

No. 754,185.

PATENTED MAR. 8, 1904.

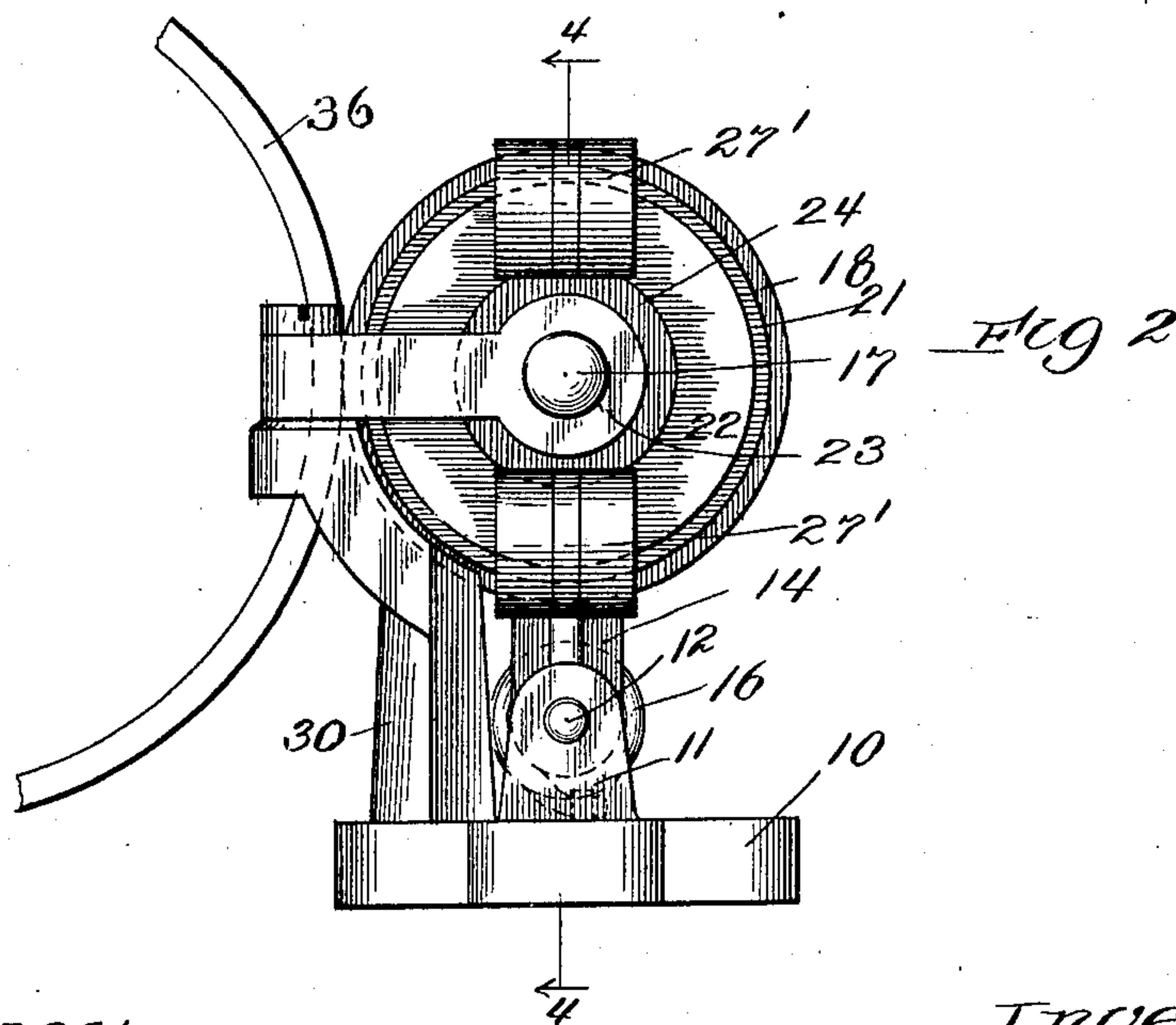
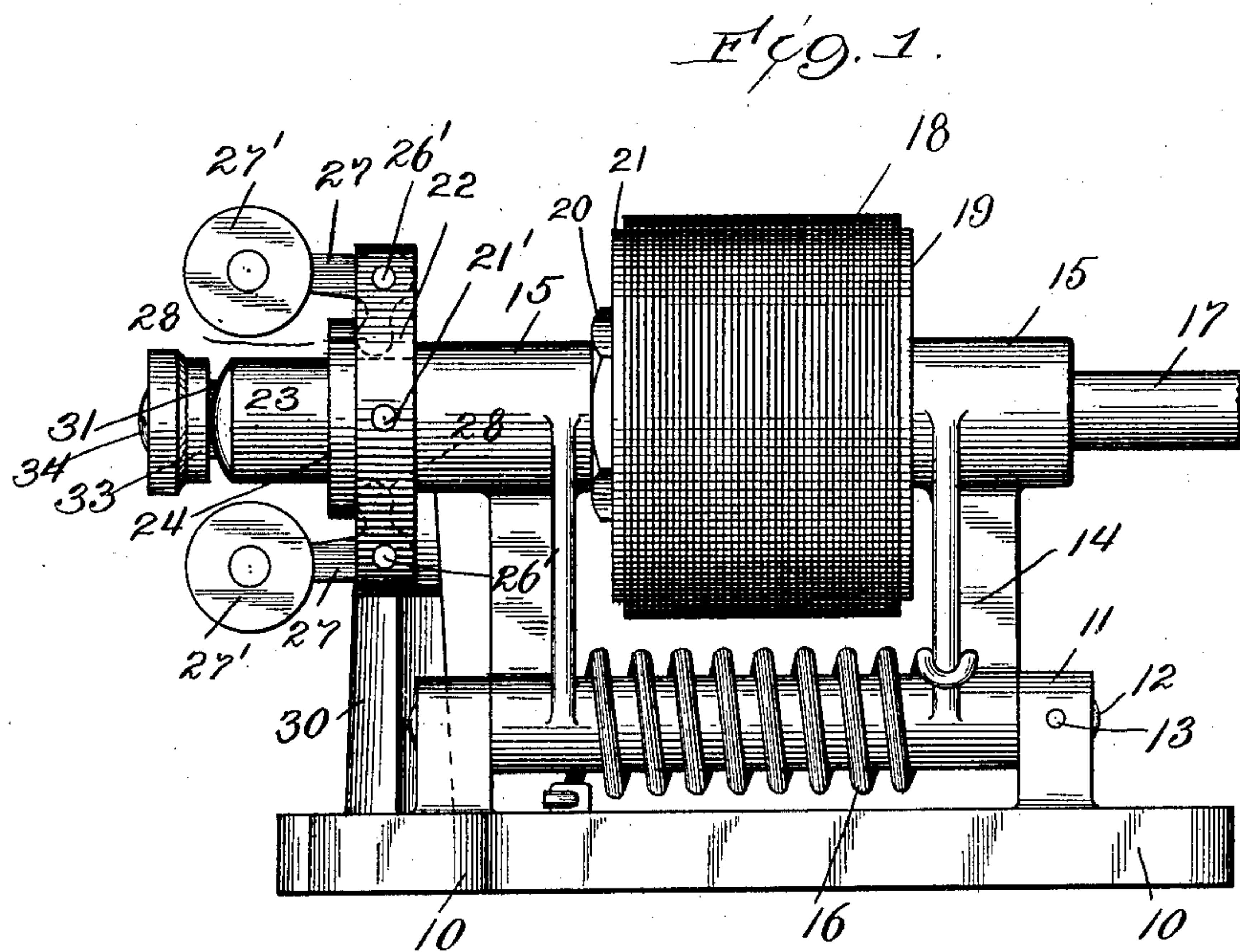
V. G. APPLE.

AUTOMATIC FRICTION GOVERNOR.

APPLICATION FILED MAY 2, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
Ray White.
Harry O. White.

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Inventor
Vincent G. Apple.
By J. Lee Rain Att'y.

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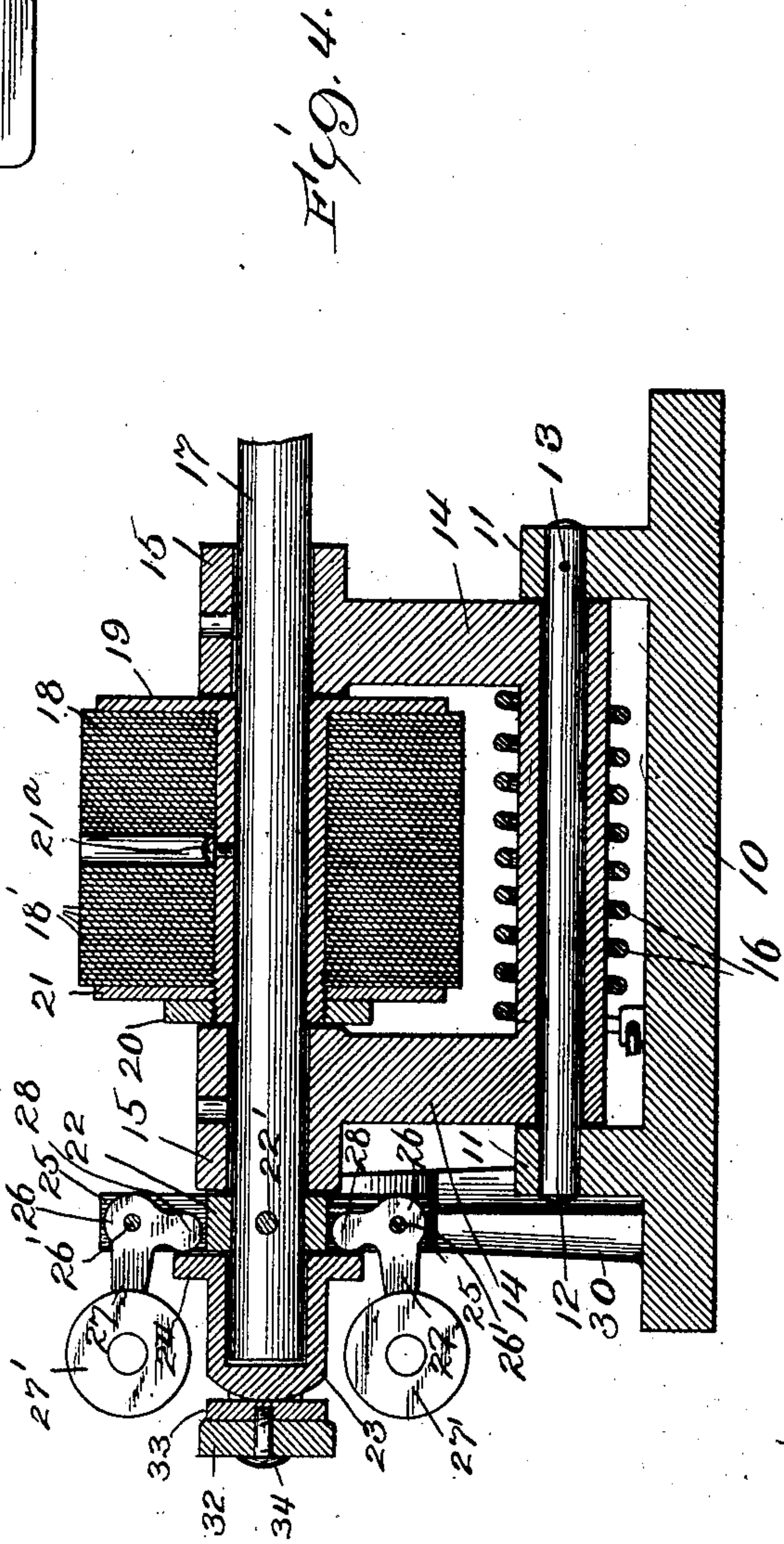
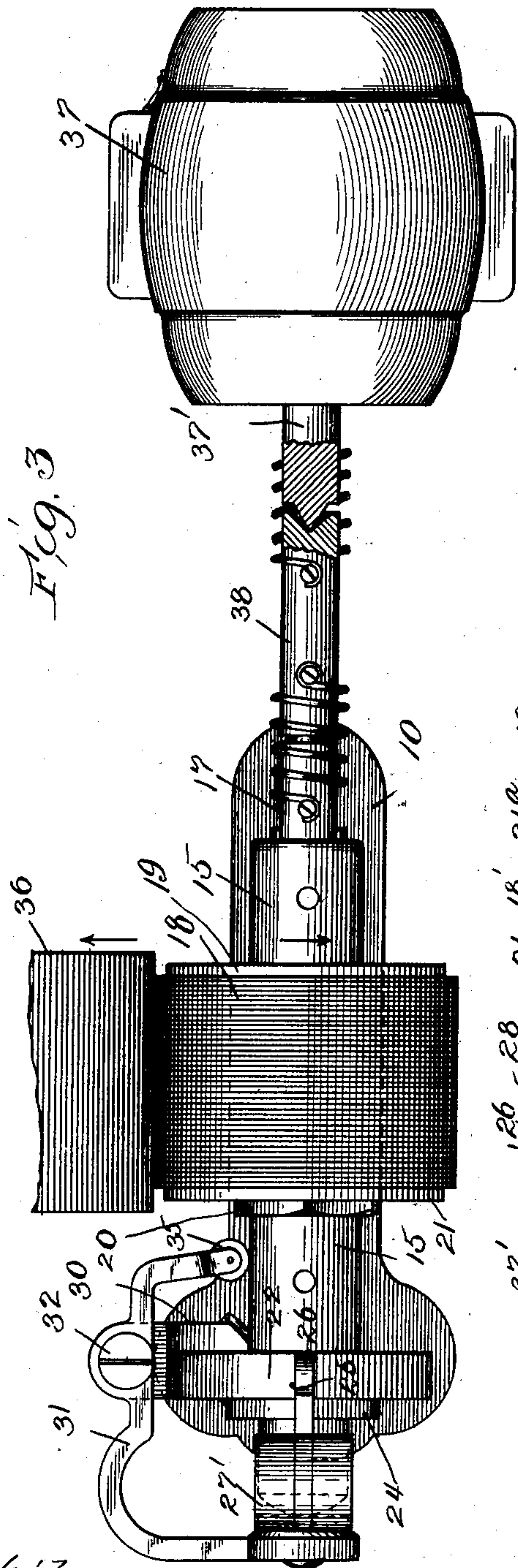
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Witnesses:
Ray White,
Harry D. White.

Inventor:
Vincent G. Apple.
By *Forrest Rain* Atty.

UNITED STATES PATENT OFFICE.

VINCENT G. APPLE, OF DAYTON, OHIO.

AUTOMATIC FRICTION-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 754,185, dated March 8, 1904.

Application filed May 2, 1903. Serial No. 155,307. (No model.)

To all whom it may concern:

Be it known that I, VINCENT G. APPLE, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Automatic Friction-Governors; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

The primary object of my invention is to provide an automatic friction-governor adapted when operatively associated with a suitable prime mover to so regulate its own frictional contact with the prime mover that its driven shaft has imparted to it a speed of rotation not exceeding a certain predetermined limit irrespective of the speed of rotation of the prime mover.

A further object of my invention is to provide a device of the character described which is simple in construction and reliable and positive in operation.

In the drawings, Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is an end elevation of the same, illustrating its application to a fly-wheel as the prime mover. Fig. 3 is a top plan view illustrating an operative association of a device embodying my invention with a prime mover and a mechanism to be driven therefrom at a regulated speed. Fig. 4 is a central longitudinal vertical section taken on line 4 4 of Fig. 2.

Referring now to the drawings, 10 indicates a frame-base.

11 11 indicate short lugs projecting upward from the base 10 to afford pivotal support for a movable frame member.

In the embodiment shown 12 is a short longitudinally-disposed shaft secured in the bearing-lugs 11, as by a pin 13. Mounted upon said shaft 12 is a laterally-oscillating frame member 14, comprising a yoke having a sleeve portion surrounding the shaft 12 and uprights projecting upward from the ends of the sleeve and terminating at their upper ends in bearing-heads 15. A spring 16 is arranged to exert a constant tension upon the movable member of the frame, tending to force it in one direction of its lateral oscillation, said spring being

herein indicated as a coiled spring wound around the sleeve portion of the movable frame member or yoke and disposed under torsional tension with one end in engagement with one of the uprights of the movable frame member and its opposite end suitably secured to a stationary part of the device.

17 indicates the main shaft of the governor device, which acts as a transmission-shaft between the prime mover and the instrument to be driven. Said shaft is journaled in the bearing-heads 15 of the movable frame member and projects therefrom at both ends.

18 indicates generally a friction-cylinder of suitable construction affixed to the shaft 17 between the bearing-heads 15.

The form of cylinder which I have herein illustrated comprises a flanged bushing 19, having mounted thereon a series of circular leather disks 18', arranged side by side. The end of the bushing 19 opposite the flange is screw-threaded to afford a seat for a nut 20, which bears against a washer 21 and serves to hold the leather disks tightly together. Any suitable means, such as the screw 21^a, may be employed to retain the cylinder in place upon the shaft 17.

22 represents a collar secured, as by a pin 22', upon one of the projecting ends of the shaft 17, adjacent one of the bearing-heads 15.

23 indicates a cap mounted to slide longitudinally upon the shaft 17 beyond the collar 22 and completely covering the end thereof. The cap 23 extends into close proximity to the collar 22 and is provided with an external flange 24.

The collar 22 is provided with two diametrically-opposed slots 25, in which are mounted bell-crank governor-levers 26, pivoted at 26' and bearing at the extremity of their longer arms 27 governor-weights 27'. The short arms 28 of the governor-levers extend radially inwardly and lie behind the flange 24 of the cap 23.

On one side of the support 10, preferably to the side of the movable member toward which it is forced by the action of its spring 16, is arranged a stationary frame member whereon is pivoted a lever; one end of which is arranged to be actuated by the cap 23 and

the other end whereof contacts with the movable frame member. As herein shown, the stationary member is a pedestal 30, having at its upper end a bearing-surface at about the
5 height from the base 10 of the shaft 17.

31 indicates a curved lever pivoted, as at 32, upon the upper bearing-face of the pedestal 30. The outer extremity of the lever 31 is curved inward and extends across the axis
10 of the shaft 17 in close proximity to the cap 23 upon the end of said shaft. At its point of intersection with the axis of the shaft 17 the lever 31 is preferably enlarged, as indicated at 32, and is preferably provided with
15 a hardened bearing-plate 33, secured thereto by a screw 34 and arranged to afford a bearing for the rounded end of the cap 23. The other extremity of the lever 31 is also bent inward, and its end approaches the movable
20 frame member 14. In the present illustration the inner arm of the lever 31 is illustrated as provided with an antifriction-roller 35, bearing against one of the bearing-heads 15 of the movable member.

I have illustrated the governor above described as associated with a fragment of a fly-wheel or other prime mover 36 and a mechanism to be driven, such as a small dynamo
25 37. The friction-cylinder 18 is shown as in driving contact with the fly-wheel 36, and the shaft 17 is illustrated as flexibly connected with the shaft 37' of the dynamo 37. The flexible connection may be of any desired nature, that which I have herein illustrated comprising a tumbling-shaft 38, having at its ends
30 universal-joint connections with the shafts 17 and 37', respectively. A joint-and-socket connection maintained by a coiled spring is herein illustrated as a suitable universal and yielding
40 connection; but any other may be used, if found desirable.

The use and operation of my invention will be as follows: It is often found desirable to transmit power from a prime mover whose
45 velocity varies to a greater or less extent to a driven mechanism and at the same time to maintain the speed of the driven mechanism constant irrespective of increase of speed of the prime mover. One instance of such condition of affairs is found where it is desirable
50 to drive a dynamo at a given speed from a fly-wheel of a gas-engine or other variably-moving prime mover. Assuming that the surface of the fly-wheel 36, herein illustrated, is moved at varying speeds in the direction
55 indicated in the arrow, the operation of the mechanism illustrated will be as follows: The rotation of the cylinder 18, due to its frictional engagement with the face of the fly-wheel 36, is transmitted through the shaft 17
60 to the governor connected thereto and tends to throw the governor-balls 27' outward, as is apparent. The short arms 28 of the governor-levers are accordingly caused to exert
65 outward pressure upon the cap 24, tending to

move the latter axially outward. This tendency is resisted by the interposition of the end 34 of the lever 31, whose opposite extremity finds bearing against the movable member of the frame. The movable member aforesaid is held against lateral oscillation
70 by the tension of its spring 16, and up to a certain limit the outward pressure of the cap 24 upon the lever 31 will be balanced by the resistance of the said spring. If, however, 75 the velocity of the fly-wheel 36 exceeds a predetermined limit dependent upon the tension and strength of the spring 16 the pressure upon the cap 24, due to the centrifugal action of the governor, will move the end 32 of the
80 lever 31 outward, so that its opposite end engaging with the movable member of the spring will be forced inward, carrying with it the frame member 14 against the tension of the spring. The lateral movement of the frame
85 member 14 decreases the degree of contact between the friction-cylinder 18 and the fly-wheel 36 or entirely withdraws it from contact therewith, and the cylinder remains out of frictional contact with said fly-wheel until
90 the speed of rotation of the shaft 17 is reduced to such a degree that the tension of the spring 16 again balances or overcomes the centrifugal action of the governor. It follows, therefore, that while the speed of the fly-
95 wheel 36 is within a certain limit the surface speed of the cylinder 18 will be equal thereto; but when the speed of the fly-wheel 36 exceeds the determined limit the cylinder 18 will be intermittently removed from contact
100 therewith for such periods that its speed is maintained practically constant.

It will be apparent that rotation impressed upon the shaft 17 will be transmitted through the tumble-shaft 38 to the shaft 37' of the
105 dynamo 37 and that the arrangement of the tumble-shaft with its two universal joints and its yielding spring connections permits the bodily movement of the friction-cylinder toward or away from the fly-wheel necessary to
110 its proper operation.

For purposes of full disclosure I have described in some detail in the present specification a form of my invention which has been found practical and advantageous in operation;
115 but I do not desire to be understood as limiting myself to the specific form of means herein shown in all its details.

Having thus described my invention, what I claim, and desire to secure by Letters Patent
120 of the United States, is—

1. The combination with a rotating prime mover and a bodily-stationary device, having a rotatable element to be driven, of a translating and governing device comprising a support, a laterally-movable shaft mounted in
125 said support, a frictional power-transmitting instrumentality mounted on said shaft and arranged for normally operative association with the prime mover, a centrifugal device
130

mounted on said shaft, means for laterally moving said shaft out of operative association with the prime mover arranged to be actuated by the centrifugal device, and a flexible shaft
5 connection between the shaft of the translating and governing device and the rotatable element of the bodily-stationary device.

2. The combination with a rotating prime mover and a bodily-stationary device having
10 a rotatable element to be driven, of a translating and governing device comprising a support, a frame member movably mounted thereon, a rotatable shaft carried by said frame member, a frictional power-transmitting instrumentality secured to said shaft for rotation
15 therewith and normally arranged in operative association with the prime mover, means for moving the frame member to remove the power-transmitting instrumentality from operative association with the prime mover, and
20 a governing device operatively associated with the shaft to actuate the moving means, and a tumble-shaft arranged to connect the shaft of the translating and governing device
25 with the rotatable element of the bodily-stationary device, said tumble-shaft having universal joints at each of its ends.

3. In a device of the character described a base having a fixed bearing-pedestal, a pivoted yoke mounted on the base, a shaft journaled for rotation in the yoke, a friction-cylinder secured to said shaft, a centrifugal governor upon the shaft operatively associated
30 therewith, a lever pivoted to the bearing-pedestal, one end of the lever being associated

with the governor and its other end arranged to bear against the yoke, whereby the movement of the governor serves to turn the yoke on its pivot to vary the position of the friction-cylinder, and a spring arranged to restore the
40 yoke to normal position.

4. In a device of the character described, a base 10 having lugs projecting therefrom, a yoke 14 mounted for oscillation in said lugs, a bearing-pedestal 30 projecting from the
45 plate 10 on one side of the axis of oscillation of the yoke, a shaft 17 journaled for rotation in said yoke and projecting beyond the same at both ends, a friction-cylinder mounted on
50 said shaft between the yoke-arms, a centrifugal governor secured to the shaft 17 beyond one of the yoke-arms and comprising weights having arms 28, a cap 23 mounted on the end
of the shaft beyond said governor and arranged to cooperate with said arms, a lever
55 31 pivotally mounted on the pedestal 30, having one arm axially arranged in contact with the cap 23 and its other arm arranged in contact with the yoke, and a spring arranged to
60 normally hold the yoke at its limit of movement in the direction of said lever-arm contacting therewith.

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

VINCENT G. APPLE.

In presence of—

L. M. ARNOLD,

N. H. KELLEHER.