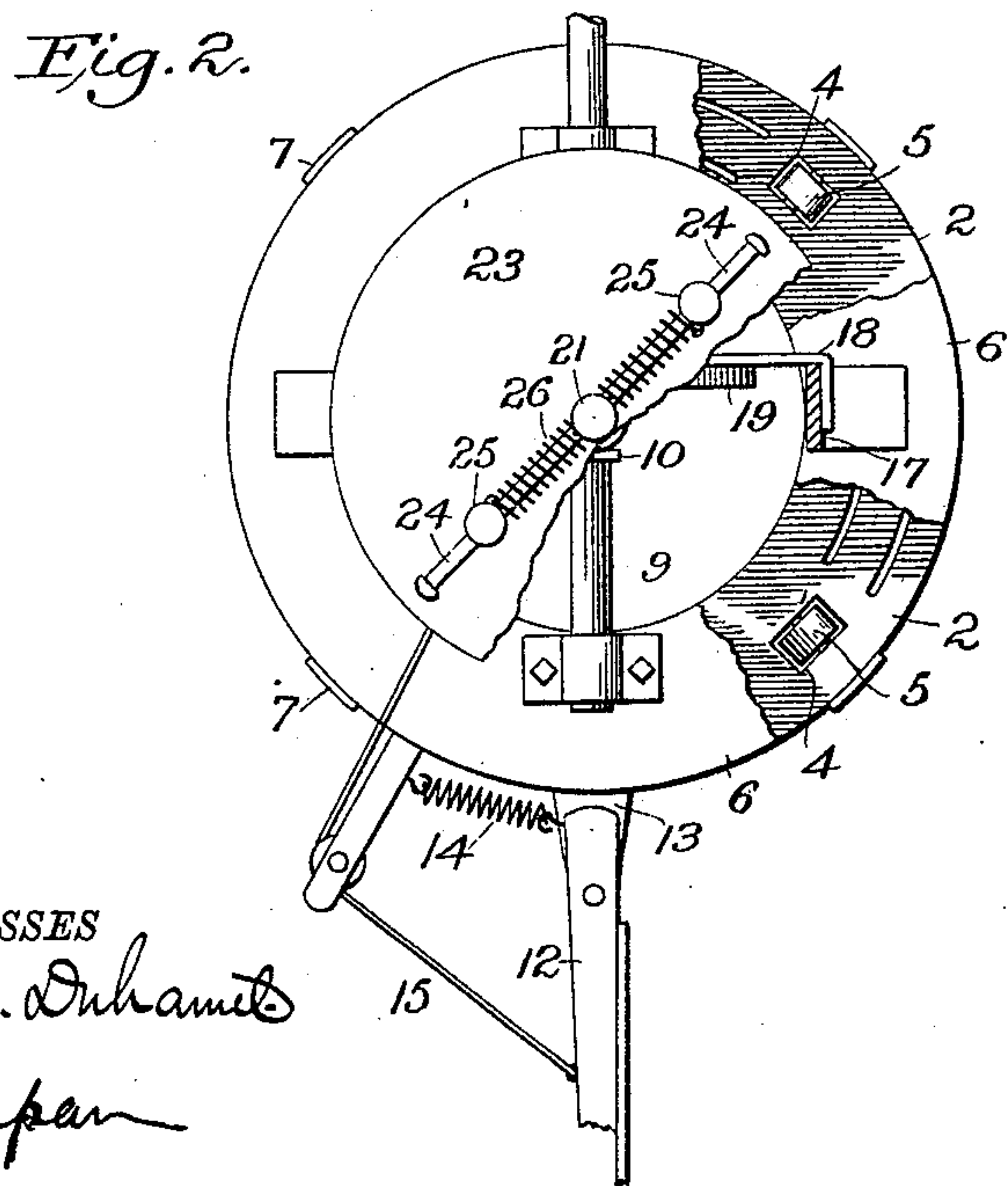
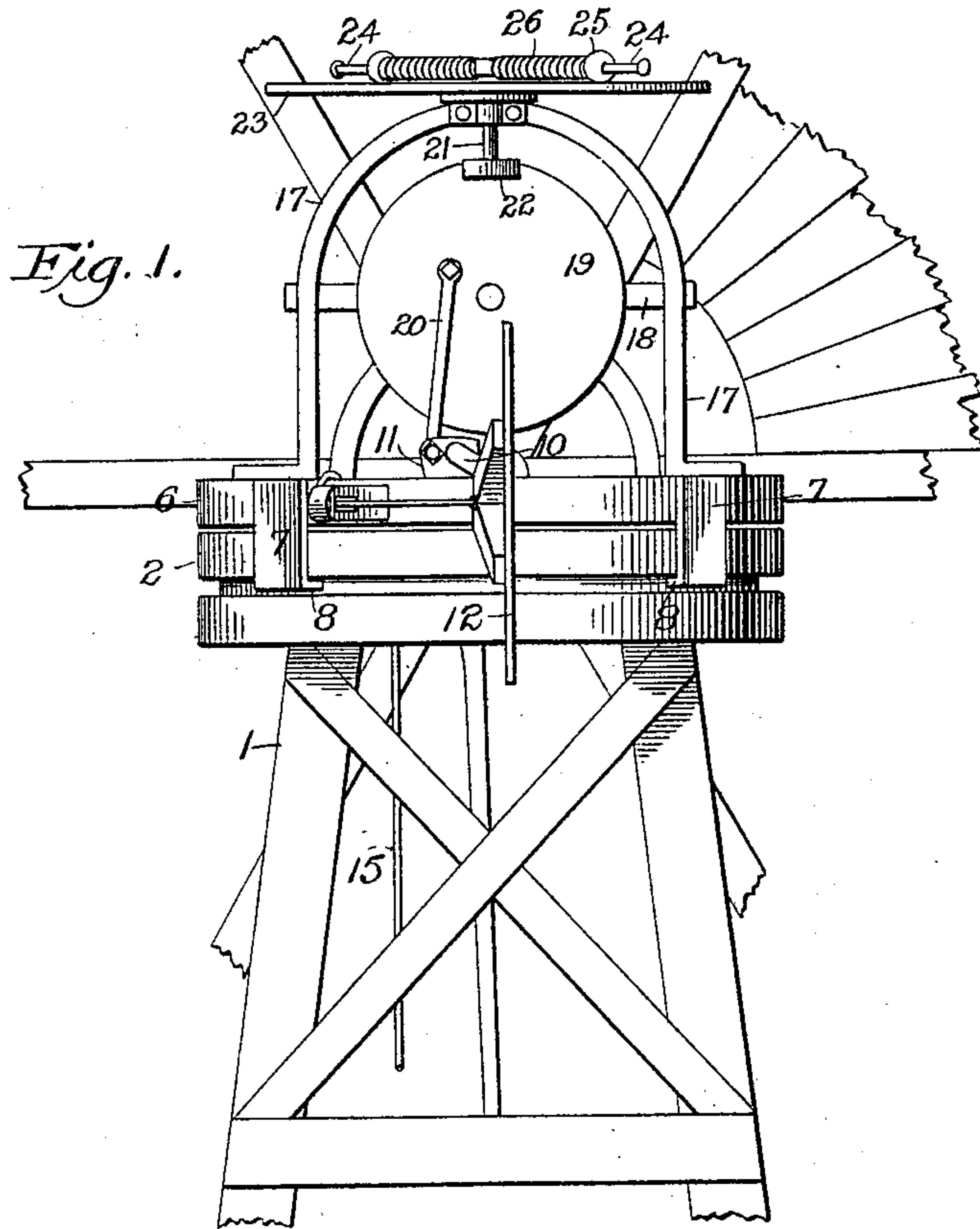


(No Model.)

O. R. LALE.
SPEED REGULATOR FOR WINDMILLS.

No. 587,445.

Patented Aug. 3, 1897.



WITNESSES
James F. Duhamel
John Tappan

INVENTOR,
Oscar R. Lale,
By John Wedderburn
Attorney

UNITED STATES PATENT OFFICE.

OSCAR RICHARD LALE, OF SHAWNEE, OKLAHOMA TERRITORY.

SPEED-REGULATOR FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 587,445, dated August 3, 1897.

Application filed September 30, 1896. Serial No. 607,487. (No model.)

To all whom it may concern:

Be it known that I, OSCAR RICHARD LALE, a citizen of the United States, residing at Shawnee, in the county of Pottawatomie, Oklahoma Territory, have invented certain new and useful Improvements in Speed-Regulators for Windmills; 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.

This invention has reference to windmills, and more especially to a novel construction in the support or bearing between the wind-wheel and the tower, and also a novel construction of a governor for regulating the speed of the wheel and beam-rod.

In the accompanying drawings, illustrating this invention, Figure 1 is a side elevation of the upper portion of a tower provided with my improvements. Fig. 2 is top plan view with the parts broken away.

In said drawings, 1 indicates the tower, provided at its upper end with a circular platform. This platform is provided on both sides with grooves 3, and in the upper face of this platform are a plurality of recesses 4, in which are situated antifriction-rollers 5. Mounted upon the platform and resting upon the rollers 5 is a rotatable ring or plate 6. This plate or ring 6 is about the same diameter as the platform and is held thereon by means of clamps 7, that are secured to the ring 6 and having at their lower ends lugs 8, that enter grooves of the platform. The wind-wheel and governor are supported upon this plate or ring 6, and it will be seen, therefore, that I provide a joint between the plate and platform that reduces the friction to a minimum, so that the wheel can readily turn according to the changes in the direction of the wind.

The power-shaft 9 is supported in bearings upon the plate 6 and carries at one end the wind-wheel, while at about the center of the plate it is provided with a crank 10, that is connected with the pump-rod 11. The tail 12 of the wheel is hinged to a short projection 13, connected with the plate 6, and is held normally in alinement with the power-shaft 9 by a spring 11. Connected with the tail 12 is the cable 15, that is trained around poles

16 and falls to a point near the ground. It will be seen that by pulling upon this cable 15 the tail can be turned to any desired angle to change the angle in which the wind will blow upon the windmill, and thus regulates the speed of the same, it of course being understood that suitable devices are provided for securing the end of the cable. When the cable is released, the spring 14 will draw the tail back into its normal position.

The governor is mounted upon the rotatable plate 6 by means of an arch 17, secured at its lower ends upon said plate. Upon and secured to said arch is a cross-piece 18, and to the center of this cross-piece 18 is mounted a rotatable wheel or disk 19, that is connected by means of the link 20 with the upper end of the pump-rod 11. At the top of the arch 17 is an upright shaft 21, and it is provided at its lower end with a gear-wheel 22, to be rotated by contact with the periphery of the wheel or disk 19.

The upright shaft 21 passes upwardly through the table 23, fixed on the top of the arch, and carries two radial arms 24, upon which are the sliding balls 25. The ends of these arms are headed to prevent the balls from flying off, while between the balls and the shaft 21 are springs 26, which serve to draw the balls 25 back to their normal position after they have been moved outwardly on the arms 24 by centrifugal force. A governor constructed in this manner acts as a brake or drag upon the power-shaft by means of the friction between the balls 25 and the table 23, it being obvious that as the balls are moved outwardly by means of the centrifugal force toward the ends of the arms 24 they will have to travel over a larger circle, and thus will offer more resistance to revolution.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a windmill, a rotatable plate or support carrying the wind-wheel, power-shaft, and pump-rod, a horizontally-arranged table, radial arms mounted above said table and connected with the moving parts of the windmill for rotating the same, rotatable rollers carried by said arms and moving longitudinally thereon, and springs for moving said rollers toward the inner ends of said arms.

2. In a windmill, a rotatable plate or support carrying the wind-wheel, power-shaft and pump-rod, a horizontally-hinged table, an upright shaft mounted upon the frame and
5 passing through said table, gearing between said shaft and a moving part of the windmill for rotating said shaft, radial arms carried by said shaft and situated close to said table, rotatable rollers carried by said arms and
10 moving longitudinally thereon, and springs for moving said rollers toward the inner ends of said arms.

3. In a windmill, a rotatable plate or support carrying the wind-wheel, power-shaft
15 and pump-rod, a rotatable wheel or disk

mounted upon a frame secured to said plate or support and connected by means of a link 20 with said pump-rod, gearing between said rod or disk and horizontally-arranged arms 24 to cause the latter to rotate, a table below said arms 24, sliding balls carried by said arms 24, and a spring 26 for moving said balls toward the inner ends of said arms.

In testimony whereof I have signed this specification in the presence of two subscrib- 25
ing witnesses.

OSCAR RICHARD LALE.

Witnesses:

B. B. BLAKENEY,
JOHN F. LEAF.