable in an arc in relation to the core.

17. A structure of the character specified including a rotatable tire-building core, a support juxtaposed thereto and comprising a fabric-stretching mechanism including a plurality of rolls of relatively different diameters, gearing between the rolls for rotating them at substantially the same speed during the rotation of the core, a fabric-guiding idler-roll associated with the stretching rolls and movable in an arc in relation to the core, and means for shifting the idler-roll toward and away from the axis of the core and at the same time shifting the axis of one of the stretching rolls to correspond with the shifted position of the idler-roll.

18. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of relatively different diametral dimensions whereby fabric passing from one instrumentality to another is given a substantial stretch longitudinally, a fabric-guiding instrumentality interposed between said stretching instrumentalities and the rotatable element and operable to deliver fabric onto the element at a predetermined angle relatively to the point of take-off of the fabric from one of said instrumentalities, and means for shifting said guiding instrumentality vertically.

19. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of relatively different diametral dimensions whereby fabric passing from one instrumentality to another is given a substantial stretch longitudinally, a fabric-guiding instrumentality interposed between said stretching instrumentalities and the rotatable element and operable to deliver fabric onto the element at a predetermined angle relatively to the point of take-off of the fabric from one of said instrumentalities, and means for shifting said guiding instrumentality vertically and simultaneously for operatively relating one of the stretching instrumentalities to the guiding instrumentality whenever it is shifted.

20. A fabric-stretching structure including a rotatable element, a support juxtaposed thereto and comprising a plurality of fabric-stretching instrumentalities intergeared for rotation at substantially the same speed during rotation of the element and of relatively different diametral dimensions, one of said instrumentalities being crowned centrally, whereby fabric passing from one of the instrumentalities to another is given a substantial longitudinal stretch along its medial portion, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, and means for shifting said guiding instrumentality vertically and simultaneously for operatively relating one of the stretching instrumentalities thereto whenever the guiding instrumentality is shifted.

21. A fabric-stretching apparatus includ-

ing a rotatable element, a fabric-supporting structure juxtaposed thereto and comprising a plurality of rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of said instrumentalities receiving motion from fabric passing over it, the fabric, itself, deriving its motion from passing around the rotatable element, said stretching instrumentalities being of relatively different diameters and one of them being formed with a central crown, while the other has a substantially cylindrical surface, whereby as the fabric passes from one to another of the rotatable instrumentalities it is stretched longitudinally along a medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, and means for vertically shifting said guiding instrumentality and simultaneously for operatively relating one of the stretching instrumentalities thereto whenever the guiding instrumentality is shifted.

22. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities, co-acting means on these instrumentalities and independent of the core, for effecting a definite rotation thereof at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, while the other has a substantially cylindrical surface, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, and means for shifting said guiding instrumentality vertically and simultaneously for operatively relating one of the stretching instrumentalities thereto whenever the guiding instrumentality is shifted.

23. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and including a supporting structure, a plurality of pairs of associated rotatable fabric-stretching instrumentalities, each pair intergeared for rotation at substantially the same speed, one rotatable instrumentality of the pair receiving motion from the fabric as it passes over its surface onto the core, the latter by its rotation giving to the fabric its motion, the pair of rotatable instrumentalities being of relatively different diameters and one of them having a crown at its central portion, whereby the fabric is given a substantial but defined and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and interposed between them and the core and operable to deliver fabric thereonto at a predetermined angle to and distance from the core, means common to each pair of stretching instrumentalities and their associated fabric-guiding instrumentality for shifting the several guiding instrumentalities vertically and at the same time effect an operative relating of their contiguous stretching instrumentalities to such guiding instrumentalities.

24. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and including a supporting structure, a plurality of pairs of associated rotatable fabric-stretching instrumentalities, each pair intergeared for rotation at substantially the same speed, one rotatable instrumentality of the pair receiving motion from the fabric as it passes over its surface onto the core, the latter by its rotation giving to the fabric its motion, the pair of rotatable instrumentalities being of relatively different diameters and one of them having a crown at its central portion, whereby the fabric is given a substantial but defined and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and interposed between them and the core and operable to deliver fabric thereunto at a predetermined angle to and distance from the core, means common to each pair of stretching instrumentalities and their associated fabric-guiding instrumentality for shifting the several guiding instrumentalities vertically and at the same time effect an operative relating of their contiguous stretching instrumentalities to such guiding instrumentalities, said means comprising a series of levers, each fulcruming on the axis of one of the pair of stretching instrumentalities and provided with a bearing for the other of the pair of stretching instrumentalities, a bell-crank-lever fulcruming at said bearing, a spider to which the series of levers is connected, and a hand-wheel for raising or lowering the spider.

25. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving mo-

tion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, and a fabric-supporting roll disposed in a plane above the stretching instrumentalities.

26. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, a fabric-supporting roll disposed in a plane above the stretching instrumentalities, and a fabric-braking roll gravitating toward the supporting-roll to prevent too free supply of fabric therefrom to the stretching instrumentalities.

27. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, a fabric-supporting roll disposed in a plane above the stretching instrumentalities, a fabric-braking roll gravitating toward the supporting-roll to prevent too free supply of fabric therefrom to the stretching instrumentalities, and a liner-roll associated with the supporting-roll.

28. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric, itself, deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, a fabric-supporting roll disposed in a plane above the stretching instrumentalities, a fabric-braking roll gravitating toward the supporting-roll to prevent too free supply of fabric therefrom to the stretching instrumentalities, a liner-roll associated with the supporting-roll, and a roll-sustaining frame disposed above the plane of the supporting-roll, and operable to deliver the fabric-supplying roll into operative position in respect to the rotatable instrumentalities.

29. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial, but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable ele-

ment and operable to deliver the fabric onto the element at a definite distance from and angle to the element, a fabric-supporting roll disposed in a plane above the stretching instrumentalities, a fabric-braking roll gravitating toward the supporting-roll to prevent too free supply of fabric therefrom to the stretching instrumentalities, a liner-roll associated with the supporting-roll, and a roll-sustaining frame disposed above the plane of the supporting-roll and having a swinging movement in relation thereto, first to receive the fabric-supplying roll and, then, to deliver the same into its fabric-delivering position relatively to the stretching instrumentalities.

30. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from an angle to the element, a fabric-supporting roll disposed in a plane above the stretching instrumentalities, a fabric-braking roll gravitating toward the supporting-roll to prevent too free supply of fabric therefrom to the stretching instrumentalities, a liner-roll associated with the supporting-roll, a roll-sustaining frame disposed above the plane of the supporting-roll and having a swinging movement in relation thereto, means for holding the frame in an elevated position away from the supporting-roll, and means on the frame for maintaining the liner-roll in position comprising a latch engageable with said frame-holding means.

31. In a tire-building machine, a rotatable tire-forming core, a fabric-supplying structure juxtaposed thereto and comprising a pair of associated rotatable fabric-stretching instrumentalities intergeared for rotation at substantially the same speed, one of the rotatable instrumentalities receiving motion from the fabric as it passes over its surface and which it transmits to its associated instrumentality, the fabric itself deriving its motion as the result of passing around the tire-forming core, said rotatable instrumentalities being of relatively different diameters and one of them being formed with a central crown, whereby the fabric is given a substantial but definite and uniform stretch longitudinally along its medial line, a fabric-guiding instrumentality associated with the stretching instrumentalities and occupying a plane above that of the rotatable element and operable to deliver the fabric onto the element at a definite distance from and angle to the element, a fabric-supporting roll disposed in a plane above the stretching instrumentalities, a fabric-braking roll gravitating toward the supporting-roll to prevent too free supply of fabric therefrom to the stretching instrumentalities, a liner-roll associated with the supporting-roll, and an actuating connection between the frame and the fabric-braking roll for shifting it toward and away from the supporting-roll.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. CONVERY.

Witnesses:

GERTRUDE PETERSON,

FRANCES WALD.