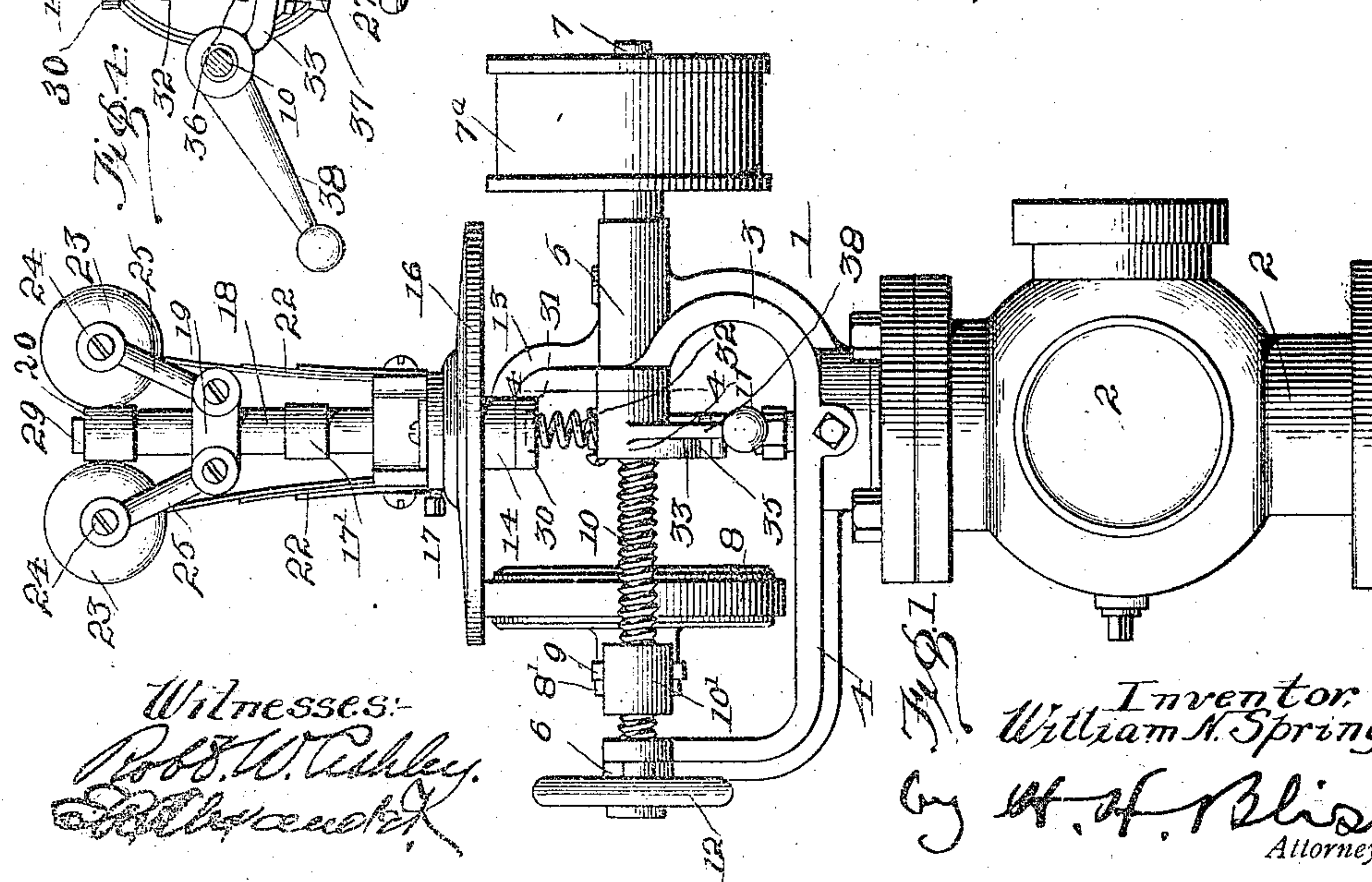
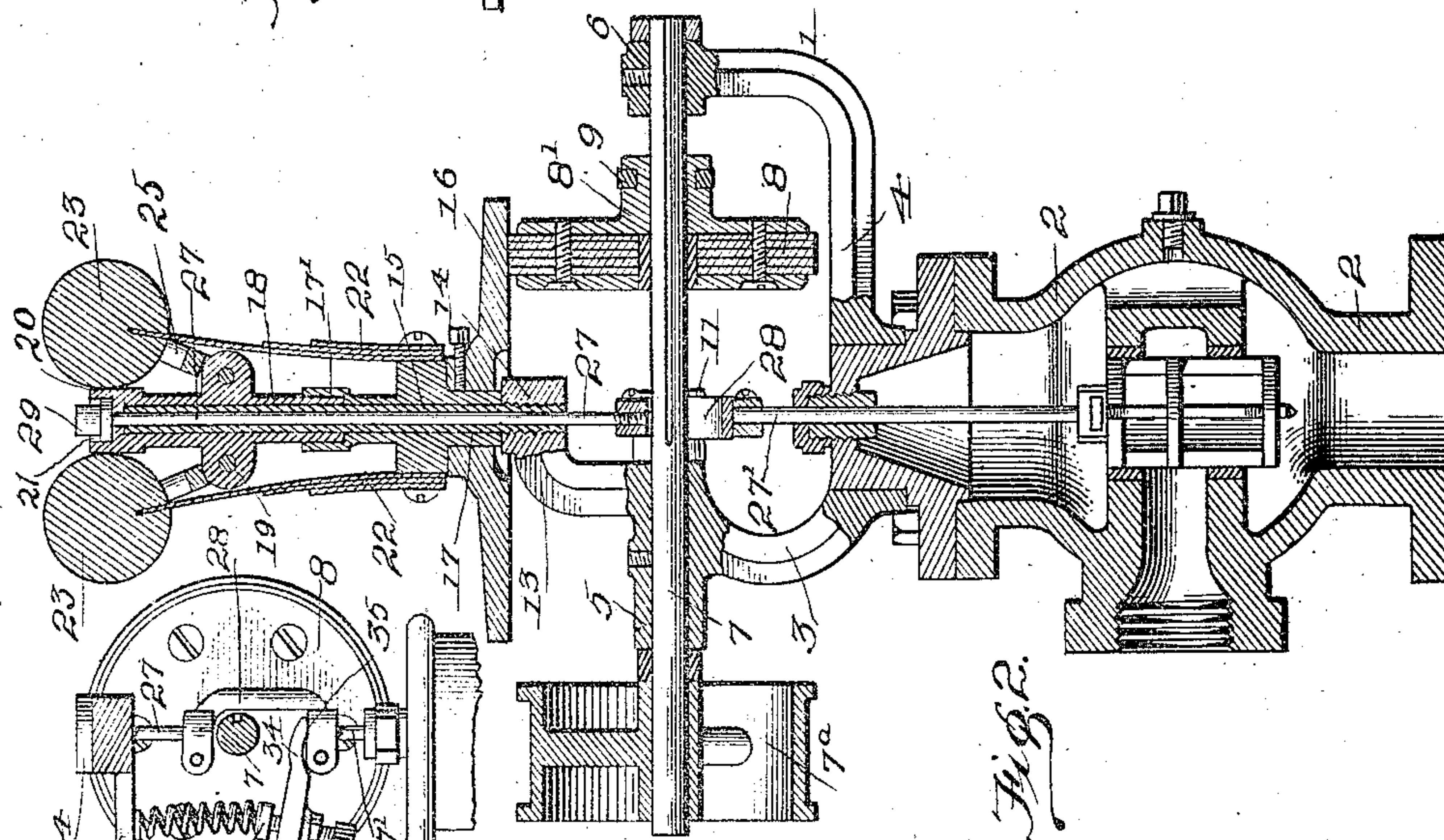
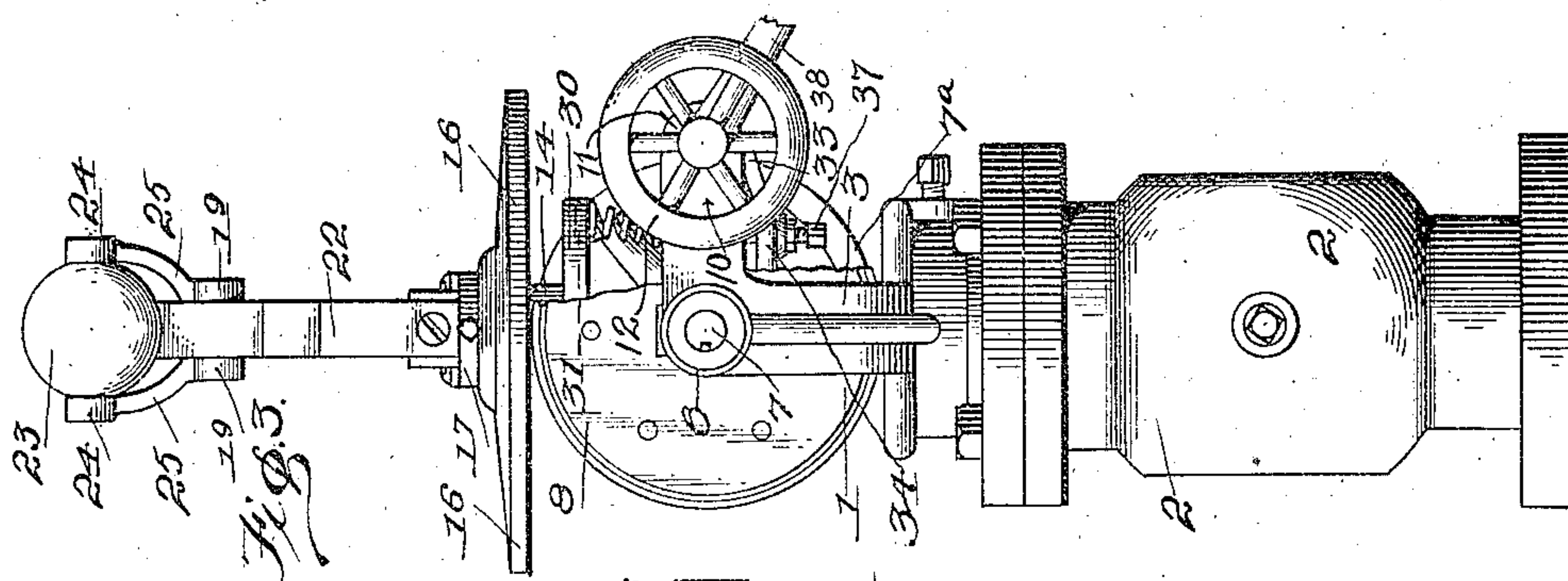


No. 785,127.

PATENTED MAR. 21, 1905.

W. N. SPRINGER.  
ENGINE GOVERNOR.

APPLICATION FILED AUG. 10, 1903.



Witnesses:  
Robt. W. Uhley.  
[Signature]

Inventor  
William N. Springer.  
By W. H. Bliss  
Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM N. SPRINGER, OF PEORIA, ILLINOIS, ASSIGNOR TO AVERY MANUFACTURING COMPANY, OF PEORIA, ILLINOIS, A CORPORATION OF ILLINOIS.

## ENGINE-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 785,127, dated March 21, 1905.

Application filed August 10, 1903. Serial No. 169,012.

*To all whom it may concern:*

Be it known that I, WILLIAM N. SPRINGER, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Engine-Governors, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in governors for steam-engines, it being intended to automatically govern or control the passage of steam from the boiler to the cylinder.

Figure 1 is a front elevation of a governor embodying my improvements. Fig. 2 is a central vertical section. Fig. 3 is a side elevation of the same. Fig. 4 is a section on the line 4 4, Fig. 1.

In the drawings, 1 indicates the framework of the governor, adapted to be bolted to the top of the valve-chamber 2, which is connected to the steam-chest and to the boiler-conduits in any preferred way. This frame comprises an upright or standard 3 and a cross bar or plate 4, the former having a horizontal bearing at 5 to support the driving-shaft, there being a companion bearing at 6 at the other end of the frame. The driving-shaft is indicated by 7, it being mounted in the bearings at 5 and 6 and is provided with a belt-pulley 7<sup>a</sup>, by which it can be connected to the crank-shaft or other suitable part of the engine. Upon this shaft there is a friction pinion 8, connected to the shaft loosely by means of a spline or feather, so that it can be adjusted longitudinally of the shaft while revolving. Such adjustment can be caused by means of a fork-arm 9, which engages with a grooved hub 8' on the pulley, the arm being connected to a screw-threaded shaft 10, engaging with a nut at 10' and having a hand-wheel 12, the other end of the shaft being mounted in a bearing at 11, supported on the standard 3. The parts last referred to not only serve to move and adjust the friction-pinion 8, but also to lock it in fixed position of adjustment. The bearing is cast with the arm 3, and from it there extends upward integral therewith an arm, (indicated by 13.) This has a ring-like portion at 14, which is

concentric with the valve-rod and through which the latter passes. 15 is a tubular bearing that extends upward from and is rigidly secured to the part 14.

16 is a relatively large friction-wheel lying in horizontal planes and mounted so as to rotate on the vertical axis of the tubular bearing 15. This friction-disk is not only the driven or power-receiving device of the governor, but is also the part which supports those that are moved automatically in accordance with the increase or decrease of speed in the engine. It carries the governor-balls 23, which engage with springs 22, that at their lower ends are rigidly connected to the supporting and driven wheel 16. Preferably I secure the rigid attachment in the way shown—that is to say, I provide a sleeve 17, concentric with the axis of the friction-wheel 16, and secure this sleeve rigidly to the latter, the sleeve having arms to which the springs 22 are fastened.

Above the sleeve 17 there is a loose sleeve or tube 18. The valve-stem 27 passes axially through the parts referred to—namely, the friction driven and supporting wheel 16, the tube 17, rigid therewith, and the loose tube 18. To the loose tube 18 there is secured a collar 19, to which are pivoted links 25, that are in turn at their other ends pivoted to the governor-balls 23. As the balls move outward during rotation they tend to draw the collar 19 upward and with it the loose sleeve 18 moves vertically. The valve-stem 27 has an enlarged head 29, which engages with the upper end of the tube 18, the latter being preferably formed with a head 20, having a socket at 21 to receive the stem-head 29.

30 is an arm or projection extending from the aforesaid central part 14 of the frame. The upper end of a spring 32 is seated in a recess 31 in the said arm 30.

The aforesaid part 27 of the valve-stem is connected to the lower stem part 27' by means of a yoke or stirrup 28, joined to the said parts of the stem and carried out far enough to escape the driving-shaft 7.

33 is a control-lever mounted on the aforesaid shaft 10 and having at its lower end an



arm 34, which normally extends inward and rests upon the upper end at 35 of the valve-stem section 27'. At the upper end this lever has an arm 38, by which it can be moved  
5 by hand when desired.

The spring above referred to (indicated at 32) bears upon the arm 34 of lever 33 through the medium of the adjusting devices at 36 37, these parts being a screw engaging with the  
10 arm 34 and having a head at 36 which serves as an abutment for the bottom part of the spring. By the threaded elements the tension of the spring can be adjusted at any time as desired.

15 What I claim is -

1. A governor of the character described, provided with speed-changing frictional gearing, a steam-controlling valve directly below the gearing, a vertically-movable valve-rod  
20 associated with said frictional gearing, a spring bearing directly on said valve-rod arranged to normally maintain the said frictional gearing in operative engagement, and means for shifting one of the gears across the face of its  
25 opposing gear, substantially as set forth.

2. In a governor of the character described, the combination of the horizontal shaft, the driving pinion-wheel thereon, the horizontally-rotating friction-wheel engaging with  
30 said driving pinion-wheel and mounted on a vertical axis, a steam-controlling valve situated on said vertical axis, a vertically-movable valve-rod extending continuously from the valve to points below the horizontally-rotating friction-wheel, a spring bearing directly  
35 on the said valve-rod, and means for shifting one of the gears across the face of its opposing gear, substantially as set forth.

3. In a governor of the character described,  
40 the combination of the speed-changing gearing comprising friction-disks, means for shifting one of said disks across the face of its opposing gear to change the point of contact, a vertically-arranged valve-rod, governor-balls  
45 connected to said valve-rod arranged to move

downward as they increase in rotary speed, means connecting the said balls directly to one of the friction-gears, and means for maintaining the friction-disks normally in engagement with each other, substantially as set forth. 50

4. The combination with the steam-duct, the valve therein, the driving-shaft, the driving friction-pinion thereon, the driven friction-wheel, the valve-rod extending from points below to points above the shaft, the spring below  
55 the driving-shaft engaging with the valve-rod, the governor-balls, means connecting the governor-balls with the valve-rod, and means connecting them with the driven friction-gearing, substantially as set forth. 60

5. In an engine-governor of the character described, the combination of the valve and the valve-rod, of the governor driving-shaft transverse to the line of the valve-rod, the driving friction-pinion on said shaft, the  
65 driven friction-wheel rotating around the line of the valve-rod, the centrifugal acting device connected with the friction-gearing and with the valve-rod, and means associated with the said rod for maintaining the frictional gearing  
70 normally in operative engagement, substantially as set forth.

6. In a governor of the class described, the combination of the valve, the valve-rod, the friction-gearing, the governor-balls arranged  
75 to move downward and outward with increase of speed, means interposed between the balls and one element of the friction-gearing and adapted to transmit pressure from the balls to said gearing element, and means interposed  
80 between the balls and the valve-rod whereby the latter is moved longitudinally, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM N. SPRINGER.

Witnesses:

A. A. NELSON,  
L. W. HAZARD.