J. A. SWART.

FRICTION SPEED REGULATOR OR GOVERNOR.

APPLICATION FILED SEPT. 25, 1916.

**1,237,409.** Patented Aug. 21, 1917.

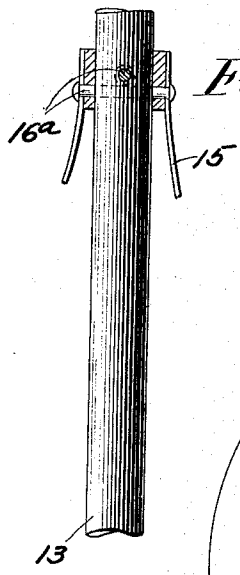


Fig. 3.

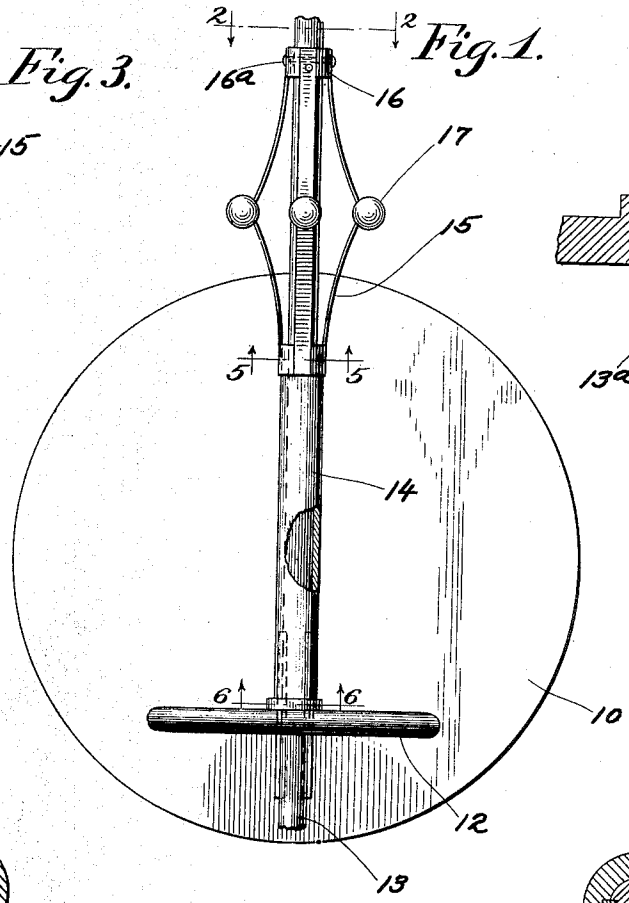


Fig. 1.

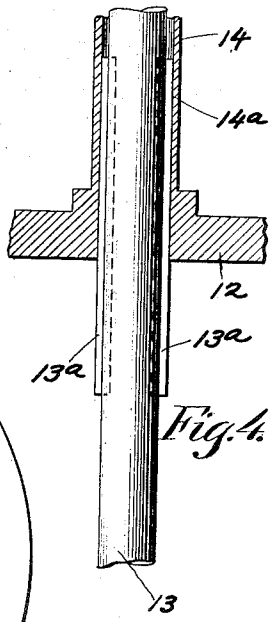


Fig. 4.

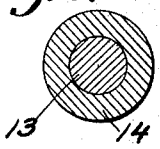


Fig. 5.

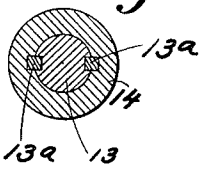


Fig. 6.

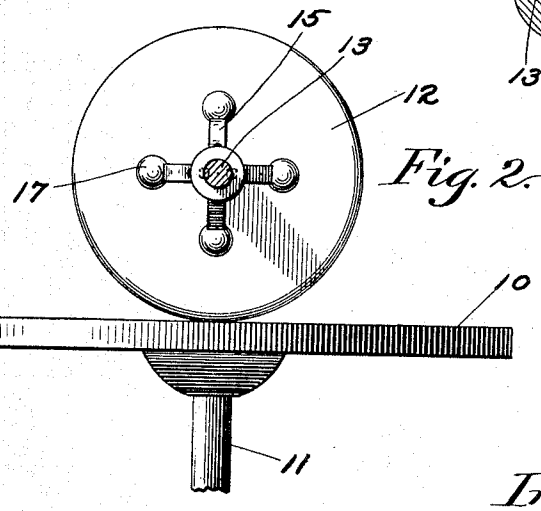


Fig. 2.

Witness:
C. C. Burnap

Inventor:
John A. Swart

By Sheridan, Wilkinson and Scott Attys

# UNITED STATES PATENT OFFICE.

JOHN A. SWART, OF DULUTH, MINNESOTA.

## FRICTION SPEED REGULATOR OR GOVERNOR.

1,237,409. Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed September 25, 1916. Serial No. 122,113.

*To all whom it may concern:*

Be it known that I, JOHN A. SWART, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Friction Speed Regulators or Governors, of which the following is a specification.

This invention relates to speed regulators and has for its object to provide a device of that nature which will automatically control the speed of a driven element. Still another object resides in the specific construction and details of my improved device. These and other advantages will be more fully set forth and described in the following specification and shown in the accompanying drawing;

In which—

Figure 1 is a plan view of my invention, a portion thereof being shown in section;

Fig. 2 is an end elevation of the same;

Fig. 3 is a detail of the governor attachment;

Fig. 4 is a detail of the sliding disk and shaft;

Fig. 5 is a transverse section along the line 5—5 of Fig. 1; and

Fig. 6 is a similar section along the line 6—6 of Fig. 1.

Like numerals refer to like elements throughout the drawing in which 10 is a rotatable disk secured to a shaft or spindle 11, and constructed and arranged for driving by a driving disk 12 whose axis is parallel to the plane of disk 10 and the periphery of which is in frictional contact with the surface of the disk 10, this being a well known form of power transmission. The disk 12 is centrally apertured and is mounted on the driving shaft 13, the latter being provided with splines $13^a$, the hub or central portion of the disk 12 being suitably grooved or slotted to slide upon the splines $13^a$. Secured to the disk 12 and projecting outwardly therefrom, is the tube 14, fitting around shaft 13 and slidable thereon, this tube being shown in Fig. 4 as formed integral with the disk 12 and as having suitable keyways $14^a$ comprising a continuation of the keyways in disk 12. At its outer end, the tube 14 has attached to it a plurality of leaf-springs 15, each of which has its other end attached to a collar 16 by pins $16^a$, or the like. Intermediate their extremities these springs 15 carry the ball weights 17 attached thereto. Pins $16^a$ extend through the shaft 13 and serve to secure the collar 16 thereto.

In operation, suitable power being applied to the shaft 13 to rotate the same, the disk 12 will be rotated therewith and a consequent rotation will be imparted to disk 10 to impel or rotate the spindle 11, from which the power may be taken for any suitable use. To maintain the speed of the driven disk 10 approximately constant, the leaf-springs 15 and the ball weights 17 are selected of proper dimension and weight, and inasmuch as the same rotate with the tube 14 and the shaft 13, a centrifugal action of the balls 17 is such as to draw the disk 12 through the medium of the tube 14 toward the center of the disk 10 as the speed of the shaft 13 and consequent centrifugal action of the balls 17 increases. This centrifugal action is resisted by the springs 15, and proper selection of the latter and the ball weights will result in a balance obtaining at the desired speed of rotation, so that the same will be maintained approximately constant. As will be obvious when the speed of the shaft 13 drops, the centrifugal action of the balls 17 will decrease, and disk 12 will be moved toward the periphery of the disk 10 so that an increased driving ratio will be obtained and fewer revolutions of the disk 12 will result in maintained constant speed of the driven disk 10.

It will be obvious that my invention is susceptible of modifications and improvements, and I do not wish to be restricted to the form shown except as defined in the appended claims.

What I claim is:

1. In combination, a driven disk, a driving disk in contact therewith and arranged to transmit rotation thereto, and means to automatically move said driving disk relative to said driven disk to maintain the speed of the latter constant during varying speeds of the former, said means comprising ball and spring members rotating with said driving disk.

2. In combination, a driven disk, a driving disk in contact therewith and arranged to impart rotation thereto, a driving shaft, said driving disk rotating with said shaft and slidable thereon, and means to slide said driving disk on said shaft and across the face of said driven disk.

3. In combination, a driven disk, a driv-

ing disk in contact therewith and arranged to impart rotation thereto, a driving shaft, said driving disk rotating with said shaft and slidable thereon, and means to slide said driving disk on said shaft and across the face of said driven disk, said means comprising a ball governor.

4. In combination, a driven disk, a driving disk in contact therewith and arranged to impart rotation thereto, a driving shaft, said driving disk rotating with said shaft and slidable thereon, and means to slide said driving disk on said shaft and across the face of said driven disk, said means comprising a plurality of spring members having one end operatively attached to said shaft, the other end to said driving disk, said springs being provided with ball weights intermediate their extremities.

In testimony whereof, I have subscribed my name.

JOHN A. SWART.

Witnesses:
JOHN MONAGHAN,
W. G. SWART.