

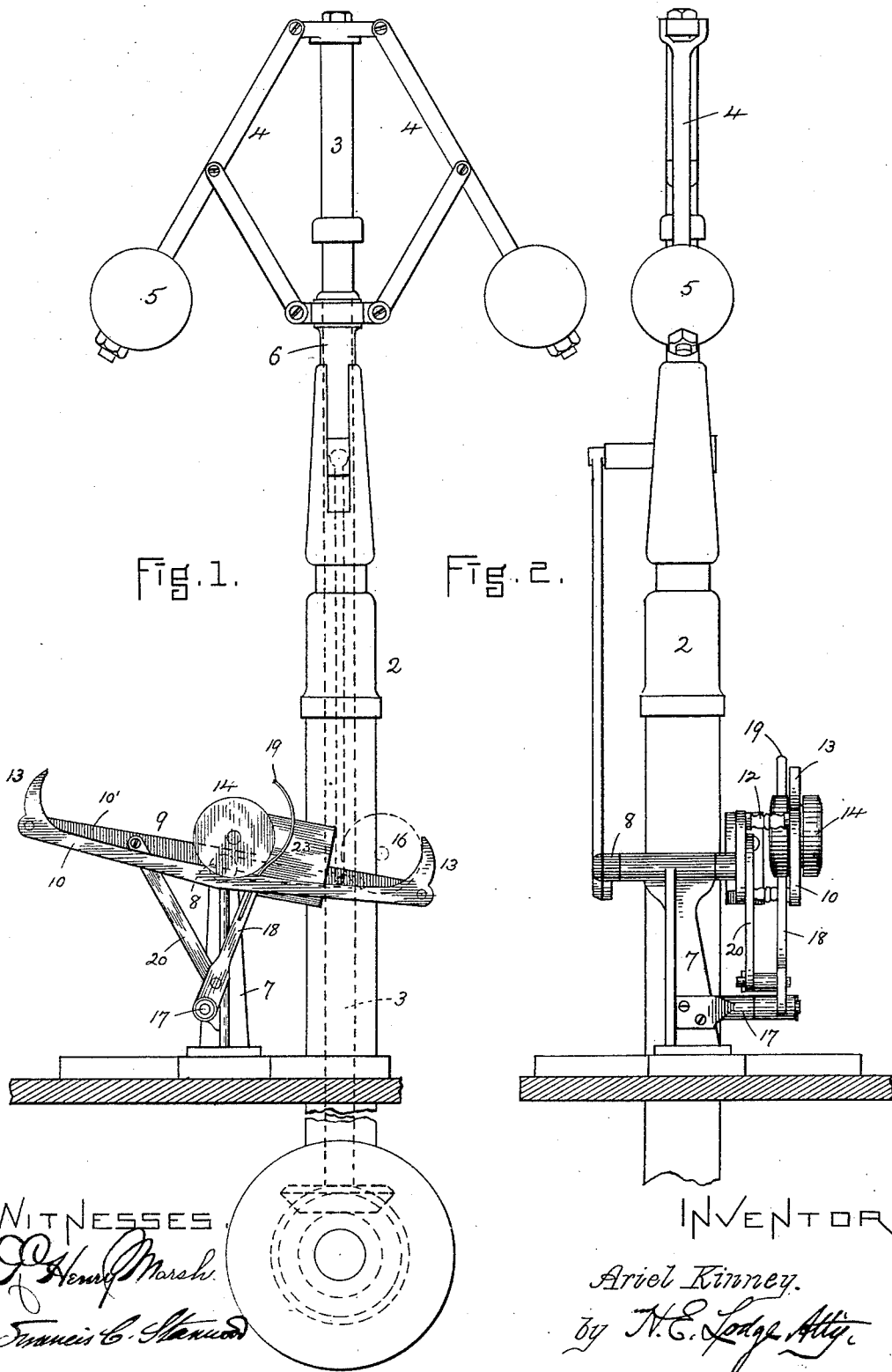
(No Model.)

2 Sheets—Sheet 1.

A. KINNEY.
ATTACHMENT FOR SPEED GOVERNORS.

No. 419,202.

Patented Jan. 14, 1890.



WITNESSES.
Henry Marsh.
Francis C. Stenwood

INVENTOR,
Ariel Kinney.
by N. E. Lodge, Atty.

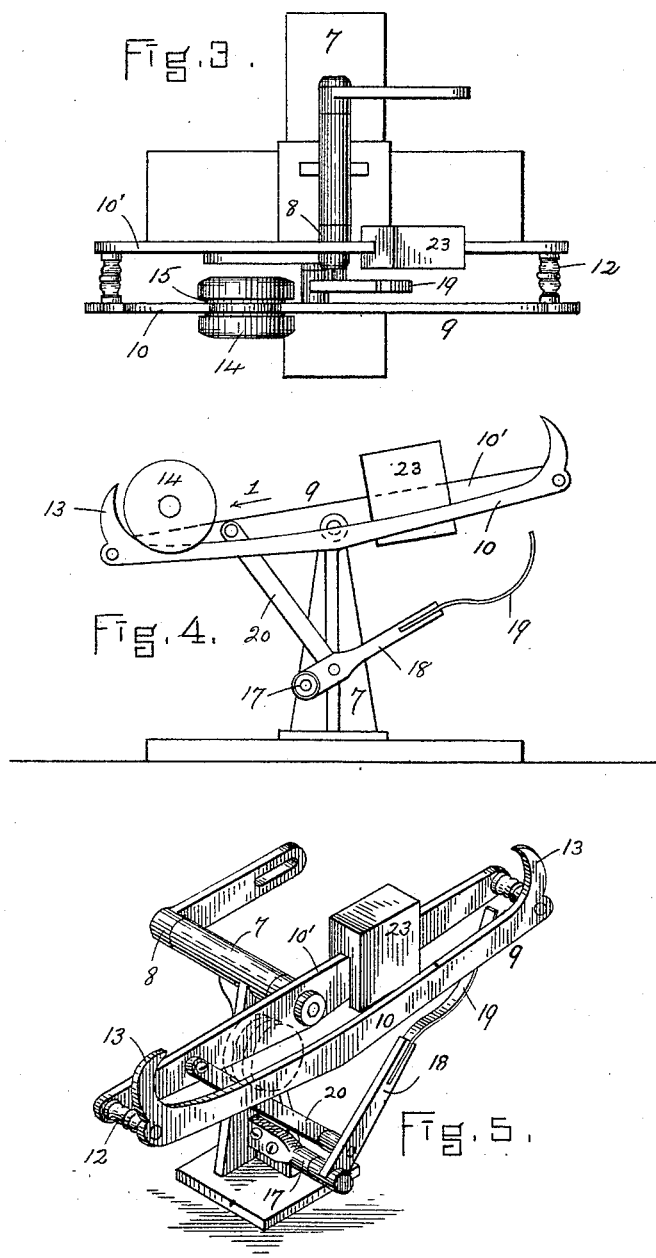
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UNITED STATES PATENT OFFICE.

ARIEL KINNEY, OF LOWELL, MASSACHUSETTS.

ATTACHMENT FOR SPEED-GOVERNORS.

SPECIFICATION forming part of Letters Patent No. 419,202, dated January 14, 1890.

Application filed October 7, 1889. Serial No. 326,213. (No model.)

To all whom it may concern:

Be it known that I, ARIEL KINNEY, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Attachments for Speed-Governors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to governors by which the speed of engines or other motors is to be maintained uniform for a variable load or under varying steam-pressure. My invention, furthermore, is particularly adapted to "ball-governors," so termed, in which the supply of steam is to be regulated by centrifugal action upon gravity-weights.

The object of my invention relates to improvements in an attachment by which the action of speed-governors is improved and they are rendered more sensitive. This attachment is embodied in a tilting frame, upon which is mounted a free-rolling weight, the latter serving to augment the action of the governor, since, instead of allowing the speed alone to regulate the action, this weight is utilized, and the result is that the differences in the speed necessary heretofore to produce a given result are not now requisite. Consequently the governor is much more sensitive and the extremes in variation of speed are reduced to a minimum.

The drawings represent, in Figure 1, a front elevation of an attachment embodying my invention attached to a speed-governor, the latter at rest. Fig. 2 is an elevation. Fig. 3 is a plan. Fig. 4 represents the position of parts after starting the motor, the governor being omitted. Fig. 5 is a perspective view of the tilting frame.

In the annexed drawings, 2 represents a hollow upright post, in which is located a rotary rod 3. Pivotaly secured to the upper end of said rod are a pair of oppositely-disposed arms 4, equipped with balls 5, said arms being connected with a reciprocating sleeve

6, operating the steam-supply valve. Laterally of said post 2, I have secured a standard 7, surmounted by a shaft 8, suitably journaled therein. One end of this shaft is connected with the reciprocating sleeve, by which rock-motion is given to said shaft. Upon the opposite end is firmly fixed a frame 9, centrally hung upon the rear bar, said frame being composed of two parallel bars 10 10', united at the ends by tie-rods 12 to strengthen it. The front bar 10 is curved lengthwise in a vertical plane, and terminates at either end in bent prongs 13, said bar being made to receive and maintain in proper position a rolling weight 14. The latter is formed with a central annular peripheral groove 15, which is of a width equal to that of the bar upon which it travels. This tilting frame 9 is to be directly influenced by the variable speed of the governor. Thus when the steam-pressure is excessive, or when the load is diminished, the outward action of the balls due to such increase in speed lifts the sleeve 6 and simultaneously depresses one end of the frame, the weight moving as shown by arrow 1. The bent terminals or prongs 13 prevent escape of the weight should the movement of the frame become excessive. When the governor is at normal speed, the weight is intended to vary but slightly to one side of the center of the longitudinal axis of the rock-shaft 8.

From the above construction and when the governor is at rest the rolling weight has heretofore been in the position as indicated at 16, the position of the latter at this portion of the frame indicating either total rest or low speed of the motor. Assuming, then, the governor is inactive, it is evident that in starting unnecessarily high speed must be attained, since the action of the governor must be retarded by the influence of the rolling weight at this point. To obviate this disadvantage is the object of my invention, and I have endeavored to arrange such mechanism that the weight is to be held inactive, or upon the pivotal axis of the frame, when the governor is at rest. As a consequence, when the engine is started the governor is unimpeded and is very sensitive and quick-working at the very moment of starting, while as

soon as the proper speed is attained any departure therefrom permits the weight to perform its duty, it being understood that coincident with the activity of the governor the weight is free to move in either direction. With this premise, I will proceed to describe how the above result is accomplished.

Upon the lower portion or base of the standard 7, I have bolted a short post 17, upon which is formed a bearing to receive the foot of an oscillating arm 18, bent at its free end, preferably being furnished with a thin piece of curved metal, as shown at 19. Proper oscillations of said arm are produced by means of a connecting-rod 20, pivoted at its upper extremity to the rear bar 10' of the tilting frame. At the opposite end said rod is fastened to a stud extending laterally from the foot of said arm 18. With such an arrangement it will be seen that the movements of said arm are just the reverse of those of the sleeve 6. Thus when the latter moves upwardly the arm moves downwardly. As a result, when the motor has stopped and the balls and sleeve have dropped to their extreme limit, the weight-supporting arm 18 at that time is in its extreme of upward oscillation. Such a point is preferably, as shown in Fig. 1, slightly to the right of the center of the rock-shaft axis, and hence, in lieu of permitting the weight to roll to the position indicated at 16, as heretofore, this weight-supporting arm now rises up and meets the weight as the sleeve drops. When the latter has attained its inactive position, the weight is opposed by the arm, and is so held until the governor again becomes active.

The weight-supporting arm is of such length as to prevent the weight from ever rolling over its free extremity. Moreover, the movements of the several parts by which said arm is actuated are such that the function of said weight is not affected in the least. In fact, the oscillations of said arm 18 are so timed that it contacts with the weight only as the balls of the governor drop, and just prior to a state of rest. Only then does said arm become active, and the weight of the balls causes the weight to be held over the axial point of the frame, and said weight is to all intents and purposes useless. In other words, the result performed by my invention is equivalent to the removal of the weight, while the governor is uninfluenced by the latter until the normal speed of the motor is obtained, when the weight is then perfectly free to roll. Upon the rear bar 10' of the frame, and to

one side of the center, is placed a counter-balance 23, which is intended to produce an effect equal to a change in the size or weight of the rolling weight, and the consequent results therefrom are thus easily obtained by causing said balance to approach or recede from the rocking pivot of the frame. In other words, this counter-balance is intended to adjust the speed to any exact number of revolutions. The said counter-balance may be made to fit so tightly on said frame that it will be held by its friction in any position to which it may be adjusted; or any convenient fastening device may be employed for the same purpose.

What I desire to claim is—

1. An attachment for speed-governors, composed of a rocking frame, a rolling weight thereupon, and an oscillating arm to contact with said weight at stated times, the oscillation of the arm and rocking of the frame being produced by the variable speed of the governor, substantially as stated.

2. The combination, with a rock-shaft mounted upon a standard and operated by the variable speed of the governor, a tilting frame, and a rolling weight thereon, of an oscillating arm secured to said standard with its free end to contact with said weight at specified times, and a connecting-rod secured to said frame to produce oscillations of the arm simultaneously with but oppositely to the rocking movement of said frame, substantially as specified.

3. In combination with a rock-shaft operated by the variable speed of a governor, a tilting frame secured to said shaft and composed of two parallel bars 10 10', the former curved in a vertical plane and with terminal prongs, the latter with a counter-balance, a rolling weight upon said bar 10, the oscillating arm 18, and the actuating-rod interconnecting said arm with the tilting frame, all operating substantially as herein described.

4. The combination, with a speed-governor and its attachment composed of a tilting frame carrying a rolling weight operated by the varying speed of said governor, of an arm oscillating reversely of the tilting frame by means of a connecting-roll, substantially as set forth.

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

ARIEL KINNEY.

Witnesses:

H. E. LODGE,

FRANCIS C. STANWOOD.