

No. 755,776.

PATENTED MAR. 29, 1904.

L. K. HONG.
SPEED GOVERNOR.

APPLICATION FILED MAY 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

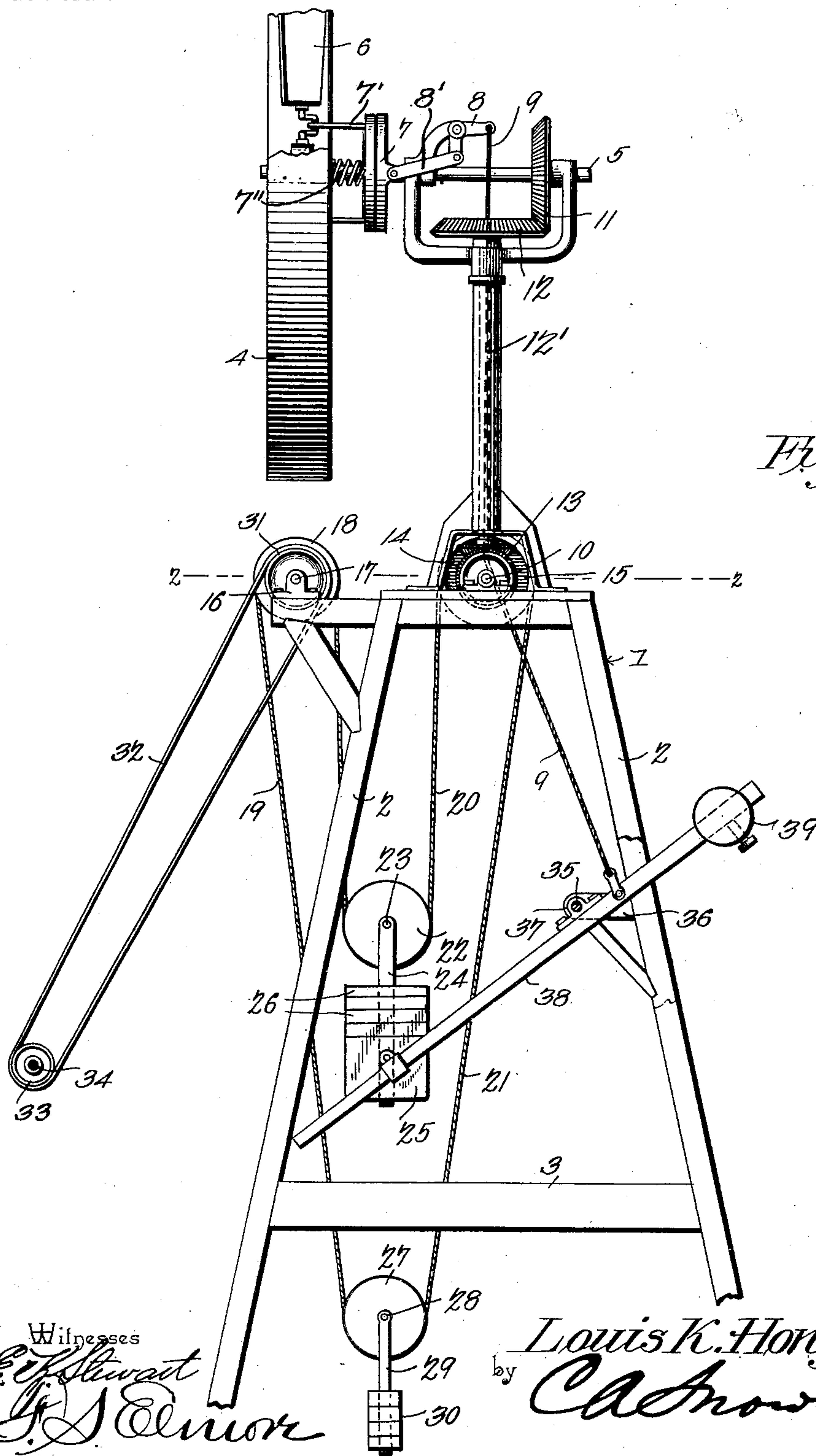


Fig. 1.

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2 SHEETS—SHEET 2.

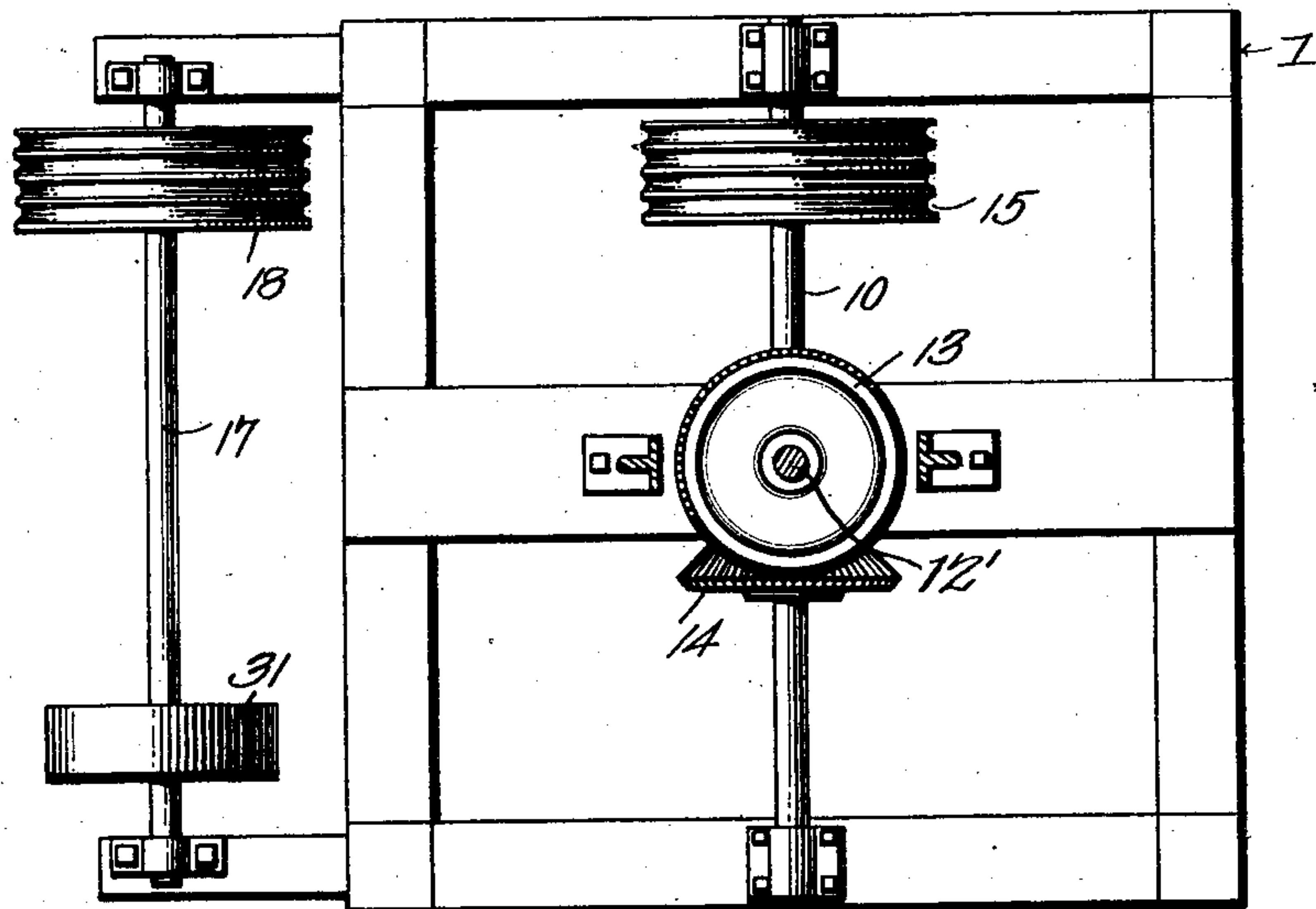


Fig. 2.

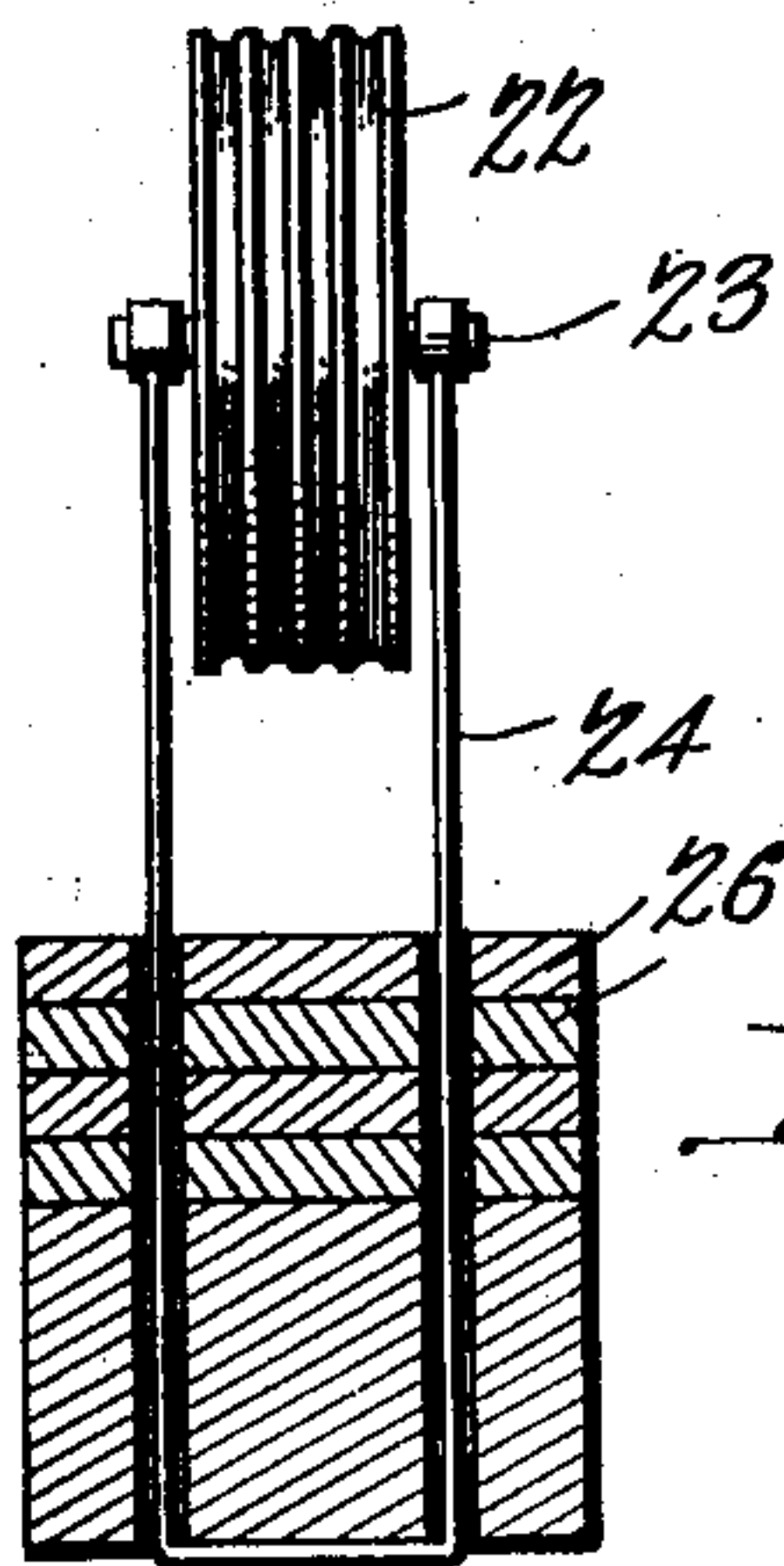


Fig. 3.

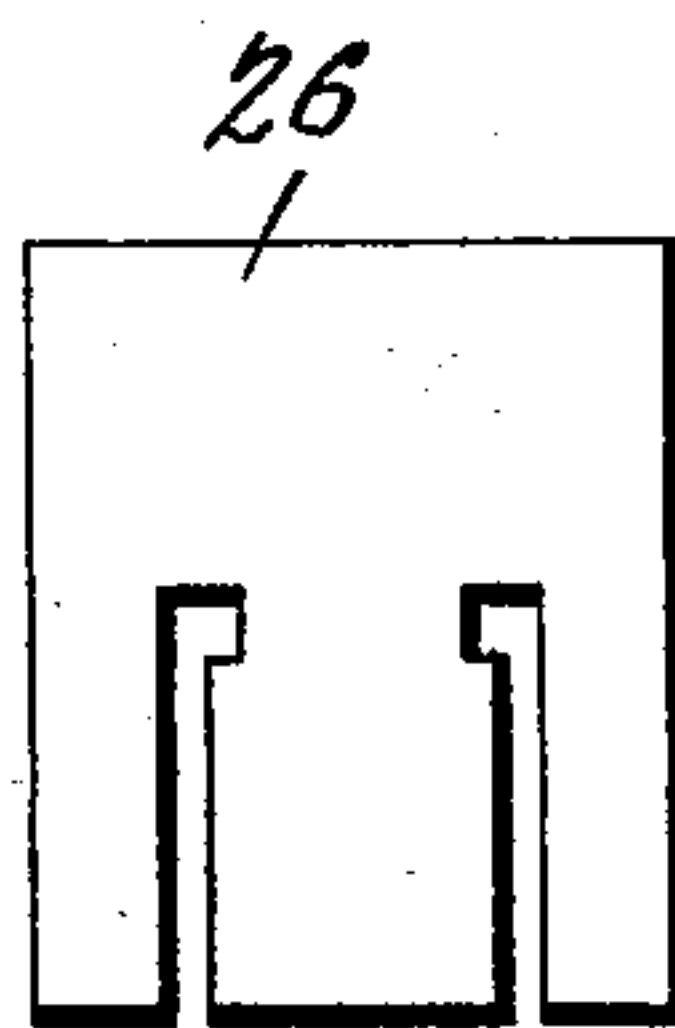


Fig. 4.

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UNITED STATES PATENT OFFICE.

LOUIS K. HONG, OF SISSETON, SOUTH DAKOTA.

SPEED-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 755,776, dated March 29, 1904.

Application filed May 8, 1903. Serial No. 156,251. (No model.)

To all whom it may concern:

Be it known that I, LOUIS K. HONG, a citizen of the United States, residing at Sisseton, in the county of Roberts and State of South Dakota, have invented a new and useful Speed-Governor, of which the following is a specification.

My invention relates to speed-governors, and has for its objects to produce a simple and efficient device of this character by which power from a drive-shaft which is driven at a variable speed may be transmitted to a driven shaft for imparting to the same a uniform speed.

To these ends the invention comprises the novel details of construction and combination of parts more fully hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation of a windmill, illustrating my improved device applied thereto. Fig. 2 is a horizontal sectional elevation on the line 2-2 of Fig. 1 as viewed in the direction of the arrow. Fig. 3 is a detail view of one of the weight-sustaining arms. Fig. 4 is a similar view of one of the weights.

Referring to the drawings, 1 indicates the tower of the windmill, comprising uprights 2, connected by transverse braces 3 and 4, a wind-wheel fixed upon a shaft 5, journaled for rotation in suitable bearings at the upper end of the tower, the wheel being provided with pivoted sails or blades 6, which may be thrown into and out of the wind for controlling the speed of rotation of the wheel.

7 is a collar mounted for sliding movement longitudinally of the shaft 5 and connected by suitable rods or links 7' with the sails 6, the arrangement being such that when the collar is moved in one direction upon the shaft the sails will be thrown into the wind and when moved in the opposite direction they will be thrown out of the wind. For moving the collar in the direction for maintaining the sail in the wind I employ a normally expanded spring 7'', and for moving the same in the opposite direction against the action of the spring I employ a bell-crank lever 8, connected by a link 8' with the collar, the other arm of the lever 8 being connected with an operating-rope 9, which when actuated in the

manner hereinafter described serves through the medium of the foregoing mechanism to actuate the sails in the manner and for the purpose above explained.

The wind-wheel 4 as it rotates transmits motion to a drive-shaft 10 through the medium of a gear 11, fixed upon shaft 5 and meshing with a gear 12 upon the upper end of a vertically-disposed shaft 12', provided at its lower end with a gear 13, meshing with a similar gear upon the shaft 10, which latter is journaled for rotation in suitable bearings upon the tower 1.

In accordance with my invention I mount upon the drive-shaft 10 a sheave-pulley 15, of any suitable character, but preferably of a type herein shown, and also journal in bearings 16, connected to the uprights 2, a driven shaft 17, having fixed thereon a similar sheave-pulley 18, which is operatively connected with and driven from the pulley 15 by means of an endless belt 19, the belt being of sufficient length to hang downward below the pulleys to form an upper loop 20 and a lower loop 21, as illustrated in Fig. 1. Suspended upon the belt 19 within the upper loop 20 is a pulley 22, upon the shaft 23 of which a depending U-shaped frame 24 is mounted. This frame is provided with a primary weight 25 and with a series of secondary weights 26, which are adapted for ready removal from the frame in the manner and for the purpose hereinafter explained.

27 is a pulley which is suspended upon the belt 19 within the lower loop 21, and from the shaft 28 of said pulley a U-shaped frame 29 depends and is provided with removable weights 30. These weight-carrying pulleys 22 27 serve to draw the belt 19 tightly over the sheaves 15 18, as will be readily understood, to transmit motion from one to the other, and the tension upon said belt may be regulated, as circumstances require, by varying the number of weights within the respective frames 24 29, the weights being provided with transverse slots to permit their ready insertion to or removal from the frames.

Fixed upon the shaft 17 for operation thereby is a belt-pulley 31, which connects, through the medium of a belt 32, with a pulley 33,

fixed upon a shaft 34 of the mechanism to be operated.

35 indicates a short shaft journaled in bearings 36, connected to one of the uprights 2, and upon this shaft is mounted a sleeve 37, to which is secured in any suitable manner a lever 38, connected at one end with the primary weight 25 of pulley 22 and provided at its free end with an adjustable weight 39. To this lever is secured the lower end of operating-rope 9, which actuates the bell-crank lever 8 for throwing the blades of the wind-wheel into and out of operation, as above described. As the wind-wheel moves it imparts motion to the shaft 10 through the medium of the intermediate gearing and causes the sheave 15 to wind up the belt 19, thus raising the pulley 22 and its weights and the adjacent inner end of the lever 38. This raising of the lever 38 at its inner end causes its outer end to swing downward and exert a downward pull upon the rope 9 for throwing the wind-sails out of the wind influence. After the sails have been moved sufficiently to discontinue the winding of the belt the weighted pulley 22 again moves downward, carrying the inner end of the lever, which action again raises the lever at its outer end and permits the wind-sails to again move into position to be acted upon by the wind. During this operation of the parts the shaft 10, which is driven at a variable speed owing to the wind variations, imparts a continuous uniform speed through the medium of the belt 19 to the shaft 17, due to the fact that when the speed of the shaft 10 increases it will act to simply lift the weighted pulley and as it decreases to lower the weighted pulley. Thus the weight-bearing pulleys will compensate for and regulate the speed variations of shaft 10 during transmission to the shaft 17, as will be readily understood.

From the foregoing it will be seen that I produce a simple and effective device for at-

taining the ends in view, and it is to be noted that I do not limit or confine myself to the details herein shown and described, inasmuch as various changes may be made thereon without departing from the spirit or scope of my invention. For example, while I have herein shown the device as applied to a windmill it is to be noted that the same may be employed in any connection where it is desired to transmit a uniform speed to a driven shaft from a shaft traveling at a variable speed.

Having thus described my invention, what I claim is—

1. The combination with a wind-wheel having pivoted blades, of a drive-shaft operable thereby, a driven shaft, a flexible weighted belt operatively connecting said shafts, a pivoted lever operatively and constantly connected with the belt for movement therewith throughout the operation of the device, and operative connections between the lever and blades for throwing the latter into and out of the wind owing to variations in the speed of the drive-shaft.

2. The combination with a wind-wheel having pivoted blades, of a drive-shaft operable thereby, a driven shaft, a belt connecting said shafts and hanging below the same to form an upper and a lower loop, a weighted pulley suspended upon the belt in each of the loops, a pivoted lever operatively connected with one of the weighted pulleys, and operative connections between the lever and blades for moving the latter into and out of the wind owing to variations in the speed of the drive-shaft.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

LOUIS K. HONG.

Witnesses:

A. D. PAULSON,
R. K. HONG.