No. 751,557. PATENTED FEB. 9, 1904.

C. REEVES.

SHIFTABLE SHAFT BEARING.

APPLICATION FILED AUG. 18, 1903.

NO MODEL.

Fig. 1.

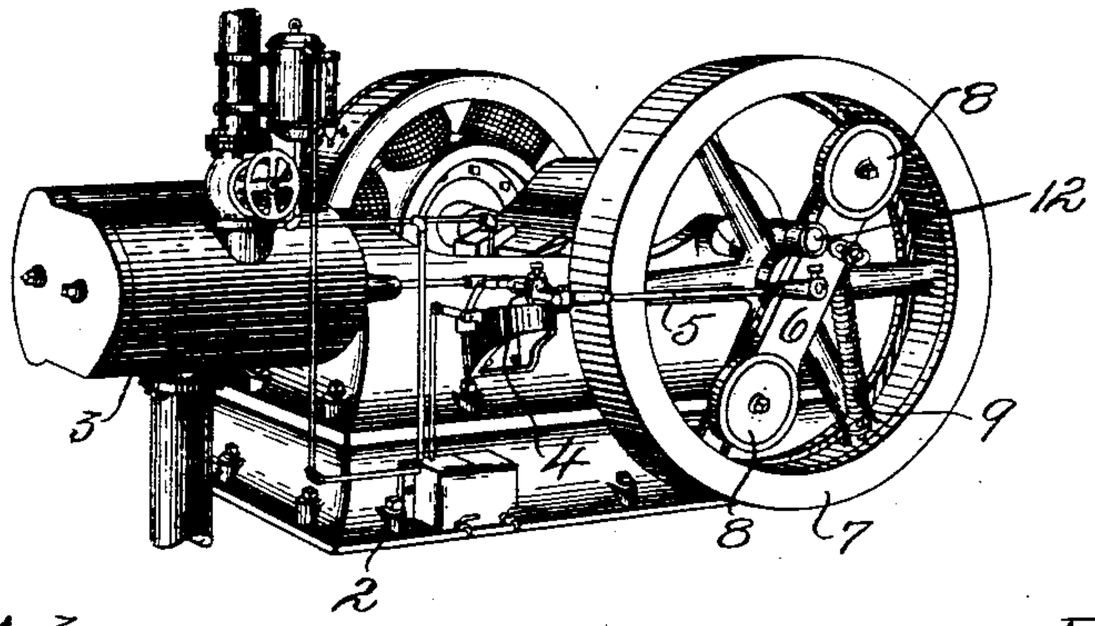
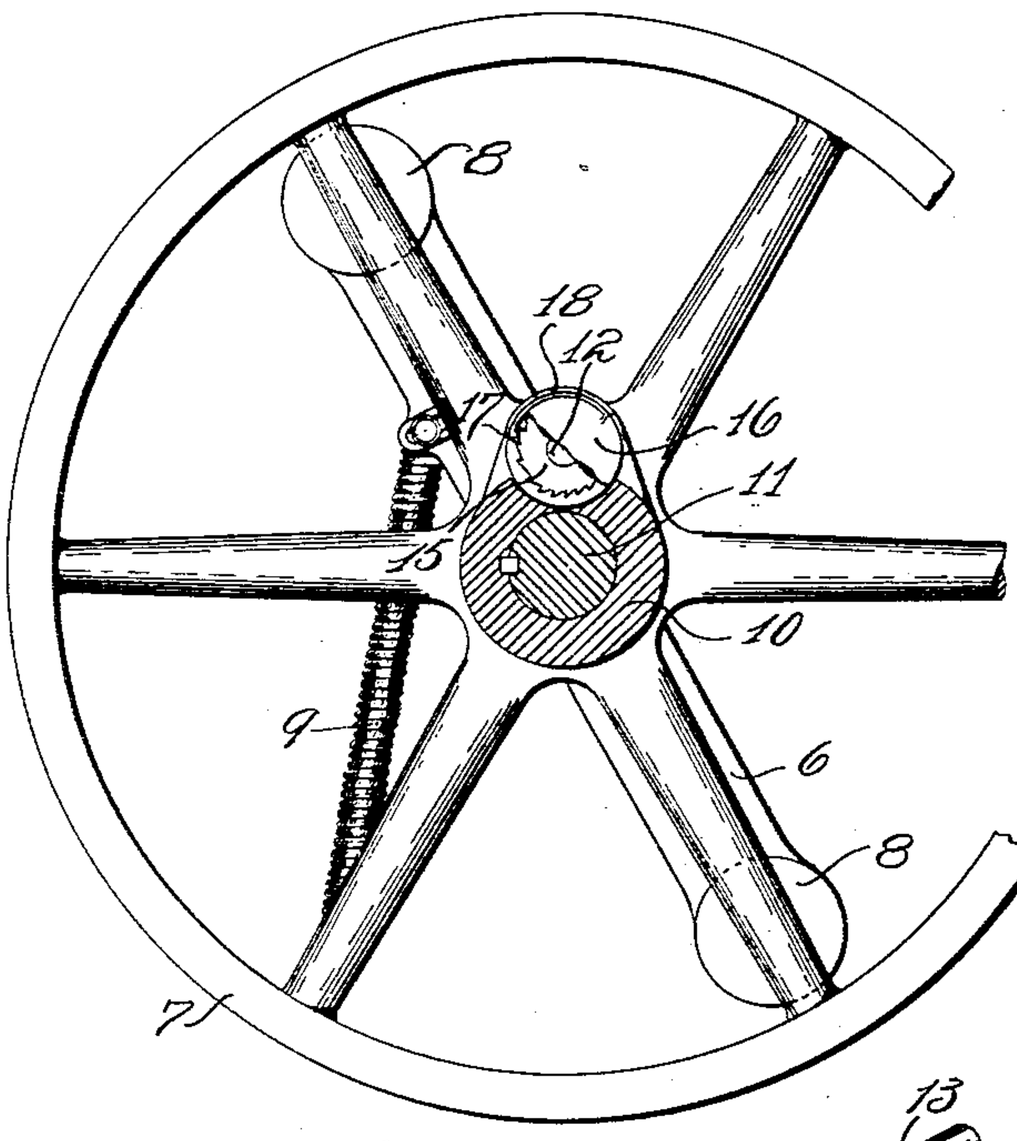
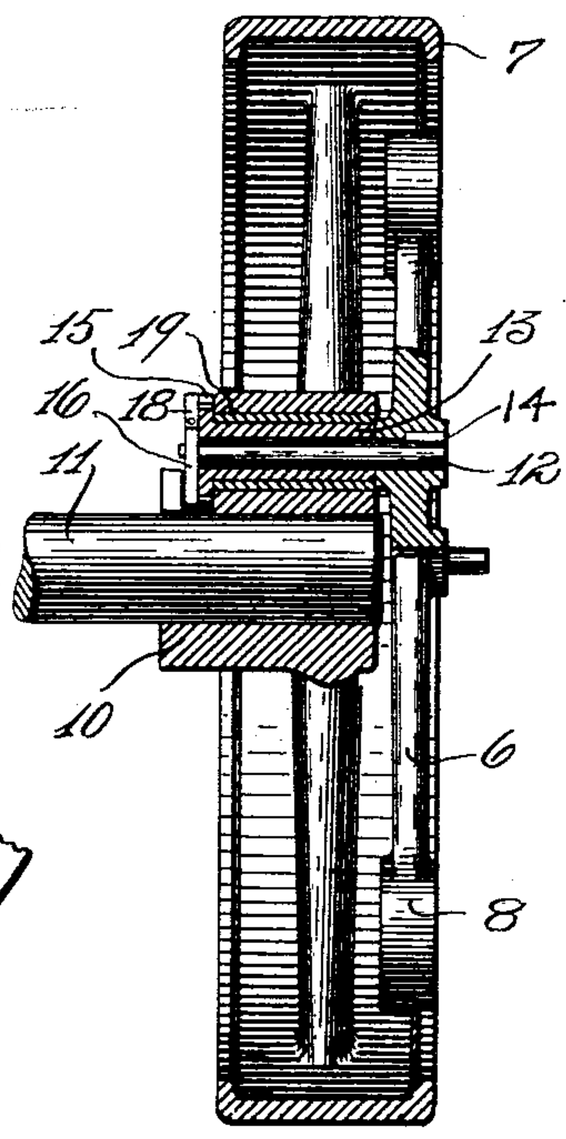



Fig. 3.

Fig. 2.



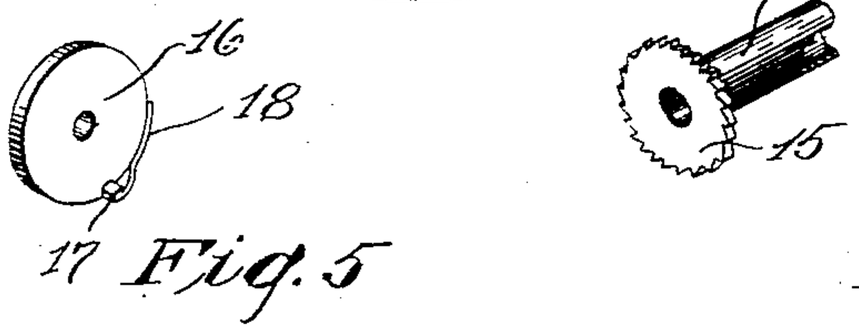







Fig. 5

Fig. 4.

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# UNITED STATES PATENT OFFICE.

CLIFTON REEVES, OF TRENTON, NEW JERSEY.

## SHIFTABLE SHAFT-BEARING.

SPECIFICATION forming part of Letters Patent No. 751,557, dated February 9, 1904.

Application filed August 18, 1903. Serial No. 169,869. (No model.)

*To all whom it may concern:*

Be it known that I, CLIFTON REEVES, a citizen of the United States, residing in Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Shiftable Shaft-Bearings, of which the following is a specification.

Bearings in which work shafts or analogous machine parts embodied in various mechanisms and machines are oftentimes liable to uneven wear, especially when the pressure per unit area varies over the surface of the bearing. This is not only true of shafts which in operation turn in the same direction, but of parts—such as shafts, pins, pivots, &c.—which oscillate through an arc less than a full rotation. The continued working of such parts tends in many instances in practice to occasion the establishment of conditions unfavorable to smooth and satisfactory motion. In order to nullify the effects, as far as may be, of such tendency, the present invention contemplates the provision for the rotating or oscillating part of a bearing which is capable of being shifted step by step in order to present intermittently a new relation of bearing-surfaces for the part. This lack of uniformity of wear around the cylindrical surface of the bearing is particularly noticeable in the governing mechanism of automatic high-speed engines, in which improper action on such mechanism, due, for instance, to the sticking or uneven motion of the weight-arm of the governor, materially interferes with the regulation. I have therefore illustrated an embodiment of the present invention in an application of the latter to the shaft-governor of an automatically-regulating high-speed engine.

In the drawings accompanying the present specification, Figure 1 is a perspective view of an engine having a shaft-governor and in the mounting of which latter the present invention is embodied. Fig. 2 is an axial section, upon a somewhat larger scale, of the fly-wheel or main pulley of the engine in which the shaft-governor is mounted, the section being taken through the supporting-pin of the governor or weight-arm. Fig. 3 is a face view of the parts represented in Fig. 2 looking from the left and part being broken away to show the ratchet-wheel on the bushing, in which latter said supporting-pin oscillates back and forth. Fig. 4 is a perspective view of such bushing, and Fig. 5 is a similar view of the collar rigid with said supporting-pin and which carries the spring-pressed pawl for engaging with the ratchet-wheel on the bushing.

Similar characters of reference designate corresponding parts in all the figures.

While the present improvements are represented as applied to the supporting-pin or short shaft of the governor or weight-arm comprised in the particular type of shaft-governor illustrated, it will of course be understood that the same is applicable under other conditions and to other mechanisms in which the bearing in which a shaft (this term being used to designate generally a part mounted in bearings) is mounted is designed for an intermittent rotation in order to present from time to time a new relation of surfaces constituting the bearing-surfaces.

Proceeding, however, to a description of the organization of parts illustrated, 2 designates the frame of an engine having the usual cylinder, steam-chest, and valve-chamber, (designated generally by 3,) and the steam regulation of which is controlled by a valve mechanism, such as 4, embodying a rod 5, pivoted to a governor-arm 6, mounted within a fly-wheel or main pulley 7. It will be understood, of course, that the particular governor construction illustrated is only typical and that the form of the arm 6, as well as the disposition and number of the weights 8 and spring 9, may be other than that indicated. The hub 10 of the fly-wheel 7 is secured to the main driving-shaft 11, and in this hub is mounted the supporting-pin 12 of the governor-arm, a bushing 13 constituting the bearing for this pin.

It is evident that in operation the pin 12, which is here shown fastened to the arm by a key 14, partakes of an oscillatory motion as the arm moves in and out by centrifugal action in effecting the regulation. This oscillation, however, takes place through an arc less than a full rotation, and if the bushing 13 is

fixed in place in the hub it is the general experience that the pin 12 is liable to stick in its bearings or otherwise interfere with the proper action of the governor in accomplishing the designed closeness of regulation. In order to obviate causes of improper action from such source, the bushing 13 is given a step-by-step rotation during the running of the engine, thus effecting a constant change in the relation of the wearing-surfaces, and thereby tending to make the wear proceed uniformly and evenly. This step-by-step movement or intermittent rotation may be conveniently effected by a pawl-and-ratchet device rendered operative through the oscillation of the governor-arm. In the particular construction of such device indicated the bushing is provided at one end with a ratchet-wheel 15, while rigid with the pin 12 is a pawl-carrier in the nature of a collar 16, secured to the end of the pin and carrying a dog or pawl 17 at the end of a spring-arm 18, secured to the collar. The parts are so organized that the pawl 17 remains constantly in operative engagement with the teeth of the ratchet-wheel 15, motion of the arm and hence of its supporting-pin in one direction causing the pawl to slide idly over the teeth of the ratchet-wheel, while when the arm moves in the opposite direction the ratchet-wheel and the bushing are turned through an angle, thus changing the relation of the wearing-surfaces.

Preferably the rotary bushing 13 is itself supported in a suitable annular shell or bearing 19, rigidly secured in the bore of the opening in the hub of the fly-wheel.

Having thus described my invention, I claim—

1. The combination with a supporting-shaft for a governor-arm, of a rotating bushing constituting a bearing for said shaft, a ratchet-wheel carried by said bushing, a pawl-carrier carried by said shaft, and a spring-pressed pawl movable on said carrier and engaging with the teeth of said ratchet-wheel.

2. The combination with a supporting-shaft for a governor-arm, of a rotating bushing constituting a bearing for said shaft, a ratchet-wheel carried by said bushing, a pawl-carrier carried by the shaft, a spring-pressed pawl mounted on said carrier adapted to engage with the teeth of the ratchet-wheel, and a bearing in which said bushing rotates.

3. The combination with the supporting-shaft for a governor-arm, of a bushing constituting a bearing for said shaft, a ratchet-wheel rigid with said bushing, a pawl-carrier rigid with said shaft, and a spring-pressed pawl mounted on said carrier and engaging with the teeth of the ratchet-wheel.

4. The combination with the supporting-shaft for a governor-arm, of a bushing constituting a bearing for said shaft, a ratchet-wheel rigid with said bushing, a pawl-carrier rigid with said shaft, a spring-pressed pawl mounted on said carrier and engaging with the teeth of the ratchet-wheel, and a bearing in which said bushing rotates.

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