W. MEIN.

Steam-Governor.

No. 165,851. Patented July 20, 1875.

Fig. 1

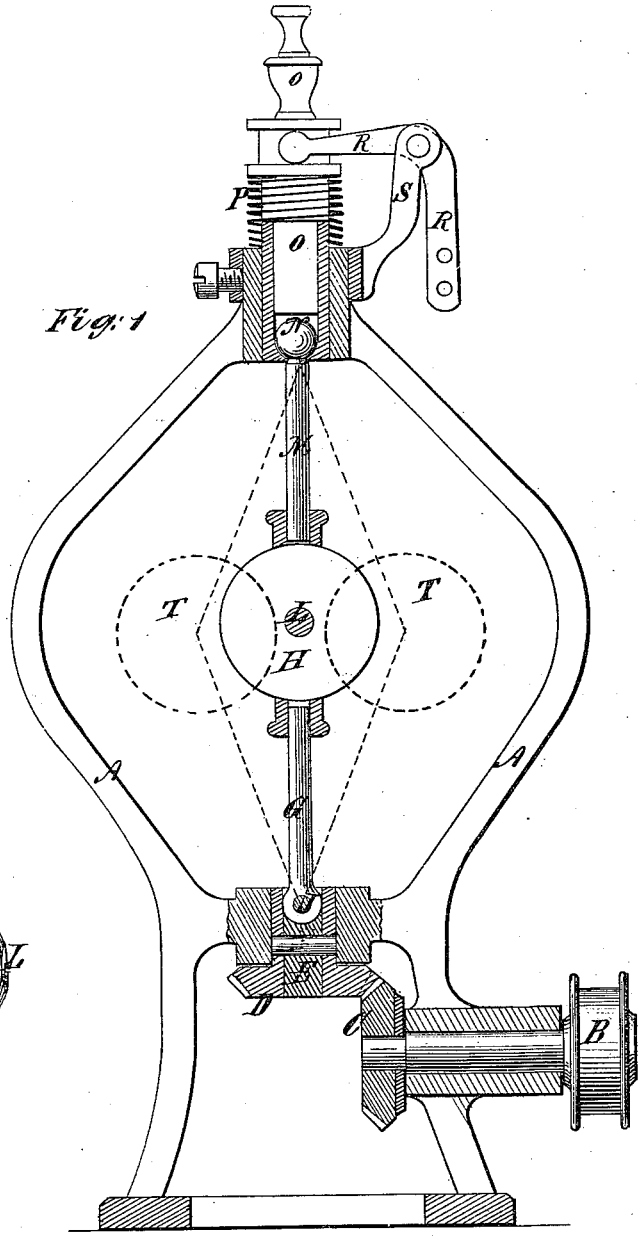
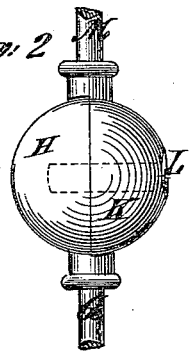


Fig. 2



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WILLIAM MEIN, OF STRATFORD, ESSEX, ENGLAND.

IMPROVEMENT IN STEAM-GOVERNORS.

Specification forming part of Letters Patent No. **165,851**, dated July 20, 1875; application filed July 18, 1874.

To all whom it may concern:

Be it known that I, WILLIAM MEIN, of Stratford, Essex, England, engineer, a subject of the Queen of Great Britain, have invented or discovered new and useful Improvements in Steam-Governors; and I, the said WILLIAM MEIN, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof—that is to say:

My invention of improvements in steam-governors consists in so arranging the working parts as to dispense with the ordinary outside levers and rotating balls, and also with the central spindle for a part of its length, whereby I obtain greater simplicity of construction and increased sensitiveness of action.

I construct a light cast-iron frame-work or carrier-bracket, which may be bolted to any part of the engine most convenient for the action of the governor, the place preferred, under ordinary circumstances, being, for stationary engines, across the slide-bars, about the center of the bed. At the base of this frame-work is cast a bearing carrying a short cross-shaft. On the outer end of the shaft is keyed a small band or cord pulley, receiving motion from the crank-shaft or other convenient working part of the engine, and communicating that motion to the governor. On the inner end of the cross-shaft is keyed a bevel, miter, or spur-pinion, gearing into a wheel, which runs freely in a vertical bearing cast to the frame-work. In a central position within the frame-work is a single governor-ball cut through the center, forming two semi-spherical halves, each half having a small projection or boss cast on. The two halves are held together by a screwed pin, preventing them being drawn asunder, but allowing reciprocal motion on their faces. Into each half of this ball is screwed or otherwise fixed a short spindle or lever, the lower one being continued down and into a small bush in the wheel. The spindle is pinned to the bush, and the bush is pinned to the wheel, so that rotary motion is communicated from the wheel to the spindle and ball, the spindle being also allowed to oscillate on its pin so as to adjust itself to the extension of the ball. Owing to its centrifugal motion the spindle or lever connected to the other half of the ball is continued upward, and has at the top a spherical end, forming, with a spherically-recessed bush, a ball-and-socket joint. This bush is pinned onto a short vertical spindle rotating and sliding in a bearing at the top of the frame-work. From the frame-work projects a small bracket, which may be either loose or cast on. This bracket carries a bell-crank or straight lever, with a forked end clipping the spindle. Around the spindle is a strong spiral spring, which tends to keep the ball and rods in a central position when not in action, and also to bring them toward that position whenever the speed of the engine is lessened. The connection between the engine and the governor may be made by belt or gearing, as most convenient.

When the engine is set to work rotatory motion is communicated to the ball, which rotates in a greater or less circle, according to the velocity of the driving-wheel. The greater the circle of gyration the more the spindle becomes depressed. As the circle decreases through the loss of speed the spring elevates the spindle, and tends to straighten the levers, thereby acting immediately on the throttle-valve of the engine.

One section of the ball may be infinitesimally lighter than the other, or a portion of one section may be cut away in such a manner that the center of gravity will not be absolutely in the axis of rotation of said ball, or the arms may be connected with the ball so as to secure such result.

My improved governor is connected to the steam-valve by rods and levers, or by any of the ordinary ways. The frame-work of this governor may be made of a box form, so as entirely to inclose the working parts.

And in order that my invention may be better understood and more readily carried into effect, I will now proceed to describe the drawing hereunto annexed, in which—

Figure 1 is a sectional elevation of a complete governor, and Fig. 2 a detail view of the governor-ball and spindles.

A A are the frame-work. B is the band-pulley, receiving motion from the engine. C is the bevel-pinion, keyed to the cross-shaft. D is the driving-wheel, with a long boss rotating

in the bottom bearing of the frame-work. E is a slotted shaft pinned to the driving-wheel D, so as to prevent said slotted shaft from rising. J is a pin by which the spindle G is fastened to the slotted shaft, from which it receives rotatory motion. H is one-half of the governor-ball, which is fastened to the other half, K, by the screwed pin L. M is the upper spindle, forming a ball-and-socket joint with the spherically-recessed bush N. This bush is pinned to the vertical spindle O, which rotates and is also drawn down by the action of the ball. P is a spiral spring acting between the collar of the spindle and the top of the frame-work. R is a lever carried by the bracket S, for connecting by rods to the throttle-valve. T shows the positions of the ball when revolving at their greatest speed.

From the above description it will be seen that the arms are connected with the sections of the ball in such manner that the center of gravity will not be absolutely in the axis of rotation of said ball, so that the slightest deviation will be sufficient to insure the flexure of the point of centrifugal rotation. The parts being thus arranged, the arms will not be allowed to come in a straight line.

Having now described and particularly ascertained the nature of my said invention, and how the same is to be carried into effect, I would have it understood that what I claim, and desire to secure, is—

The combination, with the pivoted spindle G and the spindle M, connected with the valve-operating spindle O, of the single divided governor-ball H K, pivoted between the spindles, substantially as described, and the whole constructed to operate in the manner and for the purpose specified.

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