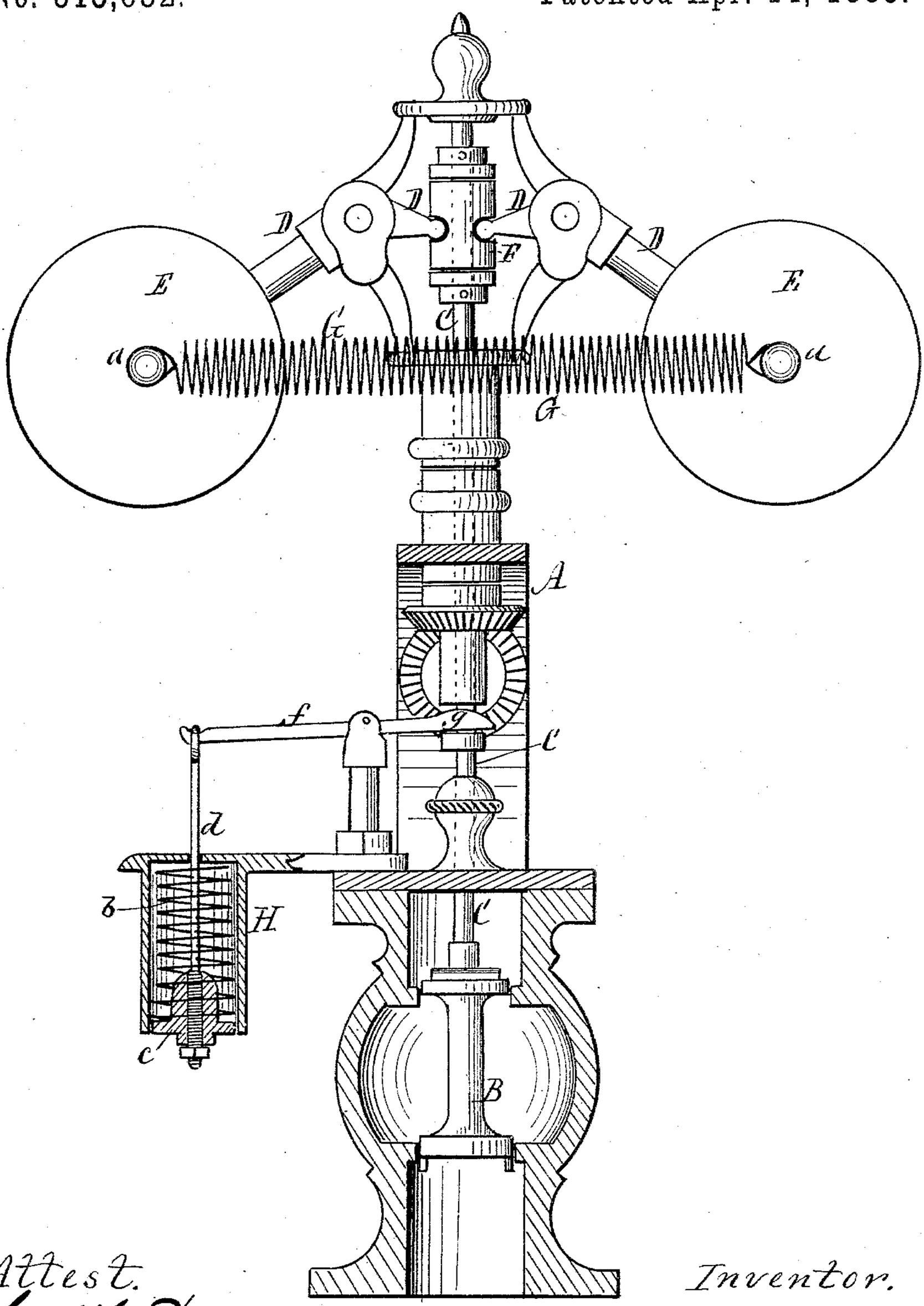
(No Model.)

J. JUDSON.

GOVERNOR.

No. 315,632. Patented Apr. 14, 1885.



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JUNIUS JUDSON, OF ROCHESTER, NEW YORK.

GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 315,632, dated April 14, 1885.

Application filed July 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, JUNIUS JUDSON, of Rochester, Monroe county, New York, have invented a certain new and useful Improvement in Governors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which the figure shows a central vertical section of a governor with my invention applied thereto.

The object of this invention is to render the governor more sensitive to variations of engine-speed caused by variations in boiler-pressure, or by variations in the resistance against which the engine labors.

In the drawing, A represents the ordinary Judson governor, and B is the valve attached to a rod, C, which extends up to the top of the governor, and is operated by means of the arms D D, attached to the governor-balls E E, this form being well known in the Judson governor.

My improvement is as follows:

G G are coiled springs, one on each side of the governor, attached to studs *a a* in the center or other part of the balls, and extending from one ball to the other, as shown. These springs exert tension on the balls, and tend to hold them down, and therefore a more rapid motion is required to start the balls up than in the ordinary governor where no springs are used.

H is a spring tension device attached to the casing, and which I denominate the "spring-speeder." It consists of a small barrel or cylinder holding a coiled spring, *b*, resting on a follower, *c*, in the bottom of the barrel, the follower having a stem, *d*, screwing therein, which extends up through the top of the barrel, and hooks on the end of a lever, *f*. The lever is pivoted midway, and its opposite end forms a head, *g*, which is forked and embraces the valve-rod C, and is connected therewith so that as the lever is moved it will correspondingly operate the rod up or down. The constant pressure of the spring downward in the barrel has a tendency to raise the rod against the action of the balls. Both of these devices—viz., the springs on the balls and the spring-speeder—have before been used on governors, but, so far as I am aware, each separately, and never both together. By their use in combination some advantages are attained, as follows: It is desired to exert as nearly as possible a regular and gradually-increasing tension upon the balls and valve-rod during the whole range of the balls from their lowest to their highest position. It is also desired to attain an increased velocity of the balls before they commence to rise, as in that case, when they do commence to rise, they go through the range of motion with the minimum of change of speed in the engine. The tension of the spring-speeder is the least on the balls in their lowest position when they commence to rise, and then this tension gradually increases as the balls go higher. On the contrary, the action of the springs on the balls is the greatest in the first movement of the balls, and gradually decreases as the balls go higher. This is owing to the springs gradually approaching the pivots as the balls rise, and drawing less directly downward. If carried clear up in line with the pivots, they would exert no action at all upon the balls. The effect is therefore to equalize the action and make it more uniform and regular. As the springs decrease in power upon the balls, the spring-speeder increases in power, so that at the highest position of the balls the action is as regular as at the lowest.

It has been found in practice that although the springs alone are effective in their first action, and during a portion of the movement of the balls, when the balls rise high so much of the force of the springs is lost that the balls are accelerated and irregular from want of steadiness of the governor, and that the valve will plunge more or less, and much difficulty occurs from this source, especially in large engines. Where the spring-speeder alone is used, it is difficult to obtain sufficient tension to get the proper speed before the balls begin to rise without making the spring-speeder so stiff that in the higher position of the balls too much tension is obtained for the proper working of the governor. By combining the springs and the speeder as described these difficulties are avoided.

Having thus described my invention, I claim—

In a governor, the combination, with the valve and longitudinally-reciprocating valve-spindle and governor-balls E E, of a spring

or springs, G, acting to draw the balls downward and inward, and decreasing in force as the balls rise, and a spring-speeder, H, connected with the spindle and acting against the centrifugal action of the balls with increasing force as the balls rise, substantially as above set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JUNIUS JUDSON.

Witnesses:
R. F. OSGOOD,
WM. J. MCPHERSON.