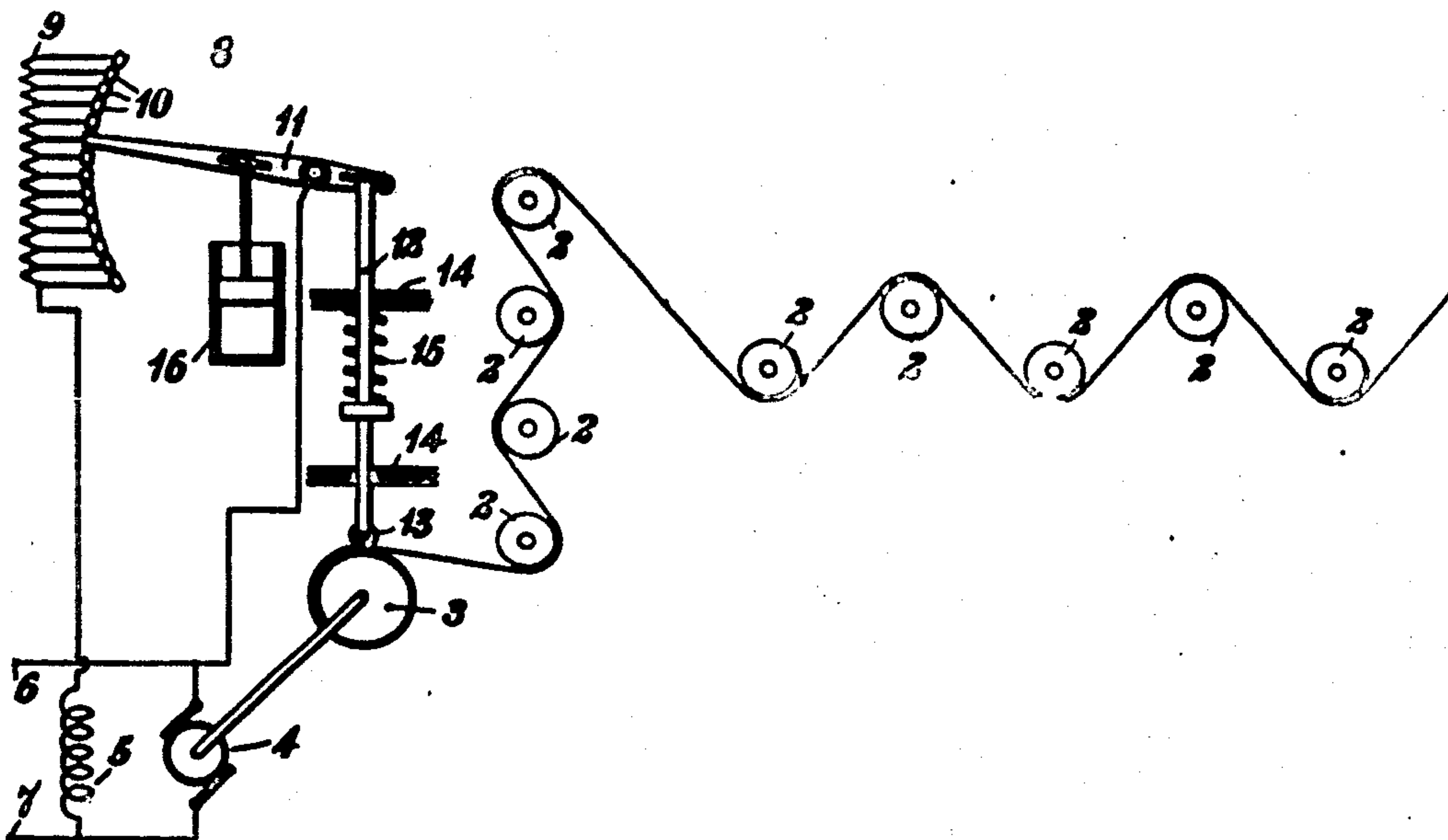


S. L. NICHOLSON.
SPEED REGULATOR FOR WINDING ROLLS.
 APPLICATION FILED MAR. 29, 1909.

947,844.

Patented Jan. 25, 1910.



WITNESSES:

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SPEED-REGULATOR FOR WINDING-ROLLS.

947,344.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL L. NICHOLSON, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Speed-Regulators for Winding-Rolls, of which the following is a specification.

My invention relates to the propulsion and speed regulation of gathering reels or rolls for paper and other material and it has for its object to provide means that shall be dependent upon diameter variations, as the material is wound upon a roll, for automatically varying the speed of the roll.

In the manufacture of various sheet materials, cord, wire, etc., gathering reels or rolls are employed to receive the material after it has been subjected to such forming and finishing processes as may be necessary or desirable. It will, of course, be readily understood that the linear velocity of the material must be maintained substantially constant and, consequently, that the speed of the gathering roll must be decreased as its diameter is virtually increased during the gathering process. Under the practice which has heretofore usually prevailed, friction clutches have been interposed between the gathering roll and its shaft which permitted the speed of the roll to decrease by reason of the pull exerted by the material as it passed onto the roll.

According to my present invention, I provide a driving motor for the gathering roll the speed of which is automatically varied in accordance with the changes in the virtual diameter of the roll. By this means, the material is entirely relieved from the strains to which it was subjected by the prior method, and thin and delicate materials may be wound without danger of rupture.

My invention is not restricted to gathering reels or rolls in which the virtual diameter is gradually increased but may be advantageously employed in printing and other arts where material is supplied to a press or other mechanism from a reel or roll the virtual diameter of which gradually decreases.

The single figure of the accompanying drawing is a diagrammatic view of a system embodying my invention.

A strip or line 1 of paper or other material is fed over a plurality of rolls 2 for drying or other purposes and passes onto a gathering reel or roll 3. The roll 3 is driven by an electric motor 4, having a field magnet winding 5, which is supplied with energy, from any suitable source, through line conductors 6 and 7. A field rheostat 8 is adapted to govern the current supplied to the field magnet winding 5 and comprises a resistance 9, a plurality of stationary contact members 10 that are connected to end and intermediate points in the resistance, and a movable contact arm 11, which is adapted to engage the stationary contact members 10.

Movement of the arm 11 is effected by a rod 12 one end of which is secured to the contact arm and the other end of which is provided with an idler roll 13 which is adapted to rest against the surface of the outer layer of material on the gathering roll 3. The center line of the rod 12 lies in a radial plane and is perpendicular to the surface of the roll. The rod 12 is adjustably mounted in the guideways 14 and the roll 13 is held in engagement with the surface of the outer layer of material on the gathering roll by a spring 15. The motion of the contact arm 11 may preferably be steadied by a dashpot 16. The arrangement of parts is such that, as the material is wound onto the reel or roll 3, the rod 12 is moved upwardly in opposition to the spring 15 and effects such a movement of the contact arm 11 as to increase the resistance included in the field magnet circuit of the motor. In this way, the speed of the motor is automatically decreased as the virtual diameter of the roll increases, and, consequently, the linear velocity of the material may be maintained constant.

It will be readily understood that if the material is traveling in the reverse direction, so that the roll 3 becomes a supply roll, the decrease in its diameter will weaken the field of the motor and increase its speed. Ordinarily, under these conditions, the pull exerted by the material itself is relied upon to rotate the roll.

It will be readily understood that the voltage applied to the motor armature may be varied in accordance with the variations in the size of the gathering roll instead of the field resistance, as shown, and I desire

that only such limitations shall be imposed on my invention as are indicated in the appended claims.

I claim as my invention:

- 5 1. The combination with a winding roll and an electric driving motor therefor, of automatic means dependent upon the amount of material on the roll for varying the field magnet excitation of the motor.
- 10 2. The combination with a winding roll for material, and an electric driving motor therefor, of automatic means for varying the field magnet excitation of the motor as the amount of material on the rolls varies.
- 15 3. The combination with a winding roll, and an electric driving motor therefor, of automatic means for increasing the field magnet excitation of the motor as the diameter of the material wound upon the roll increases.
- 20 4. The combination with a winding roll

and an electric driving motor therefor having field magnet and armature windings, and a resistance for the field winding, of automatic means for varying the field strength of the motor as the amount of material on the roll varies. 25

5. The combination with a winding roll, and an electric driving motor therefor having field magnet and armature windings, and a resistance for the field winding, of automatic means dependent upon the increase in diameter of the roll, as material is wound thereon, for strengthening the field of the motor. 30

In testimony whereof, I have hereunto subscribed my name this 16th day of March, 1908. 35

S. L. NICHOLSON.

Witnesses:

R. S. FECHT,
BIRNEY HINES.